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## Diferences In The Anxiety Of Third Trimester Pregnant Women Before And After The Combination Of Emotional Freedom Technique And Lemon Aromatherapy (Citrus limon l.)

Ni Luh Gede Sri Adnyawati<sup>1\*</sup>, Ni Luh Putu Sri Erawati<sup>1</sup>, Ni Made Dwi  
Purnamayanti<sup>1</sup>

<sup>1</sup>*Polytechnic of Health Ministry of Health Denpasar, Indonesian*

*\*Corresponding author: [006luhgedesriadnyawatijkb@gmail.com](mailto:006luhgedesriadnyawatijkb@gmail.com)*

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### ABSTRACT

**Background:** Anxiety during pregnancy is caused by increased estrogen and progesterone hormones, leading to frequent emotional changes. This can affect the mother's well-being and fetal development. There are several non-pharmacological therapies to reduce feelings of anxiety, such as Emotional Freedom Technique and lemon aromatherapy. This study aims to determine the differences in anxiety levels of third-trimester pregnant women before and after the application of a combination of EFT and lemon aromatherapy. **Method:** The research method used a pre-experimental design with 22 third-trimester pregnant women selected by nonprobability sampling technique with purposive sampling method. The data collected were primary data using the Perinatal Anxiety Screening Scale (PASS). **Result:** Data analysis showed that before the intervention, anxiety scores ranged from 21 to 30, with an average of 24.65. After the intervention, the minimum and maximum scores decreased to 9-21, with an average of 14.77. Bivariate analysis with a Paired t-Test showed a significant difference ( $t = 19.805$ ,  $p = 0.000$ ,  $\alpha < 0.05$ ). **Conclusion:** This study indicates a difference in anxiety levels in third-trimester pregnant women before and after the combination of EFT and lemon aromatherapy. This intervention is recommended for third-trimester pregnant women as a non-pharmacological method to reduce anxiety. Future researchers are encouraged to add a control group for comparison.

**Keywords:** anxiety, third trimester pregnant women, Emotional Freedom Technique (EFT), lemon aromatherapy.



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## Introduction

Pregnancy is a natural phenomenon that causes physical and psychological transformations in the mother. The transformation is characterized by significant hormonal fluctuations. The growth of the fetus in the womb triggers an increase in *estrogen* and *progesterone* hormone levels in the mother's body during the pregnancy period. Physiological changes in the hormonal system that occur during pregnancy cause emotional conditions that often change (Murdayah et al., 2021).

Pregnant women often experience anxiety up to the time of labor. The main focus in this period is anxiety about the upcoming labor process, the intensity of contraction pain, health conditions, and the well-being of the baby to be born (Gary et al., 2020). Uncontrollable hormonal changes caused by the body's inability to regulate proper biochemistry, create significant levels of physical stress in pregnant women. The impact of this condition includes increased anxiety and tension, which in turn can affect maternal well-being and fetal development (Ridayanti et al., 2023)

Maternal anxiety occurs globally with prevalence rates around 29.2% in low- and middle-income countries and around 19.4% in high-income countries (Dennis et al., 2017; Scott et al., 2022). Pregnant women in Turkey who experience anxiety about childbirth amount to 62.5%, while a study conducted in Norway showed that 7.5% of pregnant women were very anxious about labor (Kaya and Altuntu, 2023).

In Indonesian, there are 247 primigravida mothers, namely 17% of pregnant women are not anxious, 21.05% of pregnant women are mildly anxious, 32.8% of pregnant women are moderately anxious, and

29.15% of pregnant women are severely anxious. There are 260 multigravida mothers, namely 53.85% of pregnant women are not anxious, 18.85% of pregnant women are mildly anxious, 10.77% of pregnant women are moderately anxious, 10.38% of pregnant women are severely anxious, and 6.15% of pregnant women are very anxious (Arikalang et al., 2023). In Sari et al (2023) stated that the anxiety of third trimester pregnant women in Bali in 2020 was 40.35% of pregnant women with severe anxiety, 31.58% of pregnant women with moderate anxiety, and 28.07% of pregnant women with mild anxiety.

The incidence of anxiety in South Kuta in 2021 was 50.6% of pregnant women had mild-moderate anxiety and 32.9% of pregnant women showed severe anxiety (Astarini et al., 2022). Based on the results of research in 2022 in South Kuta, there were third trimester pregnant women who experienced mild anxiety as much as 36.8%, moderate anxiety as much as 17.0%, severe anxiety as much as 23.6%, and very severe anxiety as much as 0.9% (Yudiani et al., 2022).

Some factors that cause anxiety are maternal age, parity of pregnant women, knowledge, and socioeconomics (Muliani, 2022). Based on the factors that cause it, maternal age is the factor that most influences the anxiety of pregnant women. It can be seen that there are 5.1% of high-risk pregnant women (age <20 years and >35 years) experiencing mild-moderate anxiety and low-risk maternal age (20-35 years) there are 45.5% experiencing mild-moderate anxiety, 34.2% experiencing severe anxiety.

Educational status also affects the anxiety of pregnant women, namely primary education there are 2.5% experiencing mild-moderate anxiety, secondary education status there are 19.0% showing mild-moderate anxiety, and 15.2% experiencing severe anxiety. Economic status also affects the

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anxiety of pregnant women as seen from the income of Rp 1.5 million -  $\leq$  2 million as many as 16.5% with mild-moderate anxiety and 11.4% experiencing severe anxiety. Income of Rp  $\geq$  2 million -  $\leq$  3 million as much as 21.5% experienced mild-moderate anxiety and 17.7% showed severe anxiety (Astarini et al., 2022)

Anxiety among third trimester pregnant women increases before delivery, making them prone to prolonged labor. Factors causing prolonged labor include lack of maternal energy, baby size, pelvic size discrepancy, and labor unpreparedness. Excessive anxiety can have an impact on maternal and fetal health, postpartum depression, babies born prematurely, and babies born with LBW conditions (Aryani, 2019; Ritonga and Hidayat, 2023). The mortality rate of low-weight and premature newborns increased in 2022 in Badung Regency, namely 13 cases (Dinas Kesehatan Kabupaten Badung, 2022).

Handling anxiety facing childbirth there are several choices of methods that can be developed, such as *Tapas Accupressure Technique (TAT)*, *Emotional Freedom Technique (EFT)*, and *hypnobirthing* (Aprillia, 2023). The anxiety experienced by third trimester pregnant women can also be overcome with aromatherapy because there is a distinctive fragrance to revive happiness (Mirazanah et al., 2021).

*Emotional Freedom Technique (EFT)* is a combination of energy medicine and psychology that involves tapping energy points on the body. The goal is to overcome negative thoughts or subconscious beliefs that can arise in pregnant women (*psychological reversal*). Continuous tapping on these points is expected to reduce the anxiety experienced by pregnant women. The *Emotional Freedom Technique (EFT)* process is expected to restore the body's energy balance and indirectly help reduce anxiety associated with pregnancy (Maesaroh et al., 2019).

Based on research by Sarimunadi et al (2021), it shows that the average score of maternal anxiety before EFT therapy is 13.48 (moderate) while after EFT therapy it is 7.88 (normal). In this study, the tapping technique was able to overcome the anxiety of pregnant women in facing labor. The results of other studies that support Yuniarti et al (2016) state that third trimester primigravida mothers before childbirth show an increase in cortisol hormone levels. High levels of cortisol hormone will make someone experience anxiety. In this study before being given *Emotional Freedom Technique (EFT)*, the average result of cortisol hormone levels was  $355.05 \pm 36.49$  nmol / L and after being given *Emotional Freedom Technique (EFT)*, the average result of cortisol hormone levels was  $269.29 \pm 26.69$  nmol / L so that this EFT technique can reduce the anxiety of pregnant women facing labor. *Emotional Freedom Technique (EFT)* research in Iran shows that before being given the intervention, pregnant women have an average anxiety score of  $49.39 \pm 8.21$ , after being given the intervention, the average results are as follows anxiety score of  $40.42 \pm 13.43$  ( $p < 0.0001$ ). Based on this study, *Emotional Freedom Technique (EFT)* is effective for reducing anxiety scores of third trimester pregnant women in facing labor (Emadi et al., 2023).

Lemon essential oil is well-known for its properties in aromatherapy, which is known to be effective in relieving symptoms such as headaches, nausea, and anxiety. It is also proven to have a calming effect on the mind and reduce nervous tension, dizziness, and fatigue, making it an attractive option in holistic health care (Salsabila et al., 2023). The combination of lemon aromatherapy is an option in reducing anxiety because it contains *limonene*, *linalool*, and *linalyl acetate* so that it can affect *neuronal* circuits, reduce anxiety, pain, anxiety, and relaxation levels resulting

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from increased body adaptation mechanisms regulated by 5-HT and *dopamine (DA)*, especially in the *musculoskeletal* and *neuronal* systems (Fitrikasari et al., 2020).

In a study conducted in North Kalimantan, it was found that pregnant women in the third trimester experienced a decrease in the average anxiety score from 10.88 before administering lemon aromatherapy to 9.00 afterwards. Through bivariate analysis using the *Paired t-Test* test, it was found that the *p-value* result was 0.000, indicating a statistically significant difference between anxiety before and after the administration of lemon aromatherapy in third trimester pregnant women (Liliana et al., 2022). Previous research showed that the median value of anxiety of pregnant women in the third trimester before using lemon aromatherapy was 3.00 and decreased to 2.00 after using lemon aromatherapy in preparation for childbirth (Asnita et al., 2023).

Based on the results of a preliminary study conducted on Thursday, November 09, 2023 at South Kuta Health Center Work Area, the researcher met the coordinator midwife and obtained data on third trimester pregnant women in October 2023 as many as 94 pregnant women. Researchers met and conducted interviews with ten third trimester pregnant women who had a prenatal check-up. The results of the interview found that these pregnant women had feelings of anxiety before childbirth. This is because there is a mother's age that is more than 35 years old and frightening information about childbirth from the surrounding environment as well as the thought of the pain of contractions.

There is no complementary service that provides a combination of *emotional freedom technique* and lemon aromatherapy for third trimester pregnant women who experience anxiety. When anxiety comes, what mothers do is tell stories with their partners and catch their breath. Based on the

description above, the authors are interested in conducting research on "Differences in Anxiety of Third Trimester Pregnant Women Before and After Giving a Combination of *Emotional Freedom Technique* and Lemon Aromatherapy (*Citrus limon l.*) in the South Kuta Health Center Work Area".

## Research Method

This study used a pre-experimental research design with a one group pretest-posttest design, which is pre-experimental research with measurements or observations before and after treatment to research subjects. The population in this study were all third trimester pregnant women who experienced anxiety in the face of childbirth who visited the South Kuta Health Center Working Area on April 15, 2024 - April 19, 2024. The total population of third trimester pregnant women is 30 people. The samples used in this study were third trimester pregnant women with anxiety in facing childbirth who conducted examinations in the work area of South Kuta Health Center and met the predetermined inclusion criteria. The inclusion criteria of this study are third trimester pregnant women with physiological conditions, third trimester pregnant women who have an anxiety score of 21-93 and pregnant women with gestational age 29 - 40 weeks. The exclusion criteria in this study are pregnant women who have asthma, pregnant women who have allergies to aromatherapy and pregnant women who cannot read and write. The total sample in this study was 22 people.

The researcher submitted ethical clearance to the Ethics Commission of the Poltekkes Kemenkes Denpasar on March 15, 2024 (ethical approval number DP.04.02 / F.XXXII.25 / 0404 / 2024). The researcher invited three enumerators to meet at the researcher's house on March 18, 2024. This meeting aimed to equalize perceptions with

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enumerators and explain the mechanism of the research to be carried out. Researchers trained enumerators regarding the administration of a combination of Emotional Freedom Technique (EFT) and lemon aromatherapy on March 22, 2024 to March 26, 2024 at 17.00 WITA.

The researcher screened the anxiety scores of third trimester pregnant women who visited the South Kuta Health Center Working Area on April 15, 2024 to April 19, 2024 with one enumerator. During the screening process, the researcher also looked at the Antenatal book to find out the gestational age and condition of the mother during pregnancy to ensure that the pregnant woman entered the gestational age of 29 - 40 weeks and ensured that she was in a physiological and healthy condition to match the inclusion criteria, after the respondent answered the Perinatal Anxiety Screening Scale (PASS) questionnaire, the researcher immediately calculated the mother's anxiety score to ensure that the anxiety score was 21-93 in accordance with the inclusion criteria. Researchers also asked about allergies and history of asthma to third trimester pregnant women. In this study, 30 pregnant women in the third trimester were found. In finding these third trimester pregnant women, researchers first looked for enumerators, found as many as 3 people who were willing. The researcher invited the enumerators to meet at the researcher's house on March 18, 2024. This meeting aims to equalize perceptions with enumerators and explain the research mechanism that will be carried out. Researchers trained enumerators related to the combination of Emotional Freedom Technique (EFT) and lemon aromatherapy on March 22, 2024 to March 26, 2024 at 17.00 WITA.

Researchers conducted screening of anxiety scores of third trimester pregnant women who visited the UPTD Puskesmas Kuta

Selatan on April 15, 2024 to April 19, 2024 with one enumerator. In this case, the researcher looked for third trimester pregnant women who were waiting for the queue, then the researcher gave greetings, made self-introductions and explained the purpose of the anxiety screening of pregnant women, after third trimester pregnant women were willing to participate in screening activities, the researcher gave the Perinatal Anxiety Screening Scale (PASS) questionnaire.

During the screening process, the researcher also looked at the KIA book to find out the gestational age and condition of the mother during pregnancy to ensure that the pregnant woman entered the gestational age of 29 - 40 weeks and ensured that she was in a physiological and healthy condition to match the inclusion criteria, after the respondent answered the Perinatal Anxiety Screening Scale (PASS) questionnaire, the researcher immediately calculated the mother's anxiety score to ensure that the anxiety score was 21-93 in accordance with the inclusion criteria. Researchers also asked about allergies and history of asthma to third trimester pregnant women. In this study, there were 30 third trimester pregnant women, but there were five pregnant women who did not fit the criteria because the anxiety score obtained was 0-20 and three third trimester pregnant women who refused so that there were 22 third trimester pregnant women who fit the criteria and were willing to participate in this study.

The researcher has obtained respondents according to the inclusion criteria, then the researcher explains the benefits and procedures for providing a combination of Emotional Freedom Technique (EFT) and lemon aromatherapy with leaflet media so that pregnant women have an overview of the interventions provided, then the researcher asks about the availability of third trimester pregnant women to become respondents.

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Respondents who are willing can sign an agreement sheet after explanation (Informed consent).

Researchers visited the respondents' homes from April 20, 2024 - May 08, 2024 and provided interventions in the form of a combination of Emotional Freedom Technique (EFT) and lemon aromatherapy (Citrus limon l.). The combination of EFT and lemon aromatherapy was carried out 1x15 minutes for 3 consecutive days at the same time. Researchers and enumerators were beside the mother to help the mother during the

inhalation of aromatherapy. Researchers and enumerators conducted door to door research to be more effective. The researcher re-measured the anxiety score with the Perinatal Anxiety Screening Scale (PASS) questionnaire on the third day.

Before conducting the data analysis, the Shapiro Wilk test for data normality was performed due to the sample size being less than 50. In this study, the data obtained were normally distributed ( $p > 0.05$ ). Therefore, the paired t-test was used with a 95% confidence level ( $\alpha = 0.05$ ).

## Results and Discussions

The frequency distribution of age, parity, gestational age, education and occupation of respondents is presented in the following table.

**Table 1.** The frequency distribution of respondents' characteristics based on age, parity, gestational age, education and occupation in the South Kuta Health Center Work Area is as follows.

Characteristic	Frequency (f)	Percentage (%)
<b>Age</b>		
20 - 24 years old	3	13.6
25 - 29 years old	13	59.1
30 - 34 years old	6	27.3
Total	22	100
<b>Parity</b>		
Primigravida	7	31.8
Multigravida	15	68,2
Total	22	100
<b>Gestational age</b>		
30 -33 Weeks	9	40.9
34 - 37 Weeks	10	45.5
>37 Weeks	3	13.6
Total	22	100
<b>Education</b>		
Junior High School	2	9.1
Senior High School	12	54.5
Bachelor's Degree	8	36.4
Total	22	100
<b>Occupation</b>		
Having Job	17	77.3
Not Having Job	5	22.7

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Total	22	100
Based on the characteristics of the respondents presented in Table 1, it can be observed that of the 22 respondents, most respondents in this study were 25-29 years old (59.10%), multigravida (68.20%), with a gestational age of 34 - 37 weeks (45.50%), the most education was senior high school (54.50%) and the most occupation was Having Job (77.3%).		

**Table 2.** Test of Normality

Shapiro – Wilk		
	Df	Sig.
Before Intervention	22	0.262
After Intervention	22	0.287

Based on table 2, it shows that the significance value before giving the combination of Emotional Freedom Technique (EFT) and lemon aromatherapy (Citrus limon l.) is 0.262 > 0.05 which indicates normally distributed data. The significance value after giving the combination of Emotional Freedom Technique

(EFT) and lemon aromatherapy (Citrus limon l.) is 0.287 > 0.05 which indicates normally distributed data, so it can be concluded that using the Paired t Test test because the data before and after giving the combination of Emotional Freedom Technique (EFT) and lemon aromatherapy is normally distributed.

**Table 3.** Anxiety Score of Third Trimester Pregnant Women Before Giving Combination of Emotional Freedom Technique (EFT) and Lemon Aromatherapy

Anxiety Score	Frequency (f)	Percentage (%)	Mean	Min	Max
21	1	4.5			
22	2	9.1			
23	4	18.2			
24	6	27.3			
25	2	9.1	24.64	21	30
26	3	13.6			
27	1	4.5			
28	2	9.1			
30	1	4.5			
Total	22	100			

Based on the presentation of data in table 3, it shows that before being given an intervention in the form of Emotional Freedom Technique (EFT) and lemon aromatherapy (Citrus

limon l.), the most anxiety of third trimester pregnant women in anxiety score 24 (27.3%), anxiety score 23 (18.2%) and anxiety score 26 (13.6%).

**Table 4.** Anxiety Score of Third Trimester Pregnant Women After Giving Combination of Emotional Freedom Technique (EFT) and Lemon Aromatherapy

Anxiety	Frequency	Percentage	mean	min	Max
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Score	(f)	(%)			
9	1	4.5	14.77	9	21
10	2	9.1			
11	1	4.5			
12	3	13.6			
13	2	9.1			
14	3	13.6			
15	1	4.5			
16	2	9.1			
17	2	9.1			
18	1	4.5			
19	1	4.5			
21	3	13.6			
Total	22	100			

Based on table 4, it is known that after being given an intervention in the form of a combination of Emotional Freedom Technique (EFT) and lemon aromatherapy (Citrus limon l.), the anxiety scores of third trimester pregnant women for three days were the highest in

anxiety scores 12, 14, and 21 with each score of 3 people (13.6%), anxiety scores 10, 13, 16, and 17 with each score of 2 people (9.1%), and the lowest anxiety scores were in anxiety scores 9, 11, 15, 18, and 19 with each score of 1 person (4.5%).

**Table 5.** Anxiety of Third Trimester Pregnant Women Before and After Giving a Combination of Emotional Freedom Technique (EFT) and Lemon Aromatherapy (Citrus limon l.)

Combination of Emotional Freedom Technique (EFT) and Lemon Aromatherapy	min	max	Mean	SD	t	p-value
Before Intervention	21	30	24.64	2.216	19.805	0.000
After Intervention	9	21	14.77	3.664		

Based on the presentation of data in table 5, it shows that the results of the analysis obtained are a decrease in anxiety in third trimester pregnant women by giving a combination of Emotional Freedom Technique (EFT) and lemon aromatherapy (Citrus limon l.) for 3 days. The mean value before the intervention was higher at 24.64 and decreased after the intervention to 14.77 with a mean

difference of 9.87. The difference is also seen from the minimum and maximum values, where the minimum value of anxiety before the intervention was 21 and the maximum value was 30 while the minimum value after the intervention was 9 and the maximum value was 21.

The results of the bivariate analysis test with the Paired t-Test test obtained a t -

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value of 19.805 and a p - value of 0.000 ( $\alpha < 0.05$ ). This shows that there is a significant difference in the anxiety of third trimester pregnant women before and after giving a combination of Emotional Freedom Technique (EFT) and lemon aromatherapy. Based on this, the combination of Emotional Freedom Technique (EFT) and lemon aromatherapy (Citrus limon L.) is useful for reducing the anxiety of third trimester pregnant women.

## **1. Identification of Anxiety in Third Trimester Pregnant Women Before Giving the Combination of Emotional Freedom Technique (EFT) and Lemon Aromatherapy (Citrus limon L.)**

The results showed that anxiety in third trimester pregnant women before giving a combination of Emotional Freedom Technique (EFT) and lemon aromatherapy (Citrus limon L.) is the minimum value of 21 and the maximum value of 30. Most third trimester pregnant women feel anxious, fear the danger of coming to the fetus, feel panic, worry about pregnancy, feel afraid of bad things happening, worry about many things, and avoid things that make anxiety. This causes third trimester pregnant women to feel anxiety.

Based on the results of research on anxiety of third trimester pregnant women before giving a combination of Emotional Freedom Technique (EFT) and lemon aromatherapy (Citrus limon L.) has a mean value of 24.64. This is because third trimester pregnant women have physiological changes in the hormonal system that can trigger emotional changes during pregnancy. When a person experiences stress, the limbic hypothalamic pituitary adrenal axis (LHPA) is activated to stimulate the hypothalamus and trigger the secretion of Corticotrophin Releasing Hormone (CRH) which in turn instructs the anterior

pituitary gland to secrete Adrenocorticotropin Hormone (ACTH). Cortisol plays a key role in the negative feedback mechanism, where the resulting signal is then relayed to the hypothalamus and subsequently to the amygdala to amplify the individual's emotional anxiety response. ACTH release will induce activation of adrenergic neurons from the locus ceruleus (LC) producing norepinephrine (NE) which secretes epinephrine. This results in anxiety (Baroah et al., 2020; Repova et al., 2022).

Based on the results of research on anxiety of third trimester pregnant women before giving a combination of Emotional Freedom Technique (EFT) and lemon aromatherapy (Citrus limon L.) has a mean value of 24.64. This is because third trimester pregnant women have physiological changes in the hormonal system that can trigger emotional changes during pregnancy. When a person experiences stress, the limbic hypothalamic pituitary adrenal axis (LHPA) is activated to stimulate the hypothalamus and trigger the secretion of Corticotrophin Releasing Hormone (CRH) which in turn instructs the anterior pituitary gland to secrete Adrenocorticotropin Hormone (ACTH). Cortisol plays a key role in the negative feedback mechanism, where the resulting signal is then relayed to the hypothalamus and subsequently to the amygdala to amplify the individual's emotional anxiety response. ACTH release will induce activation of adrenergic neurons from the locus ceruleus (LC) producing norepinephrine (NE) which secretes epinephrine. This results in anxiety (Baroah et al., 2020; Repova et al., 2022).

Based on parity, primigravida pregnant women who experienced anxiety amounted to 31.8%, this feeling of anxiety was obtained from the mother's ignorance, the mother's first

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experience, the scary process of childbirth from movies, stories of childbirth experiences from friends and family, and the lack of attending pregnancy classes. Multigravida pregnant women who experienced anxiety of 68.2% came from previous painful childbirth experiences from contractions and concerns about possible complications during labor that could endanger themselves and their babies. Based on research by Puspitasari et al (2023) that there were primigravida pregnant women experiencing mild anxiety of 63.2%, moderate anxiety of 21.1%, and no anxiety of 15.8% while multigravida pregnant women experienced mild anxiety of 57.9%, moderate anxiety of 21.1%, and no anxiety of 21.1%. Another study by Setiawati et al (2022) found that there were no primigravida pregnant women who experienced anxiety while multigravida pregnant women who experienced mild anxiety of 8.42%, severe anxiety of 8.42%, and severe anxiety of 16.84%. The researcher's assumption related to this is that there are still pregnant women who experience anxiety both primigravida pregnant women and multigravida pregnant women. Primigravida pregnant women experience anxiety due to first-time experiences and frightening stories of the labor process from relatives. Based on the discussion above, there are also primigravida pregnant women who do not experience anxiety, this can be caused by support from spouses, family, and friends who can provide a sense of security, and mothers diligently attend pregnant women's classes. Multigravida pregnant women experience anxiety because there are factors such as health conditions and experiences during previous pregnancies, a history of previous pregnancy or childbirth complications, social support and mental readiness play a role in determining their level of anxiety.

Based on this study, the highest gestational age was 34-37 weeks (45.5%). Another study by Setiawati et al (2022) that there were no feelings of anxiety in first and second trimester pregnant women, while third trimester pregnant women who experienced mild anxiety were 8.42%, severe anxiety was 8.42%, and severe anxiety was 16.84%. This is in accordance with the theory of Yanti et al (2020) that the more the mother's gestational age increases, the more anxiety the mother will experience, because the mother will be closer to childbirth.

In this study, the dominant mother's final education was senior high school (54.5%). The results of this study are in line with Suyani (2020) that the majority of respondents' education is senior high school (56.7%). Understanding of the labor process can play a significant role in determining the level of anxiety experienced by pregnant women before labor. Limited knowledge of the process can lead to negative perceptions of labor, which is likely to increase fear and anxiety in pregnant women. Pregnant women need to gain sufficient knowledge so that anxiety about facing labor can be reduced (Putri et al., 2021; Sari et al., 2023). The researcher's assumption in this case is that the level of education can affect the mental and emotional readiness of mothers in facing pregnancy and childbirth. Mothers with a high school education may feel less confident in facing the challenges of pregnancy and labour, which may increase anxiety, and social support from family, friends and community often plays a role in reducing anxiety. Mothers with senior high school education may have different support networks than those with higher education, which may affect their anxiety levels.

Based on this study, the majority of third trimester pregnant women work as

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employees (59.1%) and entrepreneurs (18.2%). This is in line with research conducted by Suyani (2020) that third trimester pregnant women who work (46.7%), most working pregnant women experience anxiety because there are obligations at work that must be done so that anxiety may come from the work itself, not from the preparation process towards childbirth. Workload such as feeling incompetent or unable to give maximum results can stimulate anxiety in a person. The researcher's assumption in this regard is that working pregnant women may have high levels of anxiety during third trimester pregnancy because work stress, concerns about health and safety, work-life balance, social support, and financial preparedness may also affect their anxiety levels.

## **2. Identification of Anxiety in Third Trimester Pregnant Women After Giving a Combination of Emotional Freedom Technique (EFT) and Lemon Aromatherapy (Citrus limon L.)**

The results of the study after giving a combination of Emotional Freedom Technique (EFT) and lemon aromatherapy (Citrus limon L.) got a minimum value of 9 and a maximum value of 21. The decrease in anxiety scores after giving a combination of Emotional Freedom Technique (EFT) and lemon aromatherapy (Citrus limon L.) was also assessed based on the responses of 22 respondents who were assessed through a questionnaire regarding the anxiety of pregnant women. All pregnant women experienced a decrease in score, in other words, no respondents experienced an increase in score. This is also evidenced from the mean value after the intervention of 14.77. These results indicate that there is a decrease after the combination of Emotional Freedom

Technique (EFT) and lemon aromatherapy (Citrus limon L.).

The results of this study are in accordance with the research of Emadi et al (2023) who gave Emotional Freedom Technique (EFT) to 58 third trimester pregnant women that before being given the EFT intervention pregnant women had an average anxiety score of 49.39 after being given the EFT intervention the average anxiety score was 40.42. This research hypothesis states that EFT can reduce anxiety. Another study by Putranti (2021) states that the Emotional Freedom Technique (EFT) method has an effect on reducing the anxiety of third trimester pregnant women. This study had 24 samples of third trimester pregnant women with pre-test results with high and moderate anxiety levels of 75.75, after being given treatment, the post-test results were obtained with a mild anxiety level of 42.17. Emotional Freedom Technique (EFT) therapy can reduce anxiety in third trimester pregnant women because EFT therapy can stimulate energy points in the body called 'the major energy meridians' which can free emotional disturbances so that thoughts, attitudes and emotions in themselves become balanced.

The results of research by Liliana et al (2022) related to the provision of lemon aromatherapy to third trimester pregnant women obtained average results before being given an intervention of 10.88 and after being given lemon aromatherapy therapy of 9.00, through bivariate analysis using the Paired t-Test test, it was found that the p-value result was 0.000, indicating a statistically significant difference between anxiety before and after giving lemon aromatherapy to third trimester pregnant women. Lemon aromatherapy (Citrus limon L.) can reduce anxiety in third trimester pregnant women because lemon essential oil contains linalool which is useful in balancing the

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nervous system so that pregnant women are calmer when inhaling lemon aromatherapy, besides that lemon aromatherapy also contains limonene and linalyl acetate which can affect neuronal circuits so as to reduce anxiety, pain, anxiety, and relaxation levels (Fitrikasari et al., 2020).

The decrease in anxiety scores in this study is in accordance with the theory that by gently and regularly tapping the meridian points of the body and face can restore our energy balance. If the energy system is disturbed, negative emotions occur, then these negative emotions continue to disturb the mind and cause physical pain. Pain, anger, resentment, and anxiety are negative emotions that come from past memories that are embarrassing and hurt so that someone needs to apply the Emotional Freedom Technique (EFT) with a holistic approach. In this case, someone must be able to communicate with the mind, soul and body through self-talk by saying positive affirmations repeatedly. This is done to ensure that the Emotional Freedom Technique (EFT) is successful in dealing with problems (Susilo, 2022). Based on Purba in Welly et al (2021) that the decrease in anxiety scores is influenced by complex interactions between neural networks that communicate through neurotransmitters at synapses. Peripheral nerve stimulation will send signals to the nerve center in the brain through the spinal cord and brainstem, to the hypothalamus and pituitary. This process regulates the secretion of neurotransmitters such as  $\beta$ -endorphin, norepinephrine, enkephalin, and 5-HT (serotonin), which contribute to the anxiety-reducing effect. The secretion of these neurotransmitters also plays a role as a modulator of the immune system and in improving the function of other organs, including in psychiatric conditions.

### **3. Analysis of Anxiety in Pregnant Women in the Third Trimester Before and After Giving a Combination of Emotional Freedom Technique (EFT) and Lemon Aromatherapy (Citrus limon L.)**

In this study, to overcome the anxiety of third trimester pregnant women, a combination of Emotional Freedom Technique (EFT) and lemon aromatherapy (Citrus limon L.) was given once for three days with the same time. This study starts from doing Emotional Freedom Technique (EFT) for ten minutes by giving light taps on the meridian points eight times, while saying the affirmation sentence "even though I feel anxious, I accept happily, sincerely and surrender", then giving lemon aromatherapy on non-scented tissue as much as 1-2 drops and inhaled for five minutes.

The results of research related to Emotional Freedom Technique (EFT) are in accordance with the research of Saragi and Hariani (2022) who provided this intervention for three days to 38 third trimester pregnant women, before EFT therapy there were pregnant women who were anxious with normal categories of 16 people, mild 20 people, and moderate 2 people. After EFT therapy there was a change in anxiety with a normal category of 34 people, mild 4 people, and no pregnant women who experienced moderate anxiety. Another study from Kawanda (2023) that EFT therapy was performed 1 time per day for 2 days with 10-15 minutes, the results showed that anxiety levels in pre-operative patients could decrease from moderate anxiety levels to mild anxiety levels. Research conducted by Nisa (2022) related to Emotional Freedom Technique (EFT) therapy which is carried out every morning at 08.00 WIB for 3 consecutive days with 1 x 15 minutes of administration states that EFT therapy has a positive effect on increasing breast milk production in postpartum

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primigravida mothers. Smooth breast milk production correlates with no anxiety experienced by the mother (Hasiba et al., 2023)

The results of data analysis of differences in anxiety in third trimester pregnant women before and after giving a combination of Emotional Freedom Technique (EFT) and lemon aromatherapy (Citrus limon L.) in the Work Area of South Kuta Health Center Work Area show that the combination of Emotional Freedom Technique (EFT) and lemon aromatherapy (Citrus limon L.) can reduce anxiety in pregnant women with  $p = 0.000$  ( $\alpha < 0.05$ ). The results showed a decrease in anxiety scores felt by respondents before and after administering a combination of Emotional Freedom Technique (EFT) and lemon aromatherapy. In this case, before giving the combination of Emotional Freedom Technique (EFT) and lemon aromatherapy the minimum value is 21, the maximum value is 30, and the mean value is 24.64 while after giving the combination of Emotional Freedom Technique (EFT) and lemon aromatherapy the minimum value is 9, the maximum value is 21, and the mean value is 14.77. This shows a decrease in the anxiety of third trimester pregnant women.

Based on the results of previous research using only Emotional Freedom Technique (EFT) by Santi and Megasari (2022) also stated a decrease in the anxiety of third trimester pregnant women, where the mean anxiety score before intervention was 4.89 while the mean score after intervention was 3.62. The results of the analysis using the Wilcoxon test showed a p-value of 0.000 ( $<0.05$ ), which indicates that the application of the spiritual emotional freedom technique has a significant effect on reducing anxiety levels. The results of other studies that support Yuniarti et al (2016) state that pregnant women in the third trimester before childbirth show an

increase in cortisol hormone levels. High levels of cortisol hormone will make someone experience anxiety. This study before being given Emotional Freedom Technique (EFT), the average results of cortisol hormone levels were  $355.05 \pm 36.49$  nmol / L, after being given Emotional Freedom Technique (EFT), the average results of cortisol hormone levels were  $269.29 \pm 26.69$  nmol / L so that with this EFT technique can reduce the anxiety of pregnant women facing labor.

The meridian points of the body are tapped gently with two fingers in order to restore energy balance. Emotional Freedom Technique (EFT) activates the body's electrical energy. Electrical sensors in the body are necessary because the body needs to flow this energy to survive. The research respondents felt calm after administering Emotional Freedom Technique (EFT) because tapping on the body's meridian points can stimulate endorphin hormones. Endorphin hormones interact with neuron receptors that inhibit the release of neurotransmitters and stop pain signals to the brain, thereby reducing anxiety (Oktiawati et al., 2020).

The Emotional Freedom Techniques (EFT) process includes the affirmation phrase "although I feel anxious, I accept happily, sincerely and surrender". Affirmation sentences are connected to prayers that are done sincerely and surrendered. Affirmation sentences are used to flow energy positively and eliminate negativity that still affects the subconscious mind with the aim of changing it to positive. It can overcome psychological resistance by repeating affirmation sentences regularly (Ni'matuzzakiah, 2021)

The results of research related to lemon aromatherapy are in accordance with the research of Asnita et al (2023) which shows that the median value of anxiety of pregnant women

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in the third trimester before using lemon aromatherapy is 3.00 which then decreases to 2.00 after giving lemon aromatherapy. This study has a p-value of 0.000 ( $<0.05$ ) which means that there is a decrease in anxiety of third trimester pregnant women after administering lemon aromatherapy. Other research results from Claudia and Rasyid, (2021) showed that the mean before administering lemon aromatherapy was 12.33 and after administering lemon aromatherapy it was 2.63 with a significance value of 0.000 ( $<0.05$ ) which means that there is a decrease in anxiety in third trimester pregnant women after administering lemon aromatherapy.

In this study, Emotional Freedom Techniques (EFT) therapy was combined with lemon aromatherapy. The lemon aromatherapy used in this study is young living lemon essential oil which contains limonene, gamma-terpinene, beta-pinene, alpha-pinene and sabinene. Limonene content in aromatherapy is very effective in the treatment of mood disorders (Cui et al., 2022). The aromatherapy method used in this study is inhalation. The process begins with inhaling aromatherapy through the nose, then sending signals directly to the olfactory system, then the signals act on the cerebral cortex, thalamus, and limbic system of the brain, and stimulate the brain to produce neurotransmitters such as serotonin or endorphins to overcome anxiety symptoms (Cui et al., 2022).

The results of this study are in accordance with Yulistanti et al (2019) research which combines spiritual emotional freedom technique with lavender aromatherapy, before the intervention of spiritual emotional freedom technique with lavender aromatherapy, the average value of respondents' anxiety of 49.78 is included in the moderate anxiety range and

after the intervention the average anxiety value of 36.28 is included in the mild anxiety range. The calculated t value from the Paired Sample t-Test test results of the intervention group is 10.745 (greater than the t table) with a significance degree of  $p = 0.000$ . These results mean that there is a significant decrease in anxiety scores after intervention in the form of combined spiritual emotional freedom technique therapy with lavender aromatherapy. The decrease in anxiety after combined spiritual emotional freedom technique with lavender aromatherapy can be attributed to a decrease in adrenal hypothalamic pituitary axis activity.

The researcher's assumption related to the decrease in anxiety scores that occurred was due to the provision of interventions carried out at the same time, as well as the provision of a combination of Emotional Freedom Technique (EFT) and lemon aromatherapy using lemon essential oil with limonene content that stimulates peripheral nerve tissue so as to stimulate the hypothalamus to produce neurotransmitters such as  $\beta$ -endorphins, norepinephrine and enkephalins, 5-HT (serotonin). The result of these neurotransmitter effects can control a person's anxiety. Researchers also assume that the provision of lemon aromatherapy is preferred by pregnant women because it has a refreshing aroma and gives a calm effect simultaneously. In the delivery of this intervention, there is also the pronouncement of positive affirmations and breath regulation that makes the mother's mind calmer. Positive affirmation sentences provide resilience and restore the mother's focus on things that need to be prepared for labor without worrying.





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## Conclusion

Based on data analysis, it was found that giving a combination of Emotional Freedom Technique (EFT) and lemon aromatherapy (Citrus limon l.) to third trimester pregnant women is useful for reducing anxiety with the following description:

1. Anxiety in third trimester pregnant women before giving a combination of Emotional Freedom Technique (EFT) and lemon aromatherapy (Citrus limon l.) in the South Kuta Health Center Work Area, the minimum value is 21, the maximum value is 30, and the mean value is 24.64.
2. Anxiety in third trimester pregnant women after giving a combination of Emotional Freedom Technique (EFT) and lemon aromatherapy (Citrus limon l.) in the South Kuta Health Center Working Area, all experienced a decrease in scores as evidenced by a minimum value of 9, a maximum value of 21, and a mean value of 14.77.
3. There is a difference in anxiety of third trimester pregnant women before and after giving a combination of Emotional Freedom Technique (EFT) and lemon aromatherapy (Citrus limon l.) in the South Kuta Health Center Working Area.

This intervention is recommended for third-trimester pregnant women as a non-pharmacological method to reduce anxiety. Future researchers are encouraged to add a control group for comparison.

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## Conflic of Interest

The author(s) declare that they have no conflict of interest.

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