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Factors associated with pregnancy-related anxiety: a health facility-based study

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ABSTRACT

Pregnancy is a critical phase for human beings, which can lead to various mental health issues, including anxiety. It is important to recognize that pregnancy-related anxiety can increase over time and should be addressed. This study aimed to explore the multifactor of pregnancy-related anxiety during the first trimester. A cross-sectional health facility-based study was conducted in four Semarang, Central Java, Indonesia public health centers. A total of 129 pregnant women were involved and identified some exposures, such as socio-demographics, nausea and vomiting during pregnancy (NVP), emotion regulation, social support, and anxiety levels. The average age of participants was 27.3 years. Their anxiety level was moderate to severe (37.2%), and 62.8% were identified as having mild anxiety. This study suggests that pregnant women who lack social support (AOR=4.105; 1.824-9.237) and emotion dysregulation (AOR=2.749; 1.244-6.075) were identified as the risk factors of maternal anxiety during the first trimester. Being employed (AOR=0.410; 0.182-0.922) protects the high anxiety during pregnancy. This study suggests that the lack of social support, including social interaction most influences pregnant women's mental well-being. Therefore, it may be helpful to establish an intervention plan that strengthens social support to improve maternal mental well-being.

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1. INTRODUCTION

Pregnancy, particularly in the first trimester, is the most critical stage for both mothers and children. The physical, social, and emotional alterations during pregnancy can lead to mental health issues like anxiety and depression. According to the world health organization (WHO), 10% of pregnant women worldwide suffer from mental disorders, with the number rising to 15.6% in developing countries. An analysis of 10 systematic evaluations globally found that prenatal depression is prevalent in 15%–65% of cases, with a majority of 17% in both rich and poor populations [1]. These figures suggest that maternal anxiety is growing as the highlighted interest among pregnant women globally.

Pregnancy-related anxiety is defined as the experience of elevated worries and fears during pregnancy [2]. A cross-sectional study has shown that anxiety levels during pregnancy tend to be higher in the early and late stages, as evidenced by a U-shaped pattern [3]. It seems that the prevalence of generalized anxiety disorder is highest during the first trimester due to major hormonal changes [1]. Being exposed to maternal anxiety

during pregnancy includes a range of negative outcomes, both short and long-term [4]. For instance, prolonged labor, low birth weight, developmental disorders in neonates, neurodevelopmental issues in adolescents, and mental and social problems in young adults [1], [5], [6].

Various risk factors can influence pregnancy-related anxiety. Biological, social, and demographic factors such as age and parity have been identified as predictive or associated. Studies have shown that pregnant women who lack social support and individual resilience are more likely to experience anxiety [7]–[9]. Additionally, a multidimensional life experience that causes turbulence in society and civilization changes can lead to anxiety due to low levels of social skills and induced acute sense of loneliness [7]. As a result, it often becomes the direct reason for anxiety. In addition, the impact of an unsupportive social environment on mental well-being is greater for those with low self-resilience. The finding has consistently shown that individuals with higher levels of distress tolerance experience lower levels of depression symptoms [8].

Although some research has explored the reasons behind developing anxiety during pregnancy, very few studies have examined both social and individual factors. Moreover, there is a lack of published studies on this topic, and no research has been conducted on the impact of nausea and vomiting during pregnancy on anxiety among pregnant women receiving healthcare from public health centers. Therefore, this study aims to use a multivariate prediction model to investigate the demographic, self-related factors, and social support that contribute to pregnancy-induced anxiety disorder.

2. METHOD

A cross-sectional study was conducted on 129 pregnant women admitted to the 4 Public Health Centres in Semarang, Central Java, Indonesia, in August 2023. The inclusion criteria for this study were pregnant women who were less than or equal to 12 weeks pregnant. Women with more than 12 weeks of gestational age were excluded. All subjects provided written informed consent. The Ethical Committee of the Faculty of Medicine at the Diponegoro University approved the study (120/EC/KEPK/FK-UNDIP/IV/2023).

The instruments used were a demographic questionnaire, the pregnancy-uniques quantification of emesin (PUQE), the multidimensional scale of perceived social support (MSPSS), the Hamilton anxiety rating scale (HARS), and the emotion regulation questionnaire (ERQ). The demographic questionnaire included questions about age, level of education, occupation, parity, and gestational age. Gestational status was also confirmed based on the maternal child health (MCH) handbook. MCH handbook records maternal health (pregnancy, childbirth, and postpartum) and child health (monitoring growth and development, background, and child health records).

The PUQE scale measures the severity of nausea, vomiting, and retching experienced over the past 24 hours [9]. Each item is rated on a 5-point Likert scale from 1 (not at all) to 5 (severe). The nausea and vomiting during pregnancy (NVP) were categorized into mild (4 to 6), moderate (7 to 12), and severe (13 to 15) [10]. Higher scores indicate more severe NVP. The MSPPS was used to determine an individual's social support. The MSPPS, developed by Gemayel *et al.* [11] consists of 12 items and aims to assess social support perception across three subscales: family, friends, and significant other. Respondents rated their answers on a 5-point Likert scale, which ranged from strongly disagreed (1) to strongly agreed (5) [11]. The tool is valid in assessing the perceived level of social support.

In addition, a translated and validated HARS assesses anxiety severity [12], [13]. The scale consists of 14 items. Items are rated on a scale of 0 to 4. Scores range from 0 (absent) to 56 (severe). A score less than 15 indicates mild anxiety and more than 15 describes moderate to severe anxiety levels. The ERQ measures how individuals manage and regulate emotions [14]. This is a 10 items scale that measures how people manage their emotions in two ways: i) cognitive reappraisal and ii) expressive suppression. Respondents answer each item using a 7-point Likert-type scale, where one means strongly disagree, and seven means strongly agree.

The data was analyzed using SPSS 26 software. Descriptive statistics were used, including mean and range for continuous variables, while categorical variables were displayed in frequency and percentage. To determine the relationship between variables associated with pregnancy-related anxiety, a chi-square test was conducted. Multiple logistic regression was used to examine the final model of factors that influence pregnancy-related anxiety. A p-value less than 0.05 was considered statistically significant to increase the risk of anxiety during pregnancy.

3. RESULTS AND DISCUSSION

A total of 129 women were recruited from four public health centers in Semarang. The characteristics of the participants are presented in Table 1. Out of the participants, approximately 38% suffered from moderate to severe anxiety. The majority of the participants were aged between 20 and 35 (88.4%), employed (51.2%), had low formal education (82.9%), and had multiple pregnancies (62.8%). Over 74.4% of participants

experienced moderate to severe nausea and vomiting, with an interquartile range (IQR) of 3–15. About half of the participants had good emotion regulation (51.2%) and family support (51.9%).

Table 2 presents the results of assessing the relationship between potential risk factors for maternal anxiety. Significant risk factors ($p<0.05$) include employee status, NVP, emotion regulation, and social support. These factors significantly affect maternal anxiety levels and were then included in the multivariate analysis.

The final multivariate risk estimate of all factors against maternal anxiety is shown in Table 3. The results of the analysis indicate that low levels of social support and poor emotion regulation skills were found to be positively associated with maternal anxiety. Conversely, being employed was negatively associated with experiencing moderate to severe anxiety during pregnancy.

Table 1. Characteristics of participants (N=129)

Characteristics	Category	Total (N= 129) n (%)	Mean (IQR)
Age	>35	15 (11.6)	27.3 (18–40)
	20-35	114 (88.4)	
Occupation	Employed	66 (51.2)	-
	Unemployed	63 (48.8)	
Formal education	Low	107 (82.9)	-
	Higher	22 (17.1)	
Parity	Primipara	48 (37.2)	-
	Multipara	81 (62.8)	
NVP	Moderate to severe	96 (74.4)	7.8 (3–15)
	Mild	33 (25.6)	
Emotion regulation	Poor	63 (48.8)	50.8 (16–70)
	Good	66 (51.2)	
Social support	Poor	62 (48.1)	74.7 (20–84)
	Good	67 (51.9)	
Anxiety level	Moderate to severe	48 (37.2)	13.9 (1–28)
	Mild	81 (62.8)	

Table 2. Association between characteristics and maternal anxiety level

Characteristics	Category	Anxiety level		p-value
		Moderate to severe n (%)	Mild n (%)	
Age	>35	4 (26.7)	11 (73.3)	0.498
	20-35	45 (39.5)	69 (60.5)	
Occupation	Employed	31 (47.0)	35 (53.0)	0.049*
	Unemployed	18 (28.6)	45 (71.4)	
Formal education	Low	41 (38.3)	66 (61.7)	1.000
	Higher	8 (36.4)	14 (63.6)	
Parity	Primipara	20 (41.7)	28 (58.3)	0.634
	Multipara	29 (35.8)	52 (64.2)	
NVP	Moderate to severe	42 (43.8)	54 (56.3)	0.036*
	Mild	7 (21.2)	26 (78.8)	
Emotion regulation	Poor	32 (50.8)	31 (49.2)	0.006*
	Good	17 (25.8)	49 (74.2)	
Social support	Poor	33 (53.2)	29 (46.8)	0.001*
	Good	16 (23.9)	51 (76.1)	

*Significant statistic at p-value <0.05

Table 3. Prediction models of maternal anxiety level

Characteristics	Model 1		Model 2	
	p-value	AOR (95% CI)	p-value	AOR (95% CI)
Social support				
Poor	0.001*	3.935 (1.730–8.947)	0.001*	4.105 (1.824–9.237)
Good		1		
Emotion regulation				
Poor	0.025*	2.509 (1.122–5.610)	0.012*	2.749 (1.244–6.075)
Good		1		1
NVP				
Moderate to severe	0.105	2.320 (0.838–6.425)	-	-
Mild		1		
Occupation				
Employed	0.027*	0.394 (0.173–0.899)	0.031*	0.410 (0.182–0.922)
Unemployed		1		1

*Significant statistic at p-value <0.05; AOR: Adjusted odds ratio

This study was intended to assess the influenced factors for developing maternal anxiety in the first trimester. The present study revealed a one-third of the prevalence rate of moderate to severe degree of maternal anxiety during the first trimester (38%). It showed that this result is higher than previous reports, which established a 20%-25% anxiety during pregnancy [3], [15], [16]. The discrepancies might be attributed to sample size, selection methods, and sociodemographic factors. In addition, the present finding suggests that career women who had moderate to severe NVP and a lack of social support and emotion regulation are more likely to develop anxiety severity during their pregnancy. This estimation was also supported by the literature that pregnancy-specific anxiety was more prevalent during the first trimester [3].

Recent evidence reports that being anxious and depressed affects pregnancy. Maternal anxiety predicts high-risk conditions of pregnancy and indicates preterm birth. In addition, moderate to severe anxiety has significant consequences on the cognitive and psychiatric of children [17]. Dunkel Schetter and Lobel proved that severe stress predicted significant or low infant birth weight (LBW) [2]. Of note, the investigation of anxiety or stress might be difficult to measure as the assessment tends to be subjective. Yet, a validated translated HARS used as an instrument may explain a critical point to minimize the bias effect due to misclassification assessment.

It is noteworthy that factors leading to specific anxiety are complex. The rate of anxiety disorder commonly appears to be the highest in the early of pregnancy as a result of hormonal changes and asthenic syndrome, such as NVP and sleep disorder [18]. However, it is also possible as an effect of other cumulative risk factors [2], [19]. In this study, we found that social support contributed as the most dominant factor causing maternal anxiety (OR=4.105; 1.824–9.237). This finding is similar to a previous report that a lack of support from family, friends, and society enhances the possibility of suffering from anxiety during pregnancy [20]. It also emphasized that family support is a key social support component that is significantly associated with pregnancy-related anxiety. Family, particularly spouse support, is also known to affect the psychological condition of individuals, including pregnant women [21]. Poor family support may induce poor interaction with the social environment, which causes less psychological and leads to excessive anxiety [22]. Initially, during the early stage of pregnancy, women tend to overthink due to subjective feelings, body shape alteration, anxiety of childbirth, and mood swings as the adjustment in the endocrine system [23]. A safe and supportive system from the relatives is needed to improve confidence and establish a convenient atmosphere; as a result, fear and concerns related to pregnancy may be reduced [24]. In contrast, the disharmonious family relationship might cause significant anxiety degree among pregnant women, which is connected to an unstabilized emotional state [25].

The social support system involves positive social interactions, not just with family but also with friends and society. Social relationships can positively and negatively affect individuals [26], [27]. They are considered supportive if they help solve personal problems and reduce stress. Conversely, negative social support is the opposite, where an individual experiences discomfort and tension in their relationships with others. It is important to note that entering into such relationships does not solve personal issues and can also create interpersonal stress. Nevertheless, societal interaction contributes to determining anxiety during pregnancy. The findings are supported by the fact that people with low levels of social support in neighborhoods are at higher risk of social isolation and mental illness [28].

There is growing evidence suggesting that emotion regulation, which is defined as a construct of individuals expressing emotion, is linked to the onset of anxiety in general [29]. Anxiety disorder is marked by people who have highly intense emotions in expressing. This expressive suppression may cause strenuous identification of the emotion, which results in generalized anxiety disorder and panic attacks [30], [31]. For pregnant women, emotional regulation (ER) during pregnancy is known to elevate the cortisol and implicate higher levels of depression, anxiety, and self-injurious thoughts. The hormonal change during the pregnancy represents critical emotion dysregulation, which leads to excessive anxiety [32]. Nevertheless, existing literature may lack a plausible explanation of the bidirectional relationship between maternal ER and elevated anxiety.

The present finding also indicates that occupation correlated with pregnancy-related anxiety. Being employed during pregnancy decreased at 51% of the anxiety development (AOR=0.410; 0.182–0.922). A similar result revealed that anxiety and depression are larger among unemployed, pregnant women [33]. Despite the negative impact of being a worker during pregnancy as it may affect health state, this study reported contrasting results. This may be linked to interpersonal communication and socialization in the work environment, which reduces stress [34]. Social interaction enhances confidence in an individual's ability to cope with stressors by declining stress-provoked cortisol release [27]. Social connectedness, including at the workplace, may create a supportive and positive relationship and encourage people through their hard times through trust and resilience improvement [35]. Otherwise, being full housewives at home may be introduced to pregnant women more likely to develop stress and anxiety due to self-time spent. Furthermore, this relation may be specific to financial instability related to after-childbirth concerns. This finding supported the earlier

investigation that unemployed women are more likely to experience psychological distress than employed women [36].

This study, overall, strengthens the existing studies that lack of social support and ER exert influence on pregnancy-related anxiety through possible direct or indirect relationships. Meanwhile, employed women tend to reduce anxiety severity. The findings from this study have significant implications for public health centers to be more aware of mental health issues among pregnant women, including maternal anxiety, through promoting mental well-being to foster individuals' psychological strengths. Although this study has used independent investigators to interview the study's participants, several limitations should be acknowledged. First, recall bias may also affect responses for assessing anxiety levels, which may cause over or under-reporting of anxiety levels. Second, it is difficult to make a causal inference since both factors and the outcome were measured at one-time points; thus, the associations identified might be difficult to interpret due to the uncertainty of chronological events. In addition, this study did not account for anxiety records, which may significantly confound the resulting estimation.

4. CONCLUSION

This study suggests that pregnant women who lack social support, emotion dysregulation, and unemployment were identified as the risk factors of maternal anxiety during the first trimester. The prevalence of anxiety was more than one-third of the total participants, which indicated a high prevalence compared to previous findings. This study implied that lack of social support, including social interaction, was found to have the most influence on mental well-being among pregnant women. Further similar investigations are needed to explore the causal relationship by including more potential risk factors.

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