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Original Article

COMPARATIVE STUDY ON EFFECT OF SLOW AND FAST PHASED PRANAYAMA ON QUALITY OF LIFE AND PAIN IN PHYSIOTHERAPY GIRLS WITH PRIMARY DYSMENORRHOEA: RANDO-MIZED CLINICAL TRIAL

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ABSTRACT

Objective: Few studies have been done on pranayama as therapy to improve pain and quality of life for primary dysmenorrhoea. Hence, this study is aimed at understanding the effect of slow and fast pranayama on primary dysmenorrhoea among Physiotherapy girl students.
Methods: Unmarried girls (n=90) under the age group of 18-25 with primary dysmenorrhoea were randomly assigned to the study, Group A (n=45) Group B (n=45). Moos menstrual distress questionnaire (MMDQ), Numerical pain rating scale for pain, Quality of life scale by American chronic pain association were administered at baseline, after 1st menstrual cycle and follow-up after 2nd menstrual cycle. Group A was subjected to slow pranayama (Nadi Shodhan) and Group B was subjected to fast pranayama (Kapalbhati).
Result: Significant (P<0.0001) improvement in quality of life and pain scores after intervention was seen in Group A (Nadi Shodan) as compared to Group B (Kapalbhati) . Prevalence of Primary Dysmenorrhoea was found to be high between the age group of 18-22.
Conclusion: With Slow pranayama (Nadi Shodhan) the quality of life and pain scores improved when compared to Fast pranayama (Kapalbhati) indicating the benefits of Slow pranayama on Primary Dysmenorrhoea. Pranayama improves quality of life and reduces absenteeism and stress levels, so it should be implemented in college students to augment their menstrual wellbeing and should be inculcated as a routine practice to improve quality of life.
KEY WORDS: Dysmenorrhoea, Slow And Fast Phased Pranayama, Physiotherapy Girls Students.

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INTRODUCTION

Dysmenorrhoea is a common symptom during menstrual cycle characterized by pain, which is often called as menstrual pain. It hinders with day-to-day social , academic and sports activities of many women and may be disabling. Dysmenorrhoea can be primary or secondary. Secondary dysmenorrhoea is diagnosed when symptoms are attributed to a disease , disorder or structural abnormality , which is already prevailing within oroutside the uterus whereas primary dysmenorrhoea is diagnosed when none of these are de-tected. About 50 - 70% of young women are

affected by dysmenorrhea and in 10-15% the condition is disabling [1]. A study conducted on primary dysmenorrhea showed that prevalence rates were as high as 90% and it was the common cause for absenteeism and reduced quality of life among women [2]. Dysmenorrhoea is a common‘ problem in women of reproductive age. Several studies have shown that adolescents with primary dysmenorrhoea report that it effects their academic performance, social and sports activities and is a cause for school absenteeism [3,4]. The most common effect of menstrual problems on daily routine, reported by unmarried undergraduate medical students was in the form of prolonged restinghours followed by inability to study [5]. The etiology of primary dysmenorrhoea is not precisely understood , but most symptoms can be explained by the action ofuterine-prostag landins , particularly PGF2- Alfa [6]. The risk factors for dysmenorrhoea are ;age < 20 years, nulliparity, heavy menstrual flow, smoking , upper socioeconomic status ; attempts to lose weight, physical inactivity, disruptionof social networks , depression and anxiety [7].

The conventional treatment of primary dysmenorrhoea consists of oral contraceptive pills or non-steroidal anti-inflammatory drugs, which usually have a lot of side effects. Studies about non-pharmacological therapies for primary dysmenorrhoea are rare and conventional treatment usually consists of hot moist pack therapy. There is growingevidence of an association between psychosocial stress and menses – associatedhealth problems in women , suggesting that stress may affect menstrual function. Yoga appears to provide improvement in stress [8-12]. Few studies suggested that yoga reduced the severity and duration of primary dysmenorrheal [13]. Pranayama which is a yogic technique , in particular has been proved to have overall effect on primary dysmenorrhoea . One can control the rhythms of pranic energy with pranayama and achieve healthy body and mind [13].

The research on effect of pranayama to relieve stress and enhance quality of life in primary dysmenorrhoea is sparse. Very few studies have been done on prevalence of primary dysmenorrhoea in Physiotherapy girls. Hence ,the purpose of this study is to offer understanding of effect of slow and fast pranayama on pain and quality of life scores on primary dysmenorrheaamong physiotherapy girl students.

METERIALS AND METHODS

This study was endorsed by the Institutional Ethical Committee. All participants signed a consent form that declared their voluntary agreement with all the procedures involved in this project. Demographic details were taken and baseline data was assessed using Moos Menstrual Distress questionnaire , Numeric pain rating scale and the quality of life scale. Subjects who complain of menstrual pain were assessed using the Moos Menstrual Distress questionnaire. Then the subjects were assessed for severity of pain using the Numeric pain rating scale. The subjects were then examined for the effect of the former two parameters on the quality of life using the quality of life scale. These scores were compared at baseline, after first menstrual completion and intervention and follow up measurement during second menstrual cycle.

The duration of the intervention was for two menstrual cycles. 90 subjects were be included in this study and were divided into two groups. Each group had 45 participants, group 1 was given slow pranayama and group 2 was given fast pranayama.

Pranayama techniques such as slow breathing (Nadi Shodhan) to group 1 and fast breathing (Kapalbhati) to group 2 was administered in the mornings on empty stomach for 10 mins on daily basis.

1. Starting Position – Padmasana Nadi Shodhan
2. Nadishodhan – end position Kapalbhati

Statistical analysis: Statistical analysis was done using the statistic software SPSS version

12 in order to verify the results obtained. For this purpose the values of the study were entered into an Excel sheet where the data was tabulated and subjected to various statistical analyses. Statistical measures such as mean, standard deviation and other tests of significance such as Paired t test, Mann whitney test were used for the analysis of the data.

RESULTS

Comparison of Age, onset of menses, length of cycle, length of period. (Table 1).

Age distribution: There were a total of 90 participants in the study, 45 in each group. Age group of the participants chosen for the study was between 18-25 years. The average age of the participant for group A was 20±2.22 years and for group B was 20.13±2.19 years.

Onset of Menses: For the Onset of Menses the mean for Group A was 12.80±1.20 years, in Group B was 13.09±1.08. No significant differences were found for onset of menses in both the groups (Table 1).

Length ofCycle : For the length of cycle, Group A had mean of 29.07±3.57 days, in Group B mean length of cycle was 30.04±3.44 days.

Length of Period: For the length of cycle, Group A had mean of 5.27±1.16 days, in Group B mean length of cycle was 5.29±1.04 days.

Table 1: Comparison of Group A and Group B with age, Onset of menses, Length of cycle and Length of period.

Variable	Groups	n	Mean	SD	t-value	P-value
Age	Group A	45	20.36	2.22	0.4782	0.6337
	Group B	45	20.13	2.19		
Onset of menses	Group A	45	12.8	1.2	-1.1995	0.2335
	Group B	45	13.09	1.08		
Length of cycle	Group A	45	29.07	3.57	-1.3235	0.1891
	Group B	45	30.04	3.44		
Length of period	Group A	45	5.27	1.16	-0.096	0.9237
	Group B	45	5.29	1.04		

Prevalence of Risk Factors: (Table 2).

Obesity was equally prevalent in Group A and B (22.22%).

Workload was experienced more in Group B (33.33%) than in Group A (33.78%).

It was also found that

Depression was higher in Group A (31.11%) than Group B (26.67%).

Weight loss was found to be more in Group A (13.33%) than Group B (8.89%) .

Table 2: Comparison of Group A and Group B with prevalence of risk factors.

Risk factors	Group A	%	Group B	%	Total
Obesity					
No	35	77.78	35	77.78	70
Yes	10	22.22	10	22.22	20
Workload					
No	30	66.67	28	62.22	58
Yes	15	33.33	17	37.78	32
Depression					
No	31	68.89	33	73.33	64
Yes	14	31.11	12	26.67	26
Weight loss					
No	39	86.67	41	91.11	80
Yes	6	13.33	4	8.89	10
Total	45	100	45	100	90

OUTCOME MEASURES:

Moos MenstrualDistress Questionnaire (Table3). According to Moos menstrual Distress questionnaire (MMDQ) Majority of students in Group A had mild or moderate dysmenorrhea (31.1% and 33.3%). In contrastGroup B majority of students had mild and very severe dysmenorrhea (35.5% and 24.44%) before practicing fast pranayama. After the first menstrual cycle majority of students had mild to moderate dysmenorrhea (53.33% and 40%) in Group A. Ingroup B majority had moderate to mild dysmenorrhoea (31.11% and 51.11%).

After the second menstrual cycle, majority of the students in Group A and B had moderate to mild dysmenorrhea (22.22% ,73.33% and 26.66%, 64.44%).

The mean of the MMDQ scores among students of Group A was 86.58±25.28 before pranayama and in Group B was 86.64±25.72.

The mean of scores of MMDQ decreased after the 1st menstrual cycle Group A - 70.04 ±16.33 and Group B - 72.69±16.30. and further reduced after the 2nd menstrual cycle to 61.60 ±12.79 and 65.84±15.97).

The findings of the MMDQ scale showed that there was significant difference in the score of students in Group A and B before and after giving slow and fast phased pranayama therapy (t=-0.7688, P=-0.7688).

Table 3: Comparison of Group A and Group B with moos menstrual distress scores at baseline, After 1st MC and After 2nd MC by t test.

Variable	Group	n	Mean	SD	t-value	P-value
Baseline	Group A	45	86.58	25.28	-0.0126	0.9899
	Group B	45	86.64	24.72		
After 1st MC	Group A	45	70.04	16.33	-0.7688	0.4441
	Group B	45	72.69	16.3		
After 2nd MC	Group A	45	61.6	12.79	-1.3918	0.1675
	Group B	45	65.84	15.97		
BL-1st MC	Group A	45	16.53	14.41	0.9443	0.3476
	Group B	45	13.96	11.3		
BL-2nd MC	Group A	45	70.04	16.33	-0.7688	0.4441
	Group B	45	72.69	16.3		
1st MC-2nd MC	Group A	45	8.44	8.32	0.9489	0.3453
	Group B	45	6.84	7.66		

Numeric Pain Rating Scale (Table 4).

At baseline mean of numeric pain rating scale in Group A and Group B was 5.64±1.35and 6.47±1.33 respectively. Post intervention after the 1st menstrual cycle the mean of numeric pain rating scale was taken and was 4.50±1.17 in group A and 5.63±1.26 in group B. After the 2nd menstrual cycle the mean of numeric pain rating scale was 3.64±1.16 and 4.78±1.38 in Group A and Group B respectively. This suggests that both Groups A and B had considerable reduction in pain during the course of intervention. However, both the techniques proved to be equally effective in the treatment of primary dysmenorrhoea. (P= 0.0002)

Table 4: Comparison of Group A and Group B with numeric pain rating scores at baseline, After 1st MC and After 2nd MC by Mann-Whitney U test.

Variable	Group	Mean	SD	Sum of ranks	U-value	Z-value	P-value
Baseline	Group A	5.64	1.35	1734.5	699.5	-2.5258	0.0115*
	Group B	6.47	1.33	2360.5			
After 1st MC	Group A	4.5	1.17	1529	494	-4.1841	0.00001*
	Group B	5.63	1.26	2566			
After 2nd MC	Group A	3.64	1.16	1586	551	-3.7242	0.0002*
	Group B	4.78	1.38	2509			
BL to 1st MC	Group A	1.14	0.72	2303	757	-2.0618	0.0392*
	Group B	0.84	0.6	1792			
BL to 2nd MC	Group A	4.5	1.17	1529	494	-4.1841	0.00001*
	Group B	5.63	1.26	2566			
1 MC to 2nd MC	Group A	0.86	0.84	2081	979	-0.2703	0.7869
	Group B	0.85	0.67	2014			

*p<0.05

Quality of Life Scale (Table 5).

At baseline mean of quality of life in Group A and Group B was 7.82±1.19 and 8.62±0.68 respectively. Post intervention after the 1st menstrual cycle the mean quality of life was taken and was 8.18±1.59 in group A and 8.87±0.63 in group B.

After the 2nd menstrual cycle the mean of quality of life was 9.07±0.78 and 9.29±0.66 in Group A and Group B respectively. This suggests that Group A undergoing Nadishodhan had considerable increase in quality of life scores as compared to Group B who underwent Kapalbhati. This implies Group A benefited more in respect with quality of life scores as compared to Group B. (t= -1.4572, P=0.1486)

Table 5: Comparison of Group A and Group B with quality of life scale scores at baseline, After 1st MC and After 2nd MC by t test.

Variable	Group	n	Mean	SD	t-value	P-value
Baseline	Group A	45	7.82	1.19	-3.9037	0.0002*
	Group B	45	8.62	0.68		
After 1st MC	Group A	45	8.18	1.59	-2.7118	0.0080*
	Group B	45	8.87	0.63		
After 2nd MC	Group A	45	9.07	0.78	-1.4572	0.1486
	Group B	45	9.29	0.66		
BL-1st MC	Group A	45	-0.36	1.37	-0.5194	0.6048
	Group B	45	-0.24	0.43		
BL- 2nd MC	Group A	45	8.18	1.59	-2.7118	0.0080*
	Group B	45	8.87	0.63		
1st- 2nd MC	Group A	45	-0.89	1.37	-2.1484	0.0344*
	Group B	45	-0.42	0.5		

DISCUSSION

Practice of breathing exercises like pranayama is known to improve autonomic function by changing sympathetic or parasympathetic activity.

In the present study it was found that the prevalence of primary dysmenorrhea was 65% among physiotherapy girls students. This is the first study done on physiotherapy girl students. In Group B there were 35.5% 18 year olds and 40% 18 year olds in Group A with primary dysmenorrhea. It was found that the prevalence of dysmenorrhoea was higher in the age group 18-22. This finding coincides with the finding of Pedron NV et al [25]. Their study showed that the prevalence of dysmenorrhoea was 52.1% for the group < 15 years of age, 63% for the group 15-19 years and 52.3% for the group 20-24 years.

In the present study Workload was experie-

nced more in Group B (37.7%) than in Group A (33.3%). It was also found that depression was higher in Group A (31.11%) than Group B (26.67%). Many studies have proved that there is direct correlation between Workload, depression and stress .Several researchers have reported that pranayama techniques are beneficial in treating a range of stress related disorders [18], improving autonomic functions [17], relieving symptoms of asthma [19] though a different study [20] did not find any improvement and reducing signs of oxidative stress [21,22].

A longitudinal study conducted to find out the risk factor for the occurrence, duration and severity of menstrual cramps in a cohort of college women in USA it showed that Being over weight was an important risk factor for menstrual cramps [24]. This coincides with the present study finding which Showed that obesity was equally prevalent in Group A and B.

We observed after pranayama intervention there is significant ($p<0.0001$) reduction in the perceived pain in both the groups. This suggested that Pranayama was effective in reducing pain in dysmenorrhoea which coincides with the study by Usha Nag et al which proves that yoga intervention was successful in reducing pain. In study group there was significant ($p<0.0001$) reduction in the perceived pain.

The results of this study are also comparable with Rakhshaee Z, who suggested that yoga reduced the severity and duration of primary dysmenorrheal [12].

However this study was the first study to do a comparison on effectiveness of slow and fast pranayama on primary dysmenorrhea. This study also depicted improvement in quality of life scores in group with Slow pranayama as intervention. This can be proved by other studies which state that n pranayamic type of slow and deep breathing, oxygenation of blood increases without changing minute ventilation, as alveolar /ventilation increases [15,16]. Which in turn Decreases pain and improves quality of life.

In one of the studies it was observed that there was an extremely significant improvement in all the parameters, in the subjects practicing pranayama for 3 consecutive menstrual cycles [23]. Similarly in a study, increased parasympathetic activity and decreased sympathetic activity were observed in the slow breathing group, whereas no significant change in autonomic functions was observed in the fast breathing group [17].

LIMITATION

· Study group included only Physiotherapy girl students.

· Small sample size.

· No follow up after 2nd menstrual cycle

· Investigator was not blinded

CONCLUSION

With Slow pranayama (Nadi Shodhan) the quality of life and pain scores improved when compared to Fast pranayama (Kapalbhati) indicating the benefits of Slow pranayama on Primary Dysmenorrhoea. Pranayama improves quality of life and reduces absenteeism and stress levels, so it should be implemented in college students to augment their menstrual wellbeing.

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Conflicts of interest: None

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