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The Relationship between the Length of Seeking Help and the Severity of Stroke Patients

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Abstract
The length of time a stroke patient seeks help from health services plays an important role in the successful treatment of stroke patients. The golden period for stroke treatment is approximately only 3 hours from the start of the attack. Once an attack occurs, the patient must receive comprehensive therapy so that the degree of nerve damage is not severe. The aim of the research was to determine the relationship between the length of time seeking help and the severity of stroke patients at RSUD dr. Loekmono Hadi Kudus. This research is descriptive analytical with a cross-sectional approach. The research sample was taken using a purposive sampling technique. A sample of 65 respondents was obtained. The instruments used were observation sheets and the NIHSS questionnaire, while statistical tests used Spearman Rank. There is a significant relationship between the length of time seeking help and the severity of stroke patients (p-value <0.05). More than half of the respondents sought help from health services after the golden period (>3 hours), and more than half of the respondents experienced a serious stroke. Respondents' or families' ignorance of the signs and symptoms of stroke, as well as consideration of treatment costs, are the dominant factors in patients missing their golden years. Therefore, educating the public about stroke, especially the signs and symptoms of stroke, is very important so that the public can immediately take patients to the hospital. Future researchers are expected to conduct qualitative research to explore knowledge and responses to stroke attacks.

Keywords: length of seeking help; response time; severity of stroke

1. Introduction

Stroke is a neurological emergency that often happens to anyone with high rates of morbidity and mortality. A stroke will happen when a brain blood vessel ruptures or becomes blocked. As a result, part of the brain loses the blood supply that carries the necessary oxygen and causes cell and tissue death (Kementerian Kesehatan RI, 2018). Data from the World Stroke Organization shows that the global prevalence of stroke in 2019 reached 101.5 million (Feigin et al., 2022). For almost three decades (1990-2019), there has been an increase in stroke cases up to 70%, with mortality and disability-adjusted life-years lost (DALYs) rates of 34% and 143%, respectively (Feigin et al., 2022). Results of studies on basic health explain that the prevalence of stroke in Indonesia in 2018 was 10.9 % or 713,783 people (Kementerian Kesehatan RI, 2019). The prevalence of stroke in Central Java in the period of 2020-2021 has increased by 30.7% from 42,376 in 2020 to 55,412 in 2021 (Dinas Kesehatan Provinsi Jawa Tengah, 2022; Dinas Kesehatan Provinsi Jawa Tengah, 2023). The results of the preliminary study at the regional general hospital, RSUD Dr. Loekman Hadi Kudus, found a very significant increase in the number of stroke patients, reaching 89% from 493 patients (2021) to 932 (2022).

In 2019, stroke became the third leading cause of disability and the second leading cause of death in the world (Feigin et al., 2021). Some literature also confirmed that stroke is closely related to disability, decreased productivity, increased risk of depression, decreased quality of life, and economic burden (Hackett & Pickles, 2014; Lekander et al., 2017; Ramos-Lima et al., 2018; Sarfo et al., 2019; Vyas et al., 2016). The increasing economic burden due to stroke is not only felt by patients or their families but also by the government, especially regarding the burden of health financing. BPJS

Healthcare has claimed financing for 2.54 million stroke cases, with total claims reaching IDR 3,23 trillion (BPJS Kesehatan, 2023). This makes stroke classified as a catastrophic disease with the third largest financing after heart disease and cancer (BPJS Kesehatan).

Stroke is an acute neurological disease belonging to the group of cerebrovascular (CVD) (Olvera Lopez et al., 2023). A stroke is caused by a brain blood vessel disorder that suddenly occurs and turns out to be an emergency, and requires immediate treatment (Khaku & Tadi, 2023). The time spent bringing stroke patients to health services greatly determines the success of stroke patient treatment (Kusyani, 2019). The golden period in stroke treatment is approximately three hours from the beginning of the attack (Ishariani & Rachmania, 2021). Patients must also immediately get comprehensive and optimal therapy from the hospital emergency team to prevent more severe nerve damage (Kusyani, 2019).

There are some factors that make stroke patients come late to the hospital, one of which is the patients and their families (Ellis, 2013). Factors from patients and family include several things, such as a lack of knowledge about symptoms or signs of stroke, a lack of understanding of stroke as a medical emergency that needs immediate treatment, a long decision due to waiting for family agreement, and the availability of inadequate transportation (Rachmawati et al., 2017). The issue of the relationship between the length of time spent seeking help and the severity of stroke patients is quite interesting to study. It is important considering that the public rarely knows the response of stroke patients to seeking help. Most people usually seek help when the body's condition begins to deteriorate. This study is aimed at determining the relationship between the length of time spent seeking help and the severity of stroke patients.

2. Research Methods

This is a research study of analytical descriptiveness with a cross-sectional approach. The study was conducted at the emergency and Inpatient Installation of RSUD dr. Loekmono Hadi Kudus, Central Java Province. The population of this study was all stroke patients at RSUD dr. Loekmono Hadi Kudus in January – December 2022, totaling 932 patients. The sampling technique of this study used purposive sampling with the following inclusion criteria: patients with suspected stroke, hemorrhagic stroke, and ischemic stroke accompanied by family; stroke patients with infarction evidenced by CT-Scan photos; patients in treatment for no more than three days; willingness to be respondents; and ablility to join the research to the final stage. While the exclusion criteria are stroke patients or family members refusing to participate in the study. The Sample size in this study is 65 respondents.

Data was collected on April 4-18, 2023, and was carried using observation sheets and questionnaires. The observation sheets consist of complaints, time of attack, time to seek help from health service, and NIHSS conclusions. The questionnaire used in this study is the stroke severity questionnaire of the National Institute of Health Stroke Scale (NIHSS). There are 11 neurological examination items in the NIHSS questionnaire, such as level of consciousness, speech and language function, vision function, eyeball movement, facial symmetry, motor strength, sensation, and coordination (Wandira et al., 2018). The interpretation of the examination using the NIHSS instrument is as follows: a mild stroke when the NIHSS score is 0 – 8, a moderate stroke when the NIHSS score is 9-15, and a severe stroke when the NIHSS score is > 16 (Muchada et al., 2014). The validity and reliability test of the NIHSS was done by Saudin & Rajin (2017). The validity test of the NIHSS instrument yielded a value of 0.89, and more than 90 % of the NIHSS value is within 5 points with a high level of validity and a Cronbach alpha value of 0.81. It is all indicated that the NIHSS has proven reliable. Spearman Rank was used in the test of statistics. The Research Ethics Committee of STIKES Telogorejo Semarang has given ethical approval for this research as it was marked by the issuance of No. 001/III/KE/STIKES/2023.

3. Results and Discussion

3.1. Respondent Characteristics

Most of the respondents in this research were female (58.8%), elderly or in the range of 46-65 years (66.2%), an elementary school education level (73.3%), and had a history of hypertension (53.8%). These characteristics owned by the respondents are clearly shown in Table 1.

Table 1. Characteristics of Respondents

Variable	Frequency (f)	Percentage (%)
Gender		
Male	27	41.5
Female	38	58.8
Age		
Adult (36-45 years)	6	9.2
Elderly (46-65 years)	43	66.2
Old (> 65 years)	16	24.6
Education		
Elementary School	47	73.3
Junior High School	13	20.0
Senior High School	5	7.7
College/University	0	0
Medical History		
No history	7	10.8
Hypertension	35	53.8
Diabetes Mellitus	10	15.4
Hipertensi-Diabetes Mellitus	13	20.0
Total	**65**	**100**

Source: primer, 2023

The majority of respondents in this study were female (58.8%). In contrast to this study, results obtained from previous research show that men are more likely to suffer strokes (El Nahas et al., 2023; Keller et al., 2018; Mondal et al., 2022; Yi et al., 2020). Madsen et al. (2020) found that stroke cases in men increased at the age of 20-44 years. Some risk factors are associated with an increased incidence of stroke at a young age, such as hypertension, diabetes mellitus, alcohol consumption, stress, smoking, lack of physical activity, and obesity (Aigner et al., 2017; Aslam et al., 2022; Khan et al., 2023). Men have a higher risk of stroke incidence at certain ages. Despite this, women have a lifetime risk, a recurrent risk of stroke, a risk of disability, and a higher risk of death from stroke compared to men. (Arba et al., 2017; Girijala et al., 2017; Jacobs & Ellis, 2021). Referring to some research results, it was found that some unique factors may be the cause of the high-risk stroke in women. These factors include the following: women's life expectancy is higher (Girijala et al., 2017; Madsen et al., 2018); hypertension and atrial fibrillation (risk factors for stroke) are more prevalent in women (Corbière & Tettenborn, 2021; Rexrode et al., 2022); pregnancy, hypertension in pregnancy, gestational diabetes, use of oral contraceptive, menopause and hormone replacement therapy (Corbière & Tettenborn, 2021; Demel et al., 2018; Girijala et al., 2017).

The respondents of this study were mostly elderly group (46-65 years), as much as 66.2%. According to Yousufuddin & Young (2019), the risk of stroke will increase up to twice every ten years after passing the age of 55 years. The results of the previous studies even reported that the risk of stroke increased up to 23.58 times in the age group of 41-64 years compared to the age group of 15-40 years (Rahayu, 2016). This confirms that the risk of stroke increases with age. Age and gender are irreversible

risk factors for stroke. Women are generally 4-6 years older than men during the first stroke (Madsen et al., 2020; Rexrode et al., 2022).

As women age, their higher life expectancy causes them to suffer more strokes as well as more deaths from strokes compared to men. Along with age, the function of the body's organs decreases, such as in the organs of blood vessels. The elasticity of blood vessels that begins to decrease will cause the accumulation of atherosclerosis, amyloid, and hyalinizing plaques. As a result, the lumen in blood vessels narrows and causes stroke (Banerjee & Chimowitz, 2017). As they enter old age, women usually experience the stage of menopause, which results in decreased production of the hormone estrogen (Demel et al., 2018). One of the functions of estrogen hormones is to prevent the formation of atherosclerosis plaques in blood vessels, including cerebral blood vessels (Meng et al., 202; Xie et al., 2022). When estrogen levels decrease, its work becomes less optimal, and its protective function continuously weakens. As a result, more atherosclerosis plaques will form in the end. If the plaque ruptures, thrombosis will occur. It is a thrombogenic process that causes platelet activation and the formation of coagulation pathways that can cause blockage in the lumen of blood vessels and strokes.

Almost three-quarters of the total respondents in this research had elementary school education, as much as 73.3%. The results of this study are not much different from the results of Yi et al. (2020) in China, where the majority of respondents are elementary school graduates. A lower level of education is associated with an increased risk of stroke (Jackson et al., 2018). In contrast, a higher level of education has a reduced risk of stroke (Xiuyun et al., 2020). Higher education allows people to access a wide range of information about stroke, get a better job, have easy access to health services, and live a healthier lifestyle. This possibility has an indirect effect on reducing the risk of stroke. In the context of this research, where education is associated with the level of knowledge and understanding of a person regarding stroke, it indicates one thing: the higher a person's education, the better their knowledge related to stroke will be, so that if any a stroke occurs it any time, it can be immediately brought to health services so as not to worsen the severity of stroke.

It was found in this study that half of the respondents had a history of hypertension, as much as 53.8%. Hypertension increases the risk of hemorrhagic stroke by 3 – 4 times (Yi et al., 2020; Zhang et al., 2017). Li et al. (2022) reported that hypertensive patients face a cumulative risk probability of stroke of 78.9%. The risk is characterized by four distinct peaks, which occur at the age of 8, 15, 22, and 26 years after suffering from hypertension, with probabilities of 4.2%, 14.0, 6.0%, and 13.9%, respectively. The risk of stroke in women due to hypertension is higher than in men (Madsen et al., 2019).

Controlling blood pressure can decrease the risk of stroke and prevent recurrent strokes (McCarthy et al., 2021). The risk of stroke and ischemic heart disease was reduced by 30% and 23%, respectively, with a ten mmHg decrease in systolic blood pressure and four mmHg in diastolic (Li et al., 2022). McCarthy et al. (2021) explained that stroke patients with a history of hypertension account for half of stroke patients, but more than three-quarters of them have poor blood pressure control (McCarthy et al., 2021). Even elderly women with high risk also experience the same thing (Corbière & Tettenborn, 2021). This is the importance of education, monitoring, and evaluation of hypertension treatment by health workers to ensure the certainty of hypertension management working optimally as an effort to carry out effective secondary prevention of stroke in this vulnerable population.

Table 2. Distribution of frequency of respondents based on length of seeking help in stroke patients

Characteristics	Frequency (f)	Percentage (%)
Length of Seeking Help		
< 3 hours	26	40.0
> 3 hours	39	60.0
Severity		

Characteristics	Frequency (f)	Percentage (%)
Mild Stroke	20	30.8
Moderate Stroke	12	18.5
Severe Stroke	33	50.8
Total	65	100

Source: primer, 2023

Table 2 shows that more than half of respondents, as much as 60%, seek help from the health service after passing the golden period (>3 hours). Research in Saudi Arabia shows a similar thing, where more than half of stroke patients experience delays when arriving at the hospital to get treatment (Al Khathaami et al., 2018). According to Rizaldy Pinzon (2019), most patients come to the hospital more than 24 hours after a stroke. This is due to a lack of knowledge about stroke and its symptoms, so they misinterpret the visible symptoms, consider the symptoms not to be serious, and hope that the symptoms will soon disappear. It causes the patient not to immediately get medical treatment, which causes the severity of the patient's stroke to worsen. Previous studies reported similarly that a lack of family knowledge about risk factors and warning of stroke symptoms caused stroke patients not to be immediately taken to the hospital (Rachmawati et al., 2017). The delay in having treatment for stroke patients has an impact on the severity of the patient. The ignorance of respondents or their families related to signs and symptoms of stroke, as well as consideration of the cost of hospital care, is the cause of respondents' failure to miss the golden period. It was known that more than half of the respondents in the study (50.8%) had a major stroke.

Table 3. Analysis of the length of seeking help with the severity of stroke patients at RSUD dr. Loekmono Hadi Kudus

Variable	N	R	p-Value
Length of Seeking Help and Severity of Stroke Patients	65	0.896	0.000

Source: primer, 2023

The analysis using the statistical test Spearman Rank (as shown in Table 3) presented a significant relationship between the length of seeking help and the severity of stroke patients. With a p-value < 0.05 (0.000) and r = 0.896, a positive correlation was obtained, which means a very strong relationship exists between the length of seeking help and the severity of stroke patients. Examining the severity of stroke includes neurological examination such as level of consciousness, speech and language functions, vision function, eyeball movement, facial symmetry, motor strength, sensation, and coordination (Wandira et al., 2018). As a result of the length of time spent seeking help, which is not in accordance with the golden period of stroke, the degree of severity suffered by patients in this study is in the form of an inability to speak or communicate.

One of the important keys to decreasing mortality and minimizing brain damage caused by stroke is to provide prompt and appropriate treatment. Fassbender et al. (2013) stated that the most recommended time for stroke patients is 3 – 4 hours, called the golden period. The stroke treatment that is done in more than the golden period, depending on the severity of the patient, will be permanent. The main purpose of stroke treatment in the golden period is to save brain tissue that lacks nutrients and oxygen supplies. Drugs for stroke are right when given during the golden period as a blockage destroyer.

Some factors that delay stroke patients arriving at a hospital so that they miss the golden period are as follows: education level, perception of stroke, unavailability of ambulance transportation, a lack of knowledge, economic factors, and difficult access to health services. The importance of knowledge of the golden period can reduce mortality and disability in stroke patients. Doing treatment properly while still in the golden period can prevent the worsening of the severity of stroke patients.

4. Conclusion

There was a significant relationship between the length of time spent seeking help and the severity of stroke patients, with a p-value < 0.05 (0.000). More than half of respondents sought help with health care after passing the golden period, and more than half of respondents had a major stroke. The ignorance of respondents or family regarding the signs and symptoms of stroke, as well as consideration of the cost of hospital care, are the main factors of patients missing the golden period. Educating the public about stroke, especially signs of stroke symptoms is important so that they can immediately take patients to a hospital. This study was supposed to carry out this research in the emergency room only, but due to time constraints and to meet 65 respondents, it was conducted in the emergency room and the patient room. Research conducted in the emergency room faced difficulties digging deeper into the factors that slow patients from seeking help because respondents and families are in an anxious atmosphere. Many patients and families are closed, especially in the emergency room where documentation is impossible. For further researches, qualitative research on family knowledge and factors related to family response to stroke is suggested.

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Production of breast milk in pregnant women with and without Gestational Diabetes Mellitus

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Abstract
Gestational diabetes mellitus (GDM) is a health disorder associated with an increased risk of type 2 diabetes mellitus in both mother and baby. Breastfeeding is one way for mothers to reduce this risk. This study aims to determine breast milk production in GDM and non-GDM pregnant women. The research design was a prospective cohort and involved 12 pregnant women. The inclusion criteria were GDM and non-GDM pregnant women aged 28-31 weeks and willing to be respondents. The Jakarta Regional Hospital research used questionnaire instruments and breast milk production observation sheets. Chi-square statistical test analysis. The research results showed a significant relationship between the status of GDM and non-GDM pregnant women and breast milk production (P value 0.05). The maximum breast milk production of GDM pregnant women is less than non-GDM, with maximum breast milk production of 0.3cc and 0.5cc. GDM pregnant women produce lower breast milk production than non-GDM pregnant women. Breast milk production in pregnant women with GDM is slower than in pregnant women without GDM. This can be seen from the research results, which show that 58.3% of non-GDM pregnant women have expressed breast milk (on average starting at 17 weeks of gestation). Of pregnant women with GDM, only 8.3% have ever expressed breast milk (starting from the 31st week). Education on breastfeeding during pregnancy and maternal nutrition is necessary to increase maternal self-efficacy. Researchers hope to observe long-term breastfeeding expenditure from pregnancy to six months or even two years.

Keywords: gestational diabetes mellitus; GDM; pregnant women; breast milk production

1. Introduction

Gestational Diabetes Mellitus, abbreviated GDM, is one of the medical complications that often occur during pregnancy (Choudhury & Devi Rajeswari, 2021). The global GDM incidence rate ranges from 10.3% - 14% (Moody et a., 2020; Wang et al.,2022). The prevalence of GDM is highest in the Middle East and several North African countries (27,6%), followed by Southeast Asia (20.8%) (Wang et al.,2022). How about Indonesia? Studies on the prevalence of GDM show that Indonesia has relatively few or very few cases. The study using Sullivan and Mahan's criteria found that the prevalence of GDM in Indonesia ranged from 1.9 – 3.6% (Purnamasari et al.,2013).

Some studies show the presence of various complications of GDM during pregnancy and childbirth, such as an increased risk of section Caesarea (Boriboonhirunsarn & Waiyanikorn, 2016; Muche et al., 2020; Yue et al., 2022), macrosomia (Capobianco et al.,2020; Kumari et al., 2018; Yue et al.,2022), preterm labor (Greco et al., 2023; Ye et al., 2022), pregnancy-induced hypertension (Muche et al., 2020), postpartum hemorrhage (Kumari et al., 2018; Muche et al., 2020). In the long term, GDM can increase the risk of type 2 diabetes mellitus (DM type 2) (Eades et al., 2015; Noctor & Dunne, 2015), metabolic syndrome (Catov et al., 2020; Cho et al.,2016) and cardiovascular diseases (Kramer et al., 2019; S.M. Lee et al., 2022). The risk of developing type 2 DM in women with a history of GDM increases 8-10 times compared to non-GDM (Z.Li et al., 2020; Song et al., 2018; Vounzoulaki et al., 2020). The cumulative risk of developing type 2 DM at ten years postpartum ranges from 20% to 6 % (ACOG, 2018); Saucedo et al.,2020; Spaight et al., 2016). In addition, the offspring of women with

GDM have a greater risk of obesity, cardiovascular disease (CVD), type 2 diabetes (T2DM), and GDM in the future (Franzago et al.,2019; Mantzorou et al., 2023; Slupecka-Ziemilska et al., 2020). This will form a terrible vicious cycle of diabetes between generations and certainly cause a burden on health financing.

Breastfeeding plays an important role in decreasing the long-term impact of GDM. Some research results show that breastfeeding is an effective way to reduce the risk of T2DM, obesity, and metabolic diseases in mothers with GDM and their children (Jirakittidul et al., 2019; Muche et al., 2020; Qian et al., 2022). The longer the breastfeeding duration, the more the risk of T2DM decreases. Even this risk reduction reached 25% - 47% (Gunderson et al., 2018). However, the results of previous studies found the fact that compared to non-GDM women, women with GDM had lower intensity and duration of breastfeeding (Bærug et al., 2018; Chamberlain et al., 2017; Haile et al., 2016; Nguyen et al., 2019). Women with GDM will end breastfeeding earlier than those with non-GDM (Bærug et al., 2018). The rate of exclusive breastfeeding for mothers with GDM is relatively low, ranging from 28.8%-33.95% (Jirakittidul et al., 2019; Qian et al., 2023). According to (Doughty & Taylor, 2021), biological barriers in the form of cesarean delivery and late lactogenesis II, are the causes of lack breastfeeding duration in mothers with GDM.

Research on GDM in Indonesia, especially on the breast milk of GDM mothers, is rarely conducted. The studies on breast milk in GDM are carried out after childbirth. Lactogenesis is a process of milk formation that begins and occurs in early pregnancy. Lactogenesis I occurs at the age of 16 weeks of pregnancy when colostrum begins to be produced by lactocyte cells under neuroendocrine control (Supinganto et al., 2021). Research on breast milk production in pregnant women with GDM and non-GDM needs to be carried out. This is important to anticipate anything that is not expected of mothers with GDM after childbirth. In this way, they can breastfeed their babies properly in sufficient breastfeeding. This study aims to determine how breast milk production in GDM and non-GDM pregnant women.

2. Research Method

This research is an analytical study with a prospective cohort approach. The comparative research design is non-experimental. This research was conducted at the Jakarta Regional General Hospital in March 2023. The population of this study was pregnant women with GDM and non-GDM at Regional General Hospital, Jakarta. The calculation of the sample formula is a hypothesis test of the difference between two proportions. The samples were obtained from 12 GDM pregnant women and 12 non-GDM pregnant women. The inclusion criteria are pregnant women with GDM and non-GDM pregnant women with a gestational age of 28 – 31 weeks.

Breast milk production becomes the dependent variable, and GDM and non-GDM pregnant women become independent variables. The instruments used in this research are questionnaires containing demographic data and observation sheets containing data such as time and amount of breast milk production. Before collecting data, the researcher explained the research, its procedure, and others related to the research to the respondents. The respondent then signed the informed consent sheet.

Breast milk in this study was obtained by manual squeezing. In this process, respondent used their hands to stimulate the mammary glands and directed the milk flow into a small container (mini cryotube). Milk produced by pregnant women with GDM and non-GDM was then measured in volume using an insulin syringe. Data analysis used a chi-square statistical test. This research has undergone an ethical test at Tanjung Karang Health Polytechnic with ethics number 223/KEPK-TJK/III/2023.

3. Results and Discussion

3.1.Results

This research involved 24 respondents. They are GDM pregnant women and non-GDM pregnant women, with the average age and gestational ages not much different. The average age of the respondents in this research is approximately 30 years, with a gestational age of 30 weeks, as shown in Table 1.

Table 1. Characteristics of respondents (n = 24)

No	Variable	N	Mean	Median	SD	Min	Max
1.	Age						
	• GDM	• 12	29.92	29.00	3.39	24	35
	• Non-GDM	• 12	30.25	31.50	6.29	22	42
2.	Gestational age						
	• GDM	12	29.92	30.00	1.24	28	31
	• Non-GDM	12	30.33	30.50	0.88	28	31
3	Parity						
	• GDM	12	0.92	1.00	0.90	0	2
	• Non-GDM	12	1.08	0.50	1.31	0	4

Source: (Data Primer, 2023)

Table 2. The relationship of breast milk production to GDM status

		Breast Milk Production				
Status of GDM	**N**	**Yes**	**%**	**No**	**%**	**P value**
Undiagnosed GDM	12	7	58.3	5	41.7	0.027
Diagnosed GDM	12	1	8.3	11	91.7	
Total	24	8	33.3	16	66.7	

Source: (Data Primer, 2023)

Based on Table 2, it was found that of all respondents in the research, only 33.3% of them had expressed their milk. Non-GDM pregnant women who have breastfed amounted to seven respondents, or 58.3%, while in the group of pregnant women with GDM, one respondent, or 8.3%, had expressed breast milk. The results of the data analysis showed a significant relationship between the status of GDM and non-GDM pregnant women with breast milk production (p-value < 0.05).

Table 3. The First Time Breast Milk Comes Out and the Total Milk Production of GDM and Non-GDM Pregnant Women

Variable	Mean	Median	SD	Min	Max	N
GDM						
• Breast Milk Production (week)	2,58	0	8,94	0	31	1
• Breast Milk Production (cc)	0	0	0	0,0	0,3	1
Non-GDM						
• Breast Milk Production (week)	17	24	15	0	34	7
• Breast Milk Production (cc)	0,19	0,16	0,19	0,0	0,5	7

Source: (Data Primer, 2023)

Generally, non-GDM pregnant women said that breast milk came out for the first time at 17 weeks gestation, while pregnant women with GDM at 31 weeks gestation. The maximum amount of breast milk production in pregnant women with GDM and non-GDM is 0.3cc and 0,5cc, respectively. Data related to the time of first release of breast milk and the amount of milk production of GDM and non-GDM pregnant women are easily seen in Table 3.

3.2.Discussion

GDM and non-GDM pregnant women involved in this study were, on average, approximately 30 years old. Some research results expose that the risk of GDM increases with age (Leng et al., 2015; G. Li et al., 2020; Y. Li et al., 2020). Leng et al. (2015) found that the age of ≥30 increased the risk of GDM by 2.3 times. This is due to reduced insulin sensitivity and pancreatic β cell function in elderly women, which increase the risk of abnormal glucose and lipid metabolism during pregnancy (Juan & Yang, 2020).

The study found a significant relationship between GDM status in pregnant women and breast milk production (p-value <0,05). Maximum milk production in pregnant women with GDM is less than non-GDM. The maximum amount of breast milk production in pregnant women with GDM is 0.3cc, while non-GDM is 0.5cc. It is also found that pregnant women with GDM have slower milk expenditure than non-GDM pregnant women. It is evidenced in this study that 58,3% of non-GDM pregnant women have expressed breast milk (on average starting at 17 weeks gestation), and 8.3% of GDM pregnant women have breastfed (starting at 31 weeks of age). Normal breast development during pregnancy affects milk production. According to Pillay & Davis (2022), at 16 weeks gestation, breast milk begins to be excreted even in small amounts. Lactation begins with conception and pregnancy, which induces changes in the mammary glands, such as ductal proliferation and aveolar development. The first phase of lactation is referred to as secretory differentiation. During this phase, the breast develops the capacity to synthesize dairy products characterized by lactocyte maturation. This phase requires progesterone, prolactin, and placental lactogen. The second phase is called secretory activation, triggered by the birth of the placenta and beginning about the first 60 hours after birth (range 24-72 hours). This phase is characterized by abundant milk discharge, and colostrum is available to babies during the first 60 hours (Pham et al., 2020).

Most studies show that insulin metabolism is responsible for breast secretion and is important in the mammary glands' transition from proliferation to differentiation. Regulation of genes associated with the proliferation of mammary epithelial cells (MEC) is enhanced by insulin, and conversely, the regulation of genes associated with MEC differentiation is enhanced by insulin (Suwaydi et al., 2022; Watt et al., 2021). In diabetic patients, low insulin sensitivity is associated with secretion differentiation, leading to delayed secretion activation and decreased milk production. The risk of decreased milk supply in women with GDM increases up to 2.6 times compared to those with normal blood sugar (Nommsen-Rivers, 2016).

In addition to hormonal regulation, several factors affect milk production, including nutrition, infant attachment, breast care, frequency of breastfeeding, husband and family support, and psychological condition of the mother (Golan & Assaraf, 2020; Widiarta & Megaputri, 2022). The results of the systematic review and meta-analysis show that women with GDM are at risk for maternal psychological distress, such as anxiety, stress, and depression during pregnancy and postpartum (Azami et al., 2019; K. W. Lee et al., 2020; Wilson et al., 2020). Compared to non-GDM women, during pregnancy and postpartum, women with GDM have a 2-4 times higher risk of developing depression (Delanerolle et al., 2021).

Maternal psychological pressure and GDM are two interconnected sides. The hypothalamus-pituitary and chronic adrenals are hyperactive due to psychological distress (anxiety and depression),

which causes insulin resistance and cortisol production to increase (Robinson et al., 2018). This leads to an increased risk of GDM in the mother. On the other hand, the risk of maternal psychological distress during pregnancy and postpartum increases due to the diagnosis of GDM (Azami et al., 2019). Nagel et al. (2022) state that psychological pressure on mothers inhibits the production and secretion of breast milk through 3 potential mechanisms, including psychological pressure decreases insulin sensitivity and secretion causes dysregulation of the HPA axis and causes disturbances in the anterior pituitary in oxytocin release. Studies have shown that the duration of breastfeeding in GDM mothers is shorter than in non-GDM mothers (Melov et al., 2022; Nguyen et al., 2019). The decrease in milk production is the cause of shorter breastfeeding duration in GDM mothers (Pang et al., 2021).

Breastfeeding can reduce the risk of T2DM, obesity, and metabolic diseases in mothers with GDM and their children (Jirakittidul et al., 2019; Much et al., 2014; Qian et al., 2022). According to Tendoménech et al. (2020), the long-term benefits of breast milk consumption in children with maternal GDM are a reduced risk of type 1 diabetes and inflammatory bowel disease and overweight in adulthood. Bjerregaard et al. (2019) found that breastfeeding for>4 months reduced the risk of T2DM by 51%. Considering how great the benefits of breastfeeding are for mothers with GDM and their children, some efforts are needed to increase the self-efficacy, intensity, and duration of breastfeeding in GDM mothers. Efforts that can be made include providing education about breastfeeding and its benefits, increasing social support for mothers, minimizing barriers to breastfeeding initiation, increasing hospitalization, and education about breast care.

Breast care during pregnancy has a positive and important relationship with milk production (Nur et al., 2021). It can improve blood circulation, prevent milk duct clogging, and help produce healthy breast milk. In addition, maintaining breast hygiene, flexing, and keeping the nipples can make it easier for babies to breastfeed and prevent inflammation (Nur et al., 2021). Research by Avellar et al. (2022) clearly shows the differences in milk production in mothers with GDM and normal pregnant women in the form of changes in immune characteristics observed in the blood of GDM pregnant women that affect breast milk composition. Breast milk colostrum of GDM mothers indicated a decrease in antibody levels and a reduced phagocytic capacity of monocytes.

It must be admitted that this research faced various limitations. One of them is the number of respondents. The research needed 16 non-GDM pregnant women and 16 samples of pregnant women with GDM. The fact there were only 12 non-GDM pregnant and 12 pregnant women in GDM.

4. Conclusion

The result of this research showed a significant relationship between the status of GDM and non-GDM pregnant women on breast milk production (P value < 0.05). Pregnant women with GDM have less milk production compared to non-GDM pregnant women. Giving education about breastfeeding and its benefits and breast care, besides increasing social support for mothers, can minimize the obstacles or problems of breastfeeding initiation and increase hospitalization. It can also be an effort to increase self-efficacy, intensity, and duration of breastfeeding in mothers with GDM. Observation of breast milk expenditure in pregnant women with and without GDM in this study was carried out within one month. It is admitted that the length of research is still lacking. It is reasonable that further researchers can observe long-term breast milk expenditure in pregnancy from six months to two years with more samples.

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Progressive Muscle Relaxation Effectively Reduces Nausea and Vomiting Postoperative Laparotomic Surgery

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Abstract
Nausea and vomiting are unpleasant effects that often occur after surgery. Some efforts to reduce the incidence of postoperative nausea and vomiting can be done with several strategies. Progressive muscle relaxation is a complementary approach to minimize physical and psychological stress. Peppermint aromatherapy by inhalation or inhalation in postoperative patients with general anesthesia can reduce the average frequency of nausea and vomiting**.** The method used in this research was quasi-experimental with a pre-post-test control group design. The population in this study was 60 postoperative laparotomy patients. The technique used in taking this research sample is a consecutive sampling technique. Data analysis used Wilcoxon and Kruskal-Wallis at $\alpha < 5\%$. In the treatment group, according to the hospital's SPO, there was a difference in the score of nausea and vomiting before or after treatment, but it was not significant, with a p-value of 0.090. Progressive muscle relaxation therapy for 15 minutes can reduce nausea and vomiting scores but not significantly in the intervention group, with a p-value of 0.003. Combination therapy of progressive muscle relaxation and peppermint aromatherapy for 15 minutes is effective and significantly reduces nausea and vomiting scores in the combination group with a p-value of 0.000**.** There was a significant difference in the nausea and vomiting scores of the three groups. Compared to other groups, the combination of progressive muscle relaxation and peppermint aromatherapy effectively reduced postoperative nausea and vomiting with a p-value score of 0.000.

Keywords: peppermint aromatherapy; postoperative nausea vomiting; progressive muscle relaxation

1. Introduction

The World Health Organization (WHO) reports that about 11% of diseases or health problems can be treated with surgery. Surgery cases are currently a health problem many people experience (WHO,2018). In 2018, in Indonesia, laparotomic surgery was ranked fifth as many as 1.2 million people, of which about 42% were laparotomic surgery (Kementrian Kesehatan RI, 2018).

Unpleasant side effects are often experienced after surgery, one of which is nausea and vomiting. Postoperative nausea and vomiting are common complications, especially after surgery using general anesthesia (Litalien et al.,2016). The incidence of postoperative nausea and vomiting in the recovery room mostly reaches 30%. The prevalence of nausea and vomiting can reach 70% in high-risk patients (Fransisca et al.,2019). Postoperative nausea and vomiting account for up to 30% of the 230 million major surgeries performed annually in each region, with an incidence of 69 million (80%) in people at high risk. The results of previous research found that the incidence of nausea and vomiting after laparotomic surgery reached 31.25% of cases (Wijaya et al.,2014). Postoperative nausea–vomiting can cause medical and psychological complications, thereby disrupting the treatment process and postoperative patient recovery and increasing the burden of medical costs during hospitalization (Cing et al., 2022).

Efforts to reduce the incidence of postoperative nausea and vomiting can be taken with various control and treatment strategies with pharmacological and non-pharmacological therapies. Antiemetics are the first-line treatment for postoperative nausea and vomiting, but they are not always effective and closely related

to side effects affecting the patient's state (Stoicea et al., 2015). Another pharmacological therapy is to consume ondansetron drugs, which are ant-nausea drugs that are commonly used and have become the gold standard in dealing with nausea and vomiting (Gan et al., 2014). The ondansetron drug has some side effects that are dangerous for clients such as arrythmias and sedative effects. The collaborative action of combination with antiemetics also gives rise to some side effects of the drug (Stoicea et al., 2015). Complementary non-pharmacological approaches are carried out through music therapy, aromatherapy, acupuncture, acupressure, relaxation, and hypnotherapy (Shaikh et al.. Non-pharmacological therapeutic treatment for various health conditions is advantageous because it is relatively easy to perform and does not cause complications.

Progressive muscle relaxation is a complementary approach to minimizing physical and psychological stress. This movement is carried out by stretching and relaxing large muscles slowly, regularly, and sequentially (Astuti et al., 2021). Progressive muscle relaxation can reduce nausea and vomiting in ca mamae patients identified by reduced nausea and vomiting and make patients feel more relaxed (Putri et al., 2020). Xu Tian said that progressive muscle relaxation positively impacts nausea and vomiting during chemotherapy, especially on the frequency and degree of nausea and vomiting (Tian et al.,2020).

Based on the preliminary studies conducted at hospitals in Bantul in one month, there were 425-450 surgery patients, 100-150 patients under general anesthesia, and 25-75 patients experiencing postoperative complications in the form of nausea and vomiting every month. Studies that have been conducted previously do not concern any research on the combination of progressive muscle relaxation to reduce nausea, vomiting, and also anxiety in postoperative. This study is expected to reduce nausea and vomiting in laparotomic postoperative patients by providing progressive muscle relaxation. Based on the conditions mentioned above, the researcher was motivated to conduct a study entitled "The Effectiveness of Progressive Muscle Relaxation Against Nause Vomiting Post Laparotomic Surgery at PKU Muhammadiyah Bantul".

2. Research Methods

The method used in this study is quantitative with a quasi-experimental type of research with a pre-post test control group design. The population of this study was laparotomic postoperative patients, and the study was conducted from January 13 to February 28, 2023, at PKU Muhammadiyah Bantul. The sampling technique of this study uses a consecutive sampling technique by providing progressive muscle relaxation by the standard operating procedure for 15 minutes, which is expected to reduce nausea and vomiting in postoperative patients. Data analysis used univariate and bivariate, while the measuring instrument was Gordon's Standard vomit nausea observation sheet, which has been standardized and used to measure postoperative vomiting nausea. For the data collection procedure, patients were first measured for nausea and vomiting after entering the wardroom, then given progressive muscle relaxation measures, and two hours later, patients were reassessed for nausea and vomiting.

3. Results and Discussion

3.1.Results

3.1.1. Univariate Analysis

This study involved 40 respondents; 20 respondents were given progressive muscle relaxation measures, and 20 respondents became a group given SPO-appropriate measures from the hospital. The

characteristics of respondents to this study included age, weight, sex, history of smoking, history of nausea and vomiting, history of blood pressure, and history of surgery.

Table 1. Distribution of frequency of respondents based on age, sex, and length of surgery

Characteristics	Intervention		SPO		P
	f	%	f	%	
1. Age					
a. < 25 years	1	1,7	6	10,0	0,177
b. 25 - 45 years	12	20,0	9	15,0	
c. > 45 years	7	11,7	5	8,3	
2. Gender					
a. Male	7	11,7	10	16,7	0,631
b. Female	13	21,7	10	16,7	
3. Weight (BMI)					
a. Underweigh	0	0	1	1,7	0,443
b. Normal	8	13,3	6	10,0	
c. Overweight	12	20,0	13	21,7	
4. Smoking History					
a. Tidak	14	23,3	9	15,0	0,282
b. Ya	6	10,0	11	18,3	
5. Blood Pressure (MAP)					
a. Hypotension					
b. Normal	5	8,3	7	11,7	0,048
c. Hypertension	12	20,0	13	21,7	
	3	5,0	20	33,3	
6. Motion Sickness History					
a. No					0,576
b. Yes	16	26,7	14	23,3	
	4	6,7	6	10,0	

Source: Primary Data, 2023

Table 1 illustrates the characteristics of respondents in both groups. The average age in all groups was between 26 and 45. Both have a homogeneity value of 0.177 (p>0.05), which means that all three groups have similar values or no age difference in each group.

The average sex in the intervention group was 20% and 21.7% women, while in the control group, there were equal numbers of women and men. All three groups have a homogeneity value of 0.631 (p>0.05) which means that both groups have the same value or there is no sex difference between the groups.

The average body weight in the intervention and control groups averaged 20% and 21.7% of overweight, respectively. Both groups have a homogeneity value of 0.443 (p>0.05), which means that all three groups have similar values. There is no difference in body weight or BMI between groups.

The average smoking history in the control group was 18,3%, while the average in the intervention group with non-smoking respondents was 23.3 %. Both groups have homogeneity values of 0.048 (p>005), which means that both groups have different or inhomogeneous blood pressure values.

On average both groups had no history of nausea, vomiting was 26.7% in the intervention group and 23.3% in the control group. Both groups had a homogeneity value of 0.4766 (p>0.05), meaning that all three groups had the same value or no difference in travel nausea and vomiting history between groups.

3.1.2. Bivariate Analysis

Bivariate analysis aims to see the relationship between independent and dependent variables.

Table 2. Differences in the Incidence of Pre and Post Vomiting Nausea

Group	Category	Mean Ranks	Sum Ranks	Z	Signifikansi
SPO Hospital	pretest	7,70	77,00	-1,698	p=0,090
	posttest	7,00	28,00		
Progressive Muscle Relaxation	Pretest	7,21	86,50	-2,961	p=0,003
	Posttest	4,50	4,50		

Source: Primary Data, 2023

After being analyzed, the results in Table 2 showed a decrease in pre and post-v vomiting nausea scores of as many as 12 respondents; 1 respondent experienced an increase in vomiting nausea scores, while seven respondents had no difference between pre and post-vitance. The results of the Wilcoxon Test obtained a significance value p value = 0.003 (p<0,05), which means that there is a difference in the score of nausea and vomiting in the combination group given progressive muscle relaxation therapy before and after progressive muscle relaxation therapy. While the group given the hospital SPO showed a decrease in pre and post-v vomiting nausea scores, as many as 10 respondents, 4 experienced an increase in vomiting nausea scores, and 6 respondents had no difference between pre and post-vitance. The results of the Wilcoxon Test obtained a p-value = 0.090 (p>0.05), which means there is a difference in the score of nausea and vomiting but not significant in the control group or the group given hospital SPO.

Table 3. The Effectiveness of Progressive Muscle Relaxation Against Postoperative Nausea and Vomiting

Category	Frequency	Mean Ranks	Sum Ranks	Chi-Square	Sig
Hospital SPO	20	40,55	77,00	14,255	p=0,001
Relaxation Intervention	20	30,20	28,00		

Source: Primary Data, 2023

Table 3 clearly explains that the results of the difference in the incidence of nausea and vomiting in the three groups tested by Mann Whitney obtained a p-value of 0.001 (p < 0.05). It can be interpreted that there is an effect of progressive muscle relaxation on postoperative vomiting nausea compared to the hospital SPO group.

3.2.Discussion

3.2.1. Differences in Incidence of Pre and Post-Vomiting Nausea in the Hospital SPO Group

The paired control obtained a p-value = 0.090, meaning there was a difference in nausea-vomiting scores but not significant in the group given the action of the hospital SPO.

Vomiting stimulation in postoperative patients can be caused by various factors, including risk factors from patients (Wahyuda et al., 2023). Each factor will increase the risk of postoperative nausea and vomiting by 18-22%. Increased postoperative vomiting nausea response in most patients experiencing a slow nausea vomiting response or other factors such as high injection area or spinal block and surgical risk factors. Risk factors include age, sex, motion sickness or previous vomiting, history of migraines, diet, and postoperative anxiety.

3.2.2. Differences in the Incidence of Pre and Post-Nausea Vomiting in the Progressive Muscle Relaxation Intervention Group

It obtained a significant value of p = 0.003, which explains a difference in the score of nausea and vomiting in the group given progressive muscle relaxation therapy pre and post-surgery. The incidence of nausea vomiting in respondents is individual and influenced by other factors that trigger the occurrence of nausea vomiting after anesthesia. Progressive muscle relaxation therapy can reduce muscle tension, anxiety, depression, high blood pressure, mild phobias, and stuttering. The parasympathetic nervous system controls the activities during rehabilitation, such as decreased heart rate after a phase of tension and increased blood flow to the gastrointestinal system (Oktaviani et al., 2014; Rahmawati, 2017).

The decrease in the nausea and vomiting response in the intervention group is due to progressive muscle relaxation therapy. Respondents will feel tense, and there is a nausea-vomiting response, but after being given progressive muscle relaxation therapy, respondents will feel relaxed and inhibit the nausea-vomiting response. Another research found that cancer patients undergoing chemotherapy who were given PMR (progressive muscle relaxation) exercises showed increased average functional status. PMR can reduce nausea and vomiting (Putri et al., 2020).

3.2.3. Differences in the Incidence of Nausea and Vomiting in Each Group

The three groups were tested with Mann-Whitney and obtained a value of p=0.001. It can be interpreted that there is a significant difference in the scores of nausea and vomiting from the three groups. To find out the best treatment for reducing nausea and vomiting, researchers continued statistics using post hoc tests. A combination of progressive muscle relaxation and peppermint aromatherapy treatment was more effective in reducing postoperative vomiting than only progressive muscle relaxation interventions.

In this study, progressive muscle relaxation therapy and peppermint aromatherapy were given 15 minutes to laparotomic postoperative patients with general anesthesia from the combination group or the group given progressive muscle relaxation treatment and peppermint aromatherapy. Progressive muscle relaxation can improve relaxation by decreasing sympathetic nerve activity and increasing parasympathetic nerve activity, resulting in vasodilation of arteriole diameter (Anaabawati et al., 2021). The parasympathetic nervous system controls the activities during rehabilitation, such as decreased heart rate after a phase of tension and increased blood flow to the gastrointestinal system. Inhaling peppermint aromatherapy affects the nerves in the brain so that the effect can be felt directly by the patient after inhaling it. Pharmacologically, fragrances from essential oils (EO) can involuntarily transmit effects on the central nervous and endocrine systems. Through inhalation, volatile molecules of essential oils that pass through olfactory receptors in the nose recognize these molecular characteristics and send signals to the brain through nerves. Some of the constituents of these molecules enter the bloodstream through the lungs and directly affect the nerves in the brain after passing through the blood barrier in the brain (Alfarisi et al., 2020; Lisnawati et al., 2021; Rihiantoro et al., 2018; Sunaeni, 2022). This makes the combination therapy

of progressive muscle relaxation and peppermint aromatherapy more effective in reducing laparotomy postoperative vomiting nausea.

4. Conclusion

From this study, it can be concluded that the treatment group with hospital SPO had differences in nausea and vomiting scores before or after treatment but not significant, as seen from the result of the p = 0.090. Progressive muscle relaxation therapy for 15 minutes can reduce the score of nausea and vomiting but not significantly in the intervention group, with a value of p = 0.003. There was a significant difference in the nausea and vomiting scores of the two groups. The provision of progressive muscle relaxation was more effective in reducing nausea and vomiting after laparotomic surgery than the group not given progressive muscle relaxation, as indicated by a score of p = 0.000. From this study, hospitals need to implement complementary therapies such as progressive relaxation therapy as one of the nursing care measures based on standard operating procedures (SOP) in surgical wards to reduce postoperative nausea and vomiting.

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The Effectiveness of Lavender Aromatherapy on Anxiety Levels in Maternity Mothers

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Abstract
Anxiety in mothers is a clinical problem that can cause maternal depression and affect development. However, there is actually no special treatment that can be given to maternity mothers to reduce the anxiety felt. Giving lavender aromatherapy is one way of reducing maternal anxiety before labor. This study aims to analyze the effect of lavender aromatherapy on the level of anxiety in labor. This quantitative research uses a quasi-experimental design and a pretest-posttest control design. The sampling for the research was carried out by using random sampling techniques. The sample was 60 maternity mothers in the active phase with 30 intervention group respondents and 30 control group respondents, with lavender aromatherapy intervention in one of the hospitals in Kediri. The results showed a difference in anxiety levels in the intervention group and the control group after lavender aromatherapy was given to maternity mothers. Lavender aromatherapy has been proven to affect the hypothalamus and reduce the secretion of corticotrophin-stimulating hormone through olfactory pathway stimulation, which can ultimately lower maternal anxiety levels before labor. The use of lavender aromatherapy in labor rooms in various services, both services at PUSKESMAS (Community Health Centre) and hospitals, should be considered to reduce maternal anxiety before delivery.

Keywords: anxiety; aromatherapy lavender; labor

1. Introduction

During the process of labor, mothers will experience fear and anxiety (Liao et al., 2020). The anxiety is the most common response of maternity women (Ghiasi et al., 2019). Despite current advances in care and decreased maternal morbidity and mortality, mothers still experience fear and anxiety during labor (Mohyadin et al., 2021). Anxiety during pregnancy and labor will increase the intensity of pain and will decrease the mother's ability to cope with pain (Abbasi et al., 2021). Pain and anxiety can affect the process of labor; severe labor pain and anxiety can also increase adrenalin and cortisol, leading to decreased uterine activity and prolonged labor (Shahbazzadegan & Nikjou, 2022). The most common cause of anxiety is the fear of childbirth, which can lead to prolonged labor, thus causing death in the mother and fetus. Proper training can reduce anxiety (Uludağ & Mete, 2021). Anxiety in mothers is a clinical problem that can cause maternal depression and affect fetal development (Domínguez-Solís et al., 2021).

Benzodiazepines are common drugs to treat anxiety in the short term (Manor et al.,2021). Regarding the treatment of anxiety during pregnancy, labor and postpartum, many women are reluctant to take medication for fear of possible side effect for the fetus or newborn (Domínguez-Solís et al., 2021). Though medications taken to reduce anxiety are available, they are not commonly used by mothers before labor.

Non-pharmacological therapy is quite popular to reduce pain during labor. There are many techniques of non-pharmacological to reduce anxiety and increase maternity satisfaction in mothers (Movahedi et al., 2022). The most popular method of non-pharmacological for pregnant and maternity mothers are breathing techniques, position changes, massages, relaxations, music, childbirth support (e.g., doula, couple), hot and cold water-based hydrotherapy, aromatherapy, transcutaneous electrical

nerve stimulation (TENS), sterile water injections, hypnosis and acupuncture (Sharpe & Rollins, 2022). Nevertheless, aromatherapy is the safest method as it does not directly contact the patient's body. Aromatherapy works by activating the sense on the nerve cells in the nasal cavity. It has a powerful effect on the body (Purohit et al., 2021). The molecules in aromatherapy enter the brain's limbic system and simultaneously influence receptors GABA (gamma-aminobutyric acid) in the hypothalamus, which is very important for relaxation (Cui et al., 2022). Benzodiazepine, a group of tranquilizers or sedatives that can be used in anxiety disorder, and increases GABA (gamma-aminobutyric acid) in the amygdala (Jafari-Koulaee et al., 2020). Camphor, terpinen-4-ol, linalool, linalyl acetate, beta-ocimene, and 1, 8-cineole found in lavender plants that can stimulate the parasympathetic system and linalyl acetate has a narcotic effect that acts as a sedative and linalool as sedative (Crișan et al., 2023). Lavender, also called lavendulan angustifolia, is characterized by high levels of linalyl acetate and linalool (Li et al., 2021). Both components are responsible for lavenders' pharmacological effects, including their activity, which is considered soothing and sedative (Donelli et al., 2019). In addition to its low risk of toxicity, lavender aromatherapy oil is known worldwide for its sedative, antidepressant, antiseptic, relaxing, and antiemetic properties (de Melo Alves Silva et al., 2023).

Lavender aromatherapy can be used as an effort to reduce anxiety and pain in mothers during labor, where a significant relationship was found between reduced cortisol and anxiety levels (Kazeminia et al., 2020). The scent of lavender causes a decrease in serum cortisol levels. Linalool in lavender inhibits the release of acetylcholine and changes the function of ionic channels and neuromuscular connection regions, due to which linalyl acetate exhibits narcotic function. At the same time, linalool also serves as a sedative. The use of aromatherapy can reduce anxiety and induce peaceful emotions. Lavender aromatherapy affects the hypothalamus and the reduction of corticotrophin-stimulating hormone secretion through the stimulation of olfactory pathways (Farzan et al., 2023).

The decrease in anxiety is a very important factor in efforts to reduce maternal morbidity, considering that anxiety in maternity mothers can cause prolonged labor. In addition, it must also be continued with relief measures that have the potential for complications. The purpose of this study was to analyze the effect of lavender aromatherapy (Lavendula angustifolia) on the level of anxiety in childbirth at Kediri City Hospital.

2. Research Method

2.1.Research Design

This quantitative study uses a quasi-experimental design that uses a pretest-posttest control group design. Research was conducted by giving lavender aromatherapy to maternity mothers. During the active phase of the intervention, the group will be observed first before being given lavender aromatherapy and again after being given lavender aromatherapy. The population in this study was all maternity mothers at Kediri General Hospital.

2.2. Setting and Samples

This research was conducted from Juni–to July 2023 at two hospitals in Kediri as primary data. The sample of the research was 60 maternity mothers divided into two groups, namely 30 intervention group respondents and 30 control group respondents who were by the inclusion criteria of the research. The research sample technique uses random sampling. The inclusion criteria were the inclusion of primigravida and multigravida mothers who gave birth vaginally, pregnancy age 37–42 weeks, single pregnancy, cervical dilation of a maximum of 4 cm, and were willing to be given lavender aromatherapy. The number of samples in the study was 60 respondents.

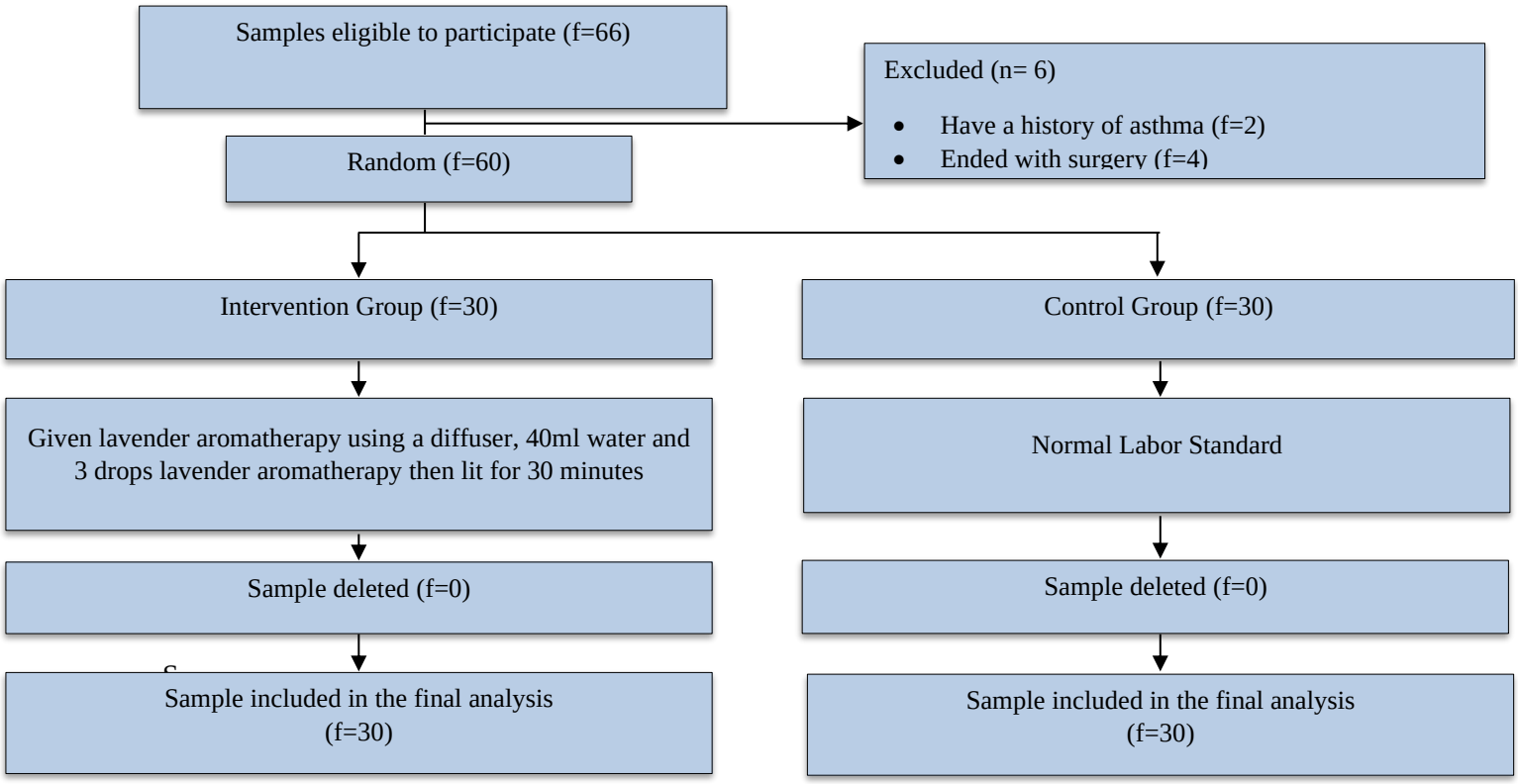

Fig 1. Research Consort
(Barbour et al., 2017)

2.3.Intervention (Applied To Experimental Studies)

Data was collected on maternity mothers in two hospitals, totaling 60 respondents divided into 30 intervention and 30 control group respondents. Then, the researcher explained the objectives, benefits, and procedures for implementing the research and provided informed consent for the respondents' approval. The Intervention Group got three drops of lavender aromatherapy and 40ml of water using a diffuser. The researcher carried out the assessment of the first anxiety level (pretest) in both groups, after which the intervention group was given a 30-minute treatment of lavender aromatherapy. For the next 30 minutes, the researcher assessed anxiety levels in both groups.

2.4.Measurement and Data Collection

Data were measured by using the State-Trait Anxiety Inventory (STAI) questionnaire. The scale of anxiety. This scale of anxiety consists of 20 question items with response options based on four points : ("Not at all: "slightly," "moderate," and "very"). STAI anxiety scores range from a minimum score of 20 to a maximum of 80. A low score indicates no or less anxiety, while a higher score indicates a higher level of anxiety.

2.5.Data Analysis

The Normality Test uses the Shapiro-Wilk test. The test is used to determine whether the data obtained is normally distributed or not. Test homogeneity using the Independence Test. Univariate analysis only describes each variable. The data analyzed were age, occupation, recent education, and parity. Bivariate analysis is used if two variables are to be analyzed. The statistical test in this study

used the Paired Sample T-Test, while the difference test between the two groups used the Independent Sample t-test. Data was then analyzed using SPSS version 26.0.

2.6.Ethical Considerations

Research ethics permits are based on six basic research principles: beneficence and non-malfeasance, fidelity and responsibility, integrity, justice, respect for people's rights and dignity, and ethical clearance. Ethical feasibility is a written statement by the Research Ethics Commission for research involving living things. It states that research is feasible after meeting certain requirements. This research has received ethical approval from the Poltekkes Ethics Commission of the Ministry of Health, Malang, with a recommendation letter No.DP.04.03/F.XXI.31/959/2023 was issued on September 4, 2023, valid until September 4, 2024.

3. Results and Discussions

3.1.Results

After one month of research at DKT Hospital and Ratih Hospital, Kediri, data was obtained and processed through editing, coding, scoring, tabulating, entry, and cleaning. The results were carried out with a normality test with normal results, while with a homogeneity test, the results were homogeneous. The study results are presented in univariate and bivariate analyses using SPSS.

Tabel 1. Distribusi frekuensi karakteristik responden

Characteristic	Group				*P value*
	Intervention (n=30)		Control (n=30)		
	n/M	%/SD	n/M	%/SD	
Age	26.93	4,479	27.27	4,748	0.781 [a]
Education					0.595 [b]
Elementary	8	23.3	15	50	
Intermediate	15	23.3	13	43.3	
Advanced	7	53.3	2	6.7	
Work					0.609 [b]
Work	10	30.3	15	50	
Not Working	20	66.7	15	50	
Paritas					0.615 [b]
Primigravida	18	60	17	56.7	
Multigravida	12	40	13	43.3	
Anxiety Level	47,77	5,654	44.97	5,499	0.078 [b]
Duration of active phase I	65,13	4,049	65.33	4,901	0.062 [b]

Note. [a] = Uji *Anova*, [b]= Uji *Levene*

Based on Table 1, it can be explained that the respondents have general characteristics: age, education, occupation, and parity. There were 60 respondents, with 30 intervention group respondents and 30 control group respondents. The table shows that the average age in the intervention group was 26.93 years, and in the control group, it was 27.27 years. Regarding education, respondents to the intervention and control groups were mostly secondary education, with 28 respondents (46.6%). Based on their work, the intervention and control groups were mostly unemployed, with 35 respondents (58.3%). Seeing the respondent parity of the intervention and control groups, primigravida mostly had three respondents (58.3).

Table 2. Anxiety level before and after lavender aromatherapy in the intervention group

Variable	Intervention Group (n=30)		P value
	Pretest	Posttest	
	Mean ±SD	Mean ± SD	
Level of Anxiety	47.77 ±6,339	32.97 ±0.5.654	0.000

Note. Paired t-test

Table 2 above explains that the level of anxiety in the intervention group showed that the average pretest was 47.77, which means a moderate level of anxiety, and the average posttest was 32.97, which means a mild level of anxiety. The data showed clearly a decrease in anxiety level by 14.8. The average results of the pre-test and post-test showed decreased anxiety in the intervention group. At the same time, the results of the paired t-test on the anxiety level of the intervention group showed significant results with a p-value of 0.000, which confirms that the level of anxiety decreased after lavender aromatherapy was given to the intervention group of maternity mothers.

Table 3. Frequency of anxiety level before and after lavender aromatherapy in the intervention group

Level of Anxiety	Intervention Group (n=30) Frequency of Anxiety Level		P Value
	Pretest	Posttest	
Mild Anxiety	0	27	0,000
Moderate Anxiety	27	3	
Severe Anxiety	3	0	
Total	30	30	

Note. Wilcoxon Test

Table 3 describes the frequency distribution of anxiety levels before and after lavender aromatherapy in the maternity intervention group. It is known that the pretest level of moderate anxiety was 27 (90%), and very few respondents experienced severe anxiety, as many as three respondents (10%). In the posttest, the level of mild anxiety was 27 (90%), and those who experienced moderate anxiety were three respondents (10%).

Table 4. Anxiety Levels before and after standard care in the control group

Variable	Control Group (n=30)		P value
	Pretest	Posttest	
	Mean ±SD	Mean ± SD	
Level of Anxiety	44.97 ±5,499	46.40 ±11,734	0.522

Note. Paired t-test Test

Based on Table 4, the results of the analysis of anxiety levels in the control group exposed an average pretest data of 44.97, which means it has a moderate level of anxiety, and the average posttest anxiety level in the control group is 46.40, which means a moderate level of anxiety. Results in the posttest control group explained an increase in anxiety of 1.43. The average pre-test and post-test confirmed an increase in anxiety in the control group. The results of the Paired t-test on the level of anxiety from the control group exposed an insignificant result of a p-value of 0.522, which means that the level of anxiety increased after receiving standard care in the control group maternity mothers.

Table 5. Frequency of anxiety levels before and after standard care in the control group

Level of Anxiety	Control Group (n=30) Frequency of Anxiety Level		P Value
	Pretest	Posttest	
Mild Anxiety	4	6	
Moderate Anxiety	26	14	0.537
Severe Anxiety	0	10	
Total	30	30	

Note = Wilcoxon Test

Table 5 above shows the frequency distribution of anxiety levels before and after standard care in the control group of maternity mothers. The data showed that the pretest level of mild anxiety was four respondents, moderate anxiety was 26 respondents, and no one experienced severe anxiety. In the posttest, a mild anxiety level of six respondents (20%), moderate anxiety level of 14 respondents (46.7), and severe anxiety of as many as ten respondents (33.3%).

Table 6. Differences in anxiety levels in both groups

Variable	Group		P value
	Intervention Mean ±SD	Control Mean ± SD	
Level of Anxiety	32.97 ±5,654	46.40 ±11,734	0.000

Note. Independent sample t-test

To determine the difference in anxiety levels between the two groups after giving lavender aromatherapy to the intervention group, a different test was done by using the independent sample t-test. The results of the data analysis shown in Table 6 revealed that the average posttest anxiety level in the intervention group was 32.97 (mild anxiety), and the average posttest anxiety level in the control group was 46.40 (moderate), where there was a posttest difference in the intervention and control groups of 13.43. The results of the independent sample t-test on the anxiety level of both groups confirmed a significant result of a p-value of 0.000, which means that there was a difference in anxiety levels in both groups after having lavender aromatherapy intervention in the maternity intervention group.

3.2. Discussions

The mean age of the intervention group was 26.93 years, and the control group was 27.27 years. Pregnant women under the age of less than 25 years have a risk of prenatal depression (Lockwood Estrin et al.,2019). Younger women significantly have a higher fear of childbirth score, as younger women have less experience (Anderson et al.,2019). Older women (>35 years) feel a higher risk of pregnancy for themselves, so they worry more about their babies (Brunton et al.,2020). The characteristics of respondents based on their education: most of the intervention and control groups were secondary education. There is a significant relationship between anxiety scores and education level (Effati-Daryani et al.,2020). The level of education a person has determines his knowledge of a particular issue. The higher the level of knowledge, the lower the level of anxiety (Suyani,2020).

Characteristics of respondents based on their occupation in the intervention group and control group, most of whom did not work or were housewives. Previous research examined the relationship between anxiety and housewives and found the results that there are unemployed housewives where stress, depression, and low social support were associated with the development of anxiety symptoms (Tang et al., 2019). The characteristics of respondents based on parity in both groups were primigravida

(first pregnancy). Previous studies found that mothers with primiparous children had higher anxiety scores since early pregnancy compared to multiparous mothers (Nakamura et al., 2020). First-time mothers have a greater fear of labor pain and other problems that may occur during labor (Brunton et al., 2020).

The difference in anxiety levels decreased, whereas in the intervention group posttest, there was an increase in anxiety by 14.8 (mean pretest 47.77 and posttest 32.97). It can be concluded that the level of anxiety decreased after lavender aromatherapy intervention (Lavendula angustifolia) in maternity mothers. Psychological factors, including fear and anxiety that will cause pain during labor, will be different (Akköz Çevik & Karaduman, 2020). Mothers who experience anxiety may increase the risk of preterm birth (Domínguez-Solís et al., 2021). Lavender aromatherapy is used as an anxiety reducer due to the content of camphor, terpinene-4-ol, linalool, linalyl acetate, beta-ocimene, and 1,8-cineole in lavender, which can stimulate the parasympathetic system and cause a relaxing effect (Salsabilla, 2020). Maternity mothers who inhale lavender aroma oil are proven to reduce anxiety during labor. It found a significant association between reduced cortisol levels and anxiety levels. Pregnant women with lavender aromatherapy have been shown to experience a decrease in serum cortisol levels. In addition to lowering serum cortisol levels, the linalool content in lavender also causes inhibition of acetylcholine release and changes in the function of ionic channels and neuromuscular connection regions. Linalyl acetate is a compound that has a narcotic function, and linalool also functions as a sedative (Kazeminia et al., 2020). Based on the study, the average increase in anxiety levels in the control group was obtained from an average of 44.97 (moderate anxiety) to 46.40 (moderate anxiety). This is because, before delivery, the average mother experiences increased anxiety due to fear and previous labor experiences. The results of the study concluded that, by looking at the average and results of the analysis, the level of anxiety in the control group increased after being given standard care compared to before being given standard care. The average anxiety level in the intervention group was mild anxiety, while the average anxiety level in the control group was severe anxiety.

Although many research results have shown a significant relationship between giving aromatherapy can reduce anxiety and anxiety scores (Ebrahimi et al., 2022), other risk factors also influence the occurrence of anxiety in maternity mothers. Age is one of the factors that influences pain. Maternity age that is too young can trigger severe pain because young age tends to be associated with psychological conditions that are still labile, so it triggers anxiety (Sari et al., 2022). Mothers with primigravida often complain of physiological symptoms such as nausea, vomiting, and back pain; this can trigger anxiety, and anxiety tends to decrease in multigravida women (Rahayu & Ariningtyas, 2023). Fear, anxiety, and fatigue when facing labor will affect the mother. Therefore, if maternity mothers want to avoid excessive pain, then there should be no need to feel afraid and anxious when facing labor (Ria et al., 2020). In addition to age, the perception of pain is also one of the factors that triggers the emergence of anxiety. Pain is an unpleasant feeling or emotion about an actual or potential danger. According to Gate Control theory, there is a link between pain and emotional or psychological problems such as anxiety. Women with lower levels of anxiety experience less pain during labor. Severe pelvic floor and perineal muscle contractions due to anxiety affect labor pain (Abbasijahromi et al., 2020). Aromatherapy is defined as a plant that involves transmitting signals from the olfactory system to the brain, which regulates anxiety, depression, and mood disorders (Grabnar et al., 2021). There are two main terpenoid constituents in lavender oil, namely linalool and linalyl acetate, which can produce anxiolytic, anti-anxiety, and anti-stress effects (Zhang & Yao, 2019; Malcolm & Tallian, 2017). Linalool functions as a sedative, and linalyl acetate has a sedative effect (Usta et al., 2021).

4. Conclusion

Anxiety levels decreased after lavender aromatherapy in the intervention group in maternity, with significant results (p-value = 0.000). Anxiety levels increased after being given standard care in a control group of maternity mothers. The difference in anxiety levels in the two groups after lavender aromatherapy in maternity showed (p-value = 0.000). It is hoped that lavender aromatherapy intervention can be an alternative for midwives in pro viding obstetric care for childbirth with non-pharmacological methods to reduce anxiety levels in maternity mothers. Further research will be able to conduct research on anxiety in maternity mothers experiencing puerperium.

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Prenatal Attachment Relationship with Pregnant Women's Compliance in Carrying Out Antenatal Care Visits

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Abstract
Yogyakarta's 2022 health profile shows that MMR in 2021 is 580.34 from 2757 live births. Data from Basic Health Research (Riskesdas) conducted by the Ministry of Health of the Republic of Indonesia shows that 2017 K4 coverage nationally was 74.1%. This figure shows that mothers who receive the first visit do not continue the ANC according to the minimum standard of four visits. Antenatal care visits are an effort to reduce maternal and infant mortality. High maternal prenatal attachment is believed to be able to make a close emotional connection and encourage mothers to do positive things to improve their health. This study analyzed the relationship between prenatal attachment and pregnant women's compliance in the third-trimester antenatal care visit at Puskesmas Kasihan 1. The method used in this study is quantitative research with a cross-sectional approach. The sample used was 45 third-trimester pregnant women with uses purposive sampling technique. Data analysis using the Chi-Square Test. Chi-Square Test results obtain a p-value of 0.003 <0.05. This means that there is a significant relationship between prenatal attachment and the compliance of pregnant women with carrying out antenatal care. It can be concluded that there is a significant relationship between prenatal attachment and antenatal care compliance in pregnant women. A high level of prenatal attachment between mother and baby will affect the mother's compliance with antenatal care visits. The results of this study are expected to provide additional information to pregnant women about the importance of prenatal attachment in dealing with pregnancy.

Keywords: antenatal care; commpliance; prenatal attachment; third-trimester pregnant women

1. Introduction

According to a 2022 report by the World Health Organisation (WHO) for 2020, the maternal mortality rate (MMR) reached 295,000. In Indonesia, in 2020, MMR reached 4,627 cases of death every year. The causes are mostly other causes (34.2%), bleeding (28.7%), hypertension during pregnancy (23.9%), and infection (4.6%) (WHO, 2022). Data from the 2022 Yogyakarta Health Profile shows that the maternal mortality rate (MMR) in 2021 will be 580.34 from 2757 live births, with an absolute number of 16 cases of maternal death. The causes include bleeding and SEZ, in addition to complication diseases. WHO reports that 40% of maternal deaths in developing countries are related to anemia during pregnancy. Anemia and chronic lack of energy (SEZ) in pregnant women are the main causes of bleeding and infection, which are factors in maternal death (Dinkes, 2022). For this reason, integrated and comprehensive antenatal services are needed during pregnancy (Dinkes, 2022).

Basic Health Research Data (Riskesdas) conducted by the Ministry of Health of the Republic of Indonesia shows that in 2017, the ideal K1 coverage nationally was 86.0%, and K4 coverage nationally was 74.1%. The data showed that mothers who received the first visit did not continue the ANC according to the minimum standard for the fourth visit. Data from the Bantul Health Office in 2022 shows K4 coverage in 2018 of 92.02%, 2019 of 89.03%, 2020 of 86.81%, 2021 of 98.2%, and 2022 of 81.1%. This shows an increase and a decrease again. This is caused by pregnant women who lose contact in K1 due to late learning of their pregnancy or unwanted pregnancy (Riskesdas, 2018).

Health problems in pregnant women, both physical and psychological, have an impact on their quality of life. Pregnant women with a low quality of life need to prepare themselves by paying more attention to their health conditions when facing pregnancy (Samutri & Endriyani, 2021). Antenatal care is care given to pregnant women during pregnancy, which is useful for facilitating providing healthy and positive outcomes for pregnant women and their babies, providing a relationship of trust with mothers, early detection of complications that can be life-threatening, preparing for birth, and providing health education (Zuchro et al., 2022). Adherence to Antenatal Care (ANC) visits can be demonstrated through the frequency of maternal arrivals. One of the efforts to reduce maternal mortality is by conducting routine monitoring of maternal and child health degrees through antenatal care visits to detect abnormalities that occur during pregnancy as early as possible (Paramita et al., 2023).

Maternal-fetal attachment or often called prenatal attachment is an emotional bond between mother and fetus during pregnancy where mother and baby live mutually beneficial lives and grow a bond of affection that is very emotional so that it can affect maternal behavior in fulfilling health by increasing the degree of health and, being willing and obedient in carrying out antenatal care during pregnancy (Salehi et al., 2019). The emotional bond between mother and fetus during pregnancy (prenatal attachment) can influence the mother's behaviour, especially in the fulfillment of her health. Mothers who have high prenatal attachment scores tend to be more obedient and willing to make regular ANC visits. This is in line with the research results conducted by Lamdianita (2019), which found that prenatal attachment affects pregnant women's compliance with antenatal care in the third trimester (Lamdianita, 2019). This study aimed to determine the relationship between prenatal attachment and pregnant women's compliance with antenatal care visits.

2. Research Methods

This study is a type of observational analytical research using a cross-sectional approach. The research was conducted at Puskesmas Kasihan I in November-December 2023. The sampling technique in this study used purposive sampling with a population of 81 third-trimester pregnant women with a total sample of 45 respondents who met the inclusion criteria. Researchers used the Indonesian Version of the Prenatal Attachment Inventory (IPAI) questionnaire, which has been translated into Indonesian and has been endorsed by Muller with a Cronbach's alpha value of 0.937 (-0.800) and has been tested for validity in previous studies with a significant value ($p < 0.01$). The IPAI questionnaire has 21 items with a total score between 21 and 84. In addition, it also uses compliance questionnaires in ANC visits, with compliance if the mother does ANC at least six times and non-compliance in doing ANC if only done less than six times.

Data was collected by distributing questionnaires to respondents at Puskesmas. The researcher explains the purpose and procedure of the study, and the respondent signs informed consent. After that, researchers began interviews according to the list of questions in the IPAI questionnaire and compliance in conducting ANC visits. Bivariate analysis using the Chi-Square test to determine the relationship between prenatal attachment and adherence to ANC. This research has obtained permission to pass ethics with the number KE/AA/XI/10111303/EC/2023 from Alma Ata University Yogyakarta.

3. Results and Discussion

3.1.Results

3.1.1. Characteristics of Respondents

Table 1. Frequency Distribution of General Characteristics of Third Trimester Pregnant Women at Puskesmas Kasihan I, Year 2023 (n=45)

No	Characteristics	Frequency (N)	Percentage (%)
1.	**Age**		
	23-28	26	57.8
	29-34	15	33.3
	35-40	4	8.9
2.	**Gravida**		
	Primigravida	24	53.3
	Multigravida	21	46.7
3.	**Education**		
	Junior High School	5	11.1
	Senior High School	24	53.3
	Higher Education	16	35.6
4.	**Occupation**		
	Civil Servants	1	2.2
	Private Employees	7	15.6
	Housewife	37	82.2
5	**Income**		
	1000.000-3000.000	31	68.9
	>3000.000-5000.000	8	17.8
	> 5000.000	6	13.3
6	**Insurance**		
	BPJS	31	68.9
	KIS	7	15.6
	No Insurance	7	15.6
7	**Distance to Health Service**		
	< 1 Km -1 Km	6	13.3
	>1 Km	39	86.7
	Total	**45**	**100**

Source: Primary Data, 2023

Table 1 above describes that of 45 respondents of third-trimester pregnant women at Puskesmas Kasihan I, the average age of 23-28 was 26 (57.8%). Gravida data showed that 24 (53.3%) were first-time pregnant women (Primigravida), while 21 (46.5%) were mothers who had been pregnant more than once (Multigravida). At the education level, the average respondent at the high school level is equivalent, or as much as 24 (53.5%). Regarding work, data shows that the average respondent is a housewife (IRT) as much as 37 (82.2%). Judging from their income, the average respondent has a moderate income, with a monthly income between Rp 1000,000-3000,000, as many as 31 (68.9%). Data on the distance to health facilities showed that the number of respondents from home to health workers was 39 (86.7).

3.1.2. Univariate Test

Table 2. Frequency Distribution of Prenatal Attachment Scores at Puskesmas Kasihan I in 2023

	Category	N	Percentage (%)
Prenatal Attachment	High	42	93.3
	Low	3	6.7
	Total	**45**	**100**

Source: Primary Data, 2023

Based on Table 2, it is known that 45 respondents of third-trimester pregnant women almost all have a high prenatal attachment score during pregnancy, as can be seen from the respondents' answers with a percentage of 93.3%, or as many as 42 respondents. Prenatal attachment scores can increase if mothers have enough family knowledge and support to influence maternal behavior and improve health degrees (Mariani et al., 2020).

Table 3. Frequency Distribution of Antenatal Care Adherence at Puskesmas Kasihan I in 2023

	Category	N	Percentage (%)
Antenatal Care	Obedient	43	95.6
	Disobedient	2	4.4
	Total	**45**	**100**

Source: Primary Data 2023

Based on table 3 shows that the average respondent is obedient in conducting antenatal care for health workers, both midwives, and doctors, both in Puskesmas, PMB, and hospitals. It is shown that of the 45 respondents who complied 43 (95.6%). Antenatal care is care given to pregnant women before birth. This is useful to facilitate healthy and positive outcomes for pregnant women and their babies. In addition, upholding trust in relationships with mothers also detects complications that can endanger lives, prepares for birth, and provides health education (Kemenkes, 2021).

3.1.3. Bivariate Test

Table 4. Results Test of Prenatal Attachment Relationship with ANC Visit Compliance

Variable	ANC Compliance				Total		P
	Obedient		Disobedient				
Prenatal Attachment	F	%	F	%	F	%	
High	42	100	0	0	42	100	0,003
Low	1	33.3	2	66.7	3	100	
Total	43	95.6	2	4.4	45	100	

Source: Primary Data, 2023

Based on Table 4, cross-tabulations between prenatal attachment and antenatal care compliance show that mothers who are obedient to ANC visits have a high prenatal score of 42 (100%), while mothers who do not comply with ANC visits have a low prenatal score of 1 (33.3%).

Based on these results, it can be seen that there is a significant relationship between prenatal attachment and maternal compliance in conducting antenatal care visits during pregnancy, measured in the third trimester with a gestational age of 32-40 weeks. The hypothesis testing process in this study uses the SPSS program version 20.0 with the provision of a Chi-Square probability value (significance) p-value less than 0.05. The results of the analysis showed that the p-value (Asymp.sig)

was 0.003, so it can be said that the relationship between prenatal attachment and the compliance of pregnant women in conducting antenatal care visits is quite significant.

Prenatal attachment components include cognitive (conceptualizing the fetus), emotional, behavioral, and health practices (Sukriani & Suryaningsih, 2018). Prenatal attachment scores can increase if the mother has good enough knowledge that will encourage maternal behavior and improve her health status. The increase in prenatal attachment scores was not only influenced by the mother's knowledge. The psychological condition of the mother also plays an important role, such as the acceptance of her pregnancy, which can be in the form of husband support as well as family support that encourages mothers to be diligent and obedient in making ANC visits (Alvianty & Suryaningsih, 2016).

3.2.Discussion

The purpose of this study was to determine the relationship between prenatal attachment and the compliance of pregnant women with ANC visits. Prenatal attachment is a term that describes the extent to which a woman engages in behaviors that manifest relationships and interactions with her unborn child. Prenatal attachment is a close, warm, and affectionate emotional relationship between mother and child (Mariani et al., 2020). Based on the analysis, the relationship between prenatal attachment and maternal compliance carrying out the third trimester of antenatal care at Puskesmas Kasihan I obtained a p-value of 0.003, which is smaller than 0.5, so it can be interpreted that between the prenatal attachment variable and the antenatal care compliance variable, there is a significant relationship. This result is in line with research conducted by Lamdianita (2019), where it was found that there was a significant relationship between prenatal attachment and maternal compliance in carrying out ANC visits with a p-value of 0.002 (Lamdianita, 2019). Pregnant women who have a high prenatal attachment score will have better habits and behavior regarding self-care during pregnancy (Alhusen et al., 2012). The result of this study is consistent with Maddahi's (2016) study, which found that mother with high scores of prenatal attachment has good health behavior during pregnancy. The health behavior referred to in this research is the health examination of pregnant women or antenatal care visits (Maddahi et al., 2016). Components of prenatal attachment include cognitive or the ability to conceptualize the fetus as an individual different from the mother, including emotional or attachment relationships between mother and fetus as well as behavioral components and health practices. Other factors that can affect prenatal attachment are education level, economic status, social support, psychological pregnant women, and pregnancy planning (Zahrani et al., 2020). The level of knowledge of mothers is one factor that affects maternal compliance when conducting pregnancy checks for health workers. In addition, mothers with a good level of education will be easier to be educated by health workers, who will support mothers and families in taking a stand during pregnancy.

Most respondents, in this study, had a good level of education, namely high school or vocational graduates, as much as 53.3%. Educational background will shape a person's way of thinking, including the ability to understand factors related to disease and use this knowledge to maintain health (Aryani et al., 2017). Women who are educated find it less difficult to digest information from health workers about the impact of not taking antenatal care (Oktia et al., 2023). This is by research conducted by Prihandini & Primana (2019), which said that there is a relationship between education level and antenatal care compliance (Prihandini & Primana, 2019). One opportunity to increase knowledge about maternal health care is through antenatal care (ANC) (Fatimatasari et al., 2017).

Antenatal care examinations, according to standards, can improve the degree of maternal and fetal health and prevent early complications in pregnancy. Mothers with high prenatal attachment scores and compliance in carrying out antenatal care examinations had the highest percentage in this study.

A good prenatal attachment will encourage the mother to pay attention to her health behavior. This is due to the strong bond between the mother and the fetus, so the mother feels the health of the fetus is her responsibility. The mother will feel more responsible for everything that happens to her fetus (Heksaputra et al., 2021).

The compliance of mothers carrying out antenatal care (ANC) in this study was assessed with compliance and non-compliance. Mothers will be said to be compliant if they have carried out ANC examinations by standards, and are said to be non-compliant if they are not in accordance with pregnancy screening standards, namely six visits during pregnancy set by the Indonesian Ministry of Health (Heksaputra et al., 2021). In this study, the average compliance of mothers with antenatal care visits was 95.6%. Other things that greatly affect pregnant women in implementing ANC, include social support. Mothers with desired pregnancies with the support of their husbands, parents and social environment tend to have high prenatal attachment scores (Sjariati & Primana, 2020).

Other factors that may affect prenatal attachment are age, number of pregnancies (Gravida), economy, geographic location, attitudes, and family support during pregnancy. Based on the data on the characteristics of respondents, it was found that the average maternal age was 23 and 28 years, as much as 26 (57.8%). In primigravida data, the average new mother undergoing her first pregnancy was 24 (53.3%). The age range of 20-35 years is considered a productive, healthy age, making pregnant women think more rationally compared to ages classified as high-risk (Rahman et al., 2022). Pregnant women aged 20-35 years will tend to check their pregnancy because they still feel that pregnancy checks are very important, while those aged less than 20 years tend not to understand too much about the importance of making regular antenatal visits. While those over 35 years old tend to be indifferent to antenatal visits and feel that they have experienced previous pregnancies (Daryanti, 2019).

Pregnancy that occurs at reproductive age is healthy, precisely for the psychological development of a woman. At this age, a woman will easily adapt to her role as a mother (Mursyida & Fithriani, 2023). Mothers with primigravida will tend to have a higher prenatal attachment score compared to multigravida pregnancies. This is because psychologically, mothers want to have a new role that has never been felt before (Astuti et al., 2021). Economic factors have an influence on pregnant women and their families in efforts to detect early pregnancy complications. Family economic status plays a role in taking action to check health (Zahrani et al., 2020). The results of this study show that most pregnant women have a moderate income ranging from Rp 1,000,000-3,000,000 as much as 31 (68.9%), so this is not a barrier for mothers in implementing ANC. This is supported by research conducted by Syafitri (2019), which said that families with sufficient economies can check their pregnancies regularly, plan childbirth with health workers, and make other preparations well (Syafitri, 2019).

Geographical factors in this case are often associated with the distance between the house and the nearest health facility. In this study, almost 39 (86.7%) of respondents have a distance between their homes and the nearest health facilities of less than 1 km and no more than 5 km, which means that the distance of respondents can still be reached with good access. With the availability of health facilities close to their residence, it can encourage someone to do ANC (Shinta, 2017). This is in line with research conducted by Zahrani et al. (2020), who said that distance to health facilities affects compliance when conducting health visits (Zahrani et al., 2020). In the group of mothers who did not comply with this study, some were caused by only knowing that she was pregnant at the end of the first trimester or in the second trimester. Generally, mothers who do not feel that they are pregnant do not experience significant abnormalities or changes, such as nausea and vomiting. Most of the mothers who do not know that they are pregnant are multiparous, or grandemultipara.

Based on the analysis of the relationship between prenatal attachment and maternal compliance in carrying out the third trimester of antenatal care at Puskesmas Kasihan I, it was found that the p-value was 0.003. This value is smaller than 0.5, so it can be interpreted that between the prenatal attachment variable and the antenatal care compliance variable, there is a significant relationship. This is by research conducted by Lamdianita (2019) where it was found that there was a significant relationship between prenatal attachment and maternal compliance in carrying out ANC visits with a p-value of 0.002 (Lamdianita, 2019).

Mothers with high prenatal attachment scores and compliance in carrying out antenatal care examinations had the highest percentage in this study, with chi-square analysis results obtaining a p-value of 0.003. The increase in prenatal attachment in this study was influenced by several things, including sufficient education levels, the average respondents per high school education (53.3%), having pregnancy support from both husband and family, so that mothers are more diligent and obedient in carrying out ANC visits according to standards. It is proven from the results of the analysis that as many as 43 (95.6%). A close, warm, and affectionate emotional bond with her baby will encourage the mother to be more responsible for everything that happens to her fetus. Mothers want to protect their fetuses, including by improving their health. Because the mother knows that this examination is important, she will do a health check (antenatal care) according to standards.

4. Conclusion

The results of this study confirmed that there was a significant relationship between prenatal attachment and compliance of pregnant women in carrying out antenatal care visits at Puskesmas Kasihan I, with a p-value of 0.003, or less than 0.05. The level of prenatal attachment in pregnant women affects maternal compliance when conducting antenatal care at Puskesmas Kasihan I. Prenatal attachment screening can be done when pregnant women visit ANC in the second trimester as one of the bonding screenings and welfare levels between mother and baby. Future research could develop interventions to improve prenatal attachment rates and maternal adherence to ANC visits, especially in undersupported pregnant women who have anxiety during pregnancy.

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