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ORIGINAL ARTICLE

Anxiety Level and Food Insecurity Level among Pregnant Women during COVID-19 Pandemic

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Abstract

Objective: The COVID-19 pandemic is known to have globally caused various psychological disorders, especially in pregnant women. This is due to the effects of the disease on global economies and the health of individuals. Psychological disorders, such as depression or anxiety, reportedly have an impact on the wellness of mothers and offsprings. Since Samarinda is presently categorized as a red zone, exploring the impact of the pandemic on the anxiety of pregnant women and household food security is very important. Therefore, this study aims to identify the anxiety level in pregnant women, and also analyze its association with household food insecurity. **Methods:** This was conducted through an online questionnaire, as the instruments used to measure the levels of anxiety and food security were DASS 21 and HFIAS, respectively. **Results:** A total of 201 pregnant women participated. Only (4.0%) of pregnant women were categorized as having mild and moderate anxiety levels and (45.3%) of pregnant women's households were food insecure. There was no relationship between the levels of food security and anxiety among pregnant women (p = 0.340). **Conclusion:** The psychological conditions, availability, and accessibility of food for women during pregnancy should be essentially and hygienically considered during the period of the Covid-19 pandemic. This is because it provides a sense of security and comfort during pregnancy monitoring or childbirth. Further research is needed to design specific instruments for pandemic conditions to measure individual-level anxiety and food insecurity for pregnant women.

Keywords: COVID-19, Anxiety, Food Insecurity, Pregnant women

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Introduction

Several studies have shown that there are psychological disorders associated with the identified habitual changes in the community, such as anxiety, during the COVID-19 pandemic. This is due to the severe effects of the disease on global economies and health of individuals. In the case of an infectious disease outbreak, rumours and closed-minded attitudes tend to emerge when the cause and result of the situation is unclear [1]. Since the beginning of the COVID-19 pandemic, the use of masks has increased [2] and there is a shortage of domestic products. For example, toilet paper shelf products in various stores were very difficult to acquire during this period [3]. The results on the COVID-19 attitudes in India showed the willingness of people to adopt guidelines on social distancing and measures, despite the high levels of anxiety. More than 80% of those polled were concerned about COVID-19 assumptions, with 72% stating that gloves and sanitizers were required. This study also indicated the occurrence of sleeping difficulty infections, paranoia of contracting COVID-19 and social media related distress at 12.5%, 37.8%, and 36.4%, respectively [2].

One of the most susceptible sources of life cycles to the changes in environmental conditions is a pregnant mother, due to their susceptibility to harsh health deviations. Pregnancy causes physiological, hormonal, and psychological alterations in women, which increases the likelihood of emotional health disturbances during the process of adaptation. Furthermore, the study conducted on 206 pregnant women by Duranku^{o} and Aksu (2022), statistically showed that the significant effect of the pandemic was found in psychology, social isolation, and average score of depression and anxiety, which was observed to be more severe within the case group [4]. Several studies found additional effects, with the most common being the prevalence of postpartum depression in pregnant women, which is directly linked to anxiety symptoms during pregnancy. According to Tachibana et al. (2015), postpartum depression affected 35% of pregnant women who had anxiety symptoms [5].

Several impacts of the pandemic on pregnant women are based on physical and psychological changes, which leads to alterations in the behaviour of an individual [6]. One of the behavioural changes during an epidemic/pandemic is social isolation (self-isolation behaviour), which is related to psychological problems in the form of fear/anxiety [7]. The novel 2019 Coronavirus (COVID-19) has aggressively spread over the world since its detection in December 2019, therefore, increasing the consequences of death, limitations of health care systems, and uncertainty of the economic and social structures (community, friends, and isolated from family), all of

which are of triggers for mental illness (psychological) [8].

Based on the mass panic of the COVID-19 period, various scarcity conditions for several products are found to have an impact on food shortage anxiety. The increasing uncertain economic changes also have implications on family income, with household-level food security becoming threatened. Wolfson and Leung (2020) showed that there was a change in the food security of households with low economic levels during the COVID-19 pandemic. The results indicated that 44% and 18.8% were categorized as normal and severe food insecurity levels, respectively. In addition, earlier research in the United States found a growing trend in the incidence of household food insecurity, which increased from 11 to 38 percent between 2018 and March 2020. Food insecurity was faced by 35% of households with 18-year-old children in April 2020 [9]. Food insecurity is being linked to maternal anxiety and depression, especially in low-income pregnant women. This is also coupled with the pandemic period, which has made food availability very unpredictable. In addition, several studies have confirmed the relationship between food insecurity and anxiety during pregnancy [10,11].

East Kalimantan, especially Samarinda, has not observed any study related to anxiety in pregnant respondent during the COVID-19 pandemic. The research on the anxiety level in pregnant women was previously carried out within Samarinda in 2016, showing that 47.5% of respondents had. moderate and severe disorders [12]. It also indicated that there was a tendency for anxiety among pregnant maternal before the occurrence of the pandemic. For this reason, identifying the anxiety and household food availability states of pregnant mother during the COVID-19 period is very important. Based on the condition of Samarinda (Red Zone), essentially understanding the impact of this pandemic on the anxiety and household food insecurity levels of Pregnant Women is very necessary.

Methods

A cross-sectional study was carried, and the participants were registered pregnant women within the Samarinda Health Centre. The accidental sampling technique was used for the selection process, as the selected respondents were willing to fill out an online questionnaire. The DASS (Depression Anxiety Stress Scale) 21 was also used to measure the anxiety level of respondents in the questionnaire, which contained 21 items analyzing general psychological distresses, such as depression, anxiety, and stress. In addition, the subjects were also asked to rate their experience levels of the mentioned conditions.

Meanwhile, the HFIAS (Household Food Insecurity Access Scale) was used to assess the level of food insecurity in households. This contained nine questions. The respondents answered each question with a score of 0-3, which indicated. Never, rarely (1-2 times in 4 weeks), Sometimes (3-10 times in 4 weeks), and Often (> 10 times in 4 weeks), respectively. In this method, food security was categorized into four levels, namely Secure, as well as Mildly, Moderately, and Severely Insecure, when the total scores were observed at 0-1, 2-7, 8-14 and 15-27, respectively [13]. The data obtained were processed using the SPSS statistical software, as respondents' characteristics were presented in descriptive form with frequency information. The relationship between the levels of anxiety and food insecurity was also analyzed using the Pearson Chi-Square test. In addition, The Mulawarman University Faculty of Medicine's Health Research Ethics Commission approved this study for ethical clearance, with contract No. 57/KEPK-FK/XII/2020.

Results

The study was conducted online from October to November 2020, and also involved 201 pregnant women as respondents. Based on Table 1, the characteristic data of pregnant women were observed, with majority (87.5%) between the age of 20-35 years. Most of the respondents (73.1%) worked as housewives, with 47.8% of them being high school/equivalent graduates. For the average family income, most (52.7%) were still below the UMK of Samarinda, which is < Rp. 3,000,000. In addition, most of the respondents were in their first pregnancy experience (42.1%), dominated by those in the 3rd trimester stage (45.7%).

Table 1: Respondent characteristics

Characteristics	N (%)
Total	201 (100)
Age (Years old)	
<20	11 (5.5)
20-35	176 (87.5)
>35	14 (7.0)
Profession	
Housewife	147 (73.1)
Civil servant	5 (2.5)
Self-employed	8 (4.0)
Others	41 (20.4)
Level of education	
Not completed in primary school	2 (1.0)
Primary School	11 (5.5)
Junior High School	24 (11.9)
High School	96 (47.8)
Diploma/Bachelor	68 (33.8)
Average family income	
<Rp. 3.000.000,-	106 (52.7)
≥Rp. 3.000.000,-	95 (47.3)
Pregnancy	
1st	87 (43.3)
2nd	58 (28.9)
3rd	40 (19.9)
>3rd	16 (7.9)
Gestational age	
Trimester I	42 (20.4)
Trimester II	70 (34.8)
Trimester III	89 (44.3)
Place to Monitor Pregnancy	
Hospital	7 (3.5)
Community Health Centre	68 (33.8)
Gynecology clinic	51 (25.4)
Practice Midwife	75 (37.3)

The Figure 1, illustrated that most (96.0%) pregnant women were categorized as normal. However, 46.4 and 50.0% of them were afraid to check their pregnancy status and give birth during the COVID-19 Pandemic, respectively (Figure 2). Regarding level of Food security, it can be seen on figure 3 that there were 45.3% households categorized as food insecure, based on mild (29.9%), moderate (11.9%) and severe (3.5%) levels, respectively.

The chi-square test results indicate that there was no significant association between household food security and pregnant mother's anxiety levels during the COVID-19 pandemic. It was also observed that 94.5%, 14.3%, and 1.7% of respondents with Secure, as well as Severely and Moderately Insecure food levels experienced Normal, Mild, and Moderate states of anxiety, respectively (Table 2). Based on Table 3, the location of pregnancy check-ups was a variable associated with the anxiety levels of pregnant women (p-value = 0.000), while other factors such as average family income, parity, and gestational age did not show a significant relationship.

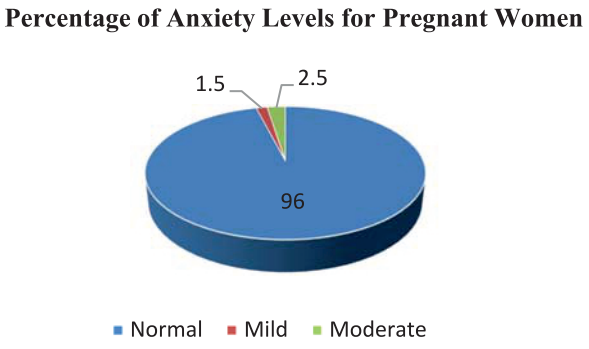

Figure 1: *Results of the anxiety levels of pregnant women during the COVID-19 pandemic.*

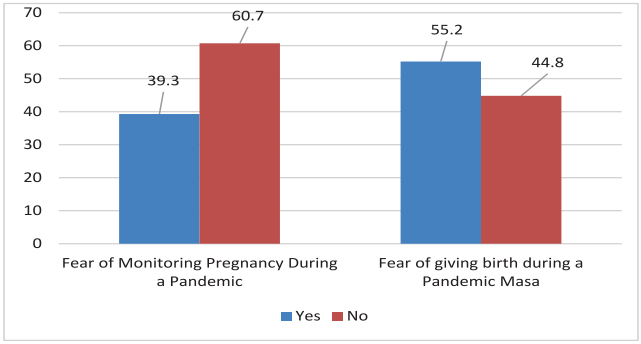

Figure 2: *Percentage of pregnant women's anxiety based on confirmation of concerns during the COVID-19 pandemic period*

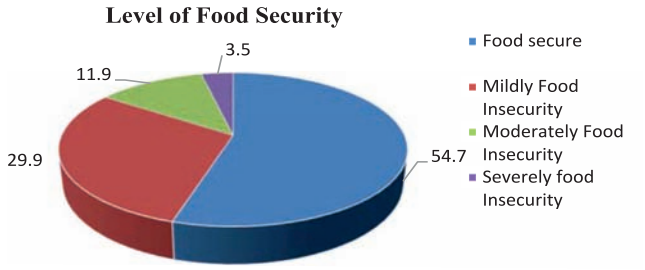

Figure 3: *Categories of food security at the household level of pregnant women during the COVID-19 pandemic.*

Table 2: Association between food security and anxiety levels of respondents during the Pandemic of COVID-19.

Variable	Level of Anxiety				
	Normal	Mild	Moderate	Total	P Value
	N (%)	N (%)	N(%)	N(%)	
Food Security Level					
Food Secure	104(94.5)	2(1.8)	4(3.6)	110(100)	
Mildly food insecurity	59(98.3)	0(0)	1(1.7)	60(100)	
Moderately food insecurity	24(100)	0(0)	0(0)	24(100)	0.340
Severely food insecurity	6(85.7)	1(14.3)	0(0)	7(100)	
Total	193(96.0)	3(1.5)	5(2.5)	201(100)	

Table 3: Association between the respondent's characteristics and level of anxiety during the COVID-19 Pandemic.

Variable	Level of Anxiety				
	Normal	Mild	Moderate	Total	P Value
	N (%)	N (%)	N(%)	N(%)	
Average family income					
<Rp.3,000,000,-	101(95.3)	2(1.9)	3(2.8)	106(100)	0.577
>=Rp.3,000,000,-	92(96.8)	1(1.1)	2(2.1)	95(100)	
Pregnancy					
1st	83(95.4)	1(1.1)	3(3.4)	87(100)	
2nd	56(96.6)	2(3.4)	0(0.0)	58(100)	0.655
3rd	38(95.0)	0(0.0)	2(5.0)	40(100)	
>3rd	16(100)	0(0.0)	0(0.0)	16(100)	
Gestational Age					
Trimester 1	40(95.2)	1(2.4)	1(2.4)	42(100)	
Trimester 2	65(92.9)	2(2.9)	3(4.3)	70(100)	0.144
Trimester 3	88(98.9)	0(0.0)	1(1.1)	89(100)	
Place to Monitor Pregnancy					
Hospital	7(100)	0(0)	0(0.0)	7(100)	
Community Health Centre	60(88.2)	3(4.4)	5(7.4)	68(100)	0.000
Gynegology Clinic/Practice Midwife	126(100)	0(0)	0(0.0)	126(100)	

Discussions

Majority of the respondents did not indicate signs of anxiety in this study, after being tested with the DASS (Depression, Anxiety, Stress Scale) 21 questionnaire. The results showed that only 1.4% of those interviewed were classified as having normal or mild anxiety. Meanwhile, 39.3% and 55.2% of the respondents admitted to being frightened to monitor their pregnancy status and give birth during the pandemic. This indicated that the anxiety of an individual was multifaceted and complex.

Based on this study, the experienced anxiety was not specifically quantified. This was because the questionnaire solely assessed anxiety levels based on the symptoms observed daily. In the DASS 21 questionnaire, only 4.0% of respondent were classified as having various levels of anxiety in the period of the COVID-19 pandemic. According to the distribution of numerous anxiety questions, 41.4% and 29.3% of the respondents replied to the items, "I find it difficult to breathe" and "I easily panicked", respectively. (Data distribution not shown).

Furthermore, the study of Nurkholis (2020), showed that the distribution of the virus was quite significant, especially on the basis of psychological effects, such as anxiety or excessive fear. This led to panic buying, especially among patients afraid of being shunned and exposed to the public [14].

The effects of the pandemic were noticed across society, due to the increasing number of people feeling apprehensive and distressed. Despite not exhibiting anxiety symptoms, 39.3% and 55.2% of the respondents were still afraid to check their pregnancy status and give birth during the COVID-19 pandemic. This result was consistent with that of other studies. According to Corbett et al. (2020), 83.1% of women had health worries during the pandemic, with those pregnant observing a 50.7% rise in anxiety. Moreover, 66.7% and 35% of pregnant women and infants were concerned [15]. According to other studies, most pregnant women were constantly concerned with their health, and that of the fetus [16]. In addition, the physiological and mechanical changes that occur during pregnancy are known to generally enhance susceptibility to infection, especially when the cardiorespiratory system is harmed. These changes also encourage the rapid advancement of respiratory failure in pregnant women. During therapies and postpartum periods, pregnant women are likely to experience psychological changes [17]. According to several studies, these psychological alterations were one of the elements that impeded fetal growth and development [18]. Untreated mental health illnesses also have long-term consequences on personal health and that of the fetus during pregnancy. Therefore, a plan to encourage early prevention and treatment is required [19].

Pregnant women's household food insecurity during the COVID-19 pandemic

The results indicated that 54.7% and 45.3% of pregnant women experienced high and low food security levels, respectively. This was consistent with the findings of the study of Moafi, et al (2018), where 56.1% and 43.9% of pregnant women experienced high and low food security, respectively [20]. These insecurities occur in the households of pregnant women when they have insufficient access to nutritious foods that are both acceptable and safe, or unable to consume the needed amount of food [21].

Food insecurity have a significant influence on the health of women, especially during pregnancy. Although the nutritional conditions during pregnancy presently affects the health of women and newborns, they also have a significant impact on the future wellness of children and adults. During the shortage of resources, the consumption of pregnant women becomes restricted, leading to the inability to consume their favourite foods. Therefore, such families tend to eat low-cost foods with high energy density and decreased micronutrient content, e.g., minimal consumption of fruits, vegetables, milk and its products, and more. As a result of restricted access to food sources, dietary variety in the family becomes diminished. According to Mathews et al. (2010), women with food insecurities ate 8.8 times fewer vegetables than those that were secure (OR = 8.8 95% CI: 2.6-29.9). Based on these conditions, pregnant women should specifically focus on the decline in food diversity, to meet their nutritional demands and that of the fetus. During pregnancy, not eating a well-balanced and varied diet affects both the mother and the baby in several long- and short-term conditions [22].

Pregnant Women's Anxiety and Food Insecurity During the COVID-19

The bivariate study between food insecurity and anxiety in respondents revealed no significant association, with a p-value of 0.340. This indicated that 94.5%, 14.3% and 1.7% of those with mildly, severely, and moderately insecure food levels, had normal, mild, and moderate states of anxiety, respectively. Furthermore, food security circumstances in the households of pregnant women showed no tendency of product scarcity or access challenges during the pandemic, as their anxiety levels were not affected. However, verifiable confessions from the respondents showed that 39.3% and 55.2% of pregnant women were afraid of having their pregnancy monitored and giving birth during the pandemic, respectively. The changes in income, job and childcare requirements also had an impact on psychological alterations during the COVID-19 pandemic. As a result, many families were dealing with psychological and social pressures, which were frequently linked to increasing mental health requirements [23].

One of the factors that contributes to depression and anxiety in pregnant mother is social support. This indicates that more effective social support leads to less anxiety and depression symptoms suffered by pregnant women. It is also an important factor in physical and psychological well-being, particularly during pregnancy, when people are taking on new obligations and duties [24]. Social support is directly carried out through the encouragement of positive health behaviours, pleasant feelings enhancement, and increase in emotion regulation [25]. It is also indirectly conducted by lowering the psychological stress response in pregnant women [26].

This study's instrument was developed to assess the symptoms of public anxiety in general, compared to specific conditions such as the COVID-19 pandemic. Therefore, the results obtained were not specific in detecting the symptoms of anxiety induced by the pandemic. For this reason, further research is needed by using a specialized anxiety instrument in the COVID-19 situation. In addition, evaluating the easy access and sufficiency of intake at the individual level of pregnant women is required, due to this study only assessing household food security.

Conclusion

The majority (96.0%) of respondents were classified as normal based on their anxiety symptoms. However, 39.3% and 55.2% were afraid of having an obstetrical check-up and delivery session during the pandemic of COVID-19, due to the confirmation of

concerns. Furthermore, 45.3% households were found with food insecurity, based on mild (29.9%), moderate (11.9%) and severe (3.5%) levels, respectively. The bivariate test showed that with a p value of 0.340, there was no significant association between pregnant women's household food insecurity and anxiety levels througout the COVID-19 pandemic. Anxiety conditions should be essentially focused on, especially health services providing a sense of security and comfort for pregnant women, during monitoring or childbirth.

The food security circumstances for pregnant women in Samarinda should be maintained and enhanced, in order to stop the emergence of insecurity during or after the pandemic. Food security should be measured at the individual level, in order to detect the spesific risk of insecurity for pregnant women. It was also used to perform a consumption survey through a 24-hour food recall, in order to elaborately observe the adequacy of nutrients consumed by pregnant women during the pandemic.

What is known about the subject?

Pregnant women are a vulnerable group to experience stress and anxiety during the COVID-19 pandemic, specifically when there are restrictions on activities that allow limited access to food. Anxiety for pregnant women in Samarinda during the Covid-19 pandemic has never been done before so there the information about this condition is still lacking.

What does the study performed add to the literature?

Almost 50% of pregnant women's households were found with food insecurity. The majority of the pregnant women in the Samarinda did not show any symptoms of anxiety, but they showed fear of monitoring and giving birth during a pandemic.

What are the implications of the results obtained?

This study's findings can be used as a reference for establishing food insecurity and anxiety preventive and interventions program in public healthcare units for pregnant women by using a specific instrument for pandemic condition.

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Ethics:	There is no ethical violation as it is based on voluntary anonymous interviews
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Guarantor:	Reny Noviasty will act as guarantor of this article on behalf of all co-authors.

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