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Original Article

The Impact of Gym Activities on Primary Dysmenorrhea Among Young Girls

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ABSTRACT

Background: Primary dysmenorrhea is a common gynecological condition among young girls and may impair daily activities, social participation, and quality of life. Physical activity has been proposed as a conservative strategy for reducing menstrual pain, but evidence among gym-going young girls remains limited. Objective: To assess the association between gym participation and self-reported change in primary dysmenorrhea severity among young girls. Methods: A descriptive observational study with retrospective paired self-report comparison was conducted among 121 unmarried young girls aged 16–24 years with primary dysmenorrhea who had participated in gym activities for 4–6 months. Participants were recruited from two gyms in Lahore, Pakistan, using non-probability convenience sampling. Dysmenorrhea severity was assessed using the WaLIDD score before gym participation by recall and after 4–6 months of gym participation as current status. Data were analyzed using descriptive statistics and paired-samples t-test. Results: The mean total WaLIDD score decreased from 6.95 ± 1.32 before gym activities to 4.07 ± 1.67 after gym activities, with a mean paired reduction of 2.88 points. The difference was statistically significant, $t = 14.58$, $p < 0.001$. Severe dysmenorrhea decreased from 33.9% to 6.6%, while mild dysmenorrhea increased from 3.3% to 72.7%. Conclusion: Gym participation was associated with lower self-reported dysmenorrhea severity among young girls, although prospective controlled studies are required to confirm causality. Keywords: Gym activities; primary dysmenorrhea; menstrual pain; WaLIDD score; young girls; physical activity.

INTRODUCTION

Primary dysmenorrhea is one of the most common gynecological complaints among adolescent girls and young women and is characterized by painful menstrual cramps in the absence of identifiable pelvic pathology. Reported prevalence varies widely across populations, ranging from mild discomfort to symptoms severe enough to impair academic performance, social participation, work productivity, sleep, and daily activities (1). The condition is primarily associated with increased endometrial prostaglandin production during ovulatory cycles, which intensifies uterine contractions, reduces uterine blood flow, and contributes to ischemic pain in the lower abdomen, often radiating to the back, thighs, or legs (2). Although pharmacological options such as non-steroidal anti-inflammatory drugs are commonly used, non-pharmacological strategies remain clinically relevant, particularly for young women who prefer conservative, accessible, and lifestyle-based approaches to symptom management (3).

Physical activity has been proposed as a potentially beneficial conservative strategy for reducing menstrual pain through several biological and psychosocial mechanisms. Exercise may improve pelvic

and systemic blood circulation, promote muscle relaxation, reduce stress and anxiety, and stimulate endogenous opioid release, including endorphins, which can alter pain perception and improve overall well-being (4). Regular physical activity is also associated with broader health benefits, including improved cardiovascular fitness, body composition, metabolic health, and psychological resilience, all of which may indirectly influence menstrual symptoms and functional tolerance during menstruation (5). In the context of primary dysmenorrhea, different forms of exercise, including aerobic activity, stretching, isometric exercise, flexibility training, and home-based exercise programs, have been reported to reduce pain intensity and improve quality of life among young women (6–9).

Despite growing evidence supporting exercise as a conservative approach for dysmenorrhea management, much of the available literature has focused on school- or university-based female populations rather than young girls already engaged in gym-based physical activity. Gym participation may represent a distinct behavioral exposure because it often involves repeated, structured, and purposeful exercise over several months, potentially combining aerobic conditioning, strengthening, stretching, and general fitness activities. However, the relationship between gym participation and perceived change in primary dysmenorrhea symptoms remains insufficiently described in local clinical and community settings, particularly among young girls in Pakistan.

Therefore, this study was conducted to assess the association between gym participation and self-reported change in primary dysmenorrhea severity among young girls. Using the Working Ability, Location, Intensity, Days of Pain, Dysmenorrhea score, the study compared recalled dysmenorrhea-related symptoms before gym participation with current symptoms after 4–6 months of gym activities among unmarried young girls with regular menstrual cycles. The research question was whether gym-going young girls with primary dysmenorrhea report lower dysmenorrhea severity after participation in gym activities compared with their recalled pre-gym symptom status.

MATERIAL AND METHODS

A descriptive observational study with a retrospective paired self-report comparison was conducted to assess the association between gym participation and self-reported change in primary dysmenorrhea severity among young girls. The study was carried out over six months, from May 2019 to October 2019, at Tonfit Gym, Tajbagh, Lahore, and International Gym, Moon Market, Lahore, Pakistan. The study population comprised gym-going unmarried young girls with primary dysmenorrhea who had participated in gym activities for 4–6 months. A non-probability convenience sampling technique was used to recruit eligible participants from the selected gym settings.

Participants were included if they were unmarried girls aged 15–25 years, had regular menstrual cycles, reported primary dysmenorrhea, and had been engaged in gym activities for 4–6 months. Participants were excluded if they reported secondary causes or comorbid conditions that could influence menstrual pain or physical activity tolerance, including endometriosis, fibroids, urinary tract infection, kidney disease, cardiac disease, hypertension, or other relevant medical conditions. Participants using special medications for related symptoms or those who were unwilling or unable to cooperate with data collection were also excluded. Primary dysmenorrhea was operationally defined as painful cramping in the lower abdomen during menstruation in the absence of pelvic pathology.

The sample size was calculated using the World Health Organization sample size calculator for health studies, using an expected prevalence of 0.15, a 95% confidence level, and 0.09 absolute precision, which produced a required sample size of 121 participants. Eligible participants were screened according to the predefined inclusion and exclusion criteria. After consent was obtained, data were collected using a self-administered questionnaire that included demographic and menstrual variables, including age, weight, height, body mass index, length of menstrual cycle, and medication history. Dysmenorrhea severity was assessed using the WaLIDD score, which evaluates four domains: working ability, location of pain, intensity of pain using the Wong-Baker pain scale, and days of pain. Each domain is scored from 0 to 3,

producing a total score ranging from 0 to 12, with higher scores indicating greater dysmenorrhea severity.

Participants were asked to report their dysmenorrhea-related symptoms before starting gym activities and their current symptoms after 4–6 months of gym participation. The main outcome was the change in total WaLIDD score from recalled pre-gym status to current post-gym status. Component-level outcomes included changes in working ability, pain location, pain intensity, and number of painful menstrual days. Gym participation was treated as the exposure of interest, defined by regular involvement in gym activities for 4–6 months, while dysmenorrhea severity measured by the WaLIDD score was treated as the primary outcome. Potential sources of bias included recall bias due to retrospective reporting of pre-gym symptoms, selection bias from convenience sampling, and confounding by factors such as body mass index, lifestyle, stress, analgesic use, menstrual cycle characteristics, and variation in exercise type or frequency.

Data were entered and analyzed using Statistical Package for Social Sciences version 20. Continuous variables were summarized using mean and standard deviation, while categorical variables were summarized using frequencies and percentages. Pre-gym and post-gym WaLIDD total scores were compared using a paired-samples t-test because the same participants provided both recalled baseline and current symptom scores. Statistical significance was assessed at a 5% level, and p-values less than 0.05 were considered statistically significant. The p-value for the paired comparison should be reported as $p < 0.001$ when the software output displays 0.000. Data integrity was maintained by using predefined eligibility criteria, a standardized data collection form, uniform scoring procedures for the WaLIDD scale, and review of entered data for completeness and consistency before analysis. Ethical approval was obtained from the Ethics Committee of Lahore College of Physical Therapy. Participants were informed about the purpose and nature of the study, their voluntary participation, and confidentiality of their responses. Consent was obtained before data collection, and participants were assured that their identities would not be disclosed in any report or publication resulting from the study.

RESULTS

A total of 121 young girls with primary dysmenorrhea who had participated in gym activities for 4–6 months were included in the analysis. The participants were aged 16–24 years, with a mean age of 21.11 ± 2.42 years. The mean body weight was 78.25 ± 11.77 kg, mean height was 1.61 ± 0.07 m, and mean body mass index was 30.23 ± 5.57 kg/m². The mean length of menstrual cycle was 5.79 ± 1.07 days.

Table 1. Participant Demographic and Menstrual Characteristics

Variable	n	Minimum	Maximum	Mean ± SD
Age, years	121	16.00	24.00	21.11 ± 2.42
Weight, kg	121	56.00	100.00	78.25 ± 11.77
Height, m	121	1.42	1.75	1.61 ± 0.07
Body mass index, kg/m²	121	21.97	47.26	30.23 ± 5.57
Length of menstrual cycle, days	121	3.00	8.00	5.79 ± 1.07

The study sample consisted of young girls with a relatively wide BMI range, from 21.97 to 47.26 kg/m². The mean menstrual cycle length was 5.79 ± 1.07 days, indicating that most participants reported menstrual bleeding duration within the expected clinical range.

Table 2. WaLIDD Component Categories Before and After Gym Activities

WaLIDD Component	Category	Before Gym Activities, n (%)	After Gym Activities, n (%)
Working ability	None	10 (8.3)	0 (0.0)
Working ability	Almost never	53 (43.8)	22 (18.2)
Working ability	Almost always	48 (39.7)	19 (15.7)
Working ability	Always	10 (8.3)	80 (66.1)
Location of pain	None	0 (0.0)	67 (55.4)
Location of pain	1 site	32 (26.4)	45 (37.2)
Location of pain	2–3 sites	75 (62.0)	8 (6.6)

WaLIDD Component	Category	Before Gym Activities, n (%)	After Gym Activities, n (%)
Location of pain	4 sites	14 (11.6)	1 (0.8)
Pain intensity	Does not hurt	0 (0.0)	70 (57.9)
Pain intensity	Hurts a little bit	19 (15.7)	39 (32.2)
Pain intensity	Hurts a little more / hurts even more	43 (35.5)	4 (3.3)
Pain intensity	Hurts a whole lot / hurts worst	59 (48.8)	8 (6.6)
Days of pain	0 days	0 (0.0)	67 (55.4)
Days of pain	1–2 days	88 (72.7)	53 (43.8)
Days of pain	3–4 days	31 (25.6)	1 (0.8)
Days of pain	≥5 days	2 (1.7)	0 (0.0)

WaLIDD component distributions showed lower symptom burden after gym participation. The proportion of participants reporting pain at no site increased from 0.0% before gym activities to 55.4% after gym activities. Similarly, 57.9% of participants reported no pain intensity after gym activities, whereas no participant was categorized as pain-free before gym activities. Severe pain intensity categories decreased from 48.8% before gym activities to 6.6% after gym activities. The proportion reporting 0 painful days increased from 0.0% to 55.4%, while those reporting 3–4 painful days decreased from 25.6% to 0.8%.

Table 3. Dysmenorrhea Severity Categories Before and After Gym Activities

Dysmenorrhea Severity	Before Gym Activities, n (%)	After Gym Activities, n (%)
Mild dysmenorrhea	4 (3.3)	88 (72.7)
Moderate dysmenorrhea	76 (62.8)	25 (20.7)
Severe dysmenorrhea	41 (33.9)	8 (6.6)
Total	121 (100.0)	121 (100.0)

Before gym activities, most participants were categorized as having moderate dysmenorrhea, followed by severe dysmenorrhea.

Table 4. Paired Comparison of Total WaLIDD Score Before and After Gym Activities

Outcome	Before Gym Activities, Mean ± SD	After Gym Activities, Mean ± SD	Mean Difference	95% CI	t	p-value	Cohen's dz
Total WaLIDD score	6.95 ± 1.32	4.07 ± 1.67	2.88	2.49 to 3.28	14.58	<0.001	1.33

After gym activities, the distribution shifted toward milder symptoms, with 72.7% categorized as mild dysmenorrhea and 6.6% remaining in the severe category. The proportion of severe dysmenorrhea decreased from 33.9% before gym activities to 6.6% after gym activities.

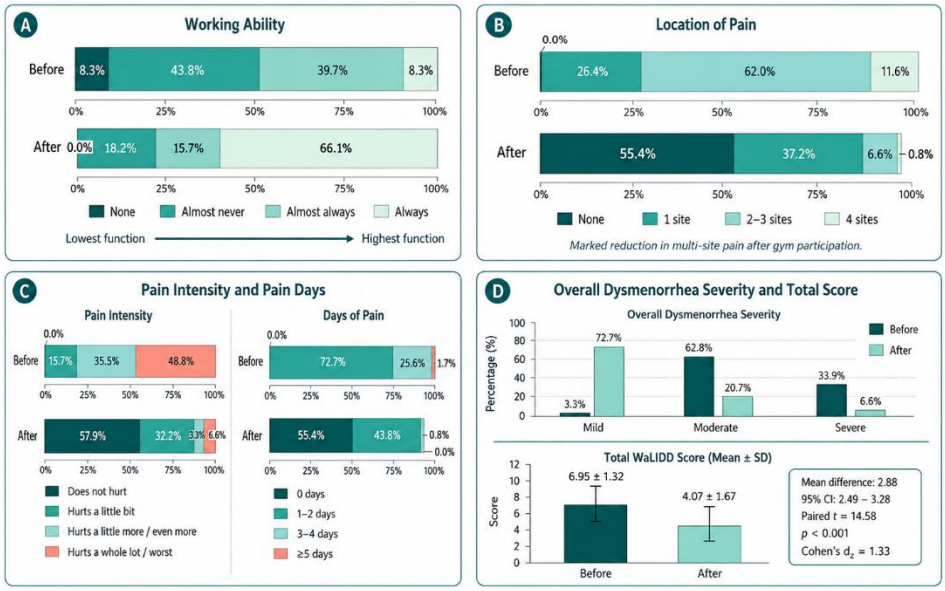

Figure 1 This multipanel figure shows that after 4–6 months of gym participation, young girls with primary dysmenorrhea reported clear improvement across WaLIDD domains: working ability shifted strongly toward the "always" functional category, pain location reduced from mostly multi-site pain to mostly no pain or one-site pain, pain intensity shifted from severe categories toward "does not hurt" or mild pain, and painful days decreased substantially. Overall dysmenorrhea severity improved from

predominantly moderate/severe before gym activities to predominantly mild afterward, with total WaLIDD score decreasing from 6.95 ± 1.32 to 4.07 ± 1.67.

The mean total WaLIDD score decreased from 6.95 ± 1.32 before gym activities to 4.07 ± 1.67 after gym activities. The mean paired reduction was 2.88 points, with a 95% confidence interval of 2.49 to 3.28. The paired-samples t-test showed a statistically significant reduction in total WaLIDD score after gym activities, $t = 14.58$, $p < 0.001$. The paired standardized effect size was large, with Cohen's $dz = 1.33$, indicating a substantial within-participant reduction in self-reported dysmenorrhea severity.

Overall, the results indicate that gym participation was associated with lower self-reported dysmenorrhea severity among young girls. Improvements were observed across all WaLIDD domains, including working ability, pain location, pain intensity, and number of painful days. However, because the study used a retrospective paired self-report comparison without a control group, these findings should be interpreted as an association with symptom reduction rather than definitive causal evidence of treatment effectiveness.

DISCUSSION

This study assessed self-reported changes in primary dysmenorrhea severity among young girls who had participated in gym activities for 4–6 months. The main finding was a reduction in total WaLIDD score from 6.95 ± 1.32 before gym activities to 4.07 ± 1.67 after gym activities, with a mean paired reduction of 2.88 points. The observed reduction was statistically significant, with a large within-participant standardized effect size, suggesting a clinically meaningful shift toward lower dysmenorrhea severity. Severity-category findings supported the same pattern: severe dysmenorrhea decreased from 33.9% before gym participation to 6.6% after gym participation, while mild dysmenorrhea increased from 3.3% to 72.7%. Improvements were also observed across WaLIDD components, including working ability, pain location, pain intensity, and number of painful days.

The findings are consistent with previous evidence suggesting that regular physical activity may be associated with reduced symptoms of primary dysmenorrhea. Aerobic exercise has been reported to reduce menstrual pain severity, possibly through improved blood flow, reduction of stress, and modulation of pain perception (6). Stretching exercises have also been associated with reduced dysmenorrhea intensity among adolescent girls, supporting the role of musculoskeletal and relaxation-based mechanisms in symptom relief (7). Similarly, physical activity interventions among female students have shown reductions in menstrual pain and related symptoms, particularly when activity is performed regularly (8). Home-based exercise has also been linked with improved quality of life and reduced pain among women with primary dysmenorrhea, further supporting exercise as a conservative and accessible approach for symptom management (9).

The reduction in pain intensity and painful days observed in this study may be explained by several plausible mechanisms. Exercise may promote endogenous opioid release, including endorphins, which can reduce pain perception. Physical activity may also improve pelvic circulation, reduce ischemic discomfort during uterine contractions, promote relaxation of abdominal and pelvic musculature, and reduce psychological stress, all of which may contribute to lower perceived menstrual pain. These mechanisms are consistent with broader evidence on the health benefits of regular physical activity and its positive effects on pain modulation, mood, and general physical functioning (4,5). However, because this study used a retrospective paired self-report comparison rather than a prospective controlled design, these mechanisms should be interpreted as biologically plausible explanations rather than confirmed causal pathways.

A strength of this study is that it focused on young girls already participating in gym-based activities, a population less frequently examined in dysmenorrhea research compared with school- or university-based samples. The use of the WaLIDD score also allowed dysmenorrhea severity to be assessed across multiple clinically relevant domains, including work ability, pain distribution, intensity, and duration.

The sample size of 121 participants provided sufficient descriptive information to identify a clear shift in symptom profile after gym participation.

Despite these strengths, several limitations must be considered. First, the study design does not establish causality because there was no control group, randomization, or prospective baseline assessment. Second, pre-gym symptoms were based on participant recall, which may introduce recall bias. Third, the use of non-probability convenience sampling from two gyms limits generalizability to all young girls with primary dysmenorrhea. Fourth, gym exposure was not quantified in terms of frequency, intensity, duration per session, type of exercise, adherence, or supervision, which limits reproducibility and prevents dose-response interpretation. Fifth, potential confounders such as analgesic use, stress, sleep, diet, body mass index, menstrual regularity, and lifestyle differences were not controlled statistically. Finally, the inclusion of participants below 18 years requires explicit documentation of guardian consent and participant assent in the final manuscript.

Overall, the findings suggest that gym participation was associated with lower self-reported dysmenorrhea severity among young girls. However, future research should use prospective controlled or randomized designs, standardized exercise protocols, objective adherence monitoring, and adjustment for important confounders. Further studies should also compare different exercise types and doses to determine which gym-based activities are most effective for reducing primary dysmenorrhea symptoms.

CONCLUSION

Among young girls with primary dysmenorrhea, gym participation for 4–6 months was associated with lower self-reported dysmenorrhea severity, reflected by reduced total WaLIDD scores and a shift from severe and moderate categories toward mild dysmenorrhea. Improvements were observed across working ability, pain location, pain intensity, and number of painful days. However, because the study used an observational retrospective paired self-report design without a control group, the findings should be interpreted as an association rather than definitive evidence of a causal treatment effect. Prospective controlled studies with clearly defined exercise protocols are needed to confirm the role of gym-based physical activity in primary dysmenorrhea management.

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