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Original Research Article

Effect of suryanamaskar on pain, workability and quality of life in college students with primary dysmenorrhea: an experimental study

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ABSTRACT

Background: Dysmenorrhea is a common gynecological issue affecting women of all ages, especially adolescents and young adults, affecting 67% to 90% of women aged 17-24 years. Pain in dysmenorrhea can severely impact daily life, leading to reduced concentration, absenteeism from college or work, and limited social engagement. These limitations directly affect quality of life, a concept defined by the World Health Organizations. Women with dysmenorrhea often experience lower quality of life scores, especially in areas such as physical functioning, bodily pain, general health, and vitality. Pharmacological treatments like NSAIDs and oral contraceptives are commonly used but may not be suitable for all. Yoga, particularly surya namaskar, has gained recognition as a safe and holistic approach.
Methods: Sixty college going students participated in this study. Participants were selected based on the inclusion and exclusion criteria. Subjects were given suryanamaskar thrice a week for 8 weeks. Pre and post assessment was taken using three outcome measures that is numerical pain intensity scale (NPRS), work ability index score (WAI) and World Health Organization quality of life scale-Bref (WHOQOLBREF).
Results: The present study included 60 female participants with a mean age of 22.15±2.02years. All changes were statistically significant (p=0.001), indicating that regular practice of surya namaskar had a substantial positive effect on pain reduction, work ability, and overall quality of life in females with primary dysmenorrhea.
Conclusions: The study concluded that suryanamaskar is effective in reducing pain, enhancing workability and improving quality of life in college students with primary dysmenorrhea.

Keywords: Pain, Primary dysmenorrhea, Quality of life, Suryanamaskar, Work ability

INTRODUCTION

Menstruation is a natural and essential biological process in which the uterus sheds its lining, resulting in bleeding through the vagina, typically occurring in a monthly cycle among individuals with female reproductive systems, beginning during puberty and continuing until menopause.[1] This process is regulated by hormonal changes and plays a crucial role in reproductive health, signifying that the body is capable of reproduction.[2]

Normal menstruation is currently defined as cyclic bleeding that occurs from the uterine corpus between menarche and menopause allowing fertilization and pregnancy.[3]

For women, menstrual health is an integral part of overall health because, menstruation can have significant impact on physical, mental and social wellbeing.[4] Although its natural phenomenon, many girls face problems of menstruation such as irregular bleeding, excessive bleeding and painful menstruation.[5]

The term dysmenorrhea originates from ancient Greek, combining three components: "dyes-" meaning difficult or painful, "men" meaning month, and "-rhea" meaning flow. Collectively, the term translates to "difficult menstrual flow".[6]

Dysmenorrhea is one of the familiar gynecological problems in all women regardless of age or race. The prevalence of dysmenorrhea is 78.4% in medical students. Dysmenorrhea is caused by excessive production of hormone vasopressin which is responsible to stimulate muscle contraction in the uterus.[7] They are further classified into two types based on pathophysiology. Primary dysmenorrhea is generally not associated with any identifiable pelvic pathology. Secondary dysmenorrhea generally implies to the one that is associated with the presence of organic pelvic pathology i.e. fibroids, adenomyosis, PID and endometriosis.[8]

Primary dysmenorrhea is defined as colic pain in the suprapubic region with radiation to lumbar region and thighs that occurs before or during menstruation in absence of pelvic illness.[8] The pain typically lasts from 8-72 hours and it is more severe on first and second day of menstruation.[9]

Primary dysmenorrhea is an important clinical cause in young girls for work absenteeism, thus having negative effect on QOL.[10] Work ability is defined as the relationship between individual resources and work demand, and low work ability hence reflects a discrepancy between individual resources and work demand.[11] Pain and discomfort associated with dysmenorrhea can lead to poor work ability by influencing energy levels, mood, cognitive performance, and motivation.[12]

Studies indicate that nearly 50-90% of young women experience some form of dysmenorrhea, with a notable proportion reporting interference with daily activities, reduced concentration, absenteeism, and decreased productivity.[13] An estimated 15% of adolescent females describe their pain as severe, impacting their quality of life. These adolescents can miss 1 to 3 days of school per menstrual cycle.[14]

The term health related QOL refers to health aspect of QOL which is generally thought to reflect the impact of illness and treatment on disability and daily functioning.[15] Considering all this it shows that primary dysmenorrhea not only affect health related quality of life, but it affects overall quality of life of women and adolescent girls.[16]

Other forms of non-pharmacological treatments such as aromatherapy, acupuncture, massage, topical heat, transcutaneous electrical nerve stimulation, behavioral interventions, dietary therapies, are increasingly attracting attention for treatment of dysmenorrhea.[17]

Yoga is a type of mind-body exercise that combines physical body with a conscious mental emphasis. In case of dysmenorrhea, yoga suppresses the pain by lowering the level of prostaglandin production and myometrial ischemia.[18]

Regular practice of suryanamaskar ensures proper and efficient functioning of not only the muscles and joints of the body but also stimulates the internal organs. Especially the stomach and other abdominal organs as it involves alternative stretching and compression at the abdominal area.[19]

Yoga suryanamaskar is an ancient yoga movement which has three aspects namely form, vital energy and rhythm. In addition, relaxation techniques in yoga can stimulate the body to release endogenous opioid that is endorphin and enkephalin (a compound that works to inhibits pain).[20] Suryanamaskar, or sun salutation, is a dynamic sequence of yoga postures that integrates physical movement with controlled breathing and mindfulness. This practice has been recognized for its potential benefits in enhancing physical fitness, reducing stress, and improving mental well-being.[21]

Recent studies have explored its efficacy as a non-pharmacological intervention for managing primary dysmenorrhea. Practiced regularly, suryanamaskar improves cardiovascular health, muscular flexibility, hormonal balance, and emotional stability. Each movement in the sequence stretches, compresses, and tones different muscles and organs, enhancing blood circulation and reducing muscle spasms- factors crucial in the management of dysmenorrhea.[21]

Numerous studies have documented the physiological benefits of suryanamaskar in improving reproductive health outcomes.[22] A randomized controlled trial by Rakhshaee demonstrated that yoga therapy significantly reduced the intensity and duration of pain in women with primary dysmenorrhea.[22]

Pain and discomfort caused by dysmenorrhea have also been shown to reduce work ability- a concept that encompasses not just occupational capacity, but also academic performance and ability to carry out daily tasks. For students, this translates to absenteeism from classes, reduced participation in extracurricular activities, and diminished academic productivity.[23]

Previous studies have demonstrated that young females affected by dysmenorrhea often miss work or school because of discomfort, which in turn can have an important social and economic impact.[24]

Furthermore, dysmenorrhea is closely linked to a lower quality of life (QoL), affecting domains such as physical functioning, emotional well-being, and social interactions.[25] A 2018 study published in Complementary Therapies in Clinical Practice found that a structured

yoga intervention significantly improved quality of life scores among university students with dysmenorrhea. The incorporation of yoga practices has been associated with improved concentration, reduced stress levels, and enhanced coping mechanisms, thereby positively influencing academic performance and work ability.[26]

Beyond pain relief, suryanamaskar practice has been linked to improvements in various QOL domains, including physical health, emotional well-being, and social functioning. These benefits are attributed to the holistic nature of yoga, which addresses both physical and psychological aspects of health.[27]

By practicing surya namaskar each cell of body gets revitalize and regenerated. Practice of surya namaskar at same time helps in spiritual awakening and results in expansion of awareness. With such profound effects on body, practice of Surya namaskar is highly recommended by all yoga experts for healthy routine life.[21]

METHODS

Population and sample

An experimental pre-post intervention study was conducted among female college students aged 18-25 years with primary dysmenorrhea. Participants were recruited using convenience sampling. Sixty students who met the inclusion criteria completed the study. The study was started in June 2024 and was conducted for one year by June 2025.

Data collection tools

Data was collected by using WALIDD score.

Inclusion criteria

Age group 18-25 years old, WaLIDD score :1-7 (mild to moderate dysmenorrhea), English speaking College students having primary dysmenorrhea. Experiencing a regular menstrual cycle, defined as a cycle length between 24 to 35 days. Dysmenorrhea pain interfering with functional and daily activities.[7]

Exclusion criteria

Taking any medications for dysmenorrhea.[7] Recent surgeries.[10] Participants which were physically and mentally challenged. Coronary heart disease, Recent cardiac surgeries.[19] Hernia or intestinal TB.[19] Any chronic illness. Sports/physical training on regular basis.

Procedure

The intervention consisted of a structured suryanamaskar program conducted for 8 weeks, three times per week. Each session included warm-up exercises followed by 12 standardized postures of suryanamaskar performed with controlled breathing and concluded with relaxation in Shavasana. The number of rounds was progressively increased from 6 to 12. The intervention was initiated from the sixth day of the menstrual cycle and continued for two menstrual cycles, excluding days of menstruation.

Ethical approval was obtained from the institutional ethical committee, and written informed consent was obtained from all participants.

Statistical analysis

Data were analyzed using SPSS version 23. Continuous variables were expressed as mean and standard deviation. Normality was assessed using the Shapiro-Wilk test. Pre- and post-intervention comparisons were performed using the Wilcoxon paired sample test, with $p<0.05$ considered statistically significant.

RESULTS

Demographic data

The Figure 1 represents that study consisting of 60 subjects with mean age of 22.15±2.02.

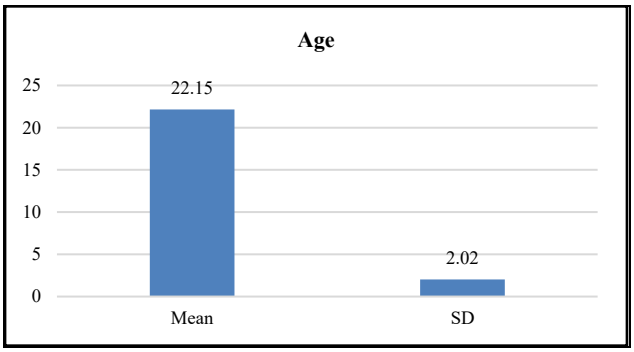

Figure 1: Demographic data.

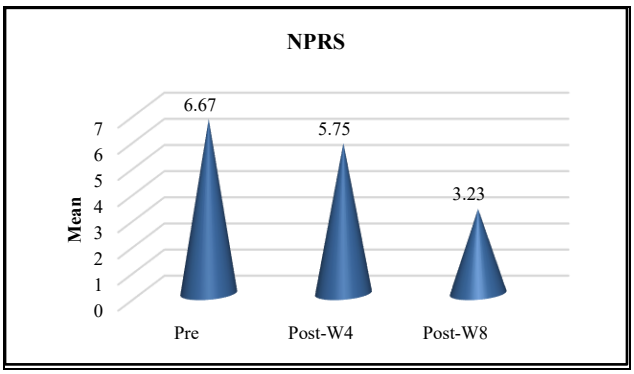

Figure 2: Effect of suryanamaskar on NPRS in females with primary dysmenorrhea.

The Figure 2 represent comparison of pre and post intervention (1st cycle and 2nd cycle) values of NPRS in subjects. It shows that pain reduced significantly with p value of 0.001.

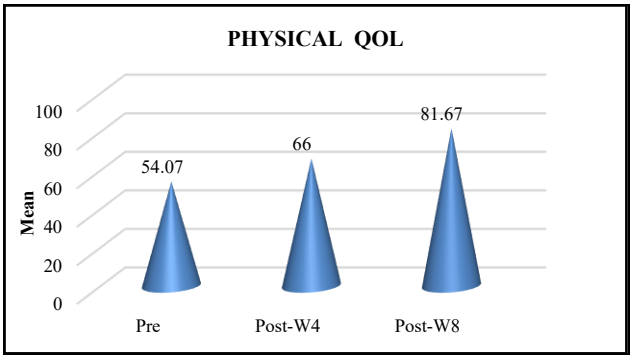

Figure 3: Effect of suryanamaskar on physical domain of quality of life in females with primary dysmenorrhea.

The above graph represents comparison of pre and post intervention (1st cycle and 2nd cycle) values of physical domain of quality of life in subjects. It shows that physical domain score increased significantly with p value of 0.001.

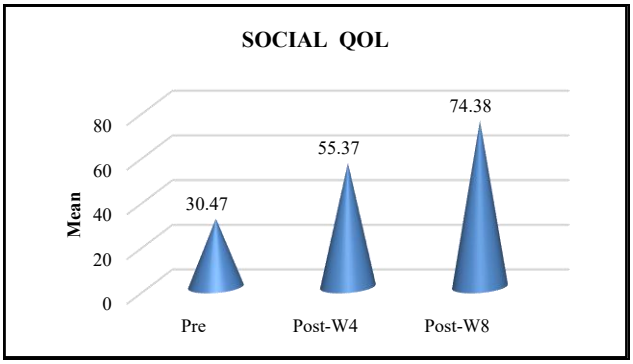

Figure 4: Effect of suryanamaskar on social domain of quality of life in females with primary dysmenorrhea.

The above graph represents comparison of pre and post intervention (1st cycle and 2nd cycle) values of social domain of quality of life in subjects. It shows that social domain scores increased significantly with p value of 0.001.

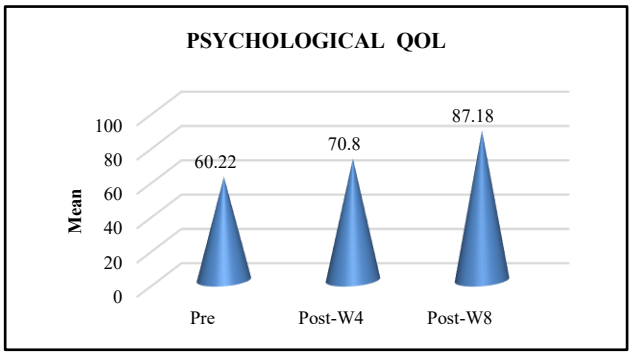

Figure 5: Effect of suryanamaskar on psychological domain of quality of life in females with primary dysmenorrhea.

The Figure 5 represents comparison of pre and post intervention (1st cycle and 2nd cycle) values of psychological domain of quality of life in subjects. It shows that psychological domain score increased significantly with p value of 0.001.

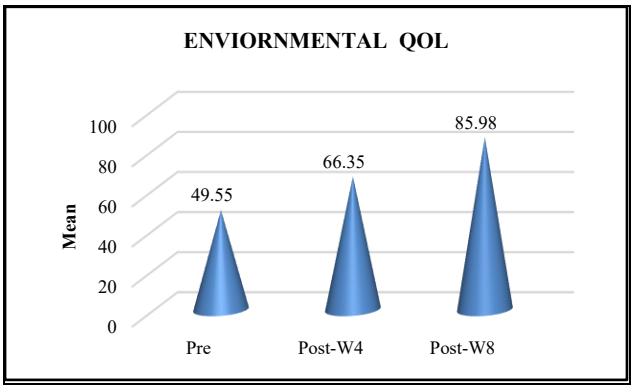

Figure 6: Effect of suryanamaskar on environmental domain of quality of life in females with primary dysmenorrhea.

The above graph represents comparison of pre and post intervention (1st cycle and 2nd cycle) values of environmental domain of quality of life in subjects. It shows that environmental domain scores increased significantly with p value of 0.001.

DISCUSSION

Menstrual pain can be severe and uncomfortable, making the menstrual cycle difficult to manage especially for college students. Many women find it hard to carry out their daily activities during this time; some even need to stay in bed, while others rely on painkillers just to get through the day.[28]

So, the present study aimed to evaluate the effectiveness of surya namaskar- a dynamic yogic sequence combining physical postures, breath control, and mindfulness- on pain intensity, work ability, and quality of life in college students diagnosed with primary dysmenorrhea. Female college students (mean age: 22.11±2.03 years) were recruited and evaluated using the numerical pain rating scale (NPRS), work ability index (WAI), and WHO quality of life-BREF (WHOQOL-BREF).

In this study, subjects were found to have complained of pain, lack of concentration, reduced work ability, etc. So, pain was the primary symptom targeted by the intervention.

The nature of menstrual pain disrupts daily functioning, leading to absenteeism and dependence on analgesics. Studies suggest that pain during menstrual cycle is caused by excess production of prostaglandins, which increase uterine contractions.[29]

Various studies have shown that there is decrease in pain after doing yoga. Regular yoga practice has been shown to reduce inflammatory markers like prostaglandins and interleukins, thereby easing uterine cramping and pain.[30] So the present study targeted effect of suryanamaskar on pain.

It was seen that the alternate stretching and compression in suryanamaskar postures (e.g., bhujangasana, ashwa sanchalanasana) improve circulation to the pelvic region, reducing congestion and ischemia that often contribute to reduction in pain. Gentle activation and stretching of abdominal, pelvic, and lumbar musculature relieve muscular tension, which reduce pressure on uterine nerves, and enhance core stability.[31]

Apart from improving blood flow and reducing stress, in our study it was seen that suryanamaskar helps reduce menstrual pain in another way- by changing how the brain processes pain. The regular practice of slow, focused movements with breathing helps the brain become better at handling pain signals, making the pain feel less intense. It also improves awareness of the body, so instead of reacting strongly to discomfort, the person feels calm. This better connection between the mind and body helped reduce the emotional reaction to pain, making it easier to manage without medicine.

This shows that suryanamaskar reduce pain not just physically, but by also changing how pain is felt and responded to in the mind. Suryanamaskar, being a dynamic sequence, combined physical postures, controlled breathing, and meditative focus, gives both physiological and psychological benefits.[32]

As suryanamaskar involved rhythmic, symmetrical, and repetitive physical movements that stimulate large-diameter A-beta fibers, which inhibit the transmission of pain signals from C and A-delta fibers at the spinal cord level- aligning with the gate control theory of pain. Moreover, by the neuroendocrine model regular yoga led to a reduction in cortisol and an increase in endorphin levels, thereby modulating the menstrual cycle and reducing associated symptoms. These all mechanisms contributed to decrease in pain.[33]

In our study, NPRS scores significantly decreased at both 4 and 8 weeks of intervention, with more profound improvements by week 8, indicating the cumulative benefits of continued Surya Namaskar. These results align with existing literature demonstrating the analgesic effects of yoga. Yang and Kim reported a VAS pain reduction of −0.94 (p=0.001) in a 12-week yoga RCT with nursing students.[34] Furthermore, Kim, a systematic meta-analysis of four RCTs involving 230 participants reported a strong effect size (SMD=−2.09; p=0.031), reinforcing yoga's overall efficacy in reducing menstrual pain.[28] These findings affirm our observation that initial improvement is seen by the first cycle (4 weeks), with greater benefits by 8 weeks- demonstrating the cumulative impact of consistent practice.

With regard to work ability, menstrual pain significantly compromises a student's work capacity and academic performance. In our study the women who mentioned usual menstrual pain were more willing to request sick leave due to this reason, as they felt that it had precluded them from leading a normal life at least once. Students with more severe pain were more likely to sick leave from academic responsibilities, and their performance was notably affected. This is in line with what was found in other studies, where the women who had more somatic symptoms related to menstruation were more willing to interrupt their work for this reason.[35]

Student's concentration was found to be more disrupted among those with primary dysmenorrhea, especially with moderate-to-severe pain in our study. Our study demonstrates that regular Surya Namaskar can mitigate this, enhancing both perceived and actual work capacity.

Enhanced work ability can be explained by decreased absenteeism as pain reduction allowed students to attend classes more consistently and concentrate better. Secondly, the aerobic and rhythmic nature of suryanamaskar enhances cardiovascular endurance and mitochondrial activity, improving stamina and reducing fatigue. With less pain and improved emotional regulation, participants experienced lower stress and anxiety which lead to increase in their work ability.[36]

In our study, WAI scores improved notably at both checkpoints, reflecting better stamina, concentration, and participation in academic activities. Though limited, relevant literature supports this trend. Karimi et al found that students with more menstrual pain had lower work ability and as pain reduced work ability was increased.[15]

Regarding quality of life, it was found that menstrual discomfort negatively impacts several domains of daily living. So, the study focused analysis on the four core WHOQOL-BREF domain scores (physical, psychological, social, and environment) excluding overall quality of life and general health, to allow a more targeted evaluation of domain specific influences.

In our study, it was observed that it affected the productivity of students through an increased rate of school absenteeism, poor academic performance, and poor social relationships with friends and families. In our study, we found that students who had more menstrual pain were less able to carry out their daily tasks and study well. The pain affected different areas of their lives. Physically, students felt tired, had cramps, and were less active. Psychologically, many felt low, anxious, or found it hard to concentrate. Socially, some avoided talking to friends or joining activities. Even the environmental domain was affected, as their comfort at college or home

and their access to needed health services were limited during painful days.

In our study, WHOQOL-BREF scores improved significantly across all domains by week 8. Our study found that suryanamaskar helped improve the overall quality of life in students with primary dysmenorrhea by positively influencing all major domains.

In the physical domain, regular practice reduced menstrual pain and fatigue by improving blood circulation and strengthening abdominal and pelvic muscles. Students reported better energy levels and ease in performing daily tasks.[37]

In the psychological domain, suryanamaskar supported emotional regulation through breathing and relaxation, which stimulated the vagus nerve and reduced stress. Hormonal balance also improved, leading to better mood, sleep, and appetite.[38]

In the social domain, students experienced improved self-confidence and were more willing to interact with others, reducing feelings of isolation during menstruation.[39]

In the environmental domain, they felt more comfortable in their daily surroundings and less dependent on medication or external support.[40]

These combined effects show that Suryanamaskar is an effective mind-body intervention that supports both physical relief and psychosocial well-being in individuals with primary dysmenorrhea. Quality of life improvements were evident at both 4 and 8 weeks, demonstrating that dynamic suryanamaskar not only eases physical symptoms but also positively affects emotional and functional aspects.

Our findings regarding improved WHO QOL BREF scores are supported by systematic evidence. Prabhu et al non-randomized trial among adolescent school children, incorporated six to eight minutes of suryanamaskar into a yoga-breathing-mindfulness package over six months and found statistically significant reductions in emotional problems (p=0.001), peer difficulties, conduct issues, and hyperactivity- highlighting improved mental health and social adaptation.

This study established the interconnectedness of pain, work ability, and quality of life in college students with primary dysmenorrhea. Pain serves as the central disturbance, leading to poor work engagement and diminished quality of life. As pain reduces, both work ability and QOL improve. Our data revealed initial benefits in all three domains by the 4th week. By the 8th week, there was a greater and statistically significant improvement, showing that the benefits of yoga increase gradually over time with regular practice.

Our findings align with existing literature, Sengupta et al conducted a 12-week home-based yoga program (~30 minutes twice weekly) among non-athletic women aged 18-22 which resulted in significant improvements in menstrual pain, physical fitness, and quality of life, compared to controls.

Limitation of the study are small sample size and lack of control group

CONCLUSION

The study concluded that suryanamaskar is effective in reducing pain enhancing workability and improving quality of life in college students with primary dysmenorrhea.

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