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Original Article

Effects of Myofascial Release versus Pelvic Floor Muscle Exercises in Women with Primary Dysmenorrhea

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ABSTRACT

Primary dysmenorrhea is also associated with significantly high economic burdens due to absenteeism, and 2-to-3-fold increased healthcare costs. **Objective:** To determine the effects of myofascial release versus pelvic floor muscle exercises in women with primary dysmenorrhea**. Methods:** The study design was Randomized Clinical Trial. The study was conducted at Gynae Department of Hamza Hospital Lahore and completed ten months after the approval of synopsis. Sample size is 22, calculated by Epitool. Nonprobability convenient sampling technique was used. Females with 17-30 years of age and who fulfilled five criteria to be considered for primary dysmenorrhea were included in the study. Visual Analogue Scale (VAS) and working ability, location, intensity, days of pain, dysmenorrhea (WaLIDD) Score was used as a tool. **Results:** Twenty-four participants with mean age of the participants was 21 ± 2.75 years while Body Mass Index (BMI) of participants was 26.23 ± 1.631. Normality of data was checked by *Shapiro wilk test* that showed that data was normally distributed with *p value ≤ 0.05. Parametric test, paired sample t test and an independent samples t-test* was conducted to compare the effects of Myofascial release and Pelvic floor muscle exercises group in between and within group. Total score of VAS and WaLIDD was measured before and after 12 weeks of intervention in between two groups. The mean difference was 5.82 in Myofascial release group and 4.3 in Pelvic floor muscle exercises group. Although there was a significant reduction in WaLIDD score in both groups after treatment, but the myofascial release group was superior to pelvic floor exercise group**. Conclusions:** It was concluded that myofascial release and Pelvic floor muscle exercises are effective for treatment for primary dysmenorrhea, but Myofascial release has greater effects on relieving primary dysmenorrhea Symptoms than the pelvic floor muscle Exercises after the treatment sessions.

INTRODUCTION

Dysmenorrhea is a disorder related to menstruation defined by the "presence of painful abdominal cramps originating from uterus and occur during menstrual cycle or menstruation. Dysmenorrhea is the most common cause of pelvic pain . Dysmenorrhea is classified into 2 types based on its pathophysiology i.e., Primary dysmenorrhea (PD) and secondary dysmenorrhea (SD). PD is menstrual pain that is due to normal ovulatory cycles, without any pelvic pathology, in young girls and is physiological in etiology . PD is most common in teenage and young girls [5]. While SD is pelvic pain due to menstrual cycle but associated with an organic identifiable cause or disease e.g. endometriosis, fibroids, pelvic adhesions, Adenomyosis, endometrial polyps, pelvic inflammatory disease and intrauterine contraceptive device. There are different treatment approaches of PD. There is a strong

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need for highlighting all available alternative methods of conservative approaches of treatment of PD as a non-invasive and non-pharmacological, easy & safe to use to relief from dysmenorrhea. They are acupuncture, yoga, Pilates , acupressure, biofeedback, transcutaneous electrical nerve stimulation, heat therapy , different types of therapeutic exercises and relaxation techniques. Exercises includes isometrics, stretching, strengthening, core stability and progressive resistance training. Literature also identifies the need of educating on self-care for management of menstrual pain . The positive effects of doing Pelvic floor muscle exercises, aerobic exercises, Pulsed Electromagnetic Field, Zumba exercises, and Resistance training, isometrics exercises, functional exercises, core strengthening exercises and Pilates have been observed in literature. Myofascial trigger points /MTrPs are tender points or tight bands in the pelvic areas are hard, hyperirritable that are palpable and tender on touch and compression, that can elicit referred distant pain . The mechanism is not clear, and one theory recommends that it can be caused by an irregular release of acetylcholine due to damage of motor endplate within muscle fiber, resulting in a sustained contractions of muscle leads to the development of MTrPs. Myofascial trigger points can cause allodynia and hyperalgesia via central sensitization. Myofascial release techniques consist of manual physical therapy with the aim of relieving muscular tension and associated pain by eliminating Myofascial trigger points, by the physiotherapist . Self myofascial release /SMFR is a comparatively a new technique of soft tissue mobilization. SMFR is a self-massage with the help of special tools, like foam rollers, trigger point wands, therapeutic balls, dilators and even the hands or fingers can also be used for Myofascial trigger points pressure release. The objective of the present study was to determine the effects of myofascial release versus pelvic floor muscle exercises in women with primary dysmenorrhea.

METHODS

The design of current study was Randomized Clinical Trial**.** The current study was conducted at Hamza Hospital Lahore. This study was completed in six months. Non-probability convenient sampling technique was used for this study after applying inclusion and exclusion criteria. The data collection tool used in this study was VAS Scale and WaLIDD Score. The VAS[1] is a validated and subjective tool to measure acute & chronic pain. Scores are documented by making a mark on 10 cm line. 10 cm line characterizes pain intensity from 0 "no pain" to 10 means "worst pain" [18]. WaLIDD Score is used to determine the diagnostic criteria for women with PD and predict their medical leave. It has 4 characteristic division in which we measure pain, Working ability, location/ sites of pain, days of pain. WaLIDD Score is abbreviated as working ability, location of pain, intensity of pain, days of pain, Scoring includes 0 means without dysmenorrhea, 1–4 score means mild dysmenorrhea, 5–7 total scores moderate dysmenorrhea, 8–12 score means severe dysmenorrhea [19]. Treatment was performed during one cycle, which was started at the third or fourth day of menstruation and continued till the onset of next menstruation. Assessments were performed before treatment (first menstruation), then after (third menstruation)[20].

Both interventional group: (Received 3 sessions/week for 12 weeks and each session included)

- Warm up (10 minutes)
- Stretching (10 minutes)

Data including demographics (age, body mass index), menstrual cycle (age at menarche, menstrual cycle duration), and menstrual pain characteristics (intensity and duration of pain, type and number of analgesics) were recorded[20].

Group A: Group A was received myofascial release (Traverses abdominis sacral, lumbar, last thoracic vertebrae-T12, and subcostal)

Myofascial release through myofascial relaxation technique 3 times a week for 12 weeks[14].

Group B: Pelvic floor exercises (Kegel, bridging, hold relax) each with 10 – 15 repetitions 3 times a week.

The data analysis was done by using SPSS version 25 for Windows software. Statistical significance was $p \leq 0.05$. Different tests were applied to analyze the collected data.

RESULTS

Twenty-two participants were included in this study. The mean age of the participants was 21± 2.75 years. There was mean BMI of participants was 26.23± 1.631. The mean length of cycle was 26.55± 3.30 days. Minimum or short cycle reported was 22 days and maximum length of cycle was 32 days. This mean age of menarche of participants that were included in this study was 11.23± .869 years (Figure 1). Only 4 girls were of 10 years old when they started to menstruate. Majority (50%) of participants were having 11 years of age when they experienced their 1st menstrual cycle. 5 girls started at 12 and only 2 out of 22 girls started their menstruation at age 13. Sixty eight percent (68 %) of females was having regular menstrual cycle and 32 % females having irregular cycle with primary dysmenorrhea. Means length of cycle was 26.55±3.30 days. Minimum or short cycle reported was 22 days and maximum length of cycle was 32 days.

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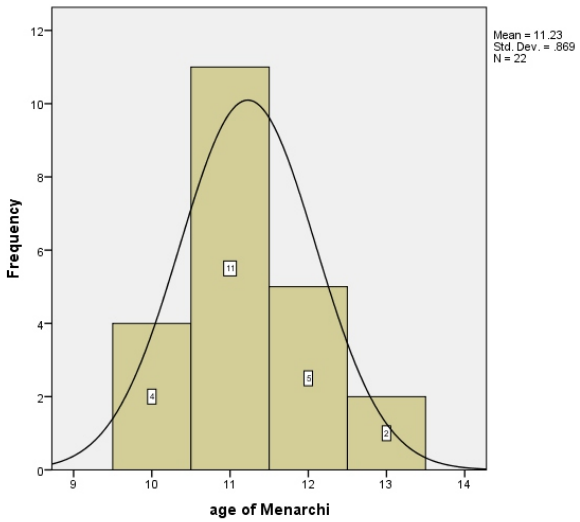

Figure 1: Histogram of Age at onset of menstruation / Menarche

Normality of data was checked by Shapiro wilk test that showed that data was normally distributed with p value ≤ 0.05. Total score of VAS and WaLIDD was measured before and after 12 weeks of intervention in between 2 groups. P value within groups pre and post intervention is significant for both groups(≤0.001)for VAS and WaLIDD scale(Table 1).

Test of Normality			
Shapiro-Wilk Test	**Statistic**	**df**	**Sig.**
Total VAS Score baseline	0.938	30	0.082
Total Walidd score baseline	0.876	30	0.079

Table 1: Shapiro-Wilk Test

The total VAS score of group 1 who performed myofascial release was (6.67± 1.07) at baseline and (2.80± 0.71) with significant mean difference of 3.87 and in group 2 i.e. pelvic floor muscle exercises VAS score was (6.30± 1.06) at baseline and (3.43± 0.63) after intervention with mean difference of 2.87 (Table 2). There was significant difference in both groups before and after treatment in VAS score, but difference was greater in group 1 that was with Myofascial release(Table 2).

VAS [2]	Before intervention	After intervention	Mean Diff	*p value*
Myofascial release	6.67± 1.07	2.80± 0.71	3.87	0.001
Pelvic floor muscle exercises	6.30± 1.06	3.43± 0.63	2.87	0.001

Table 2: Independent sample T test between group comparisons of VAS

That WaLIDD score before intervention in Myofascial release group was 9.65 ± 2.12 and in Pelvic floor muscle exercises group was 9.80 ± 1.90. After 12 weeks of intervention the total WaLIDD score reduced to 3.83± 1.02 in Myofascial release group and 5.50 ± 1.30 in Pelvic floor muscle exercises group(Table 3). The mean difference was 5.82 in Myofascial release group and 4.3 in Pelvic floor muscle exercises group. Although there was a significant reduction in WaLIDD score in both groups after treatment, but the myofascial release group was superior to pelvic floor exercise group(Table 3).

WaLIDD score	Before intervention	After intervention	Mean Diff	*p value*
Myofascial release	9.65± 2.12	3.83± 1.02	5.82	0.001
Pelvic floor muscle exercises	9.80± 1.90	5.50± 1.30	4.3	0.001

Table 3: Between Group comparison of WaLIDD score (Independent sample t test)

Table 4 showed that the total VAS score of groups 1 who performed myofascial release was 6.67 ± 1.07 at baseline and 2.80 ± 0.71 with significant mean difference of 3.87 pre and post value. Table 4 also showed paired sample t test that the total Baseline VAS in Pelvic floor exercises group was 6.30 ± 1.06 and Post treatment VAS in Pelvic floor exercises group was 3.43 ± 0.63 with significant mean difference of 2.87 pre and post value. p value was significant > 0.05 for Pelvic floor exercises group.

VAS Score in M yofascial release group before and after interventions					
Variables	**Mean ± SD**	**Df**	***t*-value**	**Mean Diff**	***p value***
Baseline VAS in Myofascial release group	6.67± 1.07	10	21.466	3.87	.001
Post treatment VAS in Myofascial release group	2.80± 0.71				
Baseline VAS in Pelvic floor exercises group	6.30± 1.06	10	10.750	2.87	.001
Post treatment VAS in Pelvic floor exercises group	3.43± 0.63				
VAS Score in Pelvic floor exercises group before and after interventions					
Baseline VAS in Pelvic floor exercises group	6.30± 1.06	10	10.750	2.87	.001
Post treatment VAS in Pelvic floor exercises group	3.43± 0.63				

Table 4: VAS Score in Myofascial release and pelvic floor exercises group before and after interventions

Table 5 showed paired sample t test for WaLIDD score in group 1 i.e., Myofascial release group. Table showed that the floor exercises total Baseline VAS in Pelvic group was 6.30 ± 1.06 and Post treatment VAS in Pelvic floor exercises group was 3.43 ± 0.63 with significant mean difference of 2.87 pre and post value. p value was significant > 0.05 for Pelvic floor exercises group. The table 5 also showed that baseline WaLIDD score in Pelvic floor exercises group was 9.80 ± 1.90 and Post treatment WaLIDD score in Pelvic floor exercises group was 5.50 ± 1.30 with significant mean difference of 4.3 and p value also significant in this group less than 0.05.

WaLIDD score in Myofascial release group before and after interventions					
Variables	**Mean ± SD**	**Df**	**t-value**	**Mean Diff**	***p value***
Baseline WaLIDD score in Myofascial release group	9.65± 2.12	10	23.106	5.82	.001
Post treatment WaLIDD score in Myofascial release group	3.83± 1.02				
WaLIDD score in Pelvic floor exercises group before and after interventions					
Baseline WaLIDD score in Pelvic floor exercises group	9.80± 1.90	10	16.323	4.3	.001
Post treatment WaLIDD score in Pelvic floor exercises group	5.50± 1.30				

Table 5: WaLIDD score in Myofascial release and Pelvic floor exercises group before and after interventions

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DISCUSSION

The main aim of the study was to compare the effects of myofascial release versus pelvic floor muscle exercises in women with primary dysmenorrhea. The results of current study showed that myofascial release and Pelvic floor muscle exercises are effective for treatment for PD, but Myofascial release *(p ≤0.001)* has greater effects on relieving PD Symptoms than the pelvic floor muscle Exercises after the treatment sessions. There was a significant Mean difference in the WaLIDD score for Myofascial release group (5.82) and Pelvic floor muscle exercises group (4.3) after treatment. *p value* is significant for both group but there was greater difference with Myofascial release than PFME group. Similarly different studies from previous literature showed Myofascial release is very effective for PD a similar study was done by Jingyun Xu *et al.,* that adding myofascial release *(p ≤ 0.01)* with biofeedback & electrical stimulation showed superior outcomes when compared with those biofeedback & electrical stimulation alone in women with Myofascial Pelvic Pain [21]. In contrast to our result, several studies found from literature in which other exercises or techniques proved to more effective technique than any other in improving the PD. For example, in 2021, Çelik and Apay research results showed that progressive relaxation exercises proved as an effective method for treatment of PD if these exercises performed on a regular basis. Çelik and Apay's study compared to this study shares the same *p value (p ≤ 0.001)* as both are significantly effective [4]. In contrast to our result, several studies found from literature in which exercises other than myofascial release proved to more effective technique in improving the PD. For example treadmill based aerobics Exercises have significant effects on pain, functional activates and quality of life in PD[22]. In the research conducted by , S Zainab *et al.,* core strengthening exercises showed significant effects in phase I and II but in Phase I doing core strengthening was most effective [23]. Elbandrawy AM, showed that Regular isometric and aerobic exercises with p value <0.001 are safe effective, and non-invasive treatment modality to reduce menstrual pain and improve menstrual symptoms. Author said that females having PD can do these exercises at every place that even do not need any cost. In current study these exercises including Pelvic Floor Strengthening Exercises *(p≤0.001)* are also effective in pain reduction caused by PD by strengthening the Pelvic Floor muscles [20]. N Ayubi said that regular aerobic exercise showed significant good results with *p value* to reduce symptoms related to PD / PD due to increased levels of hormone progesterone. While Omega 3 supplementation also showed significant improvements in PD by inhibiting prostaglandin production that are responsible for pain and uterine contractions in PD. Author said that both Aerobic exercise & omega 3 supplementation are effective methods to reduce pain in PD[24].

In contrast to our result, several studies found from literature in which other exercises or techniques proved to more effective technique than any other in improving the PD. For example, Berkiye Kirmizigil said that the functional exercises therapy proved an effective treatment option to reduce menstrual symptoms in PD [25]. G Tharani found that aerobic dance showed an effective option to reduce the pain and menstrual symptoms of PD and also helps to manage stress associated with menstrual cycle. Therefore, aerobic dance may be incorporated in treatment regimen as one of the conservative and non-pharmacological method to treat women with PD [17]. Resistance training proved a practical method to reduce symptoms associated with PD [26] while in current study myofascial release has greater effects on relieving PD Symptoms than the pelvic floor muscle Exercises after the treatment sessions. In contrast to our result, several studies found from literature in which other exercises or techniques proved to more effective technique than any other in improving the PD. For example, Samy A said that Zumba exercises are effective method to reduce the pain severity and duration thus suggesting that performing regular Zumba exercises might be a complementary treatment option for girls with PD [27]. Kirmizigil B said that a combined exercise therapy have a significant positive effects on pain, sleep quality in women with PD. The relieving effects of combined exercises on PD symptoms, severity of pain, sleep quality may be detected even starting from the 1st cycle. Author also said that combined exercises have moderate & large effect sizes on severity of pain, menstrual symptoms & sleep quality in women in clinical terms [25]. Although a very large number of studies found from previous literature for PD but studies assessing the effectiveness of myofascial release on PD are very few. The main aim of the study was to compare the effects of myofascial release versus pelvic floor muscle exercises in women with PD. The results of current study showed that myofascial release and Pelvic floor muscle exercises are effective for treatment for PD, but Myofascial release has greater effects on relieving PD Symptoms than the pelvic floor muscle.

CONCLUSION

It was concluded that myofascial release and Pelvic floor muscle exercises were effective for treatment for primary dysmenorrhea, but Myofascial release has greater effects on relieving primary dysmenorrhea Symptoms than the

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pelvic floor muscle Exercises after the treatment sessions.

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