

The Effectiveness of Stretching Exercise and Yoga Asana in Treatment of Primary Dysmenorrhea in Young Females.

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DOI: 10.29322/IJSRP.X.X.2018.pXXXX

<http://dx.doi.org/10.29322/IJSRP.X.X.2018.pXXXX>

Abstract- Menstruation is the regular intrauterine bleeding of female after puberty. There are various physical and mental pain by menstruation is called dysmenorrhea. Few studies on the yogic exercise shows that certain yoga poses control the stress and pain of dysmenorrhea and has a positive effect if practiced regularly. The stretching also has a reducing effect on pain as stretching is associated with increased endorphin production. **Aim of the study:** To determine the effect of stretching exercise and yoga asana in relief of pain and improving quality of life. **Study design:** A Research with experimental design was performed in 2 group's. **Methodology:** 8 weeks comparative study to evaluate the effectiveness of stretching exercise versus yoga asana for primary dysmenorrhea. One group was given active stretching exercise and other group was given yoga asana actively. 10 repetitions of every stretching exercise and yoga asana done with 5 second hold. NPRS, QOL and WALLID score was taken for pain scale before starting the treatment and after the menstruation to compare the effectiveness of treatment. **Result:** A significant decrease was found in pain and quality of life in both the groups ($p < 0.005$). The result showed statistical improvement in quality of life and wallid score. But there was no any significant difference found between stretching group and yoga group for NPRS score. **Conclusion:** Both stretching and yoga technique are shown to have effect on improving PAIN, QOL scale and WALIDD score. The stretching technique was found clinically more effective in improving QOL and WALIDD score than yoga asana in subjects with primary dysmenorrhea. However there is no significant difference found in improving pain between both the groups stretching and yoga group.

Key words: - Primary Dysmenorrhea, Young girls, Active Stretching, yoga.

INTRODUCTION

Menstruation is the regular intrauterine bleeding of female after puberty⁽¹⁾. There are various physical and mental pain by menstruation is called dysmenorrhea⁽¹⁾. Dysmenorrhea comes from Greek word describes painful menstruation⁽²⁾. It also define as the presence of painful cramp of uterine origin during menstruation⁽³⁾. Dysmenorrhea is cyclical lower abdominal or pelvic pain which may also radiate to the back and thighs (It occurs before or during menstruation or both^(1, 4)). It is a common symptom of various gynaecological disorder, but it also occur in most women as a primary form of disease⁽³⁾. The statement was given by the World Health Organization that dysmenorrhea is the most important cause of chronic pelvic pain⁽⁵⁾. Hyper secretion of

prostaglandins and increased uterine contractility may cause the pain associated with dysmenorrhea⁽¹⁾

Some women (3 % to 33%) have very severe pain that they can't able to work in normal way for 1 to 3 days each menstrual cycle, which restricts the activity and increase absence from school or work. It also leads to a lower academic performance in adolescents, and poor quality of sleep, and affect the mood, causing anxiety and depression. Dysmenorrhea also effect on quality of life, more than half of the girls have reported poor QOL⁽⁶⁾. Dysmenorrhea is also associated with Premenstrual Symptoms (PMS). PMS were divided into physical and psychological symptoms^(6,7). Nausea, leg cramps, dizziness, fatigue, abdominal pain and breast pain were considered as physical symptoms, whereas anxiety, irritability and emotional instability were considered^(6, 8, 9). Dysmenorrhea is more in the first day and rarely continues to next day. Primary dysmenorrhea stops spontaneously after 1-3 years; but sometimes it is possible to continue until childbirth⁽¹⁰⁾. The primary dysmenorrhea is so common in young women and the prognosis of it is good. The cause of primary dysmenorrhea is not well found still some responsible cause has been identified that the hyper-production of uterine prostaglandins, particularly of PGF2a and PGF2, which is associated which increased uterine tone and high-amplitude contractions Which highest secreted during the first two days of menstruation^(3, 11). Progesterone control the production of the prostaglandin: when progesterone level drop, immediately prior to menstruation, prostaglandin level increase.⁽¹²⁾

Different type of medical treatment physiotherapy treatment and other treatment are used to relieve dysmenorrhea^(1,12). The side effects of the medications are nausea, breast tenderness, and intermenstrual bleeding, dizziness, drowsiness, hearing and visual disturbances^(9,10). Non pharmacological treatment includes physical therapy, yoga, heating-pad, massage, taping, aerobics and Swiss ball exercises are used which effectively reduce pain and discomfort⁽¹⁾. There is also some evidence of a dose-response relationship between exposure to environmental tobacco smoke and increased incidence of dysmenorrhea⁽¹³⁾. Few studies on the yogic exercise shows that certain yoga poses control the stress and pain of dysmenorrhea. Yoga has a positive effect if practiced regularly⁽¹⁴⁾. Mechanical explanation for the effect of yoga on mental and physical health is reduction in sympathetic nervous system tone and increases in vagal activity⁽¹⁵⁾.

The stretching helps in reducing effect of pain due to stretching is associated with increased endorphin production⁽¹⁶⁾. Stretching exercise increased elasticity and strengthen the spine and pelvic muscle, the diaphragm becomes more elastic and strong, oxygenation and other fluid are circulated properly to uterus,

decrease pain of joints and backache, stimulate the appetite and bowel action, anemia decrease and free flow during menstruation, and maintain the hormone balance⁽¹⁷⁾. As there is various treatments available for the dysmenorrhea, there is a need for a standard treatment protocol, which will have good result of reduction in pain and improving the quality of life⁽¹⁾. This study designed to compare two type of treatment technique stretching and yoga asana to treat female with primary dysmenorrhea.

METHODOLOGY

Study Design-Experimental pre-test – post-test study design

Study Population - Primary dysmenorrhea Sampling Technique-Convenient Sampling, **Sample size** was calculated on G* power software on the basis of mean of pain intensity of the previously reported study from a similar population of patients with primary dysmenorrhea effect size 0.5025 and significance level of 0.05 and 0.80 power was selected. These criteria led to an estimated sample size of 23 participants in each group and to take into account a probable no drop out, the sample size is enhanced to 23 in each group so total 46 patients were included in this study.

Study Duration- 6 month, **Source of Data Collection**-S.S. Agrawal Institute of Physiotherapy, Navarra. **Inclusion Criteria** - Age (18-22) years, Primary Dysmenorrhea, Unmarried, Pain intensity 6-8, Non-Athletes, Willingness to participate **Exclusion Criteria** Psychiatric Disorder, Secondary Dysmenorrhea, Yoga Practice, Pharmacological method, Disease in genital organ, Systemic disease **Tools And Materials** Pen, Informed consent form Data, recording sheet Yoga mat Questionnaire - NPRS scale WALIDD Score QUALITY OF LIFE score sheet.

Procedure:

The purpose of this study was explained and a written informed consent was obtained from all the subjects. The study procedure was conducted through assessing patients, initial recording, treatment and final recording. Forty six participants volunteered to be a part of this study based on the inclusion and exclusion criteria were allocated into two groups, group A (stretching group) and group B (yoga group) by using quasi-randomization procedure as follows. First subject was allocated to Group A, second visiting subject to Group B once they fulfilled the inclusion and exclusion criteria. The same sequence of procedure was followed Throughout for consecutive subjects.

• Descriptions of groups were as follows:

• Group A (stretching group): patients were administered stretching technique actively.

• Group B (yoga group): patients were administered yoga actively. All the patients completed demographic details and physical examination performed by the researcher. On the first day of the study all subjects underwent a baseline assessment prior to any intervention using Questionnaire like QOL Scale, NPRS and WALIDD Score. All the measurements were taken by the researcher of the study.

Sequence of Stretching exercise Group A (stretching group)

All the 23 patients had received active stretching for 5 days a week, up to 8 weeks.

Procedure: Information was given to participants of group (A) to do 6 stretching exercises for 8 weeks (5 days per week and 1 times per day for 10-15 minutes). They were asked to avoid performing stretching exercises during the period cycle. They were given a

questionnaire prior to the stretching exercises and completed it after 8 weeks of stretching exercises.

The information about the active stretching exercises were given to the subjects prior to starting the exercise followed by warm-up exercises.

The prescribed exercises were as follows:

The first stretching exercise:



(Figure: 1)

Procedure:

The starting positions of the subjects were stranding.

The subjects were asked to stand and bend trunk forward from the hip joint. In that the shoulders and back were positioned on a straight line so that the upper body was placed parallel to the floor. The subjects were asked to hold this position for 5 seconds and 10 repetitions were done.

The second stretching exercise



(Figure: 2)

Procedure:

The starting positions of the subjects were stranding.

The subjects were requested to stand then raise 1 heel off the floor, hold this position for 5 seconds then raise the alternate heel and again hold it for 5 second. The subjects were asked to repeat the exercise 10 times.

The third stretching exercise



(Figure: 3)

Procedure:

The starting positions of the subjects were stranding.

The subjects were asked to spread their feet shoulder width, place trunk and hands in forward stretching mode. Then subjects were

asked to completely bend their knees and maintain a squatting position. The subjects were asked to hold this position for 5 second. Then raised their body and repeated the same movements 10 times.

The fourth stretching exercise:



(Figure: 4)

Procedure:

The starting positions of the subjects were standing. The subjects were asked to spread her feet wider than shoulder width. Then the subjects were asked to bend and touch left ankle with their right hand while putting their left hand in a stretched position above their head so that the head was in the middle and their head was turned and looked for their left hand. The subjects were asked to maintain this position for 5 seconds. This exercise was repeated for the opposite foot with the same method. The exercises were repeated alternatively 10 times for each side of the body.

The fifth stretching exercise:



(Figure: 5)

Procedure:

The starting positions of the subjects were supine. The subjects were asked to lie down in supine position so that the shoulder, back, and feet were kept on the floor. Then the subjects were asked to bend the knees with the help of their hands and reach to their chin. The subjects have to hold this position for the 5 seconds and repeat this exercise for 10 times.

The sixth stretching exercise:



(Figure: 6)

Procedure:

The starting positions of the subjects were standing.

The subjects were asked to stand against a wall and put their hands behind their head and elbows pointed forward in the direction of the eyes then without bending the vertebral column, the abdominal muscle wall was contracted for 5 seconds. This exercise was repeated 10 times.

Sequence of Yoga

Group B (yoga group):

Information was given to participants of group (B) to do 6 yoga asana for 8 weeks (5 days per week and 1 times per day for 10-15 minutes). They were asked to avoid performing yoga asana during the period cycle. They were given a questionnaire prior to the stretching exercises and completed it after 8 weeks of stretching exercises.

The prescribed exercises were as follows:

Vajarasana :



(Figure: 7)

Procedure:

The starting position of the subjects were to sit on the heels with the calves beneath the thighs. A four finger gap was kept between the kneecaps and the first toe of both the feet touch each other and sit erect. This position was maintained for 5 seconds, returned back to the starting position and repeated for 10 times.

Utrasana :



(Figure: 8)

Procedure:

The starting position of the subjects were kneeling. It is a deep backward bend from a kneeling position; the completed pose has the hands on the heels. The backs of the feet may be flat on the floor or the toes may be tucked under for a slightly less strong backbend. This position was maintained for 5 seconds, returned back to the starting position and repeated for 10 times.

Matsayasana :



(Figure: 9)

Procedure:

The starting position of the subjects were supine. The asana was a backbend, where the subjects lie on her back and lift the chest by rising up on the elbows and drawing the shoulders back. The neck was lengthened and the crown of the head was pointed towards floor where they were lied down. The position was maintained for 5 seconds, returned back to the starting position and repeated for 10 times.

Janusirsasana



(Figure: 10)

Procedure:

The starting position of the subjects were long sitting. In a seated position one leg was extended from knee with toes pointing upward, and the other leg is bend with knee pointing away from the straight leg and the sole of the foot in by the groin. The torso turns and folds over the extended leg. This position was maintained for 5 seconds, returned back to the starting position and repeated for 10 times.

Dhanurasana :



(Figure: 11)

Procedure:

The starting position of the subjects were prone. From a prone position, the feet are grasp to lift the legs and chest to form the shape of a bow with the body, the arms representing the bowstring. This position was maintained for 5 seconds, returned back to the starting position and repeated for 10 times.

Bhujangasana



(Figure: 12)

Procedure:

The starting position of the subjects were prone. The subjects were requested to prone position on floor with the palms placed under the shoulders, pushing down until the hips slightly. The backs of the feet rest on the ground outstretched; the gaze was directed forward, giving the preparatory pose. This position was maintained for 5 seconds, returned back to the starting position and repeated for 10 times.

Suryanamashkar :

Procedure:

The starting position of the subjects were prone. Step-1 (prayer pose): The subjects were requested to stand on floor with feet together and palms together in front of the chest in prayer position. Step-2 (raised arm pose) In prayer position, breathing in lift the arms up and back, keeping the biceps close to the ears.

Step-3 (hand to foot pose) Breathing out bend forward from the waist, keeping the spine erect. As you exhale completely, brings the hands down to the floor, beside the feet.

Step-4 (equestrian pose) Breathing in, push your right leg back, as far back as possible. Bring the right knee to the floor and look up.

Step-5 (stick pose) as your breath in, take the left leg back and bring the whole body in a straight line and keep your arms perpendicular to the floor.

Step-6 (saluting with eight points or parts) lower the chest towards the ground bending both arms at the elbows. The following eight organs should touch the ground, forehead, chest, both palms, both knees and both toes. (Because eight body parts touch the ground it is called Ashtangasan).

Step-7(Cobra pose) Slide forward and raise the chest up into the cobra posture. You may keep your elbows bent in this pose, the shoulders away from the ears. Look up. As you inhale, make a gentle effort to push the chest forward; as you exhale, make a gentle effort to push the navel down. Tuck the toes under. Ensure you're stretching just as much as you can; do not force.

Step-8(Mountain pose) Breathing out, lift the hips and the tail bone up, chest downwards in an 'inverted V' (\wedge) posture. If Possible, try and keep the heels on the ground and make a gentle effort to lift the tailbone up, going deeper into the stretch.

Step-9 (Equestrian pose) Breathing in, bring the right foot forward in between the two hands, left knee down to the floor, press the hips down and look up and place the right foot exactly between the two hands and the right calf perpendicular to the floor. In this position, make a gentle effort to push the hips down towards the floor, to deepen the stretch.

Step-10 (hand to foot pose) Breathing out, bring the left foot forward. Keep the palms on the on the floor. You may bend the Knees, if necessary. Gently straighten the knees and if you can, try and touch your nose to the knees. Keep breathing.

Step-11 (raised down pose) Breathing in, roll the spine up, hands go up and bend backwards a little bit, pushing the hips slightly outward. Ensure that your biceps are besides yours. The idea is to stretch up more rather than stretching backwards.

Step-12 As you excel, first straighten the body and then bring the arms down. Relax in this position; observe the sensation in your body.

RESULTS

The statistical analysis for the present study was done for Group-A, based on the readings taken on Day-1 when the patients had approached the researcher for the treatment and then on the last day of the 8thweek after the treatment with active stretching. The statistical analysis was done for Group-B based on readings taken on Day 1 when the patients had approached the researcher and then on the last day of the 8thweek after the treatment of yoga asana and conventional therapy. For better understanding the readings that were taken for statistical analysis were given the terms pre for 1st day for both the Groups and post for last day of 8thweek for Group A (active stretching) and Group B (yoga).

Normality of the data was checked. Since the outcome measures were measured within group pre-test and post-test values. Descriptive statistics including mean and standard deviation were analysed and Between-group differences at follow-up period were compared. Statistical significance was set at $p < 0.05$ for all

statistical analyses and confidence interval was set at 95 %. All the data analysis was done in IBM SPSS version 20.0.

Table 1 shows the demographic data of the both groups including number of patients and age and weight

Variable	STRETCHING Group	YOGA Group
Subjects	23	23
Age	18.22 ± 49.70	20.22 ± 1.04
Weight	49.70 ± 6.657	54.48 ± 12.28

Table2: Wilcoxon Signed Rank test for within group comparison of WALLID SCORE, QOL and NPRS in Group A (n=23)

Variables	Level	Mean ± SD	Mean rank	Z Value	P Value
Walidd score	Baseline	6.91 ± 1.44	11.00	-4.045	0.000
	8 TH Week	4.17 ± 1.43			
QOL Scale	Baseline	7.70 ± 2.20	11.50	-4.128	0.000
	8 TH Week	3.39 ± 1.90			
NPRS	Baseline	7.70 ± 1.39	12.00	-4.244	0.000
	8 TH Week	4.22 ± 1.59			

Table 3: Wilcoxon Signed Rank test for within group comparison of WALIDD SCORE, QOL and NPRS in Group B (n=23)

Variables	Level	Mean ± SD	Mean rank	Z Value	P Value
WALIDD SCORE	Baseline	7.04 ± 1.36	12.00	-4.220	0.000
	8 TH Week	2.70 ± 1.71			
QOL	Baseline	7.35 ± 3.06	12.00	-4.206	0.000
	8 TH Week	1.48 ± 1.64			
NPRS	Baseline	6.57 ± 1.80	12.00	-4.215	0.000
	8 TH Week	2.83 ± 1.37			

Table4: Non parametric (independent sample t-test) for between group comparison of WALIDD SCORE, QOL and NPRS in Group A (n=23) and Group B (n=23)

Variable	STRETCHING Group	YOGA Group	Z Value	P Value
	MEAN RANK	MEAN RANK		
Walidd score	28.93	18.07	-2.793	0.005
QOL	31.15	15.85	-3.952	0.000
NPRS (DIFFERENCE)	24.78	22.22	-667	0.505

DISCUSSION:

The purpose of the study was to compare the effects of yoga asana and stretching exercises in treatment of primary dysmenorrhea. In this study 46 patients were randomly allocated to any one of the two treatment groups such that there were 23 subjects in each treatment groups.

Group A received stretching exercises and group B received yoga asanas. WALIDD Score, Quality Of Life Scale and NPRS were measured both before and after 8 weeks of treatment.

For group A WALIDD Score, Quality Of Life Scale and NPRS pre and post treatment values were measured using Wilcoxon signed rank test, showed extremely statistically significant changes giving a p- value < 0.000. Thus stating that stretching that exercise has beneficial effects on improving quality of life, reducing symptoms of dysmenorrhea and reducing pain. Similarly, for group B WALIDD Score, Quality Of Life Scale and NPRS pre and post treatment values were measured using Wilcoxon signed rank test, showed extremely statistically significant changes giving a p- value < 0.000. Thus stating that stretching that exercise has beneficial effects on improving quality of life, reducing symptoms of dysmenorrhea and reducing pain. When compared between groups (group A and group B), post treatment values were measured using Man Whitney U Test, P-value for WALIDD score was 0.005, which is considered to be statistically significantly and p-value for QOL scale was 0.000, which is considered to be extremely statistically significant. The baseline value of NPRS for both the groups were significant, therefore pre-post NPRS difference of both the groups (group A and group B) were been taken and average score was obtained, using this average score further analysis using Man Whitney U Test was performed, according to this test p-value for NPRS was 0.505. Which is considered to be not statistically significant. Hence the present study concluded that there was no difference in post values.

Similar studies from the evidence databases showed that the results are in line with the present study for WALIDD Score, QOL SCALE and NPRS. The results of the study are discussed in and Also compared with the previous studies. The possible explanations for the results are also discussed below according to supporting literature.

Veena Kirthika S, et al conducted a study on Efficacy of Yoga Asana and Gym Ball stretching Exercises in the Management of Primary Dysmenorrhea with 30 subjects and concluded that

Twelve-week gym ball exercises have the sufficient potential to decrease level of menstrual distress and related pain among female with PD when compared to yoga asana. The present study supports this literature as the presence study also shows the decrease in level of pain and improving quality of life in primary Dysmenorrhea.

Hyun-Nam Ko et al conducted a study on Effects of Yoga on Dysmenorrhea: A Systematic Review of Randomized Controlled Trials it was an research study that was conducted using CINAHL, the Cochrane library, Embase, PsycINFO, PubMed, and Korea Med electronic databases to identify randomized controlled trials (RCTs) reported effects of yogic intervention on dysmenorrhea, papers retrieved by the search were (n=1,120) potentially relevant papers retrieved for evaluation of full text (n=5) .after screening of full text the total number of studies included in the review were (n= 2) and concluded from the evidence of two RCTs that yoga interventions may be favorable effective for dysmenorrhea. The present study was the Experimental pre-test–post-test comparative study on primary dysmenorrhea , it included two groups stretching and yoga (n=23) in each group, total (n=46) and concluded that yoga is effective for dysmenorrhea in improving pain and quality of life ,when yoga group was compared with stretching group in primary dysmenorrhea, stretching group showed more significant effect in improving quality of life and WALIDD score in primary dysmenorrhea.

While there was no significant difference seen in post NPRS score between stretching and yoga groups.

Salvi Shah, Neha Verma et al conducted a study on Effect of exercises on primary dysmenorrhea in young females with subjects of 40 participants equally divided into two groups

Group A: Stretching exercise group, Group B: Control group. Active stretching exercises in the abdominal, pelvic, and groin regions for 8 weeks (4 days per week twice for 10 min.) and concluded that Stretching exercises are effective in reducing pain (P=0.002) in young females with primary dysmenorrhea. In the present study (group A) consisted of active stretching exercises that include abdominal, pelvic, and groin regions and for 8 weeks (5 days per week, 10 repetitions with 10 sec hold .) and group B consisted of 6 yoga asana and both the techniques were performed for 8 weeks (10 repetition with 5 sec hold for 5days per week) and concluded that both the techniques were highly significant in improving pain (p=0.00) , while stretching group also showed there was improvement in quality of life (p=0.00) and WALIDD score (p=0.00) post intervention in primary dysmenorrhea. The present study shows increases effect in primary dysmenorrhea then previous study. This can be due to increases in repetition performed regularly 5 days per week.

The present study was in favor of the study conducted by Sandeep Kaur which included 105 girls of age 19-25 years with primary dysmenorrhea the subjects were divided into 3 groups, Intervention introduced to the subjects were active stretching and core strengthening protocol for 8 weeks (4 days per week, 2 times a day, 10 min) at home and concluded that regular exercise as a helpful means in this age group. On the other hand exercises can be done in every place that do not need to any cost. When the present study was compared with this study it also concluded that regular exercises is helpful in primary dysmenorrhea when stretching and yoga given regularly (ie.10 repetition with 5 sec hold, 5days per week for 8 weeks) helps in improving pain, quality

of life and WALIDD score, while stretching group showed more statistically significant improvement in quality of life and WALIDD score. The mechanism behind yoga effectiveness for dysmenorrhea is still unclear the mechanism in which an abnormal increase in vasoactive prostanoids in the endometrium and menstrual fluid may induce myometrium hyperactivity and tissue ischemia subsequently, a yoga intervention improves blood flow at the pelvic level as well as stimulating the release of B endorphin acting as nonspecific analgesics [4]. However, in spite of both groups (stretching and yoga) showing improvement in pain, quality of life and WALIDD score these results support stretching exercises as a positive manager of primary dysmenorrhea symptoms.

According to present study there may be no significant difference in the post value of NPRS score between stretching and yoga group but stretching shows significant improvement in the increasing improvement in quality of life of young females and reducing the symptoms of primary dysmenorrhea according to WALIDD score.

Izzo and Labriola proposed that the increase in the blood flow and metabolism of the uterus during exercise may be effective in the reduction of dysmenorrheal symptoms. In another words, improved metabolism is a factor in the reduction of symptoms. It is also suggested that increased menstrual pain by uterine muscle contraction is derived from a nervous system that is innervated by the sympathetic nerve hence; stress through hyperactivity of sympathetic nerve System via the increase contractibility of uterine muscles may lead to menstruation symptoms.

Consequently, it might be possible to reduce dysmenorrheal symptoms by decreased Sympathetic over-activity through exercise. Another hypothesis suggests that therapeutic Exercise can increase the secretion of endorphins from the brain, and these materials in turn raise the pain threshold of the body. Daley AJ believed that contracted Ligamentous bands in the abdominal region were the causative factor for physical compression of nerve pathways and their irritation, so the proposed series of stretching exercise was considered very effective⁽¹⁵⁾

Further Recommendations:

The long term benefits of this treatment protocol could be established.

CONCLUSION

The present study concluded that both stretching and yoga technique are shown to have effect on improving PAIN, QOL SCALE and WALIDD SCORE. The stretching technique was found clinically more effective in improving QOL SCALE and reducing the symptoms of dysmenorrhea by WALIDD SCORE than yoga asana in subjects with primary dysmenorrhea. However there is no significant difference found in improving pain between both the groups stretching and yoga group.

LIMITATIONS

It is a short duration study in which follow up was not done, therefore long term effects were not known. Randomized controlled trial is needed to find long term effects of both therapeutic exercises. There is lack of control group. Future research is required.

CONFLICT OF INTEREST: NONE DECLARED

ACKNOWLEDGMENT: We deeply thank I/C principal Dr. Hetvi Shukla for keeping faith in us and her throughout support. We would extend our gratitude towards all the patients who cooperated for the study.

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