



Factors associated with behavior of reducing anxiety in pregnant women during COVID-19 pandemic

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Background: Anxiety of pregnant women has increased during the coronavirus disease 2019 (COVID-19) pandemic so that it can affect their quality of life. Anxiety that cannot be overcome will result in stress and depression. The aim of this study was to determine the factors related to the behavior of reducing anxiety in pregnant women during the COVID-19 pandemic.

Methods: This study uses an observational (non-experimental) design with a retrospective cross-sectional approach. The total population of pregnant women respondents was 145 who came from the primary health center in Lamongan, East Java Province, Indonesia. The independent variables were measured using a questionnaire as an instrument for perceived self-efficacy, perceived severity, perceived barrier, susceptibility and perceived benefit. The dependent variable of pregnant women's behavior in reducing anxiety was also measured using a questionnaire. Data analysis was performed using the Spearman Rho test with a significance level of $P < 0.05$.

Results: The results showed the majority of respondents were women of productive age 20–24 years (39%) and second gravida (47.5%). The behavior of pregnant women in reducing anxiety is influenced by factors perceived barrier ($P = 0.034$, $r = -0.196$), perceived susceptibility ($P = 0.016$, $r = 0.221$) and self-efficacy ($P < 0.001$, $r = 0.382$) during the COVID-19 pandemic.

Conclusions: Pregnant women can reduce anxiety during the COVID-19 pandemic by increasing self-efficacy and perceived susceptibility, as well as reducing perceived barriers. Therefore, increasing efforts to reduce the anxiety of pregnant women during the COVID-19 pandemic through information, education and communication directed at reducing perceived barriers and increasing self-efficacy and perceived susceptibility.

Keywords: Behavior; coronavirus disease 2019 (COVID-19); maternal health; anxiety

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Introduction

Background

According to data from the World Health Organization (WHO) on February 18, 2021, the number of confirmed cases of coronavirus disease 2019 (COVID-19) was 109,426,406 with 2,419,363 cases of death, then for cases in Indonesia there were 1,243,646 cases with 33,788 deaths (1). The number of confirmed cases of COVID-19 in Lamongan, East Java Province, Indonesia alone until February 22, 2021 is 2,515 confirmed cases (2). Based on data from the National Population and Family Planning Board Indonesia, the number of pregnant women in Lamongan in April 2020 reached 6,210 pregnant women (3). In a study, it was found that as many as 385 pregnant women infected with COVID-19 (4).

Pregnant women are a particularly vulnerable population during the COVID-19 emergency and are at high risk of experiencing mental problems (5), such as depression (64.5%) and symptoms of anxiety (56.3%) (6). Meanwhile, the anxiety rate of pregnant women on the island of Java reached 52.3% (7). Anxiety disorders are mental problems that can occur at all ages and throughout life, including during pregnancy (8). The COVID-19 pandemic is a major source of mental problems experienced by pregnant women today and efforts to minimize the impact on quality of life during the COVID-19 pandemic are a must (9). Anxiety of pregnant women has increased during the COVID-19 pandemic, as was the case in the previous case, namely

the severe acute respiratory syndrome (SARS) and Ebola outbreaks (10). Symptoms of depression and anxiety were reported to reach 28% based on the results of a general psychological examination as a result of the COVID-19 pandemic (11).

Rationale and knowledge gap

According to Kahyaoglu Sut's research [2020], there were several factors that influenced the anxiety of pregnant women during the COVID-19 pandemic, namely work status, physical activity status, inconvenience of visiting the hospital and getting information about COVID-19 (6). The impact of anxiety if not handled properly can lead to stress and depression (12). Mental problems in pregnant women have a bad influence on the mother and fetus, which can cause nutritional disorders, physical activity and sleep disorders so that it can affect fetal development (13). Therefore, there is a need for clinical implications to improve the mental health of pregnant women during the COVID-19 pandemic (14).

During the COVID-19 pandemic, the government has set several policies related to special services for pregnant women which include pregnancy screening, the use of personal protective equipment (PPE) during examinations, pregnant women with COVID-19 must be referred to a COVID-19 hospital, the first mandatory antenatal care (ANC) visit is carried out in the first trimester for screening risk factors [human immunodeficiency virus (HIV), syphilis, and hepatitis B], the second mandatory visit, which is a month before delivery, and delivery is carried out at a health service in accordance with the results of the mandatory rapid test (15). These efforts are important for pregnant women to pay attention to, because if they are exposed to COVID-19, the severity will increase, including the risk of intensive care and the need for invasive ventilation compared to women who are not pregnant (16,17). Family support can reduce the anxiety of pregnant women during the COVID-19 pandemic from moderate anxiety to mild anxiety (18). In addition, reducing anxiety can also be done with the relaxation method and this method has been widely used and proven to be successful (19).

Efforts to reduce the anxiety of pregnant women are important for pregnant women to know and understand so that pregnant women can apply it in their daily lives. Perceived Susceptibility or health vulnerability is more felt by pregnant women with higher knowledge, then perceived severity pregnant women with low levels of knowledge have lower awareness of the dangers of pregnancy (20).

Highlight box

Key findings

- Pregnant women can reduce anxiety during the COVID-19 pandemic by increasing self-efficacy and perceived susceptibility, as well as reducing perceived barriers.

What is known and what is new?

- Pregnant women with good self-efficacy will encourage confidence in dealing with problems and can reduce anxiety during the problems faced.
- This study also adds information that perceived barriers to reducing anxiety during the COVID-19 pandemic are related to economic conditions in seeking psychological assistance.

What is the implication, and what should change now?

- Increasing efforts to reduce the anxiety of pregnant women during the COVID-19 pandemic through information, education and communication directed at reducing perceived barriers and increasing self-efficacy and perceived susceptibility.

Perceived barriers to getting help for anxiety disorders are 52% unable to pay for treatment, 49% feel they can handle their own problems, and are more comfortable getting help from family than psychologists 39% (21). Severe pregnancy anxiety occurs in mothers with high self-efficacy (22).

Objective

The aim of this study was to determine the factors related to the behavior of reducing anxiety in pregnant women during the COVID-19 pandemic. We present this article in accordance with the STROBE reporting checklist (available at <https://jphe.amegroups.com/article/view/10.21037/jphe-22-60/rc>).

Methods

The study was conducted in accordance with the Declaration of Helsinki (as revised in 2013). The ethics of this research was conducted at the Ethics Commission of the Faculty of Nursing, Airlangga University, Surabaya (No. 2230-KEPK) and individual consent for this retrospective analysis was waived.

Study setting

This study uses an observational (non-experimental) design with a retrospective cross-sectional approach which was carried out at the Bluluk and Sukorame Public Health Centers in the Lamongan region, East Java Province, Indonesia in May 2021. The population used were pregnant women in the Bluluk Health Center and Sukorame Health Center area with sampling using a convenience sampling technique so that obtained 118 respondents. The inclusion criteria in this study were pregnant women who could read and write to fill out the questionnaire completely. The independent variables in this study are self-efficacy, perceived severity, perceived barrier, perceived susceptibility, and perceived benefit. Then for the independent variable, namely the behavior of pregnant women in reducing anxiety during the COVID-19 pandemic.

Sample size

The population in this study were all pregnant women in the working area of the Bluluk and Sukorame health centers based on data from pregnant women who had estimated day of delivery in 6 May to 30 June 2021, amounting to 145

people. By using the calculation of the sample size formula according to Slovin's formula (23), the number of samples in this study was 118 pregnant women. The sample in this study was 118 respondents consisting of 68 pregnant women from the working area of Puskesmas Bluluk and 77 pregnant women from the working area of Puskesmas Sukorame.

Data collection

The instrument in this study used a questionnaire compiled by the researcher based on the components of the Health Belief Model (HBM) theory, to measure the independent variables (self-efficacy, perceived severity, perceived susceptibility, perceived barrier, and perceived benefit) (24) as well as the dependent variable (behavior pregnant mother). Demographic data consisted of age, education, occupation, income, and maternal gravidity status. All variables were measured using a Likert scale with answer choices 1–4 on the independent variables favorable questions (1: strongly disagree, 2: disagree, 3: agree, 4: strongly agree), and unfavorable questions (4: strongly disagree, 3: disagree, 2: agree, 1: strongly agree). Then on the dependent variable (1: never, 2: rarely, 3: often, 4: always). The final results on the scoring were categorized into low, medium and high on the independent variable, then on the dependent variable became positive and negative. Each question item using the Pearsons correlation formula with a P value <0.05.

Perceived Susceptibility questionnaire to assess the anxiety felt by pregnant women during the COVID-19 pandemic, consisting of 5 questions consisting of understanding of their condition (questions number 1, 4, 5) and susceptibility to COVID-19 transmission (questions number 2, 3). In this questionnaire, the score for favorable answers on questions number 1, 2, 3, 4 and for unfavorable on questions number 5, 6. The Perceived Severity questionnaire assesses the seriousness of the risk due to high levels of anxiety in pregnant women, consisting of 6 questions: consequences for the mother (questions number 1, 3, 5, 6) and consequences for the fetus (questions number 2, 4). In this questionnaire, the score for favorable answers on questions number 1, 2, 3, 4, 5 and for unfavorable on questions number 6, 7. The Perceived Benefit questionnaire measures the benefits felt by pregnant women from behavior to reduce anxiety, consisting of 5 questions: behavioral effectiveness for health (questions number 1, 3) and behavioral effectiveness for pregnancy

Table 1 Demographics of pregnant women in the working area of the Bluluk and Sukorame Primary Health Center, 2021

Category	Frequency	Percentage (%)
Age (year)		
20–24	46	39.0
25–29	36	30.5
30–34	24	20.3
35–39	11	9.3
40–44	1	0.8
Education		
Elementary school/equivalent	4	3.4
Middle school/equivalent	39	33.1
High school/equivalent	68	57.6
Diploma/bachelor	7	5.9
Income (district/city minimum wage Lamongan 2021)		
< Rp. 2,489,000	112	94.9
≥ Rp. 2,489,000	6	5.1
Work		
Student	2	1.7
Private	10	8.5
Housewife	62	52.5
Farmer	42	35.6
Businessman	2	1.7
Graviditas		
1	49	41.5
2	56	47.5
3	13	11.0
Total	118	100.0

(questions number 2, 4, 5). In this questionnaire, the score for favorable answers on questions number 1, 2, 3, 4 and for unfavorable on questions number 5, 6 (24).

The Perceived Barrier questionnaire is the opinion of pregnant women about what can inhibit their behavior in reducing anxiety, consisting of 5 questions related to aspects of knowledge (questions number 1, 2), support (question number 3), economics (question number 4) and sources of information (questions number 4, 5). In this questionnaire, the score for favorable answers on questions number 1, 2, 3, 4 and for unfavorable on question number 5. The Self-

Efficacy questionnaire measures the confidence of pregnant women in their ability to reduce the anxiety experienced, consisting of 6 questions including the ability to reduce anxiety (questions number 1, 6), belief in COVID-19 transmission (questions number 2, 4) and the condition of the fetus (questions number 3, 5). In this questionnaire, the score for favorable answers on questions number 1, 2, 3, 4 and for unfavorable on questions number 5, 6 (24). The questionnaire on the behavior of pregnant women in reducing anxiety measures the efforts made by pregnant women in reducing the anxiety experienced during the COVID-19 pandemic, consisting of 8 questions, namely the source of anxiety (questions number 1, 2), seeking information (questions number 3, 7), increase activity (question number 4), maintain health (questions number 5, 6) and focus on health (question number 8) (25).

Statistical analysis

The Statistical Package for Social Sciences (SPSS) was used to analyze the collected data using descriptive analysis method to determine the percentage and frequency distribution of the data. Spearman Rho test with $\alpha=0.05$ and P value <0.05 as a bivariate analysis to determine factors related to the behavior of reducing anxiety. The questionnaire in this study was tested for validity and reliability on 10 respondents to pregnant women in the Bluluk and Sukorame Districts with the expected day of birth in April 2021. For the validity test, each question item used the Pearsons correlation formula with a P value <0.05 . For the reliability test, the results of all questions were declared reliable with Cronbach alpha (I) 0.00 to 0.20 (less reliable); (II) 0.21 to 0.40 (rather reliable); (III) 0.41 to 0.60 (quite reliable); (IV) 0.61 to 0.80 (reliable); and (V) 0.81 to 1.00 (very reliable) (26,27).

Results

In *Table 1*, it is known that the characteristics of respondents based on age are in the productive age range, with the highest percentage being aged 20–24 years (39%), in terms of education the majority of respondents are high school (57.6%). In terms of income, most of the respondents have low incomes (less than the regency/city minimum wage for the Lamongan area in 2021, which is Rp. 2,489,000) (94.9%), for their work status the majority are housewives (52.5%). Furthermore, the majority of the study respondents had the status of the second child pregnancy

Table 2 The relationship between perceived susceptibility, perceived severity, perceived benefit, perceived barrier, and self-efficacy with pregnant women's behavior in reducing anxiety levels in the COVID-19 pandemic period

Variable	Score category results	Behavior of pregnant women in reducing anxiety			Spearman's Rho test	
		Negative, F (%)	Positive, F (%)	Total, Σ (%)	P	r
Perceived susceptibility	Low	17 (14.4)	7 (5.9)	24 (20.3)	0.016	0.221
	Medium	30 (25.4)	42 (35.6)	72 (61.0)		
	High	8 (6.8)	14 (11.9)	22 (18.6)		
Perceived severity	Low	11 (9.3)	10 (8.5)	21 (17.8)	0.384	0.081
	Medium	38 (32.2)	43 (36.4)	81 (68.6)		
	High	6 (5.1)	10 (8.5)	16 (13.6)		
Perceived benefit	Low	7 (5.9)	5 (4.2)	12 (10.2)	0.174	0.126
	Medium	39 (33.1)	42 (35.6)	81 (68.6)		
	High	9 (7.6)	16 (13.6)	25 (21.2)		
Perceived barrier	Low	18 (15.3)	30 (25.4)	48 (40.7)	0.034	-0.196
	Medium	24 (20.3)	27 (22.9)	51 (43.2)		
	High	13 (11.0)	6 (5.1)	19 (16.1)		
Self-efficacy	Low	11 (9.3)	3 (2.5)	14 (11.9)	0.000	0.382
	Medium	32 (27.1)	24 (20.3)	56 (47.5)		
	High	12 (10.2)	36 (30.5)	48 (40.7)		

COVID-19, coronavirus disease 2019; F, frequency.

(47.5%). Based on the validity test of the questionnaire, all question items using the Pearson's correlation formula obtained a P value <0.05. The reliability test of the questionnaire in this study used the Cronbach alpha 0–1 method. The results of the validity test on all question items in the questionnaire are P<0.05 and reliability (Cronbach's alpha perceived susceptibility: 0.828, perceived severity: 0.828, perceived benefit: 0.832, perceived barrier: 0.782, self-efficacy: 0.889, and behavior: 0.852).

Based on *Table 2*, the results of statistical analysis using the Spearman Rho test with a significance level of P<0.05, it was found that the correlation result was r=0.221 and P value =0.016. P value <0.05 indicates there is a relationship with the degree of weak strength between perceived susceptibility and the behavior of pregnant women in reducing anxiety during the COVID-19 pandemic with a positive relationship direction. Then, on the perceived severity, the correlation results r=0.081 and P=0.384. The P value >0.05 indicates there is no relationship between perceived severity and the behavior of pregnant women in reducing anxiety during the COVID-19 pandemic, as

well as for perceived benefits, the results of r=0.126 and P value =0.174. The P value >0.05 indicates there is no relationship between perceived benefits and the behavior of pregnant women in reducing anxiety during the COVID-19 pandemic. Furthermore, on the perceived barrier, the correlation results r=-0.196 and P value =0.034. P value <0.05 indicates that there is a relationship with a very weak degree of strength between the perceived barrier and the behavior of pregnant women in reducing anxiety during the COVID-19 pandemic in the direction of negative relationship. In self-efficacy, the correlation results r=0.382 and P value =0.000. P value <0.05 indicates there is a relationship with the degree of weak strength between self-efficacy and the behavior of pregnant women in reducing anxiety during the COVID-19 pandemic with a positive relationship direction.

Discussion

Key findings

In the study, it was found that perceived susceptibility,

self-efficacy, and perceived barriers were related to the behavior of pregnant women in reducing anxiety during the COVID-19 pandemic based on the HBM theory. Pregnant women can reduce anxiety during the COVID-19 pandemic by increasing self-efficacy and perceived susceptibility, as well as reducing perceived barriers.

Strengths and limitations

The main strength of this study is the focus on the behavior of pregnant women in reducing anxiety during the COVID-19 pandemic based on the HBM theory. The aspect of forming psychological value that helps reduce anxiety is the high value of self-efficacy and perceived susceptibility, as well as reducing perceived barriers felt by pregnant women during the COVID-19 pandemic. In addition, it can provide utility-based case values in pregnant women of different ages and gravid experiences that contribute to anxiety.

This study has limitations including confounding variables such as pregnant women with high risk, pregnant women who live separately from their husbands, and also gestational age is not considered which should be a factor of consideration because it can affect the level of anxiety of pregnant women. In addition, the Likert scale used is considered less able to describe the respondent's perception with certainty, it will be more effective if the measurement scale uses a numerical scale.

Comparison with similar researches

In the study, it was found that perceived susceptibility, self-efficacy, and perceived barriers were related to the behavior of pregnant women in reducing anxiety during the COVID-19 pandemic based on the HBM theory. Pregnant women can reduce anxiety during the COVID-19 pandemic by increasing self-efficacy and perceived susceptibility, as well as reducing perceived barriers. Based on the findings obtained, it is known that they are similar to several other studies using HBM as a theoretical approach to explore the preventive behavior of pregnant women during the COVID-19 pandemic (28-30). According to the HBM theory, in order for a person's behavior change to be successful, they must feel threatened by their current behavior pattern (25,29).

Seriousness can be judged by how much impact a health problem has, and a person may not take seriously the dangers of a health condition but they understand the

impact if the health problem occurs (21,28,31). Someone with a high perception of vulnerability will be more likely to behave positively. However, not all who have a high perception of vulnerability behave positively because there are still quite a lot of respondents who fall into the category of negative behavior in reducing anxiety. Perceived vulnerability is a person's feeling where they are at risk for a condition so that they feel threatened and will try to take action or seek help (32,33).

Explanations of findings

Perceived susceptibility had a weak relationship and a positive pattern with behavior of pregnant women in reducing anxiety during the COVID-19 pandemic. The perception of vulnerability to anxiety that is most felt by pregnant women during the COVID-19 pandemic is interference with the fetus. Anxiety felt by pregnant women will have an impact on the fetus, such as fetal abnormalities to death. Based on the demographic aspect, the majority of the last education level of pregnant women is high school which allows the level of knowledge possessed by pregnant women related to efforts to reduce anxiety is still lacking (6). It is further explained that perceived susceptibility is influenced by the level of knowledge, so the better the knowledge, the higher the perception of vulnerability (20).

Other findings in the study that a weak relationship and a negative pattern between the perceived barrier and the behavior of pregnant women in reducing anxiety during the COVID-19 pandemic. Most respondents have a moderate perception that tends to be low and have positive behavior. The higher the mother's obstacle in meeting the nutritional needs of her child, the behavior in meeting nutritional needs is not good (24,32). The most perceived obstacle by respondents is the inability to pay a psychologist to help reduce their anxiety, this happens because almost all pregnant women have low incomes, which is less than the UMK in Lamongan Regency. The three biggest obstacles to treatment are cost, belief that you can handle the problem yourself and help from your family (17,33). The HBM theory explains that something that hinders action can be seen from the aspect of high costs, benefits, unsatisfactory health services and support from family or others (29).

Another interesting finding is that with high self-efficacy tend to have positive behavior, but most have moderate perception and negative behavior. These results are consistent with a study which states that pregnant

women with high self-efficacy have high anxiety (18). Self-efficacy has a significant relationship with the behavior of pregnant women in reducing anxiety during the COVID-19 pandemic with a weak relationship strength. Respondents with low self-efficacy tend to have disobedient behavior, while respondents with high self-efficacy tend to behave obediently (34,35). Self-efficacy is a person's belief in his ability to take an action (30).

Good self-efficacy will encourage confidence in dealing with problems and can reduce anxiety during the problems faced (36,37). Self-efficacy emphasizes an individual's action and its success depends on how much interaction the mind has with the given task (38,39). Pregnant women have the belief that they can reduce the anxiety they feel so that they can encourage mothers to seek good actions in reducing their anxiety. This is in accordance with Bandura's theory [1997] which explains that self-efficacy is the belief that a person can successfully carry out behavior in accordance with what is needed to get an outcome (25). Then, the results of the distribution of variables show that the majority of respondents have moderate self-efficacy, this is probably influenced by the respondent's education level. The higher the knowledge, the better the self-efficacy of pregnant women (18). The level of knowledge is closely related to the level of education, respondents with junior high school, high school and college education levels are considered to be able to analyze and understand various problems in their lives, and can solve problems. In contrast to other studies which state that mothers with moderate self-efficacy are more likely to misbehave, then mothers with high self-efficacy do not all have good behavior in an effort to fulfill nutrition (24,40,41).

In this study, perceived severity and perceived benefit did not affect the behavior of pregnant women. This finding is different from the results obtained in previous studies (42). However, in this study, the perception of high anxiety was found that quite a lot of pregnant women still had negative behavior. In line with research which states that the perception of high seriousness does not make behavioral changes to be good, as well as a low perception of seriousness does not mean that mothers cannot perform good behavior in an effort to fulfill nutrition (34-36). The participation of families and health workers to build this perception of seriousness needs to be taken into account. Individuals who feel the seriousness of a health condition will try to do good behavior or take action to overcome the problem.

Based on the demographic distribution, the majority

of respondents have gravidity status 2 (2nd pregnancy). Mothers who have been pregnant don't really think about their current condition, but only focus on past experiences (37). However, the study of activities during the COVID-19 pandemic which states that in the HBM theoretical construct, a better perceived severity will have a higher level of physical activity in the context of recreation and sports (38,39).

Implications and actions needed

In line with the key findings of our study, it is important to implement strategies to provide continuous educational programs based on the HBM to enhance pregnant women's knowledge and behavior to reduce anxiety as well as efforts to seek psychological assistance to reduce anxiety during the COVID-19 pandemic. Promoting the adoption of preventive behaviors through mass media, emphasizing the sense of social responsibility and sending notifications through mobile phones and social media can improve COVID-19 preventive behaviors (29,43). Pregnant women are included in a vulnerable group during the COVID-19 pandemic, so it is important to design a program related to education based on increasing the psychological resilience of pregnant women during the COVID-19 pandemic.

Conclusions

Pregnant women can reduce anxiety during the COVID-19 pandemic by increasing perceived susceptibility and self-efficacy through an understanding of their body condition which has a high susceptibility to contracting COVID-19 and the belief that pregnant women can reduce their anxiety, as well as reducing perceived barriers through increasing knowledge about COVID-19, seeking sources of support and information. Therefore, increasing efforts to reduce the anxiety of pregnant women during the COVID-19 pandemic through information, education and communication directed at reducing perceived barriers and increasing self-efficacy and perceived susceptibility.

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