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A Quasi Experimental Study to Evaluate the Effectiveness of Aroma Massage Therapy on Premenstrual Syndrome Among B.Sc. Nursing Students of Dadra and Nagar Haveli & Daman & Diu

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Abstract

A quasi experimental study to evaluate the effectiveness of aromatherapy on premenstrual syndrome among B.Sc. Nursing Students of Dadra and Nagar Haveli & Daman & Diu.

Method: those students having **PMS** randomly assigned to experimental group (30) and control group (30) by purposive sampling method. Standardized numerical pain intensity scale were used to assess the premenstrual syndrome during pre-test and post-test of aroma massage among experimental and control group of B.Sc. Nursing students.

Results: data analysis was done using mean, SD, paired, unpaired'- tests and chi square. The results revels there is a significant difference in the premenstrual syndrome between the experimental group and control group ($t=8.553 p<0.0001$) after the administration of aroma massage therapy. So, the research hypothesis H_1 is accepted at 0.05 level of significance. The demographic data was depicted that there was no significant association between pre-test premenstrual syndrome score with selected demographic variable among B.Sc. Nursing students.

Keywords: Effectiveness, Aroma massage therapy, abdominal pain, premenstrual syndrome, B.Sc. Nursing students.

INTRODUTION

BACKGROUND:

A majority of reproductive-age women experience a constellation of various symptoms in the premenstrual phase, commonly known as premenstrual syndrome (PMS). Despite its prevalence, however, no single treatment is universally recognized as effective, and many women turn to alternative approaches, including aromatherapy, a holistic mind and body treatment. The present study investigated the soothing effects of aromatherapy on premenstrual symptoms using lavender (*Lavandula angustifolia*), a relaxing essential oil, from the perspective of autonomic nervous system function.

The term premenstrual syndrome was first coined by Green and Daltonin 1953. It has been defined as "the cyclic recurrence in luteal phase of menstruation cycle of a combination of distressing physical,

psychological, and behavioural changes of sufficient severity to result in deterioration of interpersonal relationship and or interference with normal activities. Premenstrual Syndrome (PMS) is a common health problem in women in reproductive age.

NEED FOR THE STUDY

Premenstrual syndrome is a growing concern for health care providers. The physical, psychological, and behavioural manifestations of the syndrome may impair interpersonal relationships, academic performance and family functioning. Premenstrual syndrome should be regarded not only from the women's perspective but also with respect to the entire family.Premenstrual syndrome was not treated seriously by doctors or the general public. Today, it is universally accepted in medical circles as a genuine condition.

In the year 2011 there is a wide range of estimation by American College of Obstetrics and Gynaecology that at least 85 percent of menstruating women have at least one symptom as part of their monthly cycle. Most of these women have fairly mild symptoms that don't need treatment. Others about 3 to 8 % had more severe form of premenstrual syndrome, called premenstrual dysphoric disorder.

Fadia Hussein, et al., (2014), conducted, a study regarding the assessment of adolescent student's knowledge toward premenstrual syndrome in nursing secondary schools at Al-Diwanyia Governorate. The result revealed that majority of the study sample (44.6%) had insufficient knowledge toward premenstrual syndrome. The studies recommended to develop school health services for better detection and management of Premenstrual syndrome in the adolescent population.

REVIEW OF LITERATURE

Abhijjit Dutta, Avinash saharma (2021) conducted a study to assess Prevalence of premenstrual syndrome and premenstrual dysphoric disorder in India. The pooled prevalence of PMS was 47.8% (95% CI: 32.6-62.9). The lowest and highest prevalence were reported in France 12% (95% CI: 11-13) and Iran 98% (95%) C97-100) respectively. However, meta-regression scatter plot showed an increasing trend in the prevalence of PMS during 1996-2011 but correlation between prevalence of PMS and year of study was not significance (p= 0.797).

Sultan Ayaz Alkaya (2018) conducted a study to assess the effect of aromatherapy on coping with premenstrual syndrome: A randomized controlled trial the study was designed as a randomized controlled trial. The study population was composed of 958 students. Data was collected by questionnaire form and PMS scale. The intervention and control groups were followed up for 3 cycles in terms of PMS symptoms. The method of inhalation aromatherapy by lavender oil was applied for 5 sessions on average for each cycle. it was found that there is a statistically significant difference between intervention and control groups ($p < 0.05$). It was determined that there is a statistically significant difference between the groups in terms of PMS scale and sub-dimensions of anxiety, depressive affect, nervousness, pain, bloating, depressive thoughts mean scores of pre-test and 3rd follow-up ($p < 0.05$),

Carroll (2018) conducted a study to assess the effectiveness of aroma massage therapy on premenstrual syndrome among 80 students suffering from premenstrual syndrome. The students were randomly divided into two groups and received, either 10 drops of citrus essence or placebo drops, three times a day during the luteal phase for two cycles. The group on citrus essence witnessed a significant reduction of 46.08% in the symptoms compared to the group on placebo 14.21%, ($p <0.0001$ After the intervention, there were also significant decreases in the severity of physical and psychological

symptoms in both citrus essence respectively, 24.3% and 21.78% and placebo groups respectively, 2.07% and 9.21%, ($p<0.0001$ The study showed that citrus essence could reduce the severity of premenstrual syndrome.

Methodology

Objectives

1. Assess the level of premenstrual syndrome before and after administration of Aromatherapy in control and experimental group of B.Sc. Nursing students.
2. Assess the effectiveness of aromatherapy by comparing the level of Premenstrual syndrome before and after administration of aromatherapy in Control and experimental group of B.Sc. Nursing students.
3. Find the association between the pretest level of premenstrual syndrome and selected demographic variables among B. Sc. Nursing students.

HYPOTHESIS

H1: There is a significant difference between the post test score of premenstrual syndrome in the experimental group and control group in B.sc Nursing students.

H2: There is a significant association between pre-test score of premenstrual syndrome and selected demographic variables.

OPERATIONAL DEFINITION

Evaluate

Evaluate means "To determine the significance, worth, or condition usually by careful appraisal and study". In my study, evaluate refers to determining the effectiveness of aroma massage therapy on premenstrual syndrome.

Effectiveness:

Effectiveness or effectivity is the capability of producing a desired result or the ability to produce desired output. In this study, it refers to the outcome of aromatherapy and it is measured in terms of significant reduction of premenstrual syndrome.

Aroma massage therapy

It refers to manual therapy that involves manipulating the abdominal soft tissues and muscles to improve their health or wellbeing with the use of essential oil from plants.

In this study, it refers to the massage therapy with the use of essential oil (lavender oil mixed with sweet almond oil) which is applied over the lower abdomen for a period of 3-5minutes.

Premenstrual Syndrome

It refers to a combination of physical and psychological (abdominal pain, breast tenderness, constipation, headache, mood swings etc.) that occur one or two weeks before the menstrual period.

In this study, it refers to the abdominal pain that starts from 5 days before menstruation and stops in the first day of menstrual period which is measured by using numerical pain rating scale.

B.Sc. Nursing students

B.Sc. nursing students are the students those who are enrolled in a professional nursing college under a specific university.

In my study, it refers to students who are studding in B.Sc. Nursing at Shri Vinoba Bhave College of

Nursing, Silvassa under VNSGU Surat.
Research Approach- Quantitative research approach
Research Design- A quasi-experimental research design, pre-test – posttest control group design

Representation of quasi-experimental research design

Research group	Measurement of dependent variable (pre-test)	Manipulation of independent variable		Measurement of dependent variable (post-test)
Experimental group	O1	Morning	Evening	O1
		X1,x3,x5	X2,x4,x6	
Control group	O2	-		O2

Keys
O1- Pre-test to assess the demographic variable and numerical pain intensity score
X- Intervention was given for consecutive 8 uterine contraction episode.
O2- Post-test done by using pain intensity pain score

VARIABLES
Independent variable
The variable that is believed to cause or influence the dependent variable is called independent variable. The Independent variable in this study was aroma massage therapy.
Dependent variable
The variable hypothesized to depend on or be caused by independent variable is the dependent variable. The dependent variable in this study was premenstrual syndrome.
Extraneous variables
A variable that confounds the relationship between the independent and Dependent variables that needs to be controlled either in the research design or through statistical procedures (Polit & Beck, 2008). Demographic variables (age in year, Religion, Monthly family income and Dietary pattern) and clinical variables(Age at menarche, Onset of premenstrual, Duration of menstrual flow and Family history of premenstrual) are the extraneous variables in this study.

SAMPLE
In the present study the sample are B.Sc. Nursing students who have satisfied the inclusion criteria and admitted in Shri Vinoba Bhave Civil Hospital, Silvassa.

SAMPLE SIZE
A sample of 60 B.Sc. Nursing students who is having abdominal pain.
Non probability, purposive sampling technique was adopted for this study

SAMPLING CRETERIA

INCLUSION CRITERIA

The study includes the students who were

- studying in Shri Vinoba Bhave College of Nursing, Silvassa.
- studying B.Sc. Nursing.
- having mild and moderate abdominal pain.
- above 17 Years of Age.
- having the abdominal Pain during premenstrual syndrome.
- having the regular cycle of menstruation.
- willing to participate.
- available at the time of data collection.

EXCLUSIVE CRITERIA

The study excluded those students who are:

having severe premenstrual syndrome.

Students have any disorders such as

- thyroid
- leukemia
- endocrine disorders
- psychiatric illness like major depression,
- phobic disorders
- psychotic disorders etc.,
- gynecological problem like puberty menorrhagia, polycystic ovarian syndrome, androgen excess disorder.

Doing regular exercise and using hot water bag

Using medication for reducing pain

DESCRIPTION OF THE DATA COLLECTION INSTRUMENTS

Based on the objectives of the study, data collection instrument was divided into two sections:

- **TOOL – I: DEMOGRAPHIC DATA**
- **TOOL -II: CLINICAL VARIABLES**
- **TOOL- III: NUMERICAL PAIN SCALE**

PART I- SocioDemographic Data:

Structured questionnaire is made to collect the socio-demographic variables such as age, religion , monthly income in family and dietary pattern.

PART II- Clinical variables:

Clinical variables such as age at menarche, onset of premenstrual syndrome, duration of menstrual flow and family history of premenstrual syndroem.

PART III - The numerical pain rating scale:

RESULT

SECTION I 4.1.1: FREQUENCY AND PERCENTAGE DISTRIBUTION OF SELECTED DEMOGRAPHIC VARIABLES IN THE CONTROL AND EXPERIMENTAL GROUP OF B.SC. NURSING, STUDENTS.

Demographic variables	Control group (n=30)		Experimental group (n=30)	
	f	**%**	**f**	**%**
1.Age in years:				
≤ 19	13	43.3	17	56.7
20-21	15	50	11	36.7
≥22	2	6.7	2	6.6
2.Religion:				
Hindu	26	86.7	30	100
Christian	0	0	0	0
Muslim	4	13.3	0	0
Others	0	0	0	0
3.Monthly family income:				
<10000	1	3.3	7	23.3
10001-15000	6	20	10	33.3
15001-19999	12	40	9	30
≥20000	11	36.7	4	13.3
4.Dietary pattern:				
Vegetarian	10	33.3	14	46.7
Non-vegetarian	20	66.7	16	53.3

TABLE NO: 4.1. Showing the frequency and percentage wise distribution of sample based on the demographical variables in control and experimental group.

Regarding the **age in year** 15(50%) subject in control group are in age in 20-21 year and 17(56.7%) subject in experimental group age is <19 year

Regarding the **religion**, 26(86.7%) subject in control group and 15 (50 %) subject in the experimental group belong to Hindu religion.

In context to **the family monthly income, 12**(40%) Rs.15001-19999 subject income in control group and 10(33%) 10001-15000 subject in the experimental group in family monthly income.

Regarding the **dietary pattern**, 20 (66.6%) subject in control group taken non vegetarian diet and 16(53%) in experimental group taken non vegetarian diet in dietary pattern

SECTION II 4.1.2: FREQUENCY AND PERCENTAGE DISTRIBUTION OF SELECTED CLINICAL VARIABLES IN THE CONTROL AND EXPERIMENTAL GROUP OF B.SC. NURSING, STUDENTS. N=60

Demographic variables	Control group (n=30)		Experimental group (n=30)	
	f	**%**	**f**	**%**
1.Age at menarche in years:				
≤ 11	6	20	2	6.7
12-13	18	60	15	50
14-15	6	20	13	43.3
≥16	0	0	0	0
5.Onset of premenstrual syndrome:				
≤12 hours before	11	36.7	0	0
two days before	11	36.7	2	6.7
three days before	4	13.35	15	50
four days before	4	13.35	13	43.3
five days before	0	0	0	0
	0	0	0	0
6.Duration of menstrual flow:				
≤3	2	6.7	12	40
4-5	21	70	17	56.7
6-7	7	23.3	1	3.3
≥8	0	0	0	0
7.Family history of premenstrual syndrome:				
Present				
Absent	12	40	21	70
	18	60	9	30

Paired "t"-test was found in control group and experimental group to evaluate the effectiveness of aromatherapy on premenstrual syndrome among B.Sc. Nursing Students of Dadra And Nagar Haveli & Daman & Diu N=60

level of pain	Mean	SD	t value	df	p value	LOS
	Pre test	Pre test				
Control group	4.83	0.87	0.561	58	0.577	NS
Experiment group	4.97	0.96				

-P<0.05, significant and **-P<0.01 &-P<0.001, Highly significant**

The above table shows that in experimental group pre-test mean score (4.83±SD 0.87) and control group pre-test mean score (4.97± SD 0.96) obtained "t" values is 0.561 which is statistically not significance at p>0.577

paired "t"-test was found between control and experimental group posttest to assess the effectiveness aroma massage therapy on premenstrual syndrome among B.sc Nursing students Dadra Nagar Haveli & Daman dui. N=60

-P<0.05, significant and **-P<0.01 &-P<0.001, highly significant**

level of pain	Mean	SD	t value	df	p value	LOS
	POST TEST	P0ST TEST				
Control group	4.56	1.25	8.553	58	0.0001	HS
Experiment group	2.03	1.03				

The above table shows that in control group post-test mean score (4.56±SD 1.25) and experimental group post-test mean score (2.03± SD 1.03) obtained "t" values is 8.553 which is statistically highly significance at p<0.0001

This finding is indicated that there is significant difference between post test score of experimental and control group after administration of aroma massage therapy. Hence, the researcher accepts the research hypothesis (H1).

DICUSSION

SECTION I: FREQUENCY AND PERCENTAGE DISTRIBUTION OF SUBJECTS ACCORDING TO THEIR DEMOGRAPHIC AND CLINICAL VARIABLES.

Age in year: In experimental group 17(56.7%) & in control group 15(50%) of the students were age 19-21 years .supportive study has found that (97.5% & 90 %,) both study control and experimental group students were of age 21-21 years.

Religion: Majority of subjects, 26(86.7%) in control group and 15 (50 %) subjects in the experimental group belong to Hindu religion. The similar study found that majority of both subject in experimental and control group (55%, 62.5%) were Hindus.

The family monthly income: Majority of subject in experimental group 10(33%) were having family monthly income of Rs100001-15000in control group majority of subject 12(40%) were having family monthly income of Rs-15001-19999.i similar study found is 10, 001-15,000 (57.5%, 57.5%)both in control and experimental group.

Dietary pattern: Majority of subject 20 (66.6%) subject in control group taken non vegetarian diet and 16(53%) in experimental group taken non vegetarian diet in dietary pattern. Similar support study found is to support that most of them non vegetarian (80%, 72.5%).

SECTION 2: FREQUENCY AND PERCENTAGE DISTRIBUTION OF SUBJECTS ACCORDING TO THEIR CLINICAL VARIABLES:

Age at menarche in year: Majority of subject 18(60%) subject in control group age of 12-13 year and 15(50%) subject in experimental group in 12-13 year of age at menarche. The similar study found that majority of the student's attained menarche at the age of 12-13years (57.5%, 90%) both in control and experimental group.

Onset of PMS: Majority of subject 11(36.7%) subject in control group of PMS Is tow day before and 15(50%) subject in experimental group is three day before the PMS. The similar study supports that 2-3 days of onset of PMS :(40%, 52.5%) control and experimental study.

Menstrual flow: The majority of study 21(70%) subjects in control group and 17(56.7%) subjects in experimental group are having 4-5 days of menstrual flow. The similar study is support the menstrual flow of 4-5 days (62.5%, 77.5%) in control and experimental group respectively.

Family history of premenstrual syndrome: Majority of subject 18(60%) subjects in control group and 21(70.00%) subjects in experimental group have the present family history of premenstrual syndrome. The similar study supports the family history of premenstrual syndrome (57.5%, 80%) in control and experimental group respectively.

SECTION-3: ASSESS THE PREMENSTRUAL SYNDROME AMONG B.SC NURSING STUDENTS AFTER INTERVENTION IN CONTROL AND EXPERIMENTAL GROUP.

In control group during pre-test, 1(3.3%) subject have mild level of pain, 29(96.7%) having moderate level of pain, But in experimental group during pre-test, 2(6.67%) subject have mild level of pain, 28(93.3%) subject having moderate level of pain, no any subject having subject having sever level of pain.

However in control group the post-test shows little deviation from pre-test to 7(23.7%) subject having mild level of pain,23(76.7%) subject have moderate level subject no having sever level of pain but in experimental group 4(13.3%) subject have no pain 26(86.7%) subject have mild pain, and no any subjects having moderate and severe pain .The similar study found that majority of the B.Sc. Nursing students in control group were experiencing severe level of premenstrual syndrome in pre-test and post-test respectively (75%,72.5%). Where as in experimental group most of the students had severe level of premenstrual syndrome (72.5%) in pre- test. However after administration of aromatherapy, significant percentage (50%) of the B.Sc. Nursing students had mild level of premenstrual syndrome. This could be attributed to the effectiveness of aromatherapy.

SECTION-4: ASSESS THE EFFECTIVENESS OF AROMA MASSAGE THERAPY ON POST-TEST ABDOMINAL PAIN SCORE AMONG EXPERIMENTAL AND CONTROL GROUP.

The present study show that, effectiveness of aroma massage therapy on premenstrual syndrome control group mean score is (4.83±SD 0.87) and mean % is 48% and post mean score is (4.57±SD 1.25) and means % is 46% in experimental group pre-test mean score is (4.96±SD 0.96) and mean % is 50%and post-test means score is (2.03±SD1.03) and mean %is 26.%. The similar supportive study show that Findings of the study reveals that there was no significant difference in the mean and standard deviation level of premenstrual syndrome (27.6±SD2.3& 27.5±SD 2.3) before and after administration of aromatherapy in control group of B.Sc. Nursing students. Whereas experimental group showed a

significant difference ($p<0.001$) in the mean and standard deviation level of premenstrual syndrome (28.2± SD 5.2 9.1SD±6.6) before and after administration of aromatherapy and it shows the effectiveness of aromatherapy upon premenstrual syndrome. Hence the null hypothesis H01 was rejected.

This was supported by the research conducted by Brush, et al.(2010) to evaluate the effectiveness of primrose oil on management of premenstrual syndrome, based on self-report scale the researcher concluded that among the participants (61%) of them had complete relief of premenstrual symptoms, (16%) of them had partial relief of symptoms. This can be attributed to the effectiveness of aromatherapy.[34]

SECTION-5: FIND OUT AN ASSOCIATION BETWEEN PRE -TEST PREMENSTRUAL SYNDROEME WITH SELECTED DEMOGRAPHIC VARIABLE AMONG B.SC NURSING STUDENTS.

Conveys the association between pre-test levels of premenstrual syndrome in control group and demographic variables. Concludes that there is a association between pre-test means score of premenstrual syndrome in control group with the selected demographic variables such as religion and age at menarche at $P<0.05$ level. Hence, the researcher accepts the research hypothesis (H3).

Finally the researcher concludes based on the literature that, prevalence rate of premenstrual syndrome was higher in women whose menarche age is less than 12 years.

This findings was supported by Aditya Prasad Sharkar, et al (2014), conducted a study to identify the premenstrual syndrome problems among adolescent girls in a rural school of West Bengal, India. The Result revealed that, premenstrual syndrome was reported by 61.5% of girls. Based on the American College Of Obstetrician and Gynaecologist (ACOG) criteria 62.7% girls reported depression and 70.5% girl reported anger and 84.8% reported irritability. Anxiety and confusion were reported by 70.0% and 66.8% adolescent girls, respectively. Around one-third of girls experienced breast pain, and 53.3% girls faced social rejection during that period. Headache and abdominal pain were reported by around 55% girls. Only 14.7% of them reported limb swelling premenstrual period. Premenstrual syndrome was found to be associated with mother's occupation, amount of blood flow during menstruation, and the presence of dysmenorrhea.[22]

The study findings revealed that religion, age at menarche were the important factors that might affect the level of premenstrual syndrome.

NURSING IMPLICATION

Nursing implication of the study could be discussed under nursing education, nursing practices, nursing administration, and nursing research.

NURSING EDUCATION

- Nursing curriculum help students to gain systematic and scientific information and apply in their nursing practice. Nursing students should teach about importance of alternative and complementary therapy.
- Ensure that they learn the assessment of level of premenstrual syndrome and effectiveness of aroma massage therapy intervention in reduction of premenstrual syndrome, as an independent nursing intervention.

- Make available literature related to aroma massage therapy in reduction of level of premenstrual syndrome in the library, for student reference.
- The complementary and alternative therapies for premenstrual syndrome can be included in the nursing curriculum

NURSING PRACTICE:

- Apply this aroma massage therapy to reduce the level of premenstrual syndrome among B.Sc. Nursing students.
- Understand the importance of aroma massage intervention as an adjunct to the pharmacologic therapy.
- The nursing personnel can be able to develop specific skill in providing aroma massage on premenstrual syndrome.
- This intervention can be used for preventing further complication among girls with premenstrual syndrome.

NURSING ADMINISTRATION:

- Administration should motivate the nursing personnel to conduct the in-service education, continuing education program on premenstrual syndrome.
- Administrators have to motivate the Medias to educate the women of reproductive age on the importance of practicing aroma massage therapy.
- Periodic mass demonstration program to be arranged in the schools, industry, community, hospital. In services education organized for the nurse on complementary and alternative techniques.

5.5 LIMITATION

- The study findings cannot be generalized due to small sample size.
- Random sampling was not possible due to practical difficulties**.**

5.6 RECOMMENDATION

- The same study can be conducted with larger number of samples.
- A comparison can be made between adolescents and adults.
- The same study can be conducted at different settings.
- A comparison can be made between different types of alternative and complementary therapies.

5.7 SUMMARY

The primary aim of the present study is to assess the effectiveness of aroma massage therapy on premenstrual syndrome among B.Sc. Nursing students study in Shri Vinoba Bhave College of Nursing Silvassa.

REFERENCE

1. Ann Marriner Tomey, Martha Raile Alligood. (2006)., “NURSING THEORISTS AND THEIR WORK” ., (6th ed), Missouri; Mosby publication., Pg No: 55-573[3],[4],[1]

2. Akram, M., Riaz, M., Munir, N., Akhter, N., Zafar, S., Jabeen, F., … Said Khan, F. (2020). Chemical constituents, experimental and clinical pharmacology of Rosa damascena: A literature review. Journal of Pharmacy and Pharmacology, **72**(2), 161–174. https://doi.org/10.1111/jphp.13185
3. Burns, E., Zobbi, V., Panzeri, D., Oskrochi, R., & Regalia, A. (2007). Aromatherapy in childbirth: A pilot randomised controlled trial. BJOG: An International Journal of Obstetrics and Gynaecology, **114**, 838–844.
4. Rapkin AJ, Winer SA. Premenstrual syndrome and premenstrual dysphoric disorder: quality of life and burden of illness. Expert Rev Pharmacoecon Outcomes Res 2009; **9**: 157–70.[7],[1][2]
5. Alimentazeri, S. (2012). PREVALENCE OF PREMENSTRUAL SYNDROME. Internationals Journal of B.Sc. Nursing Practice, 37(1), 150 – 158.[9]
6. Anderson, F.W., & Johnson, C.T. (2005). COMPLEMENTARY AND ALTERNATIVE MEDICINE IN OBSTETRICS & GYNECOLOGY. An International Journal of Obstetrics & Gynaecology, 91(2), 116 – 24. Dorothy[10]
7. etal. (1995)., "FOUDAMENTALS OF NURSING RESEARCH", (2nd ed), USA: Jones and Bartlett publication.401-403. Gupta, G.S.Kappor. (1990)., "FUNDAMENTALS OF MATHEMATICAL STATISTICS"., New Delhi: Sultan Chand publication[11][12]
8. Hofmeister S (2016) net reference premenstrual syndrome**.[3]**
9. Naval Heydari 22 May 2018Featured in International Journal of Gynecology & Obstetrics (6).
10. Anderson, F.W., & Johnson, C.T. (2005). COMPLEMENTARY AND ALTERNATIVE MEDICINE IN OBSTETRICS & GYNECOLOGY. An International Journal of Obstetrics & Gynaecology, 91(2), 116 – 24. Mishell DR. Premenstrual disorders: epidemiology and disease burden. Am J Manag Care 2005; **11** Suppl 16: S473–9.
11. Basavanthappa, B.T.(2003)., "NURSING RESEARCH"., (1St ed), New Delhi: Jaypee brothers medical publishers (pvt) Ltd., Pg No: 365-387
12. Baskar Rao K., N.N. Roy Chowdhury.(1994)., "CLINICAL GYNAECOLOGY"., (3rd ed), Madras: Orient Longmann Ltd., Pg No: 87
13. Dutta. D.C. (1994). "TEXT BOOK OF GYNAECOLOGY INCLUDING PERINATOLOGY AND CONTRACEPTION"., (2nd ed), Calcutta: New Central book agency (Pvt) Ltd., Pg No: 423