JMCH Journal of Maternal and Child Health (2023), 08(02): 203-2019
Masters Program in Public Health, Universitas Sebelas Maret

Research
Open Access

Relationship between Anxiety and Asthma Control among Pregnant Women with Asthma

Winda Aenah[1)], Arief Bakhtiar[2)], Endyka Eyre Frety[3)]

[1)]Midwifery Programme Study, Faculty of Medicine,
Universitas Airlangga, Surabaya, Indonesia
[2)]Departement of Pulmonology and Respiratory Medicine,
Faculty of Medicine, Universitas Airlangga, Indonesia
[3)]Midwifery Programme Study, Faculty of Medicine,
Universitas Airlangga, Surabaya, Indonesia

Received: 19 January, 2023; Accepted: 24 February, 2023; Available online: 16 March, 2023

ABSTRACT

Background: Asthma is a disorder of the airways in the form of chronic inflammation (inflammation). Pregnancy with a history of asthma certainly feels uncomfortable and can interfere with daily activities, this is what will cause an anxiety response. Anxiety in pregnancy with a history of asthma will certainly have an influence on asthma control in pregnant women, so there is a need for research on this case. The purpose of this study was to determine the relationship between anxiety levels and the incidence of asthma control in pregnant women with asthma comorbidities at Airlangga University Hospital, Surabaya.
Subjects and Method: This was an analytic observational study with cross sectional design. The sample in this study were pregnant women with comorbid asthma at Airlangga University Hospital who visited from January to March 2022 and sample selection used a purposive sampling method. The dependent variable is the level of asthma control. The independent variable is the level of anxiety. The research instrument used a Hamilton Anxiety Rating Scale (HARS) and Asthma Control Test (ACT) questionnaire. Data were analyzed using the Spearman Correlation test.
Results: There was a positive and moderate relationship between anxiety and asthma control in pregnant women with asthma comorbidities. Pregnant women with comorbid asthma who experienced severe anxiety had total control of asthma control, and this result was statistically significant (r= 0.41; p= 0.002).
Conclusion: There is a significant relationship between anxiety and the level of asthma control in pregnant women with asthma comorbidities at Airlangga University Hospital.

Keywords: pregnancy, anxiety, asthma control.

Correspondence:
Winda Aenah, Midwifery Program Study, Faculty of Medicine,Universotas Airlangga,Indonesia. Jl. Mayjen Prof.Dr. Moestopo No. 47, Pacar Kembang, Tambaksari, Surabaya 60132, East Java. Email: winda.aenah-2019@fk.unair.ac.id. Mobile: +6285785099130.

Cite this as:
Aenah W, Bakhtiar A, Frety EE (2023). Relationship between Anxiety and Asthma Control among Pregnant Women with Asthma. *J Matern Child Health*. 08(02): 203-209. https://doi.org/10.-26911/thejmch.2023.08.02.07.

© Winda Aenah. Published by Master's Program of Public Health, Universitas Sebelas Maret, Surakarta. This open-access article is distributed under the terms of the Creative Commons Attribution 4.0 International (CC BY 4.0). Re-use is permitted for any purpose, provided attribution is given to the author and the source is cited.

BACKGROUND

Asthma is a chronic inflammatory disease of the airways which is characterized by episodic wheezing, coughing and a feeling

of tightness in the chest due to airway obstruction (Fattory et al., 2015). Research by Nawangasri et al, (2020) states that asthma is a chronic inflammatory disease of the airway organs by the immune system and inflammatory mediators. Asthma is a major health problem in all countries in the world, even though it is classified as a non-communicable disease. Data states that 1-18% of the world's population suffers from asthma and is further strengthened based on data from the World Health Organization (WHO) with the Global Initiative for Asthma (GINA) in 2011 stating that asthma sufferers are expected to continue to increase in 2025. There are bad changes lifestyle patterns such as smoking and increasing air pollution due to transportation, industrial factories are one of the factors in the increasing prevalence of asthma.

Asthma can strike people from all age groups in all regions around the world. Along with the increase in the prevalence of asthma in the community, the incidence of asthma in pregnancy will also be more common. The National Center for Health Statistics (NCHS) in 2011 said that the prevalence of asthma according to age was 9.5% in children and 8.2% in adults, while according to gender it was 7.2% for men and 9.7% for women. Data in Indonesia based on the results of the Basic Health Research report (RISKESDAS) by the Ministry of Health and Development of the Republic of Indonesia in 2018 showed the prevalence of asthma reached a value of 2.4% (Ministry of Health RI, 2018). Based on previous research, the prevalence of asthma in pregnancy is around 0.5 – 1% of all pregnancies. This needs special attention considering the high incidence of uncontrolled asthma will increase morbidity and mortality, including making it difficult for sufferers to carry out activities and in some cases it can be fatal (Tantri, 2016).

Asthma inflammation can be caused by allergies to something, such as cold or hot air, smoke, dust, fur, or due to psychological disorders, these allergies are usually hereditary or genetic factors (Surtiretna, 2013). Triggers that cause asthma are allergens, stress, work environment, weather changes, and respiratory infections. Stress or emotional disturbances can trigger asthma in some individuals, but it can also exacerbate existing asthma attacks. One response to stress is anxiety (Hostiadi, 2015). Moreover, anxiety in pregnancy is a reaction that must occur as a response to physical and psychological changes in pregnant women (Bethsaida and Pieter, 2013). The hormonal changes that occur during pregnancy will trigger the anxiety level of pregnant women. It is this anxiety that triggers the release of histamine which causes narrowing of the airways characterized by sore throat and shortness of breath, which eventually triggers an asthma attack (Haq, 2010). This was confirmed in the research by Ainun et al. (2022) which states that anxiety in pregnancy will have many negative effects on the mother.

We cannot predict the severity of asthma in pregnancy because of the different changes, whether it becomes milder, more severe, or doesn't change at all (Agustina, 2015). This will be a burden for pregnant women with comorbid asthma apart from thinking about their own health conditions but also thinking about the health of the fetus in their womb. It was also emphasized that anxiety in pregnant women in the study of Apriyandityas and Diana (2012) stated that the anxiety experienced by pregnant women with the same co-morbidities would be prolonged and further trigger asthma attacks and lead to erratic asthma control. Based on the study by Tumigolung et al. (2016) found that there was a significant relationship between

anxiety levels and asthma attacks in ordinary people. Based on the background above, researchers feel the need and are interested in researching the "Relationship between anxiety levels and asthma control in asthmatic pregnant women with asthma at Airlangga University Hospital, Surabaya" to find out the relationship between anxiety and asthma control levels in pregnant women with asthma comorbidities in Airlangga University Hospital, Surabaya.

SUBJECTS AND METHOD

1. Study Design

This research is a quantitative study using an observational analytic study design and a cross sectional approach. The location of this research was at the Maternal Perinatal Installation and Obstetrics and Gynecology Department, Airlangga University Hospital, East Java, in June 2022.

2. Population and Sample

The population in this study were pregnant women with comorbid asthma who visited Airlangga University Hospital in the January to March 2022 period. The sample size in this study was 54 pregnant women using a purposive sampling technique.

3. Variables

The dependent variable of this study is the level of asthma control. The independent variable is anxiety.

4. Operational Definition of Variables

Asthma control level is the level of control over the clinical manifestations of asthma which is divided into three categories, namely uncontrolled, partially controlled and totally controlled. Code 1 for uncontrolled. Code 2 partially controlled. Code 3 for total control.

Anxiety is a physiological and psychological response of pregnant women that describes cognitive, somatic, emotional, and behavior due to discomfort or worry. Anxiety in this study was divided into five categories: no anxiety, mild anxiety, moderate anxiety, severe anxiety, very severe anxiety. Code 1 for no anxiety. Code 2 for mild anxiety. Code 3 for moderate anxiety. Code 4 for severe anxiety. Code 4 for very severe anxiety.

5. Instruments

The instruments used in data collection were the Hamilton Anxiety Rating Scale (HARS) questionnaire to measure anxiety and the Asthma Control Test (ACT) questionnaire which was distributed online to pregnant women with comorbid asthma who were subjects or research samples. Data management techniques include editing, coding, data entry, cleaning and tabulating techniques. Questions in the questionnaire include 14 questions to determine the category of anxiety and 5 questions about asthma control to determine the level of control of the subject's asthma.

6. Data Analysis

Data analysis methods used in this study include univariate and bivariate analysis. Univariate analysis to determine the frequency distribution of sample characteristics and bivariate analysis using statistical tests Spearman correlation with a significance level of 5% coefficient ($\alpha = 0.05$) to determine the relationship between anxiety and asthma control levels.

7. Research Ethics

Research ethics namely with informed consent, anonymity, confidentiality. A research ethics permit approval letter was obtained from the Research Ethics Committee of Airlangga University Hospital, Surabaya, Indonesia, No.050/KEP/2022,on May 27, 2022.

RESULTS

1. Sample Characteristics

Table 1 shows the age of the subjects in this study grouped into the healthy reproductive period, namely age <35 years and ≥ 35 years. In this study, subjects aged <35

totaled 35 (64.8%) pregnant women. The gestational age of women with comorbid asthma in this study divided by third trimester (TM 3) which are generally in the range ≥28 and the data shows that 52 (96.3%) pregnant women were the most subjects.

The characteristics of Gavida pregnant women with comorbid asthma in the study divided based on how many pregnancies the mother currently has, which are divided into four categories namely first pregnancy (G1), second pregnancy (G2), third pregnancy (G3), fourth pregnancy (G4). The data shows that 21 women with their first pregnancy (G1) (38.9%) were the most respondents in this study.

Table 2 show that the majority of pregnant women who visited Airlangga University Hospital in the January-March 2022 period, as many as 30 (55.6) pregnant women experienced severe anxiety. The mild anxiety category occupied the second position with 9 (16.7%) people, followed by the moderate anxiety category with 8 (14.8%) people and no anxiety with 6 (11.1%) people, and 1 (1.9%) person. A total of 54 pregnant women with comorbid asthma in this study, 33 (61.1%) pregnant women could not control their total asthma. As many as 12 (22.2%) pregnant women were partially controlled, and 9 (16.7%) could control their total asthma.

Table 1. Characteristics of subjects based on mother's age

Characteristics Subject	Frequency	Percentage (%)
Mother's Age (years)		
<35 years	35	64.8
≥ 35 years	19	35.2
Gestational Age (week)		
≥ 28 week	52	96.3
< 28 week	2	3.7
Gravida		
G1	21	38.9
G2	16	29.6
G3	15	27.8
G4	2	3.7
Total	54	100.0

Table 2. Univariate Analysis

Characteristics Subject	Frequency	Percentage (%)
Level Anxiety		
No Anxiety	6	11.1
Mild Anxiety	9	16.7
Moderate Anxiety	8	14.8
Severe Anxiety	30	55.6
Serious Anxiety	1	1.9
Level Control Asthma		
Totally controlled	9	16.7
Partially controlled / partial	12	22.2
Not controlled	33	61.1
Total	54	100.0

2. Bivariate Analysis

Table 6 shows that the majority of subjects experienced severe anxiety, namely 30 (55.6%) subjects, and 33 (61.1%) subjects could not control their asthma. The results of the Pearson correlation analysis showed

that there was a positive and moderate relationship between anxiety and the level of asthma control in pregnant women with asthma comorbidities. Pregnant women with comorbid asthma who experienced severe anxiety had total control of asthma control, and this result was statistically significant (r= 0.41; p= 0.002).

Table 3. Bivariate results between anxiety and asthma control levels

Independent Variable	Asthma control level	
	r	p
Anxiety Level	0.41	0.002

DISCUSSION

1. The relationship between anxiety and the level of asthma control in pregnant women with asthma

The results of the characteristics of the respondents are divided based on the age of the mother, gestational age, and gravida. The data shows that the respondents in this study were 52 (96.3%) pregnant women aged <35 years. The gestational age of the mothers in this study was 52 (96.3%), almost all of the respondents were in the range ≥28 weeks or the third trimester (TM 3). Meanwhile, pregnant women with their first pregnancy (G1) were the most subjects (38.9%). Characteristics such as maternal age, gestational age, and gravida in this study show that influence the recurrence or incidence of asthma in pregnant women with comorbid asthma, so that it will describe the effect on the emergence of anxiety and trigger different asthma controls (Sherwood, 2014).

The results of this study indicate that most pregnant women experience severe anxiety (56%) and cannot control asthma (61.1%). Data shows that pregnant women with asthma comorbidities who visited the hospital from January to March 2022 experienced a high level of anxiety. This is in line with previous studies which show that anxiety is one of the most common negative emotions during pregnancy, especially during the third trimester (Angesti, 2020). Anxiety can be described as a feeling of uncertainty, doubt and helplessness, restlessness, worry, unrest which is often accompanied by physical complaints (Lilik, 2016).

Pregnant women are generally affected by the different physical, emotional and social changes that occur during pregnancy (Husniawati and Fajriani, 2017). Cortisol hormone change experienced by pregnant women increased the risk of excessive stress and anxiety (Vrijkotte et al. 2022). A number of experimental animal studies have found that progesterone, cortisol and estrogen can reduce contractility and increase bronchial smooth muscle relaxation. Many studies have been conducted on pregnant women with asthma, but the results varied, although it clearly shows that pregnancy can have an effect on asthma.

Bettina et al. (2016)) stated that when anxiety occurs it will change the work of the immune system in the body and this will increase the occurrence of inflammation in the body. Some of these points will cause the respiratory tract to become more sensitive and easier to cause asthma events, and will cause uncontrolled asthma. This theory is reinforced by the research of Plourde et al. (2017) this happens because when pregnant women experience anxiety it will increase the hormones cortisol and adrenaline which increase in these hormones will increase blood pressure, and heart rate besides that it will increase the respiratory rate and make muscles become Stiffness includes the muscles surrounding the airway.

Anxiety can cause physiological changes that can lead to asthma attacks. Poor asthma control are more common in women, elderly, people with poor lung function, obese, stress and anxiety (Erlina et al., 2020). This study proves that there is a significant relationship between anxiety and asthma control in pregnant women.

AUTHOR CONTRIBUTION

In this research, Arief Bakhtiar and Winda Aenah collaborated to create a conceptual framework and research methodology. Winda Aenah collects data. Winda Aenah, Arief Bakhtiar, and Endyka Eyre Frety collaborated to analyze the data.

FUNDING AND SPONSORSHIP

This study is self-funded.

CONFLICT OF INTERESTS

There is no conflict of interest in this study.

ACKNOWLEDGMENT

There is no conflict of interest in this study.

REFERENCES

Agustina W (2015). Respon imun pada penderita asma selama kehamilan (Immune response in asthmatics during pregnancy). Jurnal Ilmu Kesehatan, 5 (1):56-66. DOI: https://doi.org/10.32831/jik.v4i1.75

Ainun SZ, Sari GM, Frety EE (2022). Anxiety and it's relationship with adherence to visit antenatal care in pregnant women. Journal of Maternal and Child Health. 7(1). DOI: https://doi.org/10.26911/thejmch.2022.07.01.10

Angesti EPW (2020). Hubungan tingkat kecemasan dan pengetahuan ibu hamil trimester 3 dengan kesiapan menghadapi persalinan di masa pandemi COVID-19 di Puskesmas Benowo dan Tenggilis (The relationship between the level of anxiety and knowledge of third trimester pregnant women and readiness for childbirth during the COVID-19 pandemic at the Benowo and Tenggilis Health Centers). Skripsi. Universitas Airlangga.

Aprisandityas A, Diana E (2012). Hubungan antara regulasi emosi dengan kecemasan pada ibu hamil (The relationship between emotion regulation and anxiety in pregnant women). Jurnal Psikologi. 8(2):80-89. http://dx.doi.org/10.24014/jp.v8i2.190

Bethsaida dan Pieter. (2013). Pendidikan psikologi untuk bidan suatu teori dan terapannya (Psychology education for midwives a theory and its application), Yogyakarta: Andi Offset.

Bettina H, Leucht V, Loerbroks A (2016.) Work stress, asthma control and asthma-specific quality of life: Initial evidence from a cross-sectional study. J Asthma. 54(2):210-216. DOI:10.1080-/02770903.2016.1201836

DINKES JATIM (2014). Profil kesehatan provinsi Jawa Timur Tahun 2014 (East Java province health profile in 2014).

Erlina L, Wibisono DS, Dwidasmara SDK, Tursini Y (2020). Relationship of anxiety to asthma control in bronchial asthma patients. Jurnal Riset Kesehatan. 12 (2) 388-394. DOI: 10.34011/-juriskesbdg.v12i2.1777

Fattory H, Endharti T, Barlianto W, Olivianto E, Kusuma C (2015). Efek imunoterapi, probiotik, nigella sativa terhadap rasio CD4+/CD8+, kadar IgE, dan skoring asma (Effects of immunotherapy, probiotics, nigella sativa on CD4+/CD8+ ratio, IgE levels, and asthma scoring). Jurnal Kedokteran Brawijaya. 4(28):328-333. https://-doi.org/10.21776/ub.jkb.2015.028.04.13

GINA (2011). Global strategy for asthma management and prevention. [Online] ginasthma.org. Retrieved fom: https://ginasthma.org/wp-content/-uploads/2019/01/2011-GINA.pdf.

Haq RK (2010). Hubungan tingkat kecemasan dengan serangan asma pada penderita asma bronkial di BP4 Semarang (Relationship between anxiety levels and asthma attacks in bronchial asthma sufferers at BP4 Semarang). Jurnal KesMaDaSka. 1(1):26-33.

Hostiadi M, Mardjiana A, Nurtjahja E (2015). Hubungan antara tingkat kecemasan dengan frekuensi kekambuhan keluhan sesak napas pada pasien asma bronkial di SMF Paru RSD DR. Soebandi Jember (The relationship between the level of anxiety and the frequency of recurrence of shortness of breath in bronchial asthma patients at the Lung SMF RSD DR. Soebandi Jember). Journal of Agromedicine and Medical Sciences. 1(1). http://repository.unej.ac.id/handle/123456789/75134

Husniawati N, Fajriani (2017). Hubungan antara karakteristik ibu dan dukungan suami terhadap tingkat kecemasan ibu hamil trimester III di Puskesmas Kecamatan Makasar (The relationship between maternal characteristics and husband's support on the anxiety level of third trimester pregnant women at the Makassar District Health Center). Jurnal Ilmiah Kesehatan. 9(1)25-30. DOI: https://doi.org/10.47701/ovum.v2i2

Kementrian Kesehatan RI (2018). Hasil utama Riskesdas 2018 (Main results of Riskesdas 2018).

Lilik A M, Zainuri I, Akbar A (2016). Buku ajar keperawatan jiwa teori dan aplikasi klinik (Textbook of mental nursing theory and clinical applications). Indomedika Pustaka

Nawangasri AP, Budiono, Bakhtiar A, Sutikno B, Surayningrum EM, Damayanti D (2022). The relationship between physical activity and fev1/fvc in asthmatics. Surabaya Physical Medicine and Rehabilitation Journal. 4(1). DOI: 10.20473/spmrj.v4i1.24726

NCHS (2011). Health United State, 2011: With Special Feature on Socioeconomic Status and Health. [Online] nchs.com. Retrieved from: https://www.-cdc.gov/nchs/data/hus/hus11.pdf.

Sherwood L (2014). Fisiologi manusia dari sel ke sistem (Edisi 8). Jakarta: EGC.

Surtiretna N (2013). Mengenal sistem pernapasan (Get to know the respiratory system). Bandung: Kiblat Buku Utama.

Tantri I (2016). Serangan asma akut derajat sedang pada kehamilan (Moderate acute asthma attack in pregnancy). Skripsi. Universitas Udayana. Retrieved from: http://erepo.unud.ac.id/id/-eprint/10729/1/1e980277d95404a6b5b7ef738cc39b6d.pdf.

Tumigolung T, Kumaat L, Onibala F (2016). Hubungan tingkat kecemasan dengan serangan asma pada penderita asma di kelurahan Mahakeret Barat dan Mahakeret Timur Kota Manado (The relationship between anxiety levels and asthma attacks in asthma sufferers in Mahakeret Barat and Mahakeret Timur sub-districts, Manado City). e-journal Keperawatan (e-Kp), 4(2):1-8. https://doi.org/10.35790/-jkp.v4i2.14071

Vrijkotte TGM, Rooij SR, Roseboom TJ, Twickler (2022). Maternal serum cortisol levels during pregnancy differ by fetal sex. Elsevier: Psychoneuroendocrinology. 149. DOI: 10.1016/j.psyneuen.2022.105999