International Journal of Science and Research (IJSR)
ISSN: 2319-7064
SJIF (2020): 7.803

To Compare the Effect of Stretching and Strengthening Exercises of Core Muscles on Primary Dysmenorrhea in Adolescent Girls

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Abstract: ***Background: Primary dysmenorrhea is immediate possible bleeding associated with the absence of any generational pathology. Pain also can be related to headaches, fatigue, nausea, and mood swings. Stretching exercise is a form of physical exercise in which a specific muscle or tendon is deliberately stretched in order to improve the muscle's felt elasticity and achieve comfortable muscle tone and increased muscle control, flexibility, and range of motion. Strengthening exercises allows the small intrinsic muscles around the spine to be conditioned to increment performance. Aim: To examine the effect stretching and strengthening exercises of core muscles on primary dysmenorrhea in adolescent girls. Methodology: In this study total of 100 subjects were taken who have primary dysmenorrhea. The subjects were divided convenient sample technique wise into two groups which were Group A and Group B. Group A was stretching exercises and for Group B was strengthening exercise. The intervention program was for 8 weeks. The subjects were divided into a group of 50. So there were 50 subjects in each group. The demographic data, the numerical pain rating scale, lumbar pressure biofeedback, and menstrual distress questionnaire prior to and after 8 weeks of study. Result: Statistically analysis was done using SPSS version 23. Within the group pre and post data analysis was done using a t-test which shows the significant improvement that is p-value <0.05 accepted. Conclusion: Significant improvement was seen in the muscle strength, and quality of life in both the groups and significant reduction in pain intensity in girls with primary dysmenorrhea. but there was more significant reduction in pain intensity and more significant improvement in muscle strength and quality of life in strengthening (group B)than the stretching (group A) in girls with primary dysmenorrhea.***

Abbreviations

Sr. No.	Short form	Full From
1	MDQS	Menstrual Distress Questionnaire
2	MS	Muscular Strength
3	NPRS	Numerical Pain Rating Scale
4	SPSS	Statistical Package For Social Sciences

1. Introduction

Dysmenorrhoea is painful congestion of the internal reproductive organs called primary or secondary dysmenorrhea. Primary dysmenorrhea is immediate possible bleeding associated with the absence of any generational pathology. This is often the most medical problem that prevails among adolescent girls. Pain also can be related to headaches, fatigue, nausea, and mood swings. Secondary dysmenorrhea is typically caused by a medicine disorder like pathology, or fibroids, or by non-hereditary abnormalities of the generation organs. Sports and traditional exercise are considered effective treatments for the prevention and treatment of dysmenorrhea. Stretching exercise is a form of physical exercise in which a specific muscle or tendon (or muscle group) is deliberately flexed or stretched in order to improve the muscle's felt elasticity and achieve comfortable muscle tone. The result is a feeling of increased muscle control, flexibility, and range of motion. Strengthening exercises allows the small intrinsic muscles around the spine to be conditioned to increment performance. This coaching allows the isolation and strengthening of core muscle group.

Aim & Objectives

To examine the effect of stretching and strengthening exercises of core muscles on primary dysmenorrhea in adolescent girls

1) To examine the impact of stretching exercises
2) To examine the impact of strengthening exercises.
3) To compare the impact of stretching and strengthening exercises of core muscle on primary dysmenorrhea

Hypothesis:

- **Null hypothesis (h_0):** There was no significant difference seen between stretching exercise and core strengthening exercises on primary dysmenorrhea.
- **Alternate hypothesis (h_1):** There was a significant difference seen between stretching exercise and strengthening exercises of core muscles on primary dysmenorrhea.

Materials

Pen-Paper, Lumbar pressure biofeedback, Plinth, Data collection sheet, Consent form

Methodology:

Research design: Interventional study
Sample size: 100 subjects
Sample source: Various schools of Rajkot

Selection Criteria

Inclusion Criteria

15-17 years group of age girls, Regular menstrual cycle (30 – 35 days), Pain intensity ≥ 5, The subject who understand the purpose of the study and willing to participate

Exclusion Criteria

The irregular cycle of menstruation, abnormal vaginal blood flow, History of gynecological disease

Procedure

Before enrolling the subject into the study, ethical approval, as well as CTRI registration was done. A total of 100 subjects were taken suffering from primary dysmenorrhea were included in the study, their parent's consent was taken

prior to the procedure. The subjects were divided convenient sample technique wise into two groups which were Group A and Group B. Group A for stretching exercises and group B for strengthening. 50 girls in each group The demographic data, The numerical pain rating scale, lumbar pressure biofeedback and menstrual distress questionnaire prior to and after 8th week of study, given exercise protocol to girls, The stretching and strengthening exercises, which included main core muscle (Multifidus, Quadratus lumborum, transverse abdominis)

Intervention

The intervention program was same for group A and group B. **Group A** included the stretching exercises (Sit and reach stretch, side flex stretch, Cobra pose). And **Group B** included the strengthening exercises (Side plank, Alternet Superman, Plank). The protocol was of 3 days per week for 8 weeks. A twice per day for ten minutes. They were approached to abstain from performing stretching exercises throughout the menstruation period. Their performances were controlled from time to time by a physiotherapist within the high school.

2. Result

Statistical analysis was done by statistical package for the social sciences (SPSS) statistical software version 23.0. Graphs and tables were done by Microsoft excel 2007. The parametric test as the data was normally distributed measured using Shapiro-Wilk and Q-Q plot. Which showed that data was parametric type for numerical pain rating scale and muscle strength. Paired t test was applied for intra group comparison, while Independent sample t test was applied for inter group comparison, data of quality of life were not normally distributed so Nonparametric Wilcoxon Signed Ranks test was applied for intra group comparison while Nonparametric Mann-Whitney U test was applied for inter group comparison with the help of SPSS (Version 23)

INTRA GROUP A							
Outcome		PRE		POST		t – VALUE & z- VALUE	*p*-VALUE
		MEAN	SD	MEAN	SD		
NPRS		7.64	1.425	2.78	1.217	26.244	.000
MS		63.12	8.679	73.12	3.778	-9.624	.000
MDQS	Pain	16	4.686	12.18	3.724	-3.753	.000
	Concentration	24.8	6.893	15.98	4.98	-5.568	.000
	Behaviour Changes	17.5	4.234	10.7	3.052	-5.595	.000
	Autonomic Reaction	11.02	2.896	7.72	2.475	-4.824	.000
	Water Retantion	8.88	3.391	6.26	2.783	-3.925	.000
	Negative Effect	23.96	6.679	15.02	4.288	-5.875	.000
	Aurosal	13.58	4.026	9.16	2.526	-5.684	.000
	Control	14.8	4.806	10.78	3.112	-4.831	.000

Interpretation: The mean average for NPRS reduced from 7.64 to 2.78, muscle strength improved from 63.12 to 73.12. As per paired t-test reflects that *p*-value is less than 0.05. A significant difference is seen in outcomes. As per the Wilcoxon Signed Ranks test quality of life reflects that *p*-value is less than 0.05. A significant difference is seen in all components.

INTRA GROUP B							
Outcome		PRE		POST		t –VALUE & z- VALUE	p-VALUE
		MEAN	SD	MEAN	SD		
NPRS		7.06	2.385	4.44	2.052	16.238	.000
MS		62.68	10.159	68.98	4.387	-4.836	.000
MDQS	Pain	16.86	5.653	7.74	4.797	-6.034	.000
	Concentration	20.76	6.939	8.94	4.705	-5.98	.000
	Behaviour Changes	15.64	6.009	6.26	3.567	-5.947	.000
	Autonomic Reaction	9.86	4.01	4.84	2.691	-5.452	.000
	Water Retantion	8.84	3.407	3.24	1.636	-5.902	.000
	Negative Effect	23.5	7.24	8.04	3.416	-6.033	.000
	Aurosal	11.16	3.93	4.78	2.102	-5.975	.000
	Control	13.86	5.043	5.46	1.865	-6.067	.000

Interpretation: The mean average for NPRS reduced from7.06 to 4.44, muscle strength improved from 62.68 to 68.98. As per paired t-test reflects that *p*-value is less than 0.05. A significant difference is seen in outcomes. As per the Wilcoxon Signed Ranks test quality of life reflects that *p*-value is less than 0.05. A significant difference is seen in all components.

INTERGROUP A & B							
Outcome		GROUP A		GROUP B		t-VALUE & z- VALUE	*P*-VALUE
		MEAN	SD	MEAN	SD		
NPRS		2.62	1.141	4.86	1.309	-9.120	.000
MS		7.58	8.169	10.76	6.100	-2.206	.000
MDQS	Pain	12.18	3.724	7.74	4.797	-4.764	.000
	Concentration	15.98	4.98	8.94	4.705	-5.969	.000
	Behaviour Changes	10.7	3.052	6.26	3.567	-6.185	.000
	Autonomic Reaction	7.72	2.475	4.84	2.691	-5.569	.000
	Water Retention	5.26	2.783	3.24	1.636	-5.379	.000
	Negative Effect	15.02	4.288	8.04	3..416	-6.578	.000
	Aurosal	9.16	2.526	4.78	2.101	-7.176	.000
	Control	10.78	3.112	5.46	1.865	-7.249	.000

Interpretation: The mean average for NPRS is 2.62 and 4.86 muscle strength are 7.58 to 10.76 respectively for Group A and B. As per the independent sample t-test, data for NPRS and muscle strength reflects that the *p*-value is less than 0.05. A significant difference is seen in NPRS and Muscle Strength. As per the Mann-Whitney U test on all components of quality of life data reflects that the *p*-value is less than 0.05 so a significant difference is seen in these components of quality of life.

3. Discussion

The applied analysis reflected the reduction in pain intensity and muscle strength between each of groups wherever reduce pain intensity and improve muscle strength was seen in each group. A significant improvement was found in quality of life in each of the group, and with improvement was found in stretching and strengthening exercise of core muscle. Therefore, the null hypothesis is accepted. Stretching exercises area unit effective in reducing pain intensity, pain length, and also the less amount of painkillers employed by girls with dysmenorrhea. As core strengthening permits the little intrinsic muscle close to the spine to be conditioned for bigger performance, Core strengthening exercises improved a lot of the activity of the core muscle. There was a big reduction in pain intensity in the core strengthening exercises as compared to the stretching exercises in females with dysmenorrhea.

4. Conclusion

Significant improvement was seen in the muscle strength, and quality of life in both the groups and significant reduction in pain intensity in girls with primary dysmenorrhea. but there was more significant reduction in pain intensity and more significant improvement in muscle strength and quality of life in strengthening (group B)than the stretching (group A) in girls with primary dysmenorrhea.