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A True Experimental Evaluation of Aromatherapy for Reducing Anxiety in Primigravid Mothers

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Abstract:

Anxiety is a frequent concern among primigravid mothers, and when prolonged it may trigger neurohormonal stress responses leading to insomnia, fatigue, depression, and severe complications. Non-pharmacological methods such as aromatherapy offer promising benefits. This study aimed to assess and compare pre- and posttest anxiety levels between study and control groups, evaluate the effectiveness of aromatherapy, and examine associations between post-intervention anxiety and selected demographic or obstetrical variables. A true experimental pre- and post-test design was conducted in Karwandiya, Rohtas, Bihar, involving 60 primigravid mothers randomly assigned to study (n=30) and control (n=30) groups by lottery method. Anxiety was measured using the Hamilton Anxiety Scale. The intervention group received lavender oil aromatherapy (1–2 drops inhaled deeply twice daily and placed under the pillow overnight) for seven consecutive days, while the control group received routine care. Results showed that in the study group, 43.3% had moderate and 56.7% severe anxiety at baseline, whereas post-intervention 86.7% reported mild and 13.3% moderate anxiety, with no severe cases. Statistical analysis confirmed a significant reduction in anxiety (t=11.383, p=0.0001). In contrast, the control group showed little change, with no significant difference between pre- and posttest (t=1.488, p=0.148). No significant associations were found between anxiety reduction and demographic or obstetrical variables. The findings demonstrate that lavender aromatherapy is highly effective in reducing anxiety among primigravid mothers. As a simple, safe, and cost-effective approach, it can be integrated into routine antenatal care to enhance maternal psychological well-being.

Keywords: anxiety, Lavender oil aromatherapy, the primi gravid mothers, neurohormonal stress.

Introduction

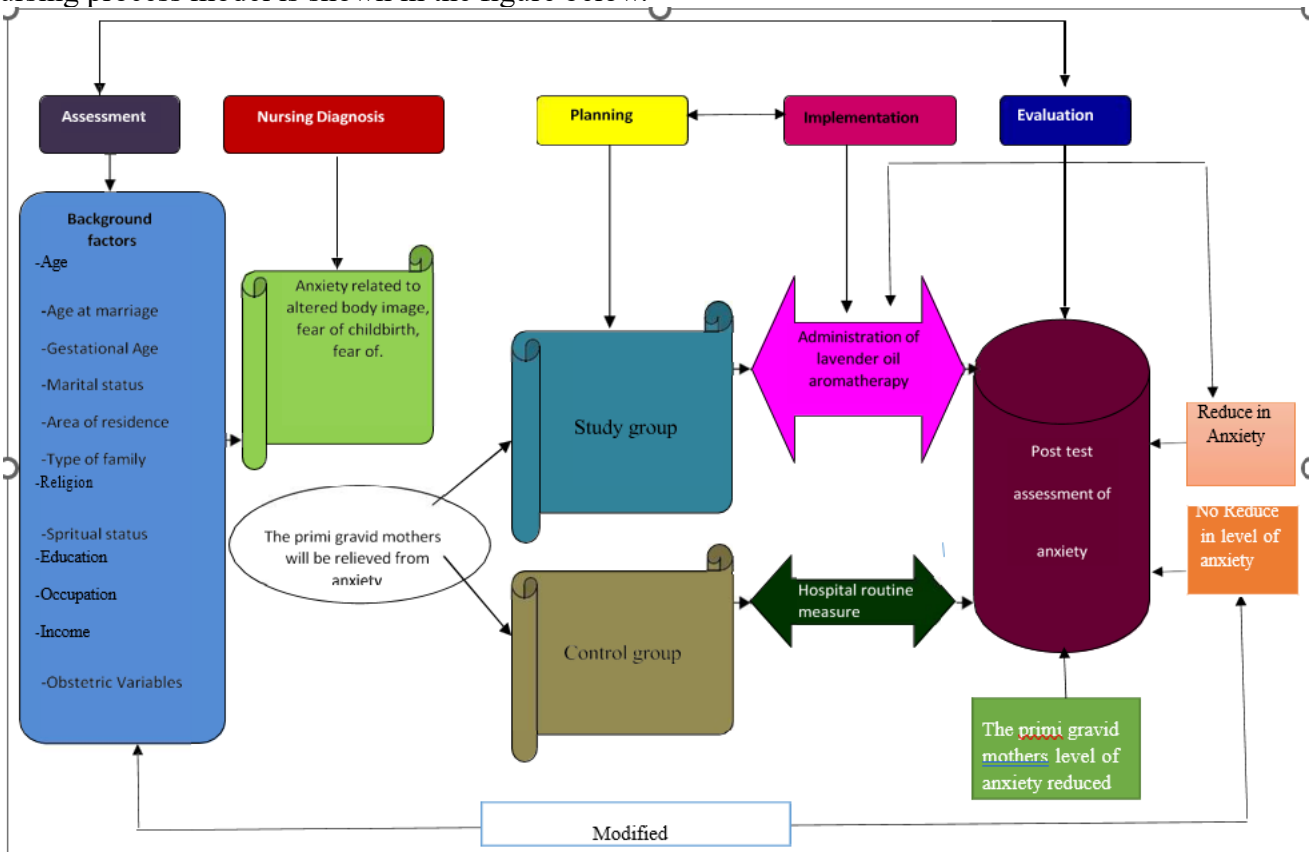
Pregnancy is a critical period for women, families, and society, requiring comprehensive antenatal care to safeguard maternal and fetal health. Beyond physical well-being, maternal psychological health plays a crucial role, as anxiety during pregnancy has been linked to adverse outcomes including preterm birth, low birth weight, preeclampsia, prolonged labor, assisted or cesarean delivery, and impaired fetal neurodevelopment [1–3]. High maternal anxiety is also associated with increased pain perception during labor, altered uterine contractility via elevated catecholamines, and reduced uterine blood flow, which may compromise fetal growth and immunity [7,8]. Studies further suggest that antenatal anxiety overlaps with depression, increases risk of postpartum depression, and is more prevalent among nulliparous women [12,13,17].

Globally, anxiety disorders affect a large proportion of pregnant women, with WHO estimating them among the top contributors to disease burden [11]. Fear of childbirth has been recognized as a significant driver of antenatal anxiety and a major factor behind requests for elective cesarean section without medical indication [1,3]. Research has demonstrated associations between maternal anxiety and impaired placental

blood flow, fetal brain circulation, and elevated maternal stress hormones such as corticotrophin-releasing hormone (CRH), which further increases the risk of premature delivery and developmental challenges [13,15].

Conventional pharmacological management of anxiety, including benzodiazepines and antidepressants, may pose risks during pregnancy, necessitating exploration of safe, non-pharmacological alternatives. Aromatherapy, particularly with lavender (Lavandula angustifolia), has been historically used for its calming, analgesic, and antidepressant properties [2,4]. Modern evidence shows that lavender oil inhalation modulates brain activity by enhancing alpha and theta EEG waves, reduces cortisol levels, and promotes relaxation, thereby exerting measurable anxiolytic effects [4–6]. Controlled trials suggest its effectiveness in reducing anxiety, improving sleep, and enhancing overall maternal well-being without harmful side effects [5–7,17].

Given its safety, affordability, and ease of administration, lavender aromatherapy has emerged as a promising complementary intervention for managing antenatal anxiety. Nurses, who remain in continuous contact with expectant mothers, are in a key position to implement such evidence-based non-pharmacological strategies. This study was therefore undertaken to evaluate the effectiveness of lavender oil inhalation therapy in reducing anxiety among primigravid mothers, with the goal of integrating complementary approaches into routine antenatal care. The overall conceptual framework based on nursing process model is shown in the figure below.



Conceptual framework based on nursing process model

METHODOLOGY

The study was conducted in Karwandiya community area near Government Middle school, Sasaram in Rohtas District. The total geographical area of village is 131 hectares. Karwandiya has a total population of 3,446 peoples, out of which male population is 1,750 while female population is 1,696. Literacy rate of Karwandiya village is 59.34% out of which 66.23% males and 52.24% females are literate. There are about 596 household in community setting Karwandiya, Sasaram.

Total number of 245 pregnant women is registered in the month of December 2024 and January 2025, in which only 130 women is under the primi gravid mothers. Out of 130, 60 samples of the primi gravid mothers is suffering from anxiety which made the setting ideal for the study.
In this study, the demographic variables & the primi gravid mothers includes age, education, occupation, socio economic status, year of marriage, support system available, type of marriage, type of family, education of husband, occupation of husband and income of the family. Obstetric variables are Week of gestation 32-37, No. of ante natal visits attended, Height, Weight, BMI, BP, Weight gain.

The study was divided in two sections.
Part A- Demographic & Obstetrical proforma to collect baseline data.

Part B- Hamilton anxiety rating scale to assist the level of anxiety.

Part A-I: A structured questionnaire consisting of demographic variables like age, education, occupation, socio economic status, year of marriage, support system available, type of marriage, type of family, education of husband, occupation of husband and income of the family.

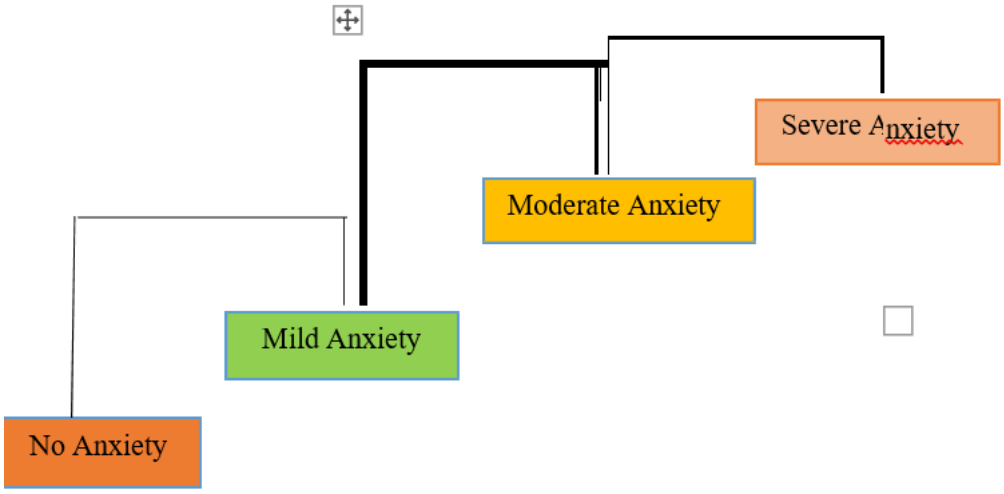
Part A-II: A structured questionnaire consisting of Obstetrical variables like week of gestation 32-37. Number of ante natal visits attended, height, weight, BMI, BP, HP and weight gain.

Part B: Hamilton anxiety rating scale.

Pregnancy specific Anxiety was assessed with modified Pregnancy Related Anxiety Scale. The items of the Pregnancy Related Anxiety scale consists of 4 items regarding anxiety. For example 0-14 = No Anxiety, 15-28 = Mild Anxiety, 29-42 = Moderate Anxiety, 43-56 = Severe Anxiety

SCORING

0-14	No Anxiety
15-28	Mild Anxiety
29-42	Moderate Anxiety
43-56	Severe Anxiety



The study was carried out after obtaining an ethical clearance from the ethical committee of Narayan Nursing College Letter No. NNC/Dean-PO/24/1194 dated 18.12.2024.

PILOT STUDY

The pilot study was conducted at community setting Karvandia, Sasaram in Rohtas District from 09-12-2024 to 09-01-2025. The data was collected from the population who fulfilled the sample selection criteria. The sample size of the pilot study was at 10% of the whole study population i.e. six samples wherein 3 were in experimental group and 3 in control group.

A brief introduction about the self and the study were given to the samples. Pretest was conducted to assess the effectiveness of Aromatherapy and anxiety level among the primi gravid mother. The selected nursing intervention were twice a day in the morning and evening for a total of 7 days. The total session for each client was for 40-50 minutes and control group were given routine hospital measures. Post test level of anxiety and effectiveness of Aromatherapy were assessed for both study and control group. The collected data were tabulated for analysis. The pilot study showed the positive effect of selected nursing intervention among the primi gravid mothers. The result of the pilot study gave the evidence that the tool was found to be a reliable, feasible and practicable to conduct the main study.

DATA COLLECTION PROCEDURE

The data collection duration was for one month from 09-12-2024 to 09-01-2025. The main study was conducted at community setting Karvandia, Sasaram in Rohtas District. A written permission was obtained from Mukhiya cum head of panchayat of Karvandia Community area. A formal written permission was obtained from the Medical Superintendent of the respective hospital to conduct the study. The investigator explained in detail about the research study.

Written consent was obtained from the primi gravid mothers in both study group and control group. The samples were selected by Randomized sampling technique and eligibility criterial for participating in the study. A total of 60 samples were selected. The investigator allocated 30 samples for study group and 30 samples for control by lottery method. The demographic data and the obstetrical variable of the primi gravid mothers were obtained by interview method using the structure questionnaire. The pretest assessment effectiveness of Aromatherapy and level anxiety among the primi gravid mothers was done using the 0-56 modified Hamilton anxiety rating scale and effectiveness of lavender oil in Aromatherapy. After the pretest the mothers in the study group were administered lavender essential oil 1-2 drops applied to a sterile gauze piece, inhaled for 10 deep breath for 02-03 minutes, twice a day, it continue for 07 days. The total session for each client was for 40-50 minutes and control group were given routine hospital

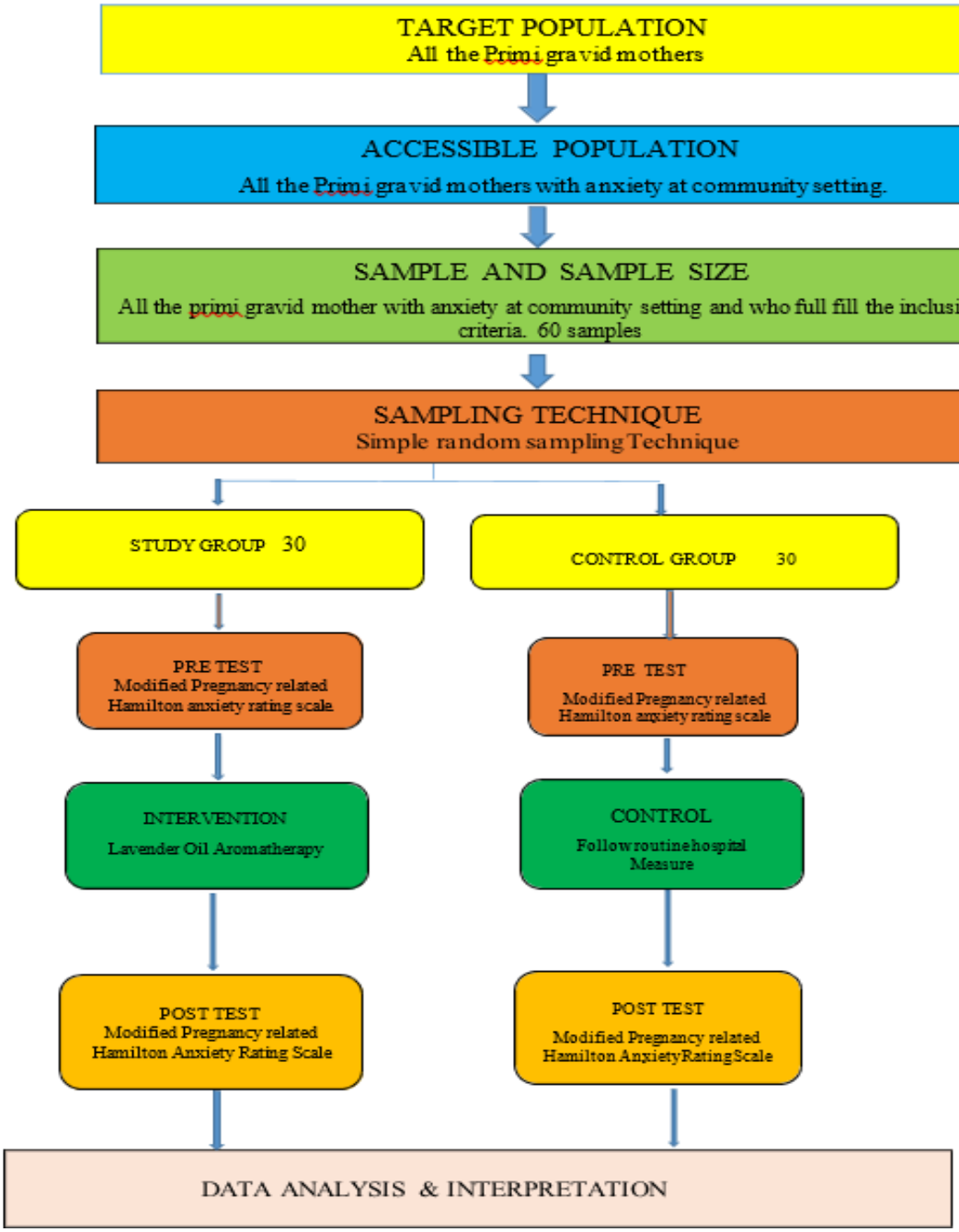
measures.

Post test assessment effectiveness of Aromatherapy with lavender oil and level of anxiety among the primi gravid mothers was collected on the seventh day after the seventh day inhalation of lavender essential oil using the 0-56 modified Hamilton anxiety rating scale. All the data collected was subjected to data analysis. The data collection was carried out for period of 04 weeks.

PLAN FOR DATA ANALYSIS

The data collected was collected, coded and analyzed using descriptive i.e. mean and sand inferential statistics. The data was analyzed using the SPSS version 29.0 software and the findings of the data was presented in descriptive, tabular and in the forms of figure.

SCHEMATIC PRESENTATION OF RESEARCH DESIGN



Data Analysis And Interpretation

The pretest level of anxiety among the primi gravid mothers, in the pretest study group 13(43.33%) of the mothers had moderate anxiety and 17(56.67%) of the mothers had severe anxiety. In the posttest study group 26(86.67%) of the mothers had mild anxiety and 4(13.33%) of the mothers had moderate anxiety and no mother had severe anxiety. On conducting paired t-test of the pre-test and post-test in the study group p=0.0001, df=29 and t= 11.383 which is statistically extremely significant p<0.05. in the pre-test control group, 14(46.67%0 of the mothers had moderate anxiety and 16(53.33%) of the mothers had severe anxiety. In the posttest control group, 4(13.33%) of the mothers had mild anxiety and 11(36.67%0 of the mothers had moderate anxiety and 15(50%) of the mothers had severe anxiety. On conduction paired t-test of the pre-test and post-test in the control group p=0.1476, df=29 and t=1.4879 which is statistically not significant at p<0.05. The study fining showed that there were no significant association with selected demographic variable and obstetrical variable except for anxiety levels among the primi gravid mothers p<0.05.

Table:1 :- Assessment of the pre test level of anxiety among the primi gravid mothers in study and control group
N=60(30+30)

Group	Mild Anxiety		Moderate Anxiety		Severe Anxiety		Mean	SD	Unpaired t- test
	n	%	n	%	n	%			
Study Group	0	0	13	43.33%	17	56.67%	7.133	1.942	P = 0.4630, df = 58 t = 0.7387
Control Group	0	0	14	46.67%	16	53.33%	6.766	1.906	

Table 1 shows the pre test level of anxiety among the primi gravid mothers. In the study group 13(43.33%) of the mothers had moderate anxiety and 17(56.67%) of the mothers had severe anxiety. In control group 14(46.67%) of the mothers had moderate anxiety and 16(53.33%) of the mother had severe anxiety. Both in the study group and control group neither of the group member had mild anxiety.

The unpaired t-test showed that p = 0.4630, df = 58 and t = 0.7387 which is not statistically significant at p<0.05. Hence it is understood that the pretest level of anxiety in both study and control group were same.

Table: 2:- Assessment of the post test level of anxiety among the primi gravid mothers in study and control group
N=60(30+30)

Group	Mild Anxiety		Moderate Anxiety		Severe Anxiety		Mean	SD	Unpaired t-test
	n	%	n	%	n	%			
Study Group	26	86.67%	4	13.33 %	0	0%	2.43	1.22	P = 0.0001, df = 58 t = 7.668
Control Group	4	13.33%	11	36.67 %	15	50%	6.1	2.32	

Table 2 shows the post test level of anxiety among the primi gravid mothers. In the study group 26(86.67%) of the mothers had mild anxiety and 4(13.33%) of the mothers had moderate anxiety and 4(13.33%) of the mothers had severe anxiety. In control group 4(13.33%) of the mothers had mild anxiety and 11(36.67%) of the mother had moderate anxiety and 15(50%) of the mothers had severe anxiety.
The unpaired t-test showed that p = 0.0001, df = 58 and t = 7.668 which is statistically significant at

p<0.05. Hence it is understood that the posttest level of anxiety in both study and control group were not same and the hypothesis (H2) is accepted.

Table 3: Frequency, Percentage Distribution And Chi – Square Associtaion Between Post Test Level Of Anxiety And Their Selected Demographic Variables Of The Primi Gravid Mothers In Study And Control Group

Demographic Data	**Level of Anxiety**				**Chi Square value**
	After intervention				
	Moderate		**Severe**		
	Frequency n (30)	**Percentage %**	**Frequency n (30)**	**Percentage %**	
Age in years a)< 20 b)21-25 c)26-30	4	13.3%	6	20%	χ^2=3.1358 df = 9.00 P >0.05 NS
d)Above 30 years	9	30%	11	36.7%	
	11	36.7%	5	16.7%	
	6	20%	8	26.7%	
Type of family					χ^2=2.7842
a) Nuclear family	18	60%	16	53.33	df = 6
b) Joint family	10	33.33%	14	46.66%	P >0.05 NS
c)Extended family	2	6.66%	0	0	
Education					χ^2=2.6064
a) Illiterate	2	6.66%	6	20%	df = 12
b) Primary school	9	30%	8	26.66%	P >0.05 NS
c) Middle school	11	36.66%	10	33.33%	
d) High school	5	16.66%	3	10%	
e) Intermediate/ Diploma	3	10%	3	10%	

The obtained chi square value regarding Age in years 3.1358 (P<0.05), Type of family 2.7842 (P<0.05), Education 2.6064(P<0.05), Occupation 2.00(P<0.05) was stated significant at P>0.05 with the posttest level of anxiety.

The obtained chi square value regarding Monthly family income 1.4548(P>0.05), Type of work 0.1308(P>0.05), Socio economic status 2.248(P>0.05), Year of Marriage 1.9294(P>0.05), Type of Marriage 0.577(P>0.05),

Table: 4:- depicts that there were no significant association were found with selected demographic variable age, Type of family, education, occupation, Monthly family income, type of work, socio economy status, year of marriage, type of marriage and the posttest anxiety level among the research participant at p<0.05.

Obstetric variable

Week of gestation					X2= 0 p=1.00 NS at p<0.05
a. 32-37 week	30	100%	30	100%	
b. 38-40 week	0	0	0	0	
No. of ante natal visits					
a. 1 time	11	36.7%	9	30%	X2= 0.6812 p=0.4092 NS at p<0.05
b. 2 time	10	33.3%	9	30%	
c. 3 time	9	30%	12	40%	
Body mass Index (BMI)					
a. Under Weight	7	23.3%	6	20%	X2= 2.9628 p=0.0852 NS at p<0.05
b. Normal	11	36.7%	17	56.7%	
c. Over weight	9	30%	6	20%	
d. Obese	3	10%	1	3.3%	
Height					X2= 0.7212 p=0.3958 NS at p<0.05
a. 5.2 -5.5 Feet	11	36.7%	10	33.3%	
b. 5 -5.2 Feet	11	36.7%	9	30%	
c. 4.5 - 5 Feet	8	26.7%	11	36.7%	
Blood Pressure					X2= 1.0934 p=0.2957 NS at p<0.05
a.100-110	17	56.7%	13	43.3%	
b.110-120	11	36.7%	14	46.7%	
c.120-130	2	6.7%	3	10%	

Week of gestation 0.0(P>0.05), ante natal visits 0.6812(P>0.05), Body mass index 2.9628(P>0.05), Height 0.7212(P>0.05), and Blood pressure 1.0934(P>0.05) was not significant.

Despite that there were no significant association were found with selected obstetrical variable like week of gestation, no. of antenatal visit, BMI, height, Blood pressure, anxiety level among the research participants at p<0.05.

CONCLUSION

The study result concludes that intervention like Lavender oil aromatherapy has great impact and is effective in reducing the level of anxiety making the pregnancy period pleasant. The researcher feels that the discomforts faced by the primi gravid mothers must be given more emphasis by the midwifes while

caring for their major needs involving the mother and their family to overcome the issues during the pregnancy period of the primi gravid mothers in a comfortable way to the mothers and the family to form a holistic nursing care approach.

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