

# The Study on Stress and Related Factors Among Pregnant Women During the COVID-19 Pandemic in Tertiary Teaching Hospital

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## Abstract

Covid 19 is one of the causes of stress among pregnant women. Stress increases the risk of complications in pregnancy and birth. The objectives were to assess the stress level among pregnant women attending Obstetrics and Gynecology Clinic at Hospital Sains Malaysia and find an association between stress levels during the COVID-19 pandemic and related factors (employment status, education level, and physical activity). The research design used in this study is cross-sectional - a self-administered questionnaire involving 207 pregnant mothers using simple random sampling methods. Most respondents had mild stress, 60.4%, followed by 39.6%, moderate and non-having high stress. There was a statistically significant association between stress level and employment status ( $p=0.003$ ). Thus, early detection can prevent complications and enable mothers to go through pregnancy happily.

**Keywords:** Stress, Pregnant Women, COVID-19 Pandemic.

## Introduction

Pregnancy can be a time of feeling happy to become a mother. However, pregnancy can also be a stressful time. Many pregnancy studies reported that the incidence of stress is higher during the perinatal period. Stress can adversely affect pregnant women and result in poor neonatal outcomes, such as can increase the chances of having a premature or a low-birth-weight baby. Furthermore, mental wellness is essential for maternal and fetal development (Khatri et al., 2019). Many studies conducted during the COVID-19 pandemic show increased stress among pregnant women.

Corona Virus Disease 2019 (COVID-19) has magnificent colossal mortality and morbidity burdens among the general population worldwide. COVID-19 virus affects high-risk people, including older people above 65, children, and pregnant women (Brenner, 2021). Pregnant women are the most vulnerable group with a greater risk of developing COVID-19. It was

associated with poor outcomes such as preterm birth, cesarean delivery, pre-eclampsia, and death (Huntley et al., 2020). A study published in *Communications Medicine* suggests that prolonged levels of stress and depression during the COVID-19 pandemic altered critical features of fetal brain development, even if the mothers are uninfected by the virus (Limperopoulos, 2022).

The present COVID-19 pandemic is considered a natural disaster with a worldwide health impact. Malaysians are also affected by COVID-19, which has caused many deaths. To break the COVID-19 transmission chain among the public, the Malaysian government implemented the Movement Control Order (MCO). In these challenging times associated with COVID-19, when there are several social and environmental disruptions, pregnant women might feel anxious and worry about their pregnancy, health, and fetus (Hossain et al., 2020).

Mental health problems resulting from the COVID-19 pandemic also afflict pregnant women (Farrell 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 (Aminah et al., 2021). In line with Ilska et al (2021), the common pandemic-related correlates of stress include uncertainty about being ill with COVID-19, limited access to outdoor space, cancellation or postponement of obstetric appointments, and compliance with safety rules and restrictions.

Consequently, anxiousness associated with devastating events or natural disasters can affect pregnant women's mental health (Feduniw et al., 2020). According to a study by Li et al (2020), fast-moving global health crises, such as COVID-19, have increased stress among pregnant women. The pandemic has introduced the fear of infection worldwide and fears for the fetus's health among pregnant mothers. The expectant mother also has stress-related preparation for childbirth. In addition, pregnant women encounter additional obstacles due to their responsibilities toward 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), as medical visits and routine follow-ups were limited to emergencies and severe cases only during the lockdown.

Due to the above concerns, this study investigates the consequences of psychological conditions outcomes during this COVID-19 pandemic in pregnant women in Hospital USM Kelantan. Besides, this study aimed to assess COVID-19 determinants of stress levels among pregnant women.

### **The Objective of the Study**

This study aimed to assess pregnant women's stress levels and related factors during the COVID-19 Pandemic in Hospital USM Kelantan.

### **Methods**

#### *Study Design and Period*

This study is a cross-sectional design conducted from January 2022 to April 2022. This study design was selected because it is the most stringent technique, allowing the result to be generalized to a larger population. And if appropriate, statistical analysis is performed (Kelly et al., 2003). Moreover, the cross-sectional data collection method is considered sufficient for this study and is usually used by many researchers.

### *Study Area*

This study was conducted at the Clinic Obstetrics and Gynecology, Hospital Universiti Sains Malaysia. Obstetricians, gynecologists, and midwives in the outpatient department have given ANC services in the hospital.

### *Eligibility Criteria*

The study population was pregnant women aged 18 years and above. The study excluded pregnant women with psychiatric problems and medical disorders and those with complications during the current pregnancy, such as pre-eclampsia.

### *Sample Size Determination*

The sample size was determined by using the sample size was calculated using Raosoft software, including the population proportion sample size. The margin of error was set at 5%, with a confidence level of 95%, the response distribution at 50%, and an adding 10% non-response rate. Therefore, the final sample size was taken to 207.

### *Sampling Technique and Procedure*

A systematic random sampling technique was employed for all participants who fulfilled the inclusion criteria. Data collection consisted of distributing a self-administered questionnaire to pregnant mothers who agreed to participate, signed the informed consent form, and completed the questionnaire. Before data collection, the purpose of the study was explained to the subjects to gain cooperation. Written consent is obtained, and completed the questionnaire. The Research Ethics Committee of Universiti Sains Malaysia approved the study. The data was collected and then compiled for analysis.

### *Data Collection Tool and Procedure*

The questionnaire is categorized into two sections.

Section 1 consists of socio-demographic data, including age, education level, occupation, household income, living status, parity, pregnancy planning, history of COVID-19, history of the CORONA family, and parity.

Section 2: Consists of questions regarding prenatal stress. The questions were assessed through the Perceived Stress Scale (PSS) survey. A previous study suggested that this survey was reliable and valid for assessing stress levels (Pedrozo, Pedrozo & Campo, 2022). The PSS-10 had 10 items on a 5-point Likert scale (0 = never, 1 = almost never, 2 = sometimes, 3 = fairly often, 4 = very often). Four positively stated items (items 4, 5, 7, and 8) were reversely scored (0 = very often, 1 = fairly often, 2 = sometimes, 3 = almost never, 4 = never). The sum of the ten items represented the total score, with a higher score representing higher stress levels.

Steps on figuring PSS Score are as below

Determine the PSS score by following these directions

First, the scores were reversed for questions 4, 5, 7, and 8. On these four questions, the scores were changed (e.g. 0 = 4, 1 = 3, 2 = 2, 3 = 1, and 4 = 0).

The scores were added for each item for the total. Individuals scored on the PSS ranged from 0 to 40, with higher scores indicating higher perceived stress. Scores ranged from 0 to 13, considered low stress. Scores ranged from 14 to 26, considered moderate stress. Scores ranged from 27 to 40, considered high perceived stress.

*Data processing and analysis*

All data were coded and analyzed using the Statistical Package for Social Sciences (SPSS) statistical software version 26.0. The prevalence was estimated along with confidence intervals of 95%. Pearson's chi-square test was used to determine the association between related factors (education level, employment status, and physical activity) and stress. The significance level has been established at p-value <0.05.

## **Results**

### *Socio-Demographic Characteristics of the Study Participant*

A total of 207 pregnant women from Hospital Universiti Sains Malaysia participated in this study. The mean ages of the participants were 32 years, the youngest age (minimum) was 19 years old, and the oldest age (maximum) was 44 years old. All the study population was Malay in ethnicity, 207 (100%). The majority had a good education, 61.4% had studied up to college /university, and only 38.6% had education up to primary/secondary school. More than half of the subjects were employed, and 43.5% were unemployed (Table 1)

Around 19.8% of participants had a household income below RM 1000. The highest number of participants, 26.2%, had household incomes ranging from RM 1000-RM1999, and the least respondents, 30 (14.5%), with monthly incomes ranging from RM 2000-RM2999. The following 20.3% of the participants had RM 3000-RM4999 as their household income, and 18.8% with a payment of more than RM 5000.

Based on the study, most women living with a spouse, 83.1%. Next, 11.6% of pregnant women live with their parents, and only 3.9% live alone. The least number of pregnant women that live with in-laws is 1.0%. The next point of view was the number of children pregnant women had, which was parity. Based on the findings, the highest number of pregnant women had already had one child with them, 34.3%, and the number of pregnant women with two children was 22.7%. Findings showed that pregnant women with children had more than three (25.6%); the last was primigravida, 17.4%.

The majority, 51.7% of pregnant women, had unplanned pregnancies, and around 48.3% were planned. The next element was pregnant women diagnosed with positive COVID-19, 45.9% and 54.1% did not have a history of COVID-19. Among them, 56.0% had a history of families diagnosed with positive COVID-19, and the number of pregnant women's families that did not have a history of Corona family was 44.0%. Lastly, pregnant women performed physical activity only 65.7%, and among the others were not performed physical activity 34.3%.

Table 1

*Socio-Demographic Characteristics of the study participant (n=207)*

<b>Socioeconomic Characteristic</b>	<b>Frequency (n)</b>	<b>Percentage (%)</b>	<b>Mean</b>	<b>Min-max</b>
<b>Maternal age (years)</b>			32	19 - 44
<b>Malay</b>	207	100		
<b>Education</b>				
Primary/secondary	80	38.6		
College/university	127	61.4		
<b>Occupation</b>				
Employed	117	56.5		
Unemployed	90	43.5		
<b>Household income</b>				
<1000	41	19.8		
1000 - 1999	55	26.6		
2000 - 2999	30	14.5		
3000 – 4999	42	20.3		
>5000	39	18.8		
<b>Living status</b>				
Live with spouse	172	83.1		
Live with parents	24	11.6		
Live alone	8	3.9		
Live in law	2	1.0		
<b>Pariti</b>				
0	36	17.4		
1	71	34.3		
2	47	22.7		
3 and above	53	25.6		
<b>Pregnancy planning</b>				
Yes	100	48.3		
No	107	51.7		
<b>History of COVID-19</b>				
Yes	95	45.9		
No	112	54.1		
<b>History of the Corona Family</b>				
Yes	116	56.0		
No	91	44.0		
<b>Physical activity</b>				
Yes	136	65.7		
No	71	34.3		

*Stress Level*

Stress was measured using ten main questions about feelings and thoughts during the last months. Table 2 shows the study's frequency and percentage of stress among women. Around 60.4% of the participants scored less than 13 and were categorized as having mild stress

levels. Out of the total 40, 39.6% of participants scored 14 to 26 (moderate stress), and no respondent scored more than 27 (high stress).

Table 2

*Level of stress among pregnant women during the COVID-19 pandemic (n=207)*

Level of stress	Stress score	Frequency (n)	Percentage (%)
Mild stress	0-13	125	60.4
Moderate stress	14-26	82	39.6
High stress	27-40	0	0

*Association between related factors (employment status, educational level, and physical activity) and stress level*

Based on the results of the association analysis between variables, it showed that employment status was significantly associated with stress level, as evidenced by the P value of 0.003 (>0.05). In contrast, educational level ( $p = 0.334$ ) and physical activity ( $p = 0.390$ ) were not significant toward stress levels among pregnant women in Hospital USM (Table 3).

Table 3

*Association between related factors (employment status, educational level, physical activity) and stress level (n=207)*

Variables	Stress level n (%)		p-value
	Low stress	Moderate stress	
<b>Employment status</b>			0.003
Employed	80 (38.6)	37 (17.8)	
Unemployed	45 (21.7)	45 (21.7)	
<b>Educational level</b>			0.334
Primary/secondary	45 (56.3)	35 (43.8)	
College/university	80 (63.0)	47 (37.0)	
<b>Physical exercise</b>			0.390
Yes	85 (62.5)	51 (37.5)	
No	40 (56.3)	31 (43.7)	

## Discussion

This study shows the overall stress level during the COVID-19 Pandemic in Hospital USM among pregnant women's are mild stress 125 (60.4%) and moderate stress 82 (39.6%). Meanwhile, no respondents were classified as having high perceived stress. The findings are comparable to the study by Crowe and Sarma (2022), who documented that the vulnerable group, pregnant women, felt less distress and better coping even during the COVID-19 pandemic. However, the results of the study by Zilver et al (2021) are different. Women who are stressed related to the COVID-19 pandemic reported significantly higher overall stress levels compared to women with stress unrelated to COVID. The result is in line with a study conducted in Northwest Ethiopia, 13.7% (Birewsaw et al., 2022). In addition, the result of the study in Poland by Ilska et al (2021) indicated high levels of COVID-19-related pregnancy stress.

Furthermore, pregnant women have been facing a wide range of pandemic-related stressors, such as restriction of movement, social isolation, financial difficulties, homeschooling, remote work, and an increase in intimate partner violence (RCOG, 2020). It was also reported that high maternal stress levels during pregnancy, including exposure to natural disasters, can have detrimental effects on both the mother and the fetus (Lafortune et al., 2021). Supported by Ilska et al (2021) noted that additional factors related to pandemic conditions and resulting pandemic stress also threatened maternal mental health. Furthermore, the result of the study showed that nearly a third of pregnant women experienced elevated stress levels related to feeling unprepared for birth or being worried about perinatal infection. The result is similar to a previous study (Sirhan et al., 2022) which recorded that the COVID-19 pandemic was associated with high-stress levels and mental health problems. Biresaw et al (2022) wrote that a recent study during the COVID-19 pandemic period indicated that there is increased anxiety and poor quality of sleep levels. Cited in Biresaw et al (2022), this condition may further aggravate the sleep disturbance caused by the physiological effects of pregnancy, which may increase the stress level of the pregnant mother.

Regarding factors significantly associated with stress levels among pregnant women, employment status was associated with stress levels among pregnant women during the COVID-19 pandemic. This study, parallel with Yusmutia et al (2019), found that occupational factors in pregnant women can make pregnant women more stressed due to the dual role in work and family. Biresaw et al (2022) stated that, in the developing world, high stress and emotional disorders are highly correlated to factors including poverty. The current research is close to the finding of Liu et al (2020), where pregnant women might also be at increased risk of developing mental health issues caused by external factors, including the stress they encounter from work, home, and financial matters, especially during this challenging period. The other possible reason might be the lack of social support, vital in decreasing stress in pregnant women during the pandemic period when lockdowns and curfews were implemented as preventive methods.

This report discovered stress level was not significant with educational level. The result shown by Vijayaselvi et al (2015), who reported academic levels with stress levels in the study, revealed no significant difference. This finding contrasts with the study by (Ilska et al., 2021). The study participants included pregnant women with a good education level, for example, high school, bachelor's degree, and post-degree. The result of the study showed that despite having higher education, they still experience stress during the COVID-19 pandemic. The stress relates to feeling unprepared for birth and worried about perinatal infection.

Physical activity also was not significant with stress level. This result contradicts Yusmutia et al (2020), who studied physical activity against stress levels in pregnant women. The results showed a significant relationship between physical activity on stress levels in pregnant women. Based on the previous study, data showed that various daily behaviors during the epidemic of COVID-19, such as physical exercise, surfing on the internet or social media, and sleep habits, indicated different manifestations of mental symptoms. It might be because less time was spent on physical exercise and sleep, but more time was invested on the internet or social media.

### **Limitations of the Study**

Due to the exclusion criteria that need to be followed, we cannot take every pregnant woman as a respondent. Most of them have medical conditions. This decreased the number of respondents joining this study. The researcher agreed with Biresaw et al. (2022) that

participants with a minimal stress level might be less motivated to recall their exposure than those with a mild and moderate stress level.

### **Conclusion**

As the present study shows, more than half of the participants had mild stress (60.4%), and 39.6% of the research participants had a moderate level. There was a statistically significant association between stress level and employment status. The research demonstrated that women's stress from the COVID-19 pandemic requires attention. Strategies are needed to reduce women's stress levels regarding preventing stress toward COVID-19.

### **Conflict of Interest**

The authors declare that the information above is correct and that the manuscript submitted by us is original. We have no conflict of interest to declare and certify that no funding has been received for the conduct of this study and the preparation of this manuscript.

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