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STUDY TO EVALUATE THE EFFECTIVENESS OF BEETROOT EXTRACT ON PAIN DURING MENSTRUATION AMONG ADOLESCENT GIRLS IN JEEVAN JYOTI PUBLIC SCHOOL AT KERALA

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ABSTRACT

The present study was aimed to evaluate the effectiveness of beetroot extract on pain during menstruation among adolescent girls in Jeevan Jyoti Public School at Kerala. The objectives of the study was to assess the level of menstrual pain among adolescent girls in the experiment and control group, administer beetroot extract for adolescent girls with menstrual pain in experimental Group, assess the effectiveness of beetroot extract on menstrual pain among adolescent girls in experimental group, compare the level of menstrual pain among adolescent girls in the experimental and control group and associate the level of menstrual pain among adolescent girls with related demographic variables. Quasi Experiment on equivalent control group pre-test and post-test design was used. This study consists of 60 samples out of which 30 belongs to experiment group and 30 belongs to control group of adolescent girls with menstrual pain were selected by non-probability convenience sampling technique. Pain level was assessed by a numerical pain score scale pain score data sheets and demographic variables where used to collect data. Descriptive and inferential statistics words used to analyses the data. The independent 't' test value was performed in experimental group and control group. The calculated value of 't' test for the experiment group is 14.4 and that of control group is 2.9 which is greater than the table value. This shows that there was significant difference in test value of experimental and control group. In conclusion, beetroot extract was effective in easing menstrual pain.

KEYWORDS

Beetroot extract, Adolescent girls and Menstrual pain.

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INTRODUCTION

"It is the eternal changefulness of life that makes life so beautiful"- Sigmund Freud

Menarche, or first mensuration, is one of the last pubertal changes that occur after development of breast bud and pubic hair. Menarche may occur as

early as 8 and as late as 17. This is transitional time from infancy to adulthood. This transitional period makes them vulnerable to a variety of problems including psychosocial issue of general and reproductive health and sexual. In essence the adolescence is a critical stage for girl's development and they can experience personal challenges that invest their mental health and personal wellbeing.

In medical terms menstruation is a woman monthly bleeding process. During this time the body of a woman sheds the thickened uterine lining of the uterus (womb) and menstrual blood flows from the uterus through the narrow opening in the cervix and passes through the vagina out of the body. Most women experience menstrual period between 3 to 5 days of menstrual period. When menstruation happen periodically, it is called the menstrual cycle. Having regular menstrual cycles indicates that a woman is healthy and capable of reproduction.

Periods makes a woman feel exhausted, since cycles mean excessive blood loss. A glass of beetroot extract can help regain some of the vigor as iron rich beetroot help to boost blood count and blood flow. Iron is an important component of the red blood cell and responsible for providing different parts of the body with oxygen and nutrients.

During the menstrual cycle, nearly 85% of women experience some discomfort and unpleasant symptoms. Such premenstrual symptoms can last for a couple of hours or a few days. For the treatment of these symptoms some herbs are found to be successful. Herbs can treat menstrual disorders and severe menstrual problems. Cure irregular menstruation and heavy menstrual problems. To reduce pain associated with menstruation, false unicorn, rasp berry, beetroot extract, cramp bark, fenugreek and mint are often used. Menstrual cramps or dysmenorrhea occurs due to increase in prostaglandin 2, just before the onset of period. Also, during this time, the calcium level in the body dips. The combined effect of both these changes results in menstrual cramps. Herbs prevent painful Cramps.

Herbal supplement is found to be very beneficial for the treatment of menstrual problem prolonged result with the zero adverse action user is one among the main advantages of using herbal cures. Beetroot is amongst the herbs, which act as a powerful analgesic. It is perfectly safe for use, and is well known for its properties related to indigestion, Stomach cramps and menstrual cramps. The nutritional values of beetroot mainly nitric oxide and antioxidant play a beneficial role in dysmenorrhea.

NEED FOR THE STUDY

Dysmenorrhea is one of the most common gynecological conditions that affect the quality of life of many women in their reproductive years. This refers severe uterine menstrual cramps and is a common gynecological complaint. The efficacy of traditional treatments such as non-steroids is considerable but the failure rate remains frequently 20-25%. Dysmenorrhea is a leading cause of absenteeism at short term schools. This is associated with many female teenagers have been a negative effect on the social, academic and athletic activities.

According to committee on Adolescent Health Care (2018), the option was established in conjunction with committee members by the American College of Obstetricians and Gynecologist Committee on adolescent healthcare highlights that dysmenorrhea or menstrual pain is the most common menstrual symptoms among adolescent girls and young females. The rate of prevalence varies but ranges from 50% to 90%. Obstetricians should be trained to diagnose and treat this disorder because of the high incidence of dysmenorrhea in adults and the severity of its possible regular interventions.

Many studies have stated that painful menstruation in their teens twenties is the leading cause of time lost from school and work among women. Dysmenorrhea refers to menstrual pain which is severe enough to reduce normal activities or require medication. Abnormalities of menstruation are a major gynecological problem in adolescence. Among which dysmenorrhea is the most popular of all being reported in 60 to 90% of adolescence and a frequent cause of the school absenteeism or the limitation of the day to day activities. This data is derived from Western population, data on menstrual Problems and their effects on adolescence is limited and largely unknown.

The literature review on predominance of dysmenorrhea, percentage of school absenteeism and self-medication with prostaglandin inhibitors among adolescence were evidenced by the investigator. The investigator felt the need to study the prevalence of dysmenorrhea, school absenteeism, academic performance and perceived stress among the adolescent girls with dysmenorrhea. In order to substitute and prove the efficacy of natural and safe treatment instead of non-steroidal analgesics for primary dysmenorrhea among school girls, this study was undertaken.

PROBLEM STATEMENT

A study to evaluate the effectiveness of beetroot extract on pain during menstruation among adolescent girls in Jeevan Jyoti Public School at Kerala.

OBJECTIVES

To assess the level of menstrual pain among adolescent girls in experimental and control group.
To administer beetroot extract for adolescent girls with menstrual pain in experimental group.
To evaluate the effectiveness of beetroot extract on menstrual pain among adolescent girls in experimental group.
To compare the level of pain during menstruation among adolescent girls in the experimental and control group.
To associate the level of pain during menstruation among adolescent girls with related demographic variables.

REVIEW OF LITERATURE

Studies related to pain during menstruation among adolescent girls

Gopal Singh Charan, Akashpreet Kaur, Ujala Joshi, Pooja Joshi (2019)[1] has conducted a study on knowledge and stress level of distress regarding primary dysmenorrhea among adolescent girls at Amritsar. 180 samples were enrolled using purposive sampling technique. A cross sectional study was done to assess the knowledge and level of distress regarding primary dysmenorrhea among adolescent girls at selected schools. The study concluded that dysmenorrhea is very common problem among adolescent girls besides they have no sufficient knowledge on this problem. So, they required the health education on dysmenorrhea. They were having various level of distress regarding dysmenorrhea as a public health practitioner should advise to home intervention on this natural silently suffer the pain due to lack of knowledge.

Jaywant Yashwant Aahar, Kiran Mahendra Rajole (2016) has conducted a study on a cross- sectional study of prevalence of dysmenorrhea among adolescent girls at Ghoti, Nasik. The overall prevalence of dysmenorrhea was present in 156 girls out of 237 girls included in the study. Statistical analysis was done with the help of IBM SPSS statistical version 17. The study concluded that it is one of the supporting studies that confirmed dysmenorrhea is a common problem among adolescent females and they usually associated with a number of physical and emotional symptoms. This ultimately affects their quality of life. This ultimately affects their quality of life. Therefore, awareness regarding this is essential for the proper management Protocol.

K. Sathish Kumar, Santhibala Konjengbam, Hanjabam Sanayaima Devi (2015)[2] had conducted a study on dysmenorrhea among Higher Secondary School girls in Imphal West district, Manipur. This was a professional study conducted among Higher Secondary School girls of Imphal West district, Manipur from December 2013 to 2015. The sample size was calculated to 660. Participants were selected by stratified two self-administered questionnaires. Analysis was done using chi-square test. The study concluded that health education on issues related to reproductive health should be incorporated early enough in school curriculum to prepare the girls for menstruation and inform them about available treatment options for dysmenorrhea.

Studies related to benefits of beetroot extract

Prof. Dr. Senthil Kavita R and Dinesh (2019)[3] had conducted a study to determine the effectiveness of Beetroot extract on hemoglobin among girls of selected hostel girls, Bidar, Karnataka. 30 samples of hostlers were included one group pre-test post-test design used with the purposive sampling techniques.

The study concludes that the extract of beetroot is an excellent source of iron and Vitamin C, which is considered good for anemia for adolescent girls.

Bryan health curry, *et al* (2016) conducted a study on effects of a dietary beetroot extract treatment on systemic and cerebral hemodynamics. 10 healthy young adult African American women were studied at 2 levels of sub maximal exercise. The study concluded the effects of dietary nitrate supplementation on the brain during conditions of rest and exercise appears to be worthy of further study. Dietary guidelines for the clinical management of hypertension related cognitive decline are lacking and future studies should determine whether dietary nitrite supplementation is a safe, effective adjunct to current antihypertensive treatments for lowering BP, lessening cerebrovascular stiffness and ameliorating cognitive decline.

Studies related to effectiveness of beetroot extract upon menstrual pain

Debjani Arora (2018) has published an article on menstruation tips. Drink a glass of beetroot extract during periods to feel energetic states that, periods are definitely not the best time for a girl to feel energized and strong. With all that blood loss, cramps, fatigue it takes a lot of effort to drum up enough enthusiasm to go about doing the regular chores through the day. One way to help you fight periods induced fatigue is that a glass of beetroot extract.

Neha Ghosh (2018) has published an article on beetroot extract for preventing menstrual cramps highlights, May 28th is observed as world menstrual hygiene day. During periods, most women and young girls suffer from painful menstrual cramps and feel less energetic. An energetic beetroot extract that will not only prevent menstrual cramps but also increase the iron content in the blood. It is usually recommended for women to consume beetroot extract before the onset of and during menstruation. Beetroot extract should be taken early in the morning on an empty stomach to reap the health benefits.

Kashani L *et al*, (2015) has published an article on herbal medicine in the treatment of primary dysmenorrhea is called "primary" when there is no specific normally and "secondary" when the pain is caused by an underlining gynecological problem. It is believed that primary dysmenorrhea occurs when hormone like substances called "prostaglandins" produced by uterine tissue trigger strong muscle contraction in the uterus during menstruation. However, the level of prostaglandins does not seem to have anything to do with how strong a woman's cramps are. Some women have high levels of prostaglandin and no cramps. Whereas, other women with low level have severe cramps. This is why experts assume that cramps must also be related to other things (such as genetics, stress and different body types) in addition to prostaglandins. Secondary dysmenorrhea may be caused by endometriosis, fibroid tumors or an infection in the pelvis. In this article we focus on herbal medicine in the treatment of primary dysmenorrhea.

Hypothesis

H1: There will be significant difference between the level of pain before and after the administration of beetroot extract among adolescent girls.

H2: There will be significant Association between demographic variables and the level of pain before and after the administration of beetroot extract among adolescent girls.

METHODOLOGY

"Methodology is a systematic way to solve the research problems. The research methodology in values the systematic procedure by which the investigation starts from the initial identification of problems to its final conclusion."- Leister

This chapter Includes research approach, research design, variables, setting, population, sample and sample size sampling technique, development of the tool, data collection procedure, plan for data analysis and ethical consideration.

Research approach

Quantitative research approach was used for this study.

Research design

The research design adopted for this study was Quasi experimental on equivalent control group pre-test and post-test design.

Independence Variables

In this the Independent variable is beetroot extract.

Dependent Variable

In the study the dependent variable is pain response of adolescent girls.

Demographic Variables

The present study demographic variables were Age in years, Type of family, Educational status, Mothers education, Residential area, BMI, Age at menarche, Duration of menses, Menstrual cycle in days, Self-medication, Duration of pain during menstruation, Family history of menstrual pain, Associated symptoms of pain during menstruation, measures taken to get relief from pain and leave taken due to menstrual pain.

Setting of the Study

The study is planned to be conducted in Jeevan Jyothi Public School at Kerala. The school is affiliated to the Central Board of Secondary Education.

POPULATION AND SAMPLING

Population

The study population comprised of adolescent girls aged between 13 to 15 years with menstrual pain.

Target population

In this study target population compresses of all adolescent girls with menstrual pain.

Accessible Population

The accessible population in the study were adolescent girls of the age between 13 to 15 years who were studying 8^{th} to 10^{th} standard with menstrual pain in Jeevan Jyothi Public School at Kerala.

SAMPLING TECHNIQUES AND SAMPLE SIZE

Sampling Technique

In this study 60 samples were selected by using non probability convenient sampling technique. Out of which samples were divided into experimental group and control group with 30 samples in each group.

Sampling size

The sample size of the study was 60 among them 30 control group and 30 experiment group.

SAMPLE SELECTION AND CRITERIA

Inclusion Criteria

Clients who are

Students with pain during menstruation

Students with first day of menstrual cycle.

The person who is with or without medication.

Exclusion Criteria

Clients who are

Not willing to participate in the study.

Students with amenorrhea.

Students with any other serious illness.

DESCRIPTION OF THE TOOL

The tool is the written device that a researcher uses to collect the data.

The tool consists of two sections.

Section A

Comprised of demographic data of the samples which consist of Age in years, Religion, Type of family, Education, Mothers education, Residential area, BMI, Age at menarche, Duration of menses in days, Menstrual cycle in days, Self-medication, Duration of pain during menstruation, Family history of menstrual pain, Associated symptoms of pain during menstruation, measures taken to get relief from pain and leave taken due to menstrual pain.

Section B

Numeric rating pain scale is used to determine the pain level.

DATA COLLECTION PROCEDURE

The study was conducted at Jeevan Jyothi Public School, Kerala. A prior permission was obtained from the ethical committee of Ellen College of Nursing and Jeevan Jyoti Public School. An oral consent was obtained from the students after explaining the purpose of the study the parents of the subject was informed through daily diary and permission was obtained. The sample size selected for the study was 60 adolescent girls of age 13 to 15 years who were studying 8 to 10th standard and fulfilled inclusion criteria. Demographic variables in checklist was used to collect data from adolescent girls. Pre and post-test of menstrual pain level was assessed by using Numeric rating pain scale in both experimental group and control group. The pretest

pain level was assessed verbally. The last month menstrual pain level was assessed verbally. The last month menstrual pain experience of the students was asked and marked in pain scale. Beetroot extract was given for the experimental group. The beetroot extract was prepared by chopping 150gm of fresh beetroot into small pieces and grinding. Add 100ml water in order to grind well. 1800ml beetroot extract is prepared by using 1050gram of beetroot and 700ml of water. 60ml of beetroot extract was given to each adolescent girl for 15 days. The post-test pain level was evaluated for both groups after 3 to 4 weeks by using the same numeric rating pain scale on the next menstrual period. The collected data tabulated and analyzed by using inferential and descriptive statistics.

DATA ON ASSOCIATION BETWEEN LEVEL OF PAIN AMONG ADOLESCENT GIRLS WITH MENSTRUAL PAIN AND THEIR SELECTED DEMOGRAPHIC VARIABLES

The substantive summary of x2 analysis of pre-test score in Experimental group which was used to bring out the relationship between effectiveness of beetroot extract among adolescent girls on menstrual pain with their selected demographic variables x^2 value for age 7.76, age at Menarche 1.24, duration of menses in days 1.5, menstrual cycle in days 2.23, duration of pain during menstruation 6.63, family history of pain during menstruation 4.86, were non-significant association between effectiveness of beetroot extract among adolescent girls with menstrual pain. There is a significant association between education 17.43, BMI 17.43, self-medication 19.8. Therefore, H2 Hypothesis is accepted and null Hypothesis is rejected.

The substantive summary of x2 analysis of post test score in Experimental group which was used to bring out the relationship between effectiveness of beetroot extract among adolescent girls on menstrual pain with their selected demographic variables.

Table shows that a x2 value for age 6.44, BMI 1.22, age at Menarche 1.97, duration of menses in days 2.07, menstrual cycle in days 0.77, were non-significant association between effectiveness of beetroot juice among adolescent girls with Menstrual pain. There is a significant association between education 5.19, self-medication 8.72, family history of pain during menstruation 18.89.

Therefore, H2 Hypothesis is accepted and null Hypothesis is rejected.

RESULTS AND DISCUSSION

The first objective of the study was to assess level of menstrual pain among adolescent girls

The severity of menstrual pain among adolescent girls was assessed by using numerical pain intensity scale. In experimental group pre-test mean score for menstrual pain was 5.6 and that of post-test was 2.3. In control group pre-test score for menstrual pain was 5.7 and that of post-test was 5.6.

The second objective of the study was to assess the effectiveness of beetroot extract on the menstrual pain among adolescent girls

In pre-test, the samples were assessed in both groups for severity of menstrual pain by using numerical pain intensity scale. On the same day, 60ml of beetroot extract was administered for experimental group and it was continued for 15 consecutive days from first day onwards, preferably morning. The post test was assessed on the basis of next menstruation in order to find out the effectiveness of beetroot extract administration on reduction of menstrual pain by using same numerical pain intensity scale in both groups.

Third objective of the study was to reassess the level of menstrual pain among adolescent girls

In experimental group the standard deviation of menstrual pain was 1.18 and 1.03. In control group the standard deviation of menstrual pain was 1.3 and 1.32 respectively. The calculated 't' value for experimental group was 14.4 and that for the control group was 2.9 and the obtained 't' value was higher than the table value, which implies there is significant difference between the pretest and post test score on severity of menstrual pain. Hence, the administration of beetroot extract was effective on reduction of menstrual pain among adolescent girls.

The fourth objective of the study was to associate the findings with selected demographic variables of adolescent girls on menstrual pain

The pre -test score in experimental group the association of demographic variable namely education, BMI and self-medication showed significant associate using chi-square test. The post test score in experimental group, the association of demographic variable namely, education, self - medication and family members of dysmenorrhea showed significant associate using chi square test.

DATA ANALYSIS AND INTERPRETATION

Data on demographic variables of adolescent girls

Table No.1: Frequency and percentage distribution of demographic variables of adolescent girls in experimental group and control group

S.No	Demographic variables	Experimental Group (n=30)		Control Group (n=30)	
		F	%	F	%
Age					
1	13 years	14	47	13	43
2	14 years	9	30	11	37
3	15 years	7	23	6	20
Education					
4	8^{th} standard	16	53	13	43
5	9^{th} standard	7	23	11	37
6	10^{th} standard	7	23	6	20
Body mass index					
7	Under weight	2	7	1	3
8	Healthy weight	27	90	29	97
9	Over weight	1	3	0	0
Duration of menses in days					
10	3 days	3	10	1	3
11	4-6 days	21	70	25	83
12	More than 6 days	6	20	4	13
Age at menarche					
13	11-12 Yrs	19	63	16	53
14	13-14 Yrs	11	37	14	47
Menstrual cycle in days					
15	23-24 days	3	10	5	16
16	25-26 days	9	30	8	27
17	27-28 days	18	60	17	57
Self-medication					
18	Yes	17	57	14	47
19	No	3	43	16	53

Family history of pain during menstruation					
20	Mother	2	7	4	13
21	Siblings	2	7	3	10
22	Both	26	86	23	76

DATA ON LEVEL OF MENSTRUAL PAIN AMONG ADOLESCENT GIRLS

Table No.2: Distribution of level of menstrual Pain in Pre-test and Post-test Among adolescent girls

S.No	Level of menstrual pain	Number of samples							
		Experimental group (n=30)				Control group (n=30)			
		Pre test		Post test		Pre test		Post test	
		F	%	F	%	F	%	F	%
1	Mild pain (1-3)	2	7	22	73	1	3	3	10
2	Moderate pain (4-6)	18	60	7	23	21	70	19	63
3	Severe pain (7-10)	10	33	1	3	8	27	8	27

DATA ON ASSOCIATION BETWEEN LEVEL OF PAIN AMONG ADOLESCENT GIRLS WITH MENSTRUAL PAIN AND THEIR SELECTED DEMOGRAPHIC VARIABLES

Table No.3: Shows Mean, Standard Deviation, and paired 't' Test Values that comparison of mean pre-test and post test score of level of menstrual pain among adolescent girls in Experimental group and Control group

S.No	Tests	Level of Menstrual pain	Mean	Mean Difference	Standard Deviation	Paired 't" Test
1	Experimental group (n=30)	Pre-test	5.6	3.3	1.18	*14.4
		Post-test	2.3		1.03	
2	Control group (n=30)	Pre-test	5.7	0.1	1.3	*2.9
		Post-test	5.6		1.32	

Significant at *2.05 level

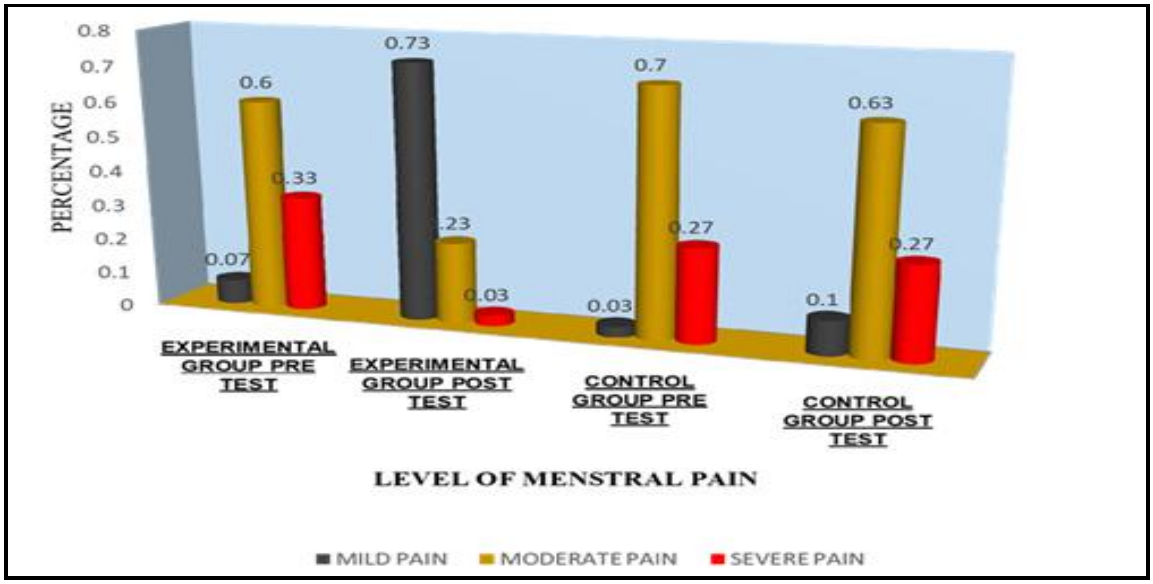

Figure No.1: Level of menstrual pain among adolescent girls

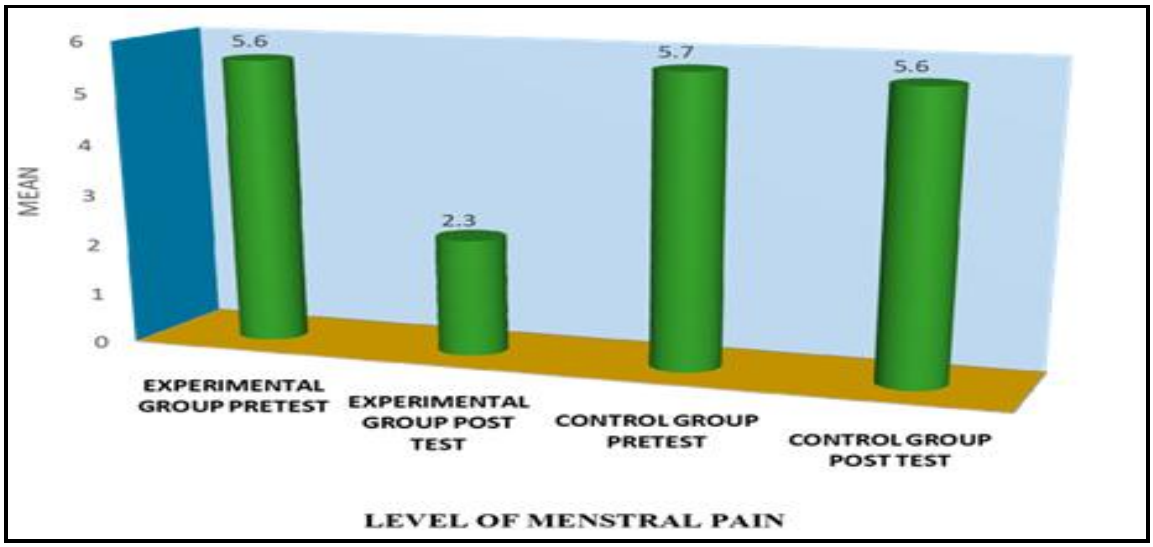

Figure No.2: Shows comparison of Mean score on both Experimental and Control group

IMPLICATION

The findings of the study have implication on child health nursing practice, nursing administration, nursing education and nursing research.

CHILD HEALTH NURSING PRACTICE

The child health nurse can demonstrate administration of beetroot extract for her clients.

Encourage nursing students to plan and organize the nursing intervention to manage menstrual pain affectively with beetroot extract as home remedies.

The findings of the study indicate that the child health nurse should be made aware of beetroot extract administration for menstrual pain.

The present study helps to draw attention of nurse to build up sound knowledge in this area.

NURSING ADMINISTRATION

The nurse administrators should be able to motivate and initiate the health personnel in organizing and participating in various educational programmers and improve their knowledge and skills.

The nurse administrative can support the nurse for conducting research on beetroot extract administration for various uses.

In service education program should be organized for develop, up to date knowledge regarding dysmenorrhea and beetroot extract administration.

NURSING EDUCATION

The curriculum of nursing education should enable the student nurses to have thorough knowledge regarding home remedies on pain during menstruation.

In service education can be conducted to update nurse's knowledge and skills on the management on the pain during menstruation.

Periodic conferences, workshops, symposium and seminars can be arranged regarding alternative to make nursing professionals, competent enough to meet over changing needs of the society.

NURSING RESEARCH

The nursing researcher should be aware of new trends in the existing health care system.

Emphasis should be laid on research in the area of non-pharmacological measures of pain management among clients with menstrual pain.

The study will be valuable reference material for future researchers.

RECOMMENDATIONS

Same study can be replicated with the largest sample size.

A similar study can be conducted with experimental group alone.

A similar study done by video teaching.

A similar study can be done by using structured teaching program.

CONCLUSION

The mean 't' test score of control group was lower than the mean 't' test score of experimental menstrual pain. The finding shows that the administration of beetroot extract was effective in reducing the severity of menstrual pain among adolescent girls. So, the alternative hypothesis was accepted. The x^2 test was used to find out the association between the demographic variables with pretest and post test score of experimental groups. The result revealed that the pretest pain level in experimental group and demographic variables like education, BMI and self-medication had significant association with findings. The post-test pain level in experimental group and demographic variables like education, self-medication and family history of dysmenorrhea had significant association with findings.

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CONFLICT OF INTEREST

We declare that we have no conflict of interest.

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