VOLUME - 13, ISSUE - 09, SEPTEMBER - 2024 • PRINT ISSN No. 2277 - 8160 • DOI : 10.36106/gjra

Original Research Paper

Physiotherapy

EFFECT OF KAPALBHATI PRANAYAMA IN WOMEN WITH PCOS ON QUALITY OF LIFE : AN PRE-POST EXPERIMENTAL STUDY

Alayalaxmi S. Wagh — Student, Pes Modern College Of Physiotherapy, Pune, Maharashtra ,india

Dr. Gauri Afle — Hod, Cardiorespiratory Department, Pes Modern College Of Physiotherapy, Pune , India

ABSTRACT

Background Of the Study: Polycystic ovary syndrome is an endocrine disorder amongst women, which can negatively impact quality of life.Physical appearance, menstrual irregularity as well as infertility are considered as sole cause of mental distress affecting health related quality of life.Kapalbhati improve autonomic function by balancing the sympathetic and parasympathetic activity which is beneficial to stress related disorders. The need of the study is to find out the effect of kapalbhati pranayama on women with PCOS on quality of life **Objectives:** The study was conducted on women aged 18-24 years with PCOS in and around pune using PCOSQol-42 **Methodology:** Ethical clearance was taken from the ethical committee. Accordingly, 54 samples were collected based on inclusion and exclusion criteria in hospitals and clinics in and around the pune. **Result:** candidates participated in the study, Paired T test was done..The result obtained . **Conclusion :** The study concluded that there is significant Effect of Kapalbhati Pranayama in women with PCOS on Quality of life at the end of 6 weeks. Hence we accepted Alternate Hypothesis (H1)that there will be an effect of kapalbhati pranayama in women with pcos on quality of life of 6 weeks.

KEYWORDS : Kapalbhati Pranayama, PCOS, Quality of life,PCOSQol-42

INTRODUCTION

Polycystic ovary syndrome (PCOS) is a heterogeneous, multifactorial, complex disorder with a broad spectrum of clinical manifestations such as hyperandrogenism, polycystic ovaries, and ovulatory dysfunction. Reports suggest that women with PCOS are more likely to develop metabolic syndrome with obesity, dyslipidemia, and insulin resistance culminating in serious long term consequences such as type 2 diabetes mellitus, cardiovascular disease, and infertility.[2]

PCOS accounts for significant health care costs and distress and has a major impact on the quality of life and fertility[3]

Approximately 4%–10% of the world population experiences PCOS although the incidence rate is higher for India, rounding off to 20%–26%.Although it has an alarming incidence globally, the syndrome is enigmatic with unclear etiology·

PCOS often goes unnoticed and undiagnosed during the adolescent period, except its manifestation as irregular cycles around menarche. The diverse manifestations of PCOS start at an early age with anovulation, oligomenorrhea, weight gain, hirsutism, and acne, leading to obesity, insulin resistance, and hyperandrogenism in late puberty

The major changes in physical appearance, obesity, along with menstrual irregularity have been found to be the main contributing factor of psychological dilemma.[8]

PCOS negative impact is always underestimated and dominates on women's life and may lead to a risk for serious anxiety and psychological disorder·

Kapalbhati :

Kapalabhati is one of the components of body cleansing techniques. The word Kapalabhati is derived from two words: "kapala" meaning "skull" and the organs inside it and "bhati" meaning"illuminating," Kapalabhati technique may correct these organ functions and help to purify blood and tone abdominal muscles.[12]

Kapalabhati is a rapid breathing technique otherwise known as automatic inhalation technique. The air is inhaled normally, but expiration is forced with the help of the abdominal musculature.[13][14][15][16]

kapalbhati is considered as form of respiratory- autonomic exercise which stimulates the respiratory, abdominal and gastro-intestinal receptors.[14]

It induces positive influences on centers within skull ,cortex, their efferent pathways get stimulated that results in synchronous discharge from autonomic nervous system ,pineal gland & hypothalamus which regulates the endocrine & metabolic processes , which in turns increase fat metabolism .[14]

Due to above it increases basal metabolic rate, reduces fat deposition, and ultimately helps in fat reduction.

It tones abdominal muscles and reduces abdominal fat, also increases hepatic and lipoprotein lipase which induces increased uptake of triglycerides.

Kapalbhati improve autonomic function by balancing the sympathetic and parasympathetic activity which is beneficial to stress related disorders

Objectives

1. To study the effect of kapalbhati pranayama in women with PCOS on quality of life by using PCOSQoL -42

Hypothesis

1. Hypothesis (H1): There will be effect of kapalbhati pranayama in women with pcos on quality of life .
2. Null Hypothesis (H0): There will be no effect of kapalbhati pranayama in women with pcos on quality of life.

MATERIALS AND METHODOLOGY

1. **Study Design**- Pre-post Experimental study design will be used to conduct the study .
2. **Study Settings** -Convenient sampling subjects from clinic and hospitals in and around the pune
3. **Participants** -54 participants
4. **Study Duration**- 6 months
5. **Intervention duration** – 6 weeks
6. **Materials**- Pen, Paper,Consent form,PCOSQoL-42 ,Yoga Mat
7. **Inclusion Criteria**

1. Subject willing to participate.
2. Age: 18-24 years.
3. Subject diagnosed with PCOS.
4. Subject should fit in ROTTERDAMS CRITERIA for PCOS.
5. ROTTERDAM CRITERIA: (any 2 of 3 of the following criteria)

a. Oligomenorrhea / oligo-ovulation
b. Hyperandrogenism
c . Polycystic ovaries visible on ultrasound

8. Exclusion Criteria

a. Subject on any medication known to affect endocrine profile (Oral Contraceptive pill)
b. Subjects who are under psychological medication.
c. Subjects who have undergone recent surgery.
d. Another major illness that influenced the woman's quality of life.
e. Subject following any other regular exercise or yoga regimen were excluded

Outcome measures

PCOSQoL -42 Questionnaire
Reliability : 0.98
Validity : 0.423 -0.697

The 42 -Items polycystic ovarian syndrome quality of life is an outcome measure instrument that is used, well-researched, self-reported measure of health. The individualized PCOSQoL-42 for unmarried women with PCOS, respectively, represent the first reliable and valid HRQoL assessment tools for assessing the health-related quality of life (HRQoL) in those women with PCOS who use Arabic as a first or native language and address the sexual function as a separate domain.(24) Its comprise 42 questions that cover 5 domains :
Psychological and Emotional status
Menstrual irregularities and fertility
Body image
Hair disorders and acne
Coping

The scoring was inspired by the 5-point Likert scale that was used during the creation of PCOS QOL-42 where each item represents the woman's experience in the last six weeks, i.e., Never=5 or no effect, on the health-related quality of life (HRQOL), (Seldom=4), (Quite often=3), (Very often=2), and (Always=1 or the maximal effect on the QOL).

The sum of the total points in each item per domain was evaluated. Then we divided the results by the number of the items that had been scored only to get the final domain score as a (mean ± SD).

The ultimate or final score per the questionnaire was gained from the sum of individual domain scores divided by the number of domains that had been evaluated. Ultimately, the first interval values (from 1 to < 3 points) represent marked effects on HRQOL; second interval values (from 3 to < 4 points) represent the marginal effect on HRQOL; third interval values (from 4 to < 5 points) represent the minimal effect on HRQOL; fourth interval (5 points) represents no effect on HRQOL.

Data Analysis And Procedure

Total 54 participants were taken for this study according to inclusion and exclusion criteria and Data analysis was done.
The study began with a synopsis presentation in front of the ethical committee in P.E.S.Modern college of Physiotherapy. Ethical clearance was obtained from the committee. The patients were selected on the basis of the inclusion and exclusion criteria. The patients were explained about the study before starting the procedure. .A Written Consent Form and PCOSQol- 42 scale was Circulated To The Subjects To Be Self Administered. Protocol was explained to the subject. Protocol daily sessions were done per 6 weeks for 20 minutes . Data was collected and statistical analysis was done .

Protocol

- Each session will be 20 minutes .
- Subjects have to do the following pranayama daily for 6 weeks.

Sr.no	Pranayama practice	Duration
1.	Nadi shuddhi pranayama (alternate nostril breathing)	5 min
2.	Kapalbhati pranayama	10min
3.	Meditation(Transcendental Meditation)	5 min

Nadi Shuddhi Pranayama : Open the right hand and bend the index and middle fingers against the palm. The thumb was used for closing the right nostril while the fourth and fifth fingers were used for the left nostril. Place the right thumb against the ala at the end of the nostril to close it and similarly press the fourth and fifth fingers against the left nostril. 3. Start the exercise in the 'vajrasana or padmasana posture', with relaxed attitude and concentration.Right nostril closed with thumb first inhale and then exhale through the left nostril and repeat this for 5 times. Now remove the hand and breathe through both nostrils for 5 times.1. Left nostril is closed with a

ring and little finger inhales first followed by exhaling through the right nostril and repeat this for 5 times. Remove the hand and breathe through both nostrils for 5 times. Right nostril closed with the thumb and breathe in through the left nostril, close the left nostril and breathe out through the right nostril, repeat for 5 times, and finally remove the hand and breathe through both nostrils for 5 times.

Kapalbhati: The subject is asked to sit either in vajrasana or padmasana, both the palms in chin mudra ,keeping her spine erect and eyes closed throughout the practice .The technique was practiced on an empty stomach usually noon time before lunch.The subject has to take a passive inhalation followed by forceful exhalation for a minimum of 60- 120 strokes per minute ,the same have to do in 2 sets. Table below will describe the practice of kapalbhati (KB) followed by normal breathing (NB) in a single session.

KB	KB	KB	KB	KB	KB	KB	KB	KB	KB
1 MIN	1 MIN	1 MIN	1 MIN	1 MIN	1 MIN	1 MIN	1 MIN	1 MIN	1 MIN

Meditation: The subject is asked to do transcendental meditation 5 min daily for 6 weeksThe subjects have to sit in padmasana,both the palms in chin mudra,keeping her spine erect and eye closed throughout the practice .The subject is asked to enchant the mantra of their choice.

Fig 1.1

Fig 1.2

Fig 1.3

The study included 54 participants females aged between 18 to 24 years old . The subjects were taken and their Pre and post QoL score is taken by using PCOSQoL-42 .

The Exercise Protocol were carried out daily for 6 week The various statistical measures such as Mean,Standard deviation (SD), were Utilized to analyze the data. The results were concluded to be statistically significant ,if p value is less than 0.001.

The Data will be Represented in both tabular and graphical format. All the values in the following table are calculated by using Paired t test for objective criteria. Statistical analysis of every symptom is described separately in the following table.

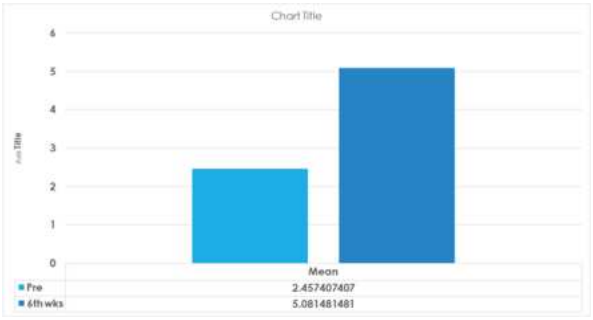

Table .The comparison of pre and post of PCOSQoL-42

SYMPTOMS	PCOSQoL-42
MEAN SCORE ,Pre	2.46

t value calculated value = 47.71
t tabulated / critical value = 3.23
Degrees of freedom (d.f.) = n – 1 = 54 – 1 = 53

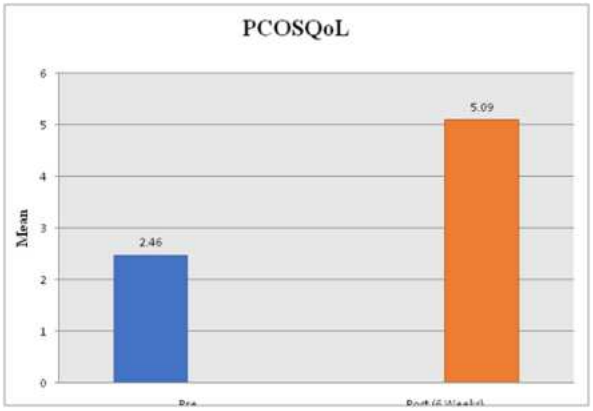

Table .The comparison of pre and post of PCOSQoL-42

Mean Score, Post (6 Weeks)	5.09
S.D.(±)	0.404
S.E.(±)	0.055
t	47.71
p	0.001
RESULT	SIGNIFICANT

RESULTS

54 Subjects were included in the study. Paired T Test was done .It revealed that mean score of PCOSQoL scale before practicing kapalbhati pranayama was 2.45±0.25 which was significantly increased to 5.08±0.40 after effect of Kapalabhati Pranayama practice.The Result Obtained from practicing Kapalbhati Pranayama to see effect on quality of life in women with PCOS were found to be significant with P value <0.0001 And T value 47.71 .As the t value calculated value is greater than the t tabulated value for degrees of freedom 53 at p 0.001, we should reject the null hypothesis H0 and accept the alternate hypothesis H1 i.e. there is a significant effect of Kapalbhati pranayam in women with PCOS on quality of life.

DISCUSSION

The Aim of Study was to check The Effect of Kapalbhati Pranayama in Women with PCOS On Quality Of Life At the end of 6 weeks.Total 54 Subjects were given Protocol for 6 weeks to Find Effect of Kapalbhati Pranayama on Quality of life .The Results indicated that practicing Kapalbhati Pranayama for 6 weeks led to significant increase in Quality of life in women with PCOS.

The Study by Dinkar kekan explains Kapalabhati is considered as a form of abdomino -respiratory -autonomic exercise which stimulates the respiratory, abdominal, and gastrointestinal receptors.Since Kapalabhati induces a

positive influence on the centers within the skull, the vital areas of the brainstem, cortex, their efferent pathways, and effector organs may also get stimulated.As a result, the synchronous discharge from the autonomic nervous system, pineal gland, and hypothalamus that regulate the endocrine and metabolic processes increases which, in turn, accelerates fat metabolism. This eventually increases basal metabolic rate, reduces fat deposition, and ultimately ends up in weight reduction .(14)

Dipak B C study on the effect of Anulom – vilom & kapalabhati pranayama on positive attitude in school going syndrome in women with PCOS and concludes In Kapalabhati, the breathing is with high force in a shorter span and hence greater impact is made on the abdomen and its contents, especially the glands. The resultant increase in blood circulation and correction of glandular secretions help in disease management.(29)

According to Aprodonidze et al Women with PCOS are prone to long-term health consequences such as type 2 diabetes mellitus, hypertension, dyslipidemia, atherosclerosis, and Frank metabolic syndrome (MS) This is due to the reason that insulin resistance plays a very important role in the pathogenesis of both the syndromes(30)Manoj Kumar P et al done study on Metabolic disorder and their improvement with yoga and concluded that Kapalabhati is known to regulate this brain-pancreas-endocrine pathway and hence corrects the features of MS, primarily hyperinsulinism and dyslipidemias. (28)

The study by Neeta M explains that The abdominal stretching which occurs during Kapalbhathi helps in the regeneration of pancreatic cells which helps the increased uptake and enzymatic peripheral utilization of glucose in tissues, thereby reducing hyperglycemia. Moreover, being an abdomino-respiratory exercise, Kapalabhati is proven to directly stimulate the pancreas to release insulin and counteract hyperglycemia.(29) According to Ganesh BR et Pranayama techniques such as Kapalabhati improve autonomic function by balancing the sympathetic and parasympathetic activity which is beneficial in stress-related disorders.(30)

The study by Tyagi A et al explains -Relaxation by Kapalabhati in stressed patients induces improved mitochondrial energy production and utilization culminating in the up-regulation of ATPase and insulin function that aids in mitochondrial resilience.(17)Some study proves that practicing yoga gives feeling of well being which in-turn reduces stress .this mights contributed in regularizing the menstrual cycles as psychological factors such as increased stress is known to induced to raised level of cortisol and prolactin which can disrupt normal menstrual cycleA case study by AP Rashmitha at al reporting the effects of kapalbhati in patients with PCOS.

In the case study there was reduction observed in weight which attributed to increased metabolism following kapalbhati practice which is abdomino-respiratory-autonomic exercise. This brings control over autonomic nervous system that in turn affects the endocrine and the metabolic processes ,leading to increase in basal metabolic rate thereby helping in reduction of weight The intervention was effective in reducing the body weight , menstrual pain, hair loss, and the polycystic ovarian features.(31)

In the current study , kapalbhati pranayama was taught to subjects.Initially during first 2 week subjects were able to do kapalbhati pranayama 10-15 strokes per min for 2-3 min . By the end of 6 weeks subjects were able to do 20-40 strokes per min for 10 min. After the data analysis This study has shown the quality of life can significantly improve in women with PCOS as the intervention was effective in improving quality of life by improving the subject's psychological and emotional status and other manifestations of PCOS like menstrual pain ,menstrual irregularities.

CONCLUSION

Looking at statistical analysis and the results our study concluded that there is a significant Effect of Kapalbhati Pranayama in women with PCOS on Quality of life at the end of 6 weeks. The intervention given was safe , easily adoptable, and feasible ,and well tolerated by subject

Limitation

The presented study was done considering psychological and emotional status,menstrual irregularities & fertility, body image, hair-disorder & acne, and coping on quality of life apart of that nutritional , social-economic status of person also affect the quality of life in women with PCOS

Future Scope Of Study

1. Longitudinal study can be done to see the long term effect of kapalbhati pranayama .
2. Study can be done in other age groups.
3. Study can be done pre-diabetics.

REFERENCES:

1. Polycystic ovaries and associated metabolic abnormalities in Indian subcontinent Asian women D. A. Rodin,G. Bano,J. M. Bland,K. Taylor,S. S. Nussey Dr D. A. Rodin, Division of Gastroenterology, Endocrinology & Metabolism, St. George's Hospital Medical School, Cranmer Terrace, London
2. Long-term health consequences of PCOS Robert A.Wild Departments of Obstetrics/Gynecology (Reproductive Endocrinology Section), Medicine (Cardiology) and Biostatistics and Epidemiology at the Oklahoma University Health Sciences Centre Oklahoma City, OK, USA
3. Quality of Life, Psychosocial Well-Being, and Sexual Satisfaction in Women with Polycystic Ovary Syndrome SIGRID ELSENBRUCH, SUSANNE HAHN, DANIELA KOWALSKY, ALEXANDRA H. O¨ FFNER, MANFRED SCHEDLOWSKI, KLAUS MANN, AND ONNO E. JANSSEN Department of Medical Psychology (S.E., M.S.) and Division of Endocrinology, Department of Medicine (S.H., D.K., K.M., O.E.J.), University of Essen, 45122 Essen, Germany; and Division of Angiology, Department of Medicine (A.H.O¨ .), Hospital Schwabing, 80804 Munich, Germany
4. COMPARATIVE STUDY OF PREVALENCE OF POLYCYSTIC OVARIAN SYNDROME IN RURAL AND URBAN POPULATION Penagaluru Radha1 , Rama Sarala Devi 2 , Jalagam Madhavi3 1,2 Associate Professor, 3 Post graduate, Department of Gynaecology and Obstetrics, Kakatiya Medical College, Warangal, Telangana
5. The Prevalence and Features of the Polycystic Ovary Syndrome in an Unselected Population RICARDO AZZIZ, KESLIE S. WOODS, ROSARIO REYNA, TIMOTHY J. KEY, ERIC S. KNOCHENHAUER, AND BULENT O. YILDIZ Departments of Obstetrics and Gynecology (R.A., K.S.W., R.R., E.S.K.), Medicine (R.A.), and Occupational Health and Safety (T.J.K.), The University of Alabama at Birmingham, Birmingham, Alabama 35233; and Department of Internal Medicine (B.O.Y.), Endocrinology and Metabolism Unit, Hacettepe University Faculty of Medicine, Ankara, Turkey, 06100
6. Vijayan CP, Sonia A. Prevalence of polycystic ovary syndrome among students of a teaching collegiate hospital. Health Sci 2013;2:1-11
7. Franks S. Polycystic ovary syndrome in adolescents. International journal of obesity. 2008 Jul;32(7):1035-41.
8. Khomami MB, Tehrani FR, Hashemi S, Farahmand M, Azizi F. Of PCOS symptoms, hirsutism has the most significant impact on the quality of life of Iranian women. PLoS One. 2015; 10(4):e0123608
9. March WA, Moore VM, Willson KJ, Phillips DI, Norman RJ, Davies MJ. The prevalence of polycystic ovary syndrome in a community sample assessed under contrasting diagnostic criteria. Human reproduction. 2010; 25(2):544–51.
10. Kumarapeli VL, Seneviratne RD, Wijeyaratne CN. Health-related quality of life and psychological distress in polycystic ovary syndrome: a hidden facet in South Asian women. BJOG: An International Journal of Obstetrics & Gynaecology. 2011; 118(3):319–28.
11. Brady C, Mousa SS, Mousa SA. Polycystic ovary syndrome and its impact on women's quality of life: More than just an endocrine disorder. Drug, healthcare and patient safety. 2009; 1:9
12. Dinesh T, Gaur GS, Sharma VK, Madanmohan T, Grrishma B. Effect of 6 weeks of Kapalabhati Pranayama training on peak expiratory flow rate in young, healthy, volunteers. Sch Acad J Biosci. 2013;1(4):111-4.
13. KUMAR R, Sahu D, Kumar P, Zafar S, Agarwal K, KUMAR N, SHARMA C. Role of Yoga and Deep Breathing Exercises on Stress Management Among Young Adults. INTERNATIONAL JOURNAL OF SPECIAL EDUCATION. 2022 Mar 11;37(3).
14. Kekan D, Kashalikar S. Effect of Kapalbhati pranayama on waist and hip circumference. Journal of Evolution of Medical and Dental Sciences. 2013 Mar 18;2(11):1695-700.
15. Chavhan DB. The Effect of Anulom-Vilom and Kapalbhati Pranayama on Positive Attitude in School Going Children. Edubeam Multidisciplinary-Online Research Journal. 2013;7(1):1-8.
16. Kekan DR. Effect of Kapalbhati Pranayama on Body Mass Index and Abdominal Skinfold Thickness.

17. Tyagi A, Cohen M, Reece J, Telles S. An explorative study of metabolic responses to mental stress and yoga practices in yoga practitioners, non-yoga practitioners and individuals with metabolic syndrome. BMC complementary and alternative medicine. 2014 Dec;14(1):1-0
18. Raja B, Preetha S, Priya J. Effect of Kapalbhati Pranayama in the blood sugar level in diabetic patients. Drug Invention Today. 2018 Nov 1;10(11).
19. Barber TM, Dimitriadis GK, Andreou A, Franks S. Polycystic ovary syndrome: insight into pathogenesis and a common association with insulin resistance. Clinical Medicine. 2016 Jun;16(3):262.
20. Kadam[1] R, Shinde K, Kadam R. Contemporary and Traditional Perspectives of Polycystic Ovarian Syndrome (PCOS): A Critical Review.
21. Chong CS, Tsunaka M, Chan EP. Effects of yoga on stress management in healthy adults: a systematic review. Alternative therapies in health and medicine. 2011;17(1):32.
22. BijendarSingh JB, Laxmi V. The Positive effects of Asanas and Pranayama on PCOS and How to deal with hormonal imbalance?. Science and Technology. 2021;7(0707029):190-5.
23. yoga – a safe and effective treatment for pcos priyanka godara*1, sunayana sharma2 and anupam pathak31P.G. Scholar in Department of Swasthavritta & Yoga, Sri Ganganagar College of Ayurvedic Science & Hospital, Tantia University, Rajasthan.
24. Barber TM, Dimitriadis GK, Andreou A, Franks S. Polycystic ovary syndrome: insight into pathogenesis and a common association with insulin resistance. Clinical Medicine. 2016 Jun;16(3):262.
25. BijendarSingh JB, Laxmi V. The Positive effects of Asanas and Pranayama on PCOS and How to deal with hormonal imbalance?. Science and Technology. 2021;7(0707029):190-5.
26. yoga – a safe and effective treatment for pcos priyanka godara*1, sunayana sharma2 and anupam pathak3 1P.G. Scholar in Department of Swasthavritta & Yoga, Sri Ganganagar College of Ayurvedic Science & Hospital, Tantia University, Rajasthan.
27. Dipak BC. The effect of Anulom-Vilom and Kapalabhati Pranayama on positive attitude in school going children. Edubeam Multidiscip Online Res J 2013;7:1-8.
28. Manoj Kumar P, Bhatnagar RK. Metabolic errors and their improvement with yoga. Indian J Pathol Res Pract 2014;3:23-33
29. Neetu M. The role of physical exercise and diet modification on lipid profile and lipid peroxidation in long term glycemic control type 2 diabetics. Gen Med 2014;2:1-3
30. Ganesh BR, Madhushree PD, Andrea RH. Comparative study on effect of slow and fast phased pranayama on quality of life and pain in physiotherapy girls with primary dysmenorrhoea: Randomized clinical trial. Int J Physiother Res 2015;3:960-5
31. RAShmithA AP, KUmAR KD, RANi PS, POOJA G. Effect of Kapalabhati in a Patient with Polycystic Ovarian Syndrome-A Case Report. Journal of Clinical & Diagnostic Research. 2021 Mar 1;15(3)