

Effect of Aerobic Training on Pre Menstrual Syndrome amongst College Girl Students

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Abstract – The aim of our study was to evaluate the effects of aerobic training on premenstrual syndrome amongst college girls. The study was conducted in Arya Girls College Ambala Cant. State of Haryana, India in the academic session 2016-17. Premenstrual syndrome was assessed by purchasing copyrights of Moos Menstrual Distress questionnaire (MMDQ)(4th edition). Students with high score on MMDQ were divided randomly into two groups with 30 each i.e. Aerobic Group and Control group. Total 10 weeks' Aerobic Training was given to Aerobic Training group for 6 days in a week for 45 minutes each session while control group was not exposed to any type of physical exercise. Subjects of both groups completed MMDQ before and after the intervention. Data was analyzed by using paired t-test and independent t-test to find out significant differences.

Keywords: PMS, Premenstrual Syndrome, Aerobic Training, College Girls, MMDQ

INTRODUCTION

In the modern era, physical activities and sports are no longer conducted simply for the purpose of entertainment or to build a muscular body. Today sports and different physical exercise are performed with particular purpose according to ones' own benefits. Field of sports has become very popular amongst all ages i.e. Children, adolescents and adults. Every sportsperson is availing all sorts of health benefits from sports and physical exercises. Aerobic Training is considered to be more effective in training any kind of health issues.

Aerobic exercise is an exercise which involves or improves oxygen consumption by large muscles of group. Aerobic means "With Oxygen" and refers to the use of oxygen in body's metabolic or energy generating process. One of the most important aspects of health related fitness is the aerobic capacity or the Cardio vascular endurance of an individual. Aerobic capacity can be defined as the ability to take in, transport and utilize oxygen efficiently. Since aerobic fitness involves so many important organs and systems, it tells much about the health of these components and about the health in general. Therefore, when aerobic fitness is high, physical and mental health is enhanced. (Frank, 1943)

Aerobic exercise is the exercise that involves or improves oxygen consumption by the body. Aerobic means "with oxygen", and refers to the use of oxygen

in the body's metabolic or energy-generating process. They are several kinds of aerobic exercise which are performed at moderate levels of intensity for extended periods of time. To obtain the best results, an aerobic exercise session involves a warming up period, followed by at least 20 minutes of moderate to intense exercise, involving large muscle groups, and a cooling down period at the end.

An Aerobic activity is a rhythmic physical activity that involves large muscle group sustained for thirty minutes or longer duration is considered as Aerobics. Aerobic exercise includes walking, jogging, running, swimming, rowing, stair climbing, stepping and dance movements, cross country and so on. Exercise is performed at moderate level of intensity over a longer period of time to improve cardio-vascular endurance. (Cooper, 1968).

Various types of Aerobic exercises are Running, Swimming, Aquarobics, Cycling, Rowing, Boxing and Aerobic or Cardio classes, Team Sports, Dancing etc. (<http://www.betterhealth.nic.gov.au>). Aerobic training strengthens heart, lungs and cardiovascular system which enable to deliver oxygen more efficiently and quickly to each and every part of body. It is a form of physical exercise with a combination of rhythmic exercise with the strength training and stretching. Aerobic exercises not only improve blood circulation and respiration but also reduce the body weight, reduce the risk of heart diseases, emotional stability and strengthened bones, tendons and ligaments. Aerobic fitness not only improves quality of life but

also adds years to our life. Exercise is very important in woman's life. By practicing regular exercises, she can regulate weight; strengthen heart and bones and overall well being. (Osteoporosis, 2001)

After the birth of baby girl, she is expected to be a wife and then a mother. God has gifted her natural phenomenon known as **Menarche**. Every girl undergoes this cycle. **Menarche** means the beginning of menstrual cycle which is very important event for adolescents. Mostly mean age of menarche amongst Indian girls is 12.5+-1.52 years with a range of 10 to 15 years. Menstruation which is also called uterine cycle is a natural process which occurs every month in woman's life right from her puberty till menopause. Menstruation means monthly vaginal discharge of blood and cells from the uterine linings. This process usually last from 2 to 7 days in one cycle . During Menstruation, a woman undergoes many hormonal changes and becomes anxious during this phase of time. There occur many physiological changes in females from age of Menarche up to Menopause .Girl has to face many problems during premenstruation like dysmenorrhea, Premenstrual Syndrome, menorrhagia and irregular cycles. (Singh A, 2008)

The diagnostic definition of PMS according to American College of Obstetricians and Gynecologists (ACOG): Symptoms must be present in five days before a woman's period for regular three menstrual cycles and must end within four days after the start of period. (ACOG, 2003) Pre Menstrual Syndrome is cyclic constellation of physical, psychological and behavioral changes symptoms and is believed to affect 75% of women of child bearing age. (Zafrane F, 2007)] Pre menstrual syndrome is a common disorder in menstruating girls and females. Females with PMS reported a poorer health related as well as work related quality of life. (Mestogullari, 2016) Irregular hormone profiles, hormone progesterone and estrogen have been known to play a dominant role in the menstrual problems. (Wen-Len Wu, 2015) Several difficulties associated with PMS could be hinder in physical functioning and psychological health and social life of a woman. (WS Biggs, 2011) PMS interferes the life of women by insufficient working hour, absenteeism and productivity. (WI, 2012)

Results show that about 40 million women suffer from PMS and more than five millions of them use medical treatment to ease their PMS. (Lichten, 2005) To eliminate the symptoms of PMS , a variety of treatment is there i.e. medical, surgical , alternative medical treatments and finally physical exercises have been recommended. (Dickerson LM, 2003)As there are many side affects of medical and surgical therapies , focus is on the safe exercise. Aerobic exercise as a mean to control PMS has been

recommended in several studies. (Pearlstein TB, 2000)

PURPOSE OF THE STUDY:

The purpose of the present study was to examine the effect of aerobic training on Pre menstrual Syndrome (PMS) amongst college girl students.

METHODOLOGY:

This study was conducted at Arya Girls College Ambala Cant. State of Haryana, India. A prior permission was obtained from the concerned authority. 500 girl students of college were screened for Pre Menstrual Syndrome by using a standardized purchased questionnaire (Moos Menstrual Distress Questionnaire, MMDQ). Out of 500, total 60 unmarried girl students within the age group of 17-28 years, with moderate to strong Pre menstrual Syndrome as measured by MMDQ(Moos Menstrual Distress Questionnaire) were selected for the study. Students who were having mild or severe PMS were excluded from the study. Students with mild symptoms were given some instructions to follow in their daily routine and students with strong PMS were asked to consult doctors. The 60 girl students were divided into two groups by simple random sampling and they were allotted to study group i.e. Aerobic Group (N=30), and other was selected for control group (N=30). The Aerobic group was asked to attend 45 minutes Aerobic Training class every day for 10 weeks. Control group didn't receive any intervention and they were asked to go with their daily routine. Each group was evaluated on Moos Menstrual Distress questionnaire after 10 weeks.

Aerobic Training Schedule:

Aerobic Training was given for 45 minutes each session for 10 weeks on all working days at the intensity of 60% of HRmax to 80% HRmax. (target heart rate and estimate maximum heart rate/physical activity cdc, 2015) (R. Vishnupriya, 2011) Schedule included 10 minutes warm up with stretching of upper and lower limbs to increase the heart rate and to decrease the risk of injury. Aerobic training phase of 25 minutes which included Walking Fast Pace and Jogging. Intensity was gradually increased within the weeks. Cool Down for 10 Minutes with the same exercise as in warm up with low intensity.

Main Outcome Measures:

The outcome measure was assessed by using a standardized copyright purchased (4th revised edition) Moos Menstrual Distress Questionnaire. (Moos, 2010) MMDQ is a self reported questionnaire. It consists of eight domains under which 46 symptoms were grouped. The domains in the questionnaire are in eight scales i.e. Pain, Water Retention, Autonomic Reactions, Negative effect,

Impaired concentration, Behavior Change, Arousal and Control. The scoring was done on five point Likert Scale i.e. 0-No experience of Symptoms, 1-Present, mild, 2 -Present, moderate, 3-Present, strong, 4- Present, Severe. Scores at the time of initial assessment and after intervention were compared.

The socio demographic data, included personal history and history related to menstruation i.e. age of menarche, duration of menstrual cycle, length of bleeding days , Use of medicine, family history on PMS were recorded.

RESULTS AND DISCUSSION:

The data was collected in Microsoft Excel 2010. Statistical analysis was done using SPSS version 17 by a statistician who was blind with the subjects' identity. The differences in pre-post treatment scores were used for analysis. For analysis the collected data Mean and S.D. was computed. To compare the differences in scores 't' test was used. The significance of difference was found at 0.05 level of confidence.

Table 1: Significance differences between pre and post test mean scores of Pre Menstrual Syndrome of Aerobic Group (Paired t-test)

Variables	Pre Test		Post Test		T Value
	Mean	S.D.	Mean	S.D.	
Pain	12.83	3.630	5.93	2.333	17.67*
Water retention	7.27	5.330	3.43	3.070	8.33*
Autonomous reaction	7.07	3.769	3.40	2.430	10.28*
Negative effects	14.77	3.350	6.67	2.309	21.57*
Impaired concentration	12.97	3.023	6.43	2.029	15.56*
Behaviour changes	12.17	3.302	5.23	1.906	15.51*
Arousal	8.60	4.375	3.77	2.344	10.62*
Control	6.93	4.331	2.97	2.341	9.22*
Total Score	82.60	20.304	37.83	12.628	26.43*

* significant at 0.05 level of confidence

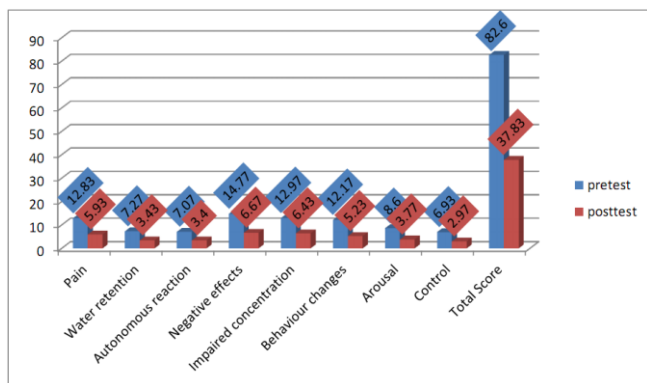


Figure 1: Mean Scores of Pre Menstrual Syndrome of Aerobic Group in Pre Test and Post Test

The results in Table-1 shows the pre and post intervention scores of pre menstrual syndrome of college girls in Aerobic Training group. The mean scores of pain, water retention, autonomic reactions, negative effect, impaired concentration, behavior change, arousal, control and total score of pre menstrual syndrome in post test decreased in Aerobic Training group as compared to the pre test and the difference was found significant at 0.05 level of confidence on the all scales of premenstrual syndrome in post test of Aerobic Training group.

Table-2 : Significance differences between pre and post test mean scores for Pre Menstrual Syndrome of Control Group (Paired t-test)

Variables	Pre Test		Post Test		T Value
	Mean	S.D.	Mean	S.D.	
Pain	12.90	2.218	13.37	1.608	-1.41
Water retention	7.60	4.073	7.03	4.081	1.90
Autonomic Reactions	5.97	4.140	5.93	3.769	0.16
Negative affect	13.57	3.401	12.87	3.159	2.20*
Impaired concentration	12.87	4.041	12.40	3.673	1.29
Behavior Change	11.30	3.313	10.50	3.540	2.40*
Arousal	8.70	3.905	9.03	4.148	-1.15
Control	6.57	2.909	6.63	2.883	-0.19
Total Score	79.47	15.520	77.77	14.741	2.76*

* significant at 0.05 level of confidence

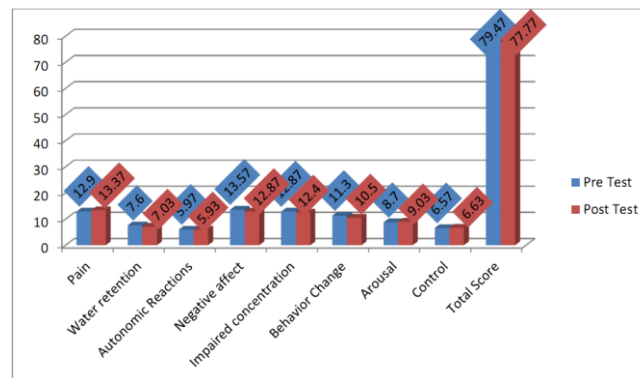


Figure 2: Mean Scores of Pre Menstrual Syndrome of Control Group in Pre Test and Post Test

Table-2 shows the pre and post intervention scores of pre menstrual syndrome of college girls in control group. The mean scores of pain, water retention, autonomic reactions, impaired concentration arousal, and control increased in post test in control group but mean scores for negative affect, behavior change and total score of pre menstrual syndrome in post test slightly decreased. The difference was found significant in the 't' values at 0.05 level of confidence only for Negative effect, behavior change scales and total score of pre menstrual syndrome but there was found no significance differences in 't' values for pain, water retention, autonomic reactions, impaired

concentration, arousal and control scales of pre menstrual syndrome in post test of control group.

Table-3: Significance differences between Pre Test mean Scores of Pre Menstrual Syndrome of Aerobic Training and Control Group (Independent t-test) N=30

Sub Variables	Groups	N	Mean	S.D.	Sem.	t-value	P-value
Pain	Aerobic	30	12.83	3.63	0.66	0.09	0.93
	Control	30	12.90	2.22	0.40		
Water retention	Aerobic	30	7.27	5.33	0.97	0.27	0.79
	Control	30	7.60	4.07	0.74		
Autonomic reactions	Aerobic	30	7.07	3.77	0.69	1.08	0.29
	Control	30	5.97	4.14	0.76		
Negative affect	Aerobic	30	14.77	3.35	0.61	1.38	0.17
	Control	30	13.57	3.40	0.62		
Impaired concentration	Aerobic	30	12.97	3.02	0.55	0.11	0.91
	Control	30	12.87	4.04	0.74		
Behavior change	Aerobic	30	12.17	3.30	0.60	1.01	0.31
	Control	30	11.30	3.31	0.60		
Arousal	Aerobic	30	8.60	4.38	0.80	0.09	0.93
	Control	30	8.70	3.91	0.71		
Control	Aerobic	30	6.93	4.33	0.79	0.38	0.70
	Control	30	6.57	2.91	0.53		
Total Score	Aerobic	30	82.60	20.30	3.71	0.67	0.50
	Control	30	79.47	15.52	2.83		

P<0.05 found no significance

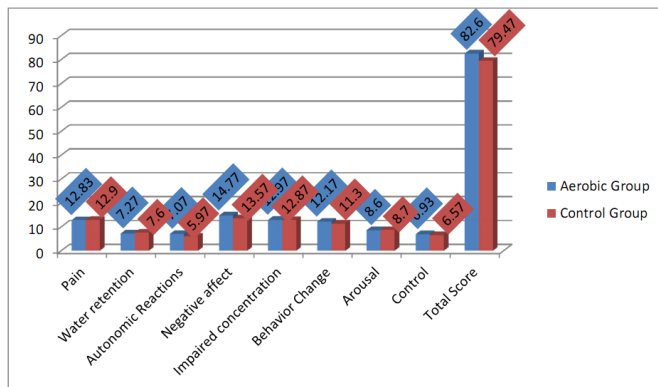


Figure 3: Pre Test Mean Scores of Pre Menstrual Syndrome of Aerobic Group and Control Group

The presented scores in Table-3 reveal the comparison of pre test mean scores of pre menstrual syndrome of college girls of aerobic and control groups. There was found statistically no significance differences in the 't' values of the pre test mean scores of aerobic and control group on sub variables of premenstrual syndrome.

Table -4: Significance differences between mean of Post Test scores of Aerobic Training and Control Group (Independent t-test) N=30

Sub Variables	Groups	N	Mean	Std. Deviation	Std. Error mean	T value
Pain	Aerobic	30	5.93	2.33	0.43	14.37*
	Control	30	13.37	1.61	0.29	
Water retention	Aerobic	30	3.43	3.07	0.56	3.86*
	Control	30	7.03	4.08	0.75	
Autonomic reactions	Aerobic	30	3.40	2.43	0.44	3.09*
	Control	30	5.93	3.77	0.69	
Negative affect	Aerobic	30	6.67	2.31	0.42	8.68*
	Control	30	12.87	3.16	0.58	
Impaired concentration	Aerobic	30	6.43	2.03	0.37	7.79*
	Control	30	12.40	3.67	0.67	
Behaviour change	Aerobic	30	5.23	1.91	0.35	7.17*
	Control	30	10.50	3.54	0.65	
Arousal	Aerobic	30	3.77	2.34	0.43	6.05*
	Control	30	9.03	4.15	0.76	
Control	Aerobic	30	2.97	2.34	0.43	5.41*
	Control	30	6.63	2.88	0.53	
Total Score	Aerobic	30	37.83	12.63	2.31	11.27*
	Control	30	77.77	14.74	2.69	

* Significant at 0.05 level of confidence

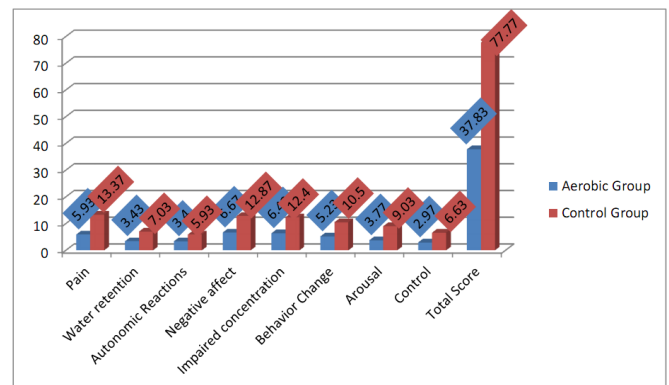


Figure 4: Post Test Mean Scores of Pre Menstrual Syndrome of Aerobic Group and Control Group

The results presented in Table -4 depict the comparison of mean differences between post test mean scores of pre menstrual syndrome of Aerobic Training and control groups. Significant difference was found in 't' values on all domains of pre menstrual syndrome after ten weeks aerobic training in Aerobic group when compared with control group. This difference was statistically significant at 0.05 level of confidence.

DISCUSSION:

The present study revealed that significant improvement was found on all sub variables i.e. Pain, Water Retention, Autonomic Reactions, Negative Affect, Impaired Concentration, Behavior Change, Arousal and Control and total score of pre menstrual syndrome after ten weeks of Aerobic Training in aerobic group as compared to control group.

Previous studies have also shown significant reduction in premenstrual syndrome. Our results are remarkably consistent with the number of other studies which have reported the effect of aerobic training on pre menstrual syndrome.

Aganoff and Boyle (1994) studied the effects of moderate aerobic exercise on mood states and menstrual cycle symptoms and the results showed there was significantly improvement in decreasing negative feeling such as anger, sin ,disgust and pain. (Aganoff, 1994)

R. Vishnupriya et.al (2011) encourages the employment of regular , moderate aerobic exercise as a potential intervention for pre menstrual syndrome. (R. Vishnupriya, 2011)

A. Khademi et.al(2008) has been found that aerobic exercise associated with fewer reported pre menstrual syndrome. Swimming is one of the aerobic exercise which can be used to reduce the pms. (al., 2008)

Zinat Ghanbari et. Al (2008) has been concluded that three months aerobic exercise could effectively reduce the severity of pms symptoms. (Zinat Ghanbari, 2008)

Pearlstein T., et.al (2012) has been found that moderate intensity (60% to 80% of the maximum heart rate) and severe intensity(80% to 90% of maximum heart rate) aerobic activity could significantly reduce the symptoms of pms as compared to mild intensity(30% to 40% of maximum heart rate). (Pearlstein T, 2012)

Sabaei Y,et.al(2015) concluded that lifestyle modification with an emphasis on increasing physical activity, specially aerobic activities, could be effective in reducing PMS. (Sabaei Y, 2015)

CONCLUSION:

Aerobic Training can be an effective measure to reduce the symptoms associated with pre menstrual syndrome. Therefore, Aerobic Training could be prescribed as a preventive measure to cope up with the premenstrual problems in girls.

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