Journal of Neonatal Surgery
ISSN(Online): 2226-0439
Vol. 14, Issue 32s (2025)
https://www.jneonatalsurg.com

OPEN ACCESS

Therapeutic Role of Yoga and Pathophysiological Insights of Pelvic Floor Dysfunction in Polycystic Ovary Syndrome (PCOS)

Shringarika Mishra[1], Gautam Khattar[3], Meenakshi Sehrawat[4], Aayush Pandey[5], Pawan Kumar Singh[6], Deepti Tripathi[7], Mahim Tiwari[2]*

[1]Ph. D. Scholar, Department of Swasthvritta and Yoga, FoA, IMS, BHU, Varanasi.
Email ID: shringarikavishwanath@gmail.com
[*2]Ph. D. Scholar, Department of Panchakarma, FoA, IMS, BHU, Varanasi
[3]Ph. D. Scholar, Department of Holistic Studies, Maya Devi University, Dehradun
[4]Ph. D. Scholar, Department of Arts and Humanities, Maya Devi University, Dehradun
[5]PhD scholar, Amity institute of Indian system of medicine (AIISM), Amity University, Noida
[6]Ph. D. Scholar, Department of Panchakarma, FoA, IMS, BHU, Varanasi
[7]M.Sc. in Yogic Sciences, University of Patanjali, Haridwar
[*]**Corresponding author:**
Mahim Tiwari.
Email ID: mahim.ims@bhu.ac.in

Cite this paper as: Shringarika Mishra, Gautam Khattar, Meenakshi Sehrawat, Aayush Pandey, Pawan Kumar Singh, Deepti Tripathi, Mahim Tiwari, (2025) Therapeutic Role of Yoga and Pathophysiological Insights of Pelvic Floor Dysfunction in Polycystic Ovary Syndrome (PCOS). *Journal of Neonatal Surgery*, 14 (32s), 1420-1425.

ABSTRACT
Polycystic Ovary Syndrome (PCOS) is a prevalent hormonal condition impacting around 8-13% of women of reproductive age, with up to 70% of cases remaining undiagnosed. One of the many symptoms of PCOS is pelvic floor dysfunction, which commonly includes urinary incontinence, pelvic pain, and sexual dysfunction, affecting many women with the condition. While hormonal and metabolic dysregulation are central to PCOS pathophysiology, emerging evidence suggests that Yoga therapy may play a beneficial role in improving pelvic muscle function. This review aims to explore the underlying mechanisms through which Yoga therapy may modulate pelvic floor function in PCOS patients. Through a review of relevant literature, We investigate the impact of Yoga on the strength of pelvic floor muscles, flexibility, autonomic nervous system balance, and hormonal regulation, with a focus on how these factors intersect in the context of PCOS.

Keywords: *Polycystic Ovary Syndrome (PCOS), Yoga Therapy, Pelvic Floor Dysfunction, Autonomic Nervous System, Hormonal Regulation, Pelvic Muscle Strength.*

1. INTRODUCTION

Polycystic Ovary Syndrome (PCOS) is a prevalent hormonal condition impacting around 8-13% of women of reproductive age, with up to 70% of cases remaining undiagnosed.[1] PCOS characterized by anovulation, hyperandrogenism, and polycystic ovaries.[2] While the primary clinical concerns in PCOS often involve metabolic issues, such as insulin resistance, obesity, and hyperglycemia,[3] there are significant musculoskeletal and pelvic floor-related symptoms. One of the underexplored aspects of PCOS is the impact of the disorder on pelvic floor muscles (PFM), which can result in pelvic floor dysfunction (PFD), including symptoms such as urinary incontinence, chronic pelvic pain, and sexual dysfunction.[4]Recent research suggests that integrative approaches like Yoga therapy, which combine physical postures, controlled breathing, and meditation, may offer therapeutic benefits for various PCOS symptoms.[5] Yoga, as an accessible and low-cost intervention, has been increasingly studied for its effects on reducing stress, improving muscle strength, and enhancing flexibility.[6] This review focuses on the mechanistic aspects of how Yoga therapy may improve pelvic muscle function in women with PCOS, integrating insights from biomechanical, neurophysiological, and hormonal perspectives.

Pathophysiology of PCOS and Its Effects on the Pelvic Floor

PCOS is a complex condition characterized by multiple contributing factors, including hormonal imbalances, metabolic disturbances, and potential genetic predispositions.[7] A key characteristic of PCOS is an elevated level of androgens, which can lead to a variety of symptoms, including hirsutism, acne, and scalp thinning.[8] This hormonal imbalance also affects the pelvic floor, which is made up of muscles and connective tissue supporting the pelvic organs. [9]

Pelvic floor dysfunction (PFD), a condition characterized by the improper functioning of the muscles and ligaments that support the pelvic organs, is becoming more common in PCOS patients. [10] Several mechanisms contribute to the development of PFD in these individuals, including hormonal imbalance, obesity, insulin resistance, and chronic stress.[11]

Hormonal Imbalance and its Effect on Pelvic Floor Muscles

One of the key hormonal abnormalities in PCOS is elevated levels of androgens, such as testosterone. These hormones have several effects on the body, including influencing the pelvic floor muscles.[12] Elevated androgen levels can lead to changes in muscle tone, causing either pelvic floor muscle hypertonicity (tightness) or hypotonicity (weakness).[13] Both conditions can result in pelvic floor dysfunction, manifesting as symptoms like urinary incontinence, pelvic organ prolapse, and sexual dysfunction.[14] Moreover, hormonal imbalances in PCOS can interfere with the body's ability to maintain optimal pelvic floor strength, further contributing to PFD.[15]

Obesity: Increased Pressure and Strain on the Pelvic Floor Obesity is prevalent in many women with PCOS, often exacerbated by metabolic dysfunction and insulin resistance.[16] The added weight increases intra-abdominal pressure, which puts extra stress on the pelvic floor muscles and ligaments.[17] This prolonged pressure can weaken the pelvic floor over time, leading to symptoms such as pelvic organ prolapse or urinary incontinence.[18] Additionally, excess body fat, particularly in the abdominal region, can alter posture and pelvic alignment, further affecting the optimal functioning of pelvic floor muscles.[19] For women with PCOS, the combination of hormonal imbalances and obesity may create a vicious cycle that promotes the development of PFD.[20]

Insulin Resistance and its Impact on Muscle Function

Insulin resistance is another common feature of PCOS that plays a critical role in pelvic floor dysfunction.[21] In this condition, the body's cells become less responsive to insulin, leading to elevated blood sugar levels.[22] Insulin resistance affects muscle metabolism by impairing glucose uptake, which is crucial for muscle contraction and repair.[23] The pelvic floor muscles, like all skeletal muscles, rely on efficient glucose metabolism for proper function. When insulin resistance disrupts this process, the pelvic muscles may become weak or fatigued, further increasing the risk of dysfunction.[24] Additionally, insulin resistance is associated with chronic inflammation, which can exacerbate muscle weakness and impair pelvic floor health.[25]

Chronic Stress and Pelvic Floor Tension

Chronic stress is commonly reported among women with PCOS, partly due to hormonal imbalances and the emotional challenges associated with the condition.[26] Stress triggers the release of cortisol, a hormone that can increase muscle tension, particularly in the pelvic region.[27] This constant muscle tension can lead to hypertonicity of the pelvic floor muscles, making it difficult to relax and contract them properly.[28] Over time, this can result in pain, discomfort, and dysfunction, including urinary retention, painful intercourse, or difficulty emptying the bladder.[29] Stress-induced pelvic floor tension can also exacerbate other symptoms of PCOS, creating a feedback loop that worsens both conditions.

Mechanisms of Action of Yoga on Pelvic Muscle Function

Yoga therapy consists of physical postures (asanas), controlled breathing (pranayama), and mindfulness/meditation practices. The following mechanisms illustrate how Yoga may positively influence pelvic muscle function in women with PCOS:Neuromuscular Control and Pelvic Floor Muscle Activation

Postural Alignment and Core Stability

Many Yoga asanas (poses) are particularly effective in engaging the core muscles and fostering better postural alignment, which is essential for pelvic floor health.[30] Asanas such as Uttanpadasana (Raised Leg Pose) and Naukasana (Boat Pose)are excellent for strengthening the core and lower abdominal muscles, which in turn support the pelvic floor.[31]

Specific poses that target the pelvic muscles include:

Setu Bandhasana (Bridge Pose): This pose activates the glutes, hamstrings, and lower back muscles, while also engaging the pelvic floor. It helps to improve pelvic stability and muscle tone.[32]

Baddha Konasana (Bound Angle Pose): This seated hip opener helps stretch the inner thighs and groin area, promoting flexibility and relieving tension in the pelvic region.[33]

Utkatasana (Chair Pose): This strengthening pose helps build endurance in the pelvic floor muscles by engaging the thighs, core, and lower body, encouraging better muscle tone and pelvic alignment.[34] These asanas help to engage the pelvic floor

muscles in a controlled manner, leading to improved muscle tone, strength, and endurance. By promoting better postural alignment, Yoga also enhances the body's ability to maintain optimal pelvic floor function, which is particularly important for women with PCOS who may experience muscle weakness or dysfunction.[35]

2. MINDFULNESS AND MUSCLE RELAXATION

In addition to strengthening, Yoga emphasizes mindfulness and breath control (pranayama), which plays a crucial role in pelvic floor health.[36] The deep, diaphragmatic breathing techniques used in pranayama activate the parasympathetic nervous system, triggering the body's relaxation response.[37] This is especially beneficial for women with hypertonic (tight or overactive) pelvic floor muscles, a condition often associated with stress, anxiety, or pain.

By consciously relaxing the pelvic floor through mindful breathing, women can help alleviate symptoms of pelvic pain, discomfort, and muscle tension.[38] Pranayama techniques such as Ujjayi (Victorious Breath), Nadi Shodhana (Alternate Nostril Breathing), and Abdominal Breathing are particularly useful for promoting relaxation, reducing muscle hypertonicity, and restoring balance to the pelvic region.[39]

Pranayama also encourages awareness of the breath and its connection to the pelvic floor, enabling individuals to consciously relax or engage the pelvic muscles as needed, which is essential for restoring neuromuscular balance.[40]

2.1 Enhancing Both Activation and Relaxation

The combination of mindful movement and controlled breathing allows Yoga to target both weak and hypertonic pelvic floor muscles.[41] While asanas focus on strengthening and activating the pelvic floor emphasize relaxation and stretching, which can help release tension from overactive muscles. This dual approach promotes a balanced, functional pelvic floor, improving both strength and flexibility.[42]

2.2. Hormonal Regulation through Yoga

Yoga has been found to influence various hormones involved in PCOS, such as cortisol, insulin, and sex hormones. [43] The role of Yoga in modulating hormonal balance can directly or indirectly benefit pelvic floor function.

- Reduction in Cortisol: Yoga's impact on reducing cortisol levels has been well-documented.[44] Chronic stress and elevated cortisol levels are linked to pelvic muscle tension and dysfunction. By promoting a relaxation response through deep breathing and meditation, Yoga may help mitigate stress and its associated impact on the pelvic floor.[45]
- Insulin Sensitivity: Yoga has been shown to improve insulin sensitivity, which is crucial for women with PCOS. Improving insulin regulation may reduce the negative metabolic effects on muscle function, including the pelvic floor.[46]
- Reduction in Androgens: Some studies suggest that Yoga may help in reducing elevated androgen levels in women with PCOS.[47] By promoting hormonal balance, Yoga could potentially reduce the muscular and connective tissue abnormalities associated with high androgen levels in the pelvic floor.[48]

2.3. Autonomic Nervous System Balance

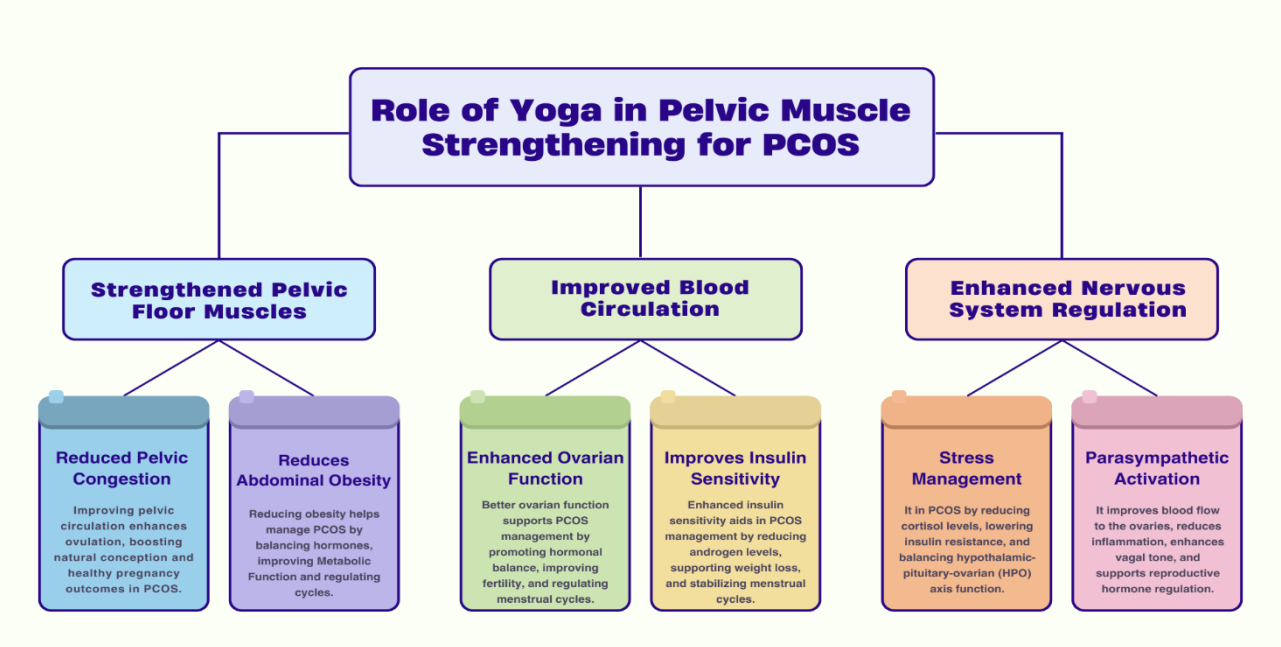
The autonomic nervous system (ANS) regulates involuntary bodily functions, including those of the pelvic floor.[49] Women with PCOS often exhibit dys-regulation of the ANS, leading to an overactive sympathetic nervous system and an underactive parasympathetic nervous system. This imbalance can contribute to muscle tension and dysfunction, particularly in the pelvic region.[50]

Yoga's emphasis on controlled breathing and mindfulness helps to activate the parasympathetic nervous system, promoting relaxation and muscle recovery.[51] By enhancing the balance between the sympathetic and parasympathetic systems, Yoga may help alleviate pelvic floor muscle hypertonicity and improve overall muscle function.[52]

2.4. Pelvic Muscle Blood Flow and Lymphatic Drainage

Certain Yoga poses improve blood circulation to the pelvic region, which can aid in the relaxation and strengthening of the pelvic floor muscles.[53] Improved circulation may facilitate tissue repair and muscle function, which is particularly important for women with PCOS who experience pelvic discomfort and pain.[54] Additionally, poses that encourage deep stretching and opening of the hips, such as Supta Baddha Konasana and Malasana (Garland Pose), can stimulate lymphatic drainage, helping to reduce inflammation in the pelvic area.[55]

A representation of effect of Yoga therapy in pelvic floor muscles to cure associated factors of PCOS has shown fig no



3. CONCLUSION

Yoga therapy appears to offer a promising, multifaceted approach to addressing pelvic floor dysfunction in women with PCOS. By improving neuromuscular control, hormonal balance, autonomic nervous system regulation, and circulation to the pelvic region, Yoga may provide significant relief for women experiencing pelvic pain, urinary incontinence, and sexual dysfunction. Despite the encouraging evidence, further randomized controlled trials and mechanistic studies are necessary to better understand the precise pathways through which Yoga influences pelvic muscle function in PCOS patients. Given its low cost, accessibility, and holistic approach, Yoga could be an invaluable adjunctive therapy for managing pelvic floor dysfunction in this population.

REFERENCES

[1] https://www.who.int/news-room/fact-sheets/detail/polycystic-ovary-syndrome

[2] Rasquin LI, Anastasopoulou C, Mayrin JV. Polycystic Ovarian Disease. [Updated 2022 Nov 15]. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2024 Jan-. Available from: https://www.ncbi.nlm.nih.gov /books/NBK459251/

[3] Purwar A, Nagpure S. Insulin Resistance in Polycystic Ovarian Syndrome. Cureus. 2022 Oct 16;14(10):e30351. doi: 10.7759/cureus.30351. PMID: 36407241; PMCID: PMC9665922.

[4] Saei Ghare Naz M, Ramezani Tehrani F, Behroozi-Lak T, Mohammadzadeh F, Kholosi Badr F, Ozgoli G. Polycystic Ovary Syndrome and Pelvic Floor Dysfunction: A Narrative Review. Res Rep Urol. 2020 May 7;12:179-185. doi: 10.2147/RRU.S249611. PMID: 32440514; PMCID: PMC7213900.

[5] Verma A, Upadhyay V, Saxena V. Effect of Yoga Therapy on Health Outcomes in Women With Polycystic Ovary Syndrome: A Systematic Review and Meta-Analysis. Am J Lifestyle Med. 2021 Aug 6;17(1):73-92. doi: 10.1177/15598276211029221. PMID: 36636398; PMCID: PMC9830238.

[6] Woodyard C. Exploring the therapeutic effects of yoga and its ability to increase quality of life. Int J Yoga. 2011 Jul;4(2):49-54. doi: 10.4103/0973-6131.85485. PMID: 22022122; PMCID: PMC3193654.

[7] De Leo V, Musacchio MC, Cappelli V, Massaro MG, Morgante G, Petraglia F. Genetic, hormonal and metabolic aspects of PCOS: an update. Reprod Biol Endocrinol. 2016 Jul 16;14(1):38. doi: 10.1186/s12958-016-0173-x. PMID: 27423183; PMCID: PMC4947298.

[8] Lujan ME, Chizen DR, Pierson RA. Diagnostic criteria for polycystic ovary syndrome: pitfalls and controversies. J Obstet Gynaecol Can. 2008 Aug;30(8):671-679. doi: 10.1016/S1701-2163(16)32915-2. PMID: 18786289; PMCID: PMC2893212.

[9] Grimes WR, Stratton M. Pelvic Floor Dysfunction. [Updated 2023 Jun 26]. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2024 Jan-. Available from: https://www.ncbi.nlm.nih.gov/books/NBK559246/

[10] Omar MG, Yousef AM, Kamel HE, Yosri MM. Prevalence of pelvic floor dysfunction among women with polycystic ovarian syndrome: a case-control study. Bulletin of Faculty of Physical Therapy. 2023 Mar 8;28(1):9.

[11] Saei Ghare Naz M, Ramezani Tehrani F, Behroozi-Lak T, Mohammadzadeh F, Kholosi Badr F, Ozgoli G. Polycystic ovary syndrome and pelvic floor dysfunction: a narrative review. Research and Reports in Urology. 2020 May 7:179-85.

[12] Antônio FI, Bo K, Ferriani RA, de Sá MF, de Sá Rosa e Silva AC, Ferreira CH. Pelvic floor muscle strength and urinary incontinence in hyperandrogenic women with polycystic ovary syndrome. International urogynecology journal. 2013 Oct;24:1709-14.

[13] Rogers RG, Pauls RN, Thakar R, Morin M, Kuhn A, Petri E, Fatton B, Whitmore K, Kingsberg SA, Lee J. An International Urogynecological Association (IUGA)/International Continence Society (ICS) joint report on the terminology for the assessment of sexual health of women with pelvic floor dysfunction. International urogynecology journal. 2018 May;29:647-66.

[14] Jundt K, Peschers U, Kentenich H. The investigation and treatment of female pelvic floor dysfunction. Deutsches Ärzteblatt International. 2015 Aug;112(33-34):564.

[15] Tim S, Mazur-Bialy AI. The most common functional disorders and factors affecting female pelvic floor. Life. 2021 Dec 14;11(12):1397.

[16] Rojas J, Chávez M, Olivar L, Rojas M, Morillo J, Mejías J, Calvo M, Bermúdez V. Polycystic ovary syndrome, insulin resistance, and obesity: navigating the pathophysiologic labyrinth. International journal of reproductive medicine. 2014;2014(1):719050.

[17] Jeanes YM, Reeves S. Metabolic consequences of obesity and insulin resistance in polycystic ovary syndrome: diagnostic and methodological challenges. Nutrition research reviews. 2017 Jun;30(1):97-105.

[18] Handa VL, Harris TA, Ostergard DR. Protecting the pelvic floor: obstetric management to prevent incontinence and pelvic organ prolapse. Obstetrics & Gynecology. 1996 Sep 1;88(3):470-8.

[19] Tim S, Mazur-Bialy AI. The most common functional disorders and factors affecting female pelvic floor. Life. 2021 Dec 14;11(12):1397.

[20] Li Y, Chen C, Ma Y, Xiao J, Luo G, Li Y, Wu D. Multi-system reproductive metabolic disorder: significance for the pathogenesis and therapy of polycystic ovary syndrome (PCOS). Life sciences. 2019 Jul 1;228:167-75.

[21] Saei Ghare Naz M, Ramezani Tehrani F, Behroozi-Lak T, Mohammadzadeh F, Kholosi Badr F, Ozgoli G. Polycystic ovary syndrome and pelvic floor dysfunction: a narrative review. Research and Reports in Urology. 2020 May 7:179-85.

[22] Kahn CR. Insulin resistance, insulin insensitivity, and insulin unresponsiveness: a necessary distinction. Metabolism. 1978 Dec 1;27(12):1893-902.

[23] Pérez-Martin A, Raynaud E, Mercier J. Insulin resistance and associated metabolic abnormalities in muscle: effects of exercise. Obesity reviews. 2001 Feb;2(1):47-59.

[24] Micussi MT, Freitas RP, Angelo PH, Soares EM, Lemos TM, Maranhão TM. Evaluation of the relationship between the pelvic floor muscles and insulin resistance. Diabetes Metab Syndr Obes. 2015 Aug 28;8:409-13. doi: 10.2147/DMSO.S85816. PMID: 26357485; PMCID: PMC4559236.

[25] de Luca C, Olefsky JM. Inflammation and insulin resistance. FEBS Lett. 2008 Jan 9;582(1):97-105. doi: 10.1016/j.febslet.2007.11.057. Epub 2007 Nov 29. PMID: 18053812; PMCID: PMC2246086.

[26] Sadeeqa S, Mustafa T, Latif S. Polycystic Ovarian Syndrome-Related Depression in Adolescent Girls: A Review. J Pharm Bioallied Sci. 2018 Apr-Jun;10(2):55-59. doi: 10.4103/JPBS.JPBS_1_18. PMID: 29962792; PMCID: PMC5998697.

[27] Hannibal KE, Bishop MD. Chronic stress, cortisol dysfunction, and pain: a psychoneuroendocrine rationale for stress management in pain rehabilitation. Phys Ther. 2014 Dec;94(12):1816-25. doi: 10.2522/ptj.20130597. Epub 2014 Jul 17. PMID: 25035267; PMCID: PMC4263906.

[28] Scharp D. Hypertonic Pelvic Floor Muscle Dysfunction and Urinary Tract Infection: A Comprehensive Approach to Diagnosis and Treatment. Urologic Nursing. 2020 Sep 1;40(5).

[29] Faubion SS, Shuster LT, Bharucha AE. Recognition and management of nonrelaxing pelvic floor dysfunction. Mayo Clin Proc. 2012 Feb;87(2):187-93. doi: 10.1016/j.mayocp.2011.09.004. PMID: 22305030; PMCID: PMC3498251.

[30] Huang AJ, Jenny HE, Chesney MA, Schembri M, Subak LL. A group-based yoga therapy intervention for urinary incontinence in women: a pilot randomized trial. Female Pelvic Med Reconstr Surg. 2014 May-Jun;20(3):147-54. doi: 10.1097/SPV.0000000000000072. PMID: 24763156; PMCID: PMC4310548.

[31] Shivakumar S, Balakrishna M. CONCEPTS OF YOGA AND FITNESS. Ashok Yakkaldevi; 2022 Apr 1.

[32] Rathore M, Trivedi S, Abraham J, Sinha MB. Anatomical correlation of core muscle activation in different yogic postures. International journal of yoga. 2017 May 1;10(2):59-66.

[33] Doohwa VJ. Identifying Postural Imbalances Through Yoga: An Innovative Guide to Yoga Asana Observation and Adjustment for Your Postural Type. Human Kinetics; 2023.

[34] Dua R, Malik S, Bhadoria AS, Kumar R. Chair yoga. Journal of Medical Evidence. 2021 Sep 1;2(3):262-6.

[35] Mishra S, Patel G, Tiwari M. Polycystic Ovarian Syndrome and their Management through Yoga Therapy: A Narrative Review. AYUHOM. 2023 Jul 1;10(2):83-9.

[36] Ryba CD. Pelvic Yoga Therapy for the Whole Woman: A Professional Guide. Singing Dragon; 2022 May 19.

[37] Singh RB, Wilczyńska-Kwiatek A, Fedacko J, Pella D, De Meester F. Pranayama: the power of breath. International Journal on Disability and Human Development. 2009 Jun;8(2):141-54.

[38] Rosenbaum TY. An integrated mindfulness-based approach to the treatment of women with sexual pain and anxiety: Promoting autonomy and mind/body connection. Sexual and Relationship Therapy. 2013 Feb 1;28(1-2):20-8.

[39] Werner D. The Illuminated Breath: Transform Your Physical, Cognitive & Emotional Well-Being by Harnessing the Science of Ancient Yoga Breath Practices. Victory Belt Publishing; 2021 Feb 23.

[40] Duncanson E. Cultivating a Sustainable Core: A Framework Integrating Body, Mind, and Breath Into Musculoskeletal Rehabilitation. Singing Dragon; 2023 Jul 21.

[41] Duncanson E. Cultivating a Sustainable Core: A Framework Integrating Body, Mind, and Breath Into Musculoskeletal Rehabilitation. Singing Dragon; 2023 Jul 21.

[42] Prosko S. Optimizing pelvic floor health through yoga therapy. Yoga Therapy Today. 2016;1:32-4.

[43] Mishra S, Pal S, Tiwari M. Polycystic ovarian syndrome: A literature Review.

[44] Li Q. [Retracted] The Effects of Yoga Exercise on Pelvic Floor Rehabilitation of Postpartum Women. Journal of Healthcare Engineering. 2022;2022(1):1924232.

[45] Bratborska AW, Piotrowski I. The impact of yoga practice on cortisol levels in breast cancer patients—a comprehensive review. Oncology in Clinical Practice. 2024 Jan 19.

[46] ELBanna MM, Kamel DM, Shaaban A, Botla AM, Hamoda RE. Effect of Yoga Training and High Probiotic Food Supplements on Insulin-Resistance in Polycystic-Ovarian-Syndrome: A Randomized Controlled Trial. International Journal of Kinesiology and Sports Science. 2024 Jul 30;12(3):52-61.

[47] Patel V, Menezes H, Menezes C, Bouwer S, Bostick-Smith CA, Speelman DL. Regular mindful yoga practice as a method to improve androgen levels in women with polycystic ovary syndrome: a randomized, controlled trial. Journal of Osteopathic Medicine. 2020 May 1;120(5):323-35.

[48] Nidhi R, Padmalatha V, Nagarathna R, Amritanshu R. Effects of a holistic yoga program on endocrine parameters in adolescents with polycystic ovarian syndrome: a randomized controlled trial. The Journal of Alternative and Complementary Medicine. 2013 Feb 1;19(2):153-60.

[49] Nightingale TE, Mehnert U, Kessler TM, Krassioukov AV. Autonomous nervous system dysfunction. Oxford Textbook of Neurorehabilitation. 2020 May 28:111.

[50] Mishra S, Patel G, Tiwari M. Polycystic Ovarian Syndrome and their Management through Yoga Therapy: A Narrative Review. AYUHOM. 2023 Jul 1;10(2):83-9.

[51] Pattyn N, Beech D, Wilhelmsson J, Kilding H, Mendrek A. Restorative techniques: Mindfulness, relaxation, breathing, and yoga. InHandbook of Mental Performance 2024 (pp. 86-118). Routledge.

[52] Ryba CD. Pelvic Yoga Therapy for the Whole Woman: A Professional Guide. Singing Dragon; 2022 May 19.

[53] Tabatabaie NS, Borujeni FR, Tavakol Z, Shahraki HR. The Effect of Yoga and Pelvic Floor Muscle Exercise on Sexual Function and Sexual Self-esteem of Reproductive-age Women: A Randomized Clinical Trial. International Journal of Community Based Nursing and Midwifery. 2024 Jul;12(3):188.

[54] Bai H, Ding H, Wang M. Polycystic Ovary Syndrome (PCOS): Symptoms, Causes, and Treatment. Clinical and Experimental Obstetrics & Gynecology. 2024 May 21;51(5):126.

[55] Aggithaya MG, Narahari SR, Ryan TJ. Yoga for correction of lymphedema's impairment of gait as an adjunct to lymphatic drainage: A pilot observational study. International journal of yoga. 2015 Jan 1;8(1):54-61