

Correlation of Level of Physical Activity and Anxiety-Depression in Polycystic Ovarian Syndrome in Young Females: A Cross-sectional Study

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ABSTRACT

Polycystic Ovarian Syndrome (PCOS) is a multifactorial endocrine disorder commonly affecting young females, often associated with obesity, anxiety, depression, and reduced physical activity. Lifestyle modification and exercise play a crucial role in the management of PCOS; however, the relationship between physical activity levels and psychological symptoms remains underexplored. To assess the correlation between levels of physical activity and symptoms of anxiety and depression in young females diagnosed with PCOS. A cross-sectional study was conducted among young females diagnosed with PCOS. Physical activity was assessed using the International Physical Activity Questionnaire (IPAQ), while anxiety and depression were evaluated using the Hamilton Anxiety Rating Scale (HAM-A) and Hamilton Depression Rating Scale (HAM-D), respectively. Descriptive and correlational analyses were performed to determine associations between physical activity and psychological variables. Analysis revealed that 95% of participants were involved in low physical activity, while only 5% reported moderate activity levels. The mean anxiety score was 21.69 ± 7.37 , and the mean depression score was 18.25 ± 6.13 , indicating a higher prevalence of anxiety compared to depression among young females with PCOS. A significant positive correlation ($r = 0.49$) was found between anxiety and depression symptoms. Furthermore, anxiety showed a moderate negative correlation with physical activity ($r = 0.5$), while depression exhibited a strong negative correlation with physical activity levels, suggesting that lower physical activity is associated with higher anxiety and depression scores. The findings indicate that young females with PCOS exhibit predominantly low physical activity levels, which are significantly associated with higher symptoms of anxiety and depression. Promoting regular physical activity may serve as a potential non-pharmacological strategy to improve both physical and psychological well-being in this population.

Keywords: Polycystic Ovarian Syndrome, Physical Activity, Anxiety, Depression, IPAQ, HAM-A, HAM-D

INTRODUCTION

Polycystic Ovarian disease is a common, heterogenous endocrine disease in young females in reproductive age group. In India, worldwide prevalence is about 8.2% - 22.5%. The woman's ovary enlarges and begins producing an excessive amount of male hormones (androgens), which leads to a range of abnormalities of reproductive system, persistent anovulation and many more. The disease being a complex disorder of various clinical manifestations like, Hyperandrogenism, Hirsutism, amenorrhea, obesity, Acne, dark patches of skin in folds and creases affecting quality of life, emotional health, and physical health⁽¹⁾.

Polycystic ovarian syndrome is becoming more widespread both globally and in India, owing primarily to poor lifestyle choices. Because to poor diet, stress, and lack of physical activity, the prevalence of polycystic ovarian syndrome in India ranges from 37 to 225 percent, depending on the demographic studied⁽²⁾ with increased urbanisation, the condition has gained momentum. Thus, making it as a lifestyle disorder.

Women with Polycystic Ovarian Syndrome have hormonal imbalances that affect their psychological well-being, resulting in mood swings, fatigue, failure to maintain social relationships, and a lack of self-esteem, all of which are associated with the disease and, as a result, increase stress. The disease further worsens the condition by impacting their cardiometabolic and reproductive health, as well as mental health and health-related quality of life^{(3),(4)}

Ghazeeri G et al in study titled, "Anxiety, cognitive, and depressive assessment in adolescents with polycystic ovarian syndrome" highlighted that adolescents with PCOS perceive the clinical symptoms of depression and anxiety and indications of PCOS.⁽⁶⁾⁽⁷⁾

Compared to healthy women, women with PCOS are more prone to experience anxiety

and depressive disorders as well as depression. Sadly, no studies have been conducted to find out how adolescents perceive the clinical symptoms and indications of PCOS. This study looked at the cognitive, depressive, and anxiety states of adolescent girls with polycystic ovarian syndrome.⁽⁸⁾

PCOS is a complicated disease that has an impact on cardiometabolic and reproductive health, as well as mental health and health-related quality of life. Exercise has long been known to have physical health advantages for women with PCOS, and it is now increasingly becoming recognized as an effective way to improve psychological well-being.⁽⁹⁾

The psychological anguish experienced by women with polycystic ovarian syndrome is caused by a variety of symptoms, including high body mass index (BMI), dyslipidemia, insulin resistance, and potential infertility⁽⁷⁾ polycystic ovarian syndrome-related alterations in a woman's physical appearance have been identified as the key contributors to psychological morbidity^{(7),(8)}.

In addition to these medical conditions, a correlation between physical activity level and anxiety-depression in young females with polycystic ovarian syndrome has been found to increase the risk of depression, anxiety, bipolar disorder, and obsessive-compulsive disorder in women⁽⁵⁾.

Obesity is more prevalent in females, especially in those with polycystic ovarian syndrome than in those without the condition, and it is strongly associated with depression, independent of its underlying aetiology. Patients with polycystic ovarian syndrome frequently experience anxiety and depression, however its correlation with physical activity has not been extensively researched⁽⁹⁾

There is growing evidence that suggests regular physical activity helps alleviate many of the pathophysiological symptoms

of PCOS. For instance, weight loss brought on by physical activity in obese people has been linked to a reduction in depression symptoms. Women's quality of life and mental health may advance thanks to physical activity's beneficial impacts on symptomatology and comorbidity severity.⁽¹²⁾

Because it lowers insulin resistance, enhances the metabolic and reproductive aspects of polycystic ovarian syndrome, and improves body image, physical activity is advised as the main therapy method for the condition. Exercise is a powerful tool for managing mental health difficulties. Physical activity is thought to be an excellent way to improve both the mental health and quality of life of individuals with polycystic ovarian syndrome⁽⁴⁾. Endorphins, hormones that enhance emotions of well-being, are released as a result of exercise. This can aid in weight loss, stress management, the reduction of some depressive symptoms, and other health benefits^{(10), (15)}.

Disruptions in sleep, tension and pain in the muscles Headache, exhaustion, tension, and anxiety, eating too much or too little a decline in enthusiasm mood swings moodiness and depression, gaining weight (especially around the belly), Infertility, Miscarriage, Fatigue, sleep problems, Stress is indicated by restlessness and a lack of motivation⁽¹⁵⁾. It has been claimed that women with PCOS may be more prone to eating issues due to the condition's propensity for obesity. Obesity, and more specifically central obesity, worsens the phenotypic of PCOS.⁽¹⁴⁾

People with PCOS frequently experience depression. Most obese people frequently experience mood disorders and depressed symptoms. But it's unclear how fat affects the likelihood of developing depression. Similar difficulties prevent women with polycystic ovarian syndrome (PCOS) from changing their lifestyles as other women of reproductive age. Impaired gut hormone control and energy expenditure in PCOS may affect one's physical capacity for

lifestyle modifications. Due to psychological symptoms and a lack of critical health literacy, psychological capability may be diminished.⁽¹⁶⁾

However, the evidence for this association between higher BMI and depression is tenuous. The onset of melancholy and depressive symptoms in PCOS may also be related to hyperandrogenism, hyperinsulinemia, and greater levels of inflammation.⁽¹⁰⁾

Women with PCOS are more likely to report feeling insecure about their capacity to maintain physical activity, which may be related to feelings of guilt and worthlessness as well as a negative body image.⁽¹³⁾

Although women with PCOS are not the only ones who experience body image issues, this population does experience it more frequently, and it has been suggested that this may play a part in the development of depression and anxiety.⁽¹¹⁾

There is scarcity of evidence to support the idea that increasing physical activity will benefit polycystic ovarian syndrome; thus, this study intends to examine the relationship between physical activity levels and the levels of anxiety and depression reported by women with PCOS.

MATERIALS & METHODS

Participants

Hundred young females of age group 18-25 with polycystic ovarian syndrome participated in this study. The females who are diagnosed with polycystic ovarian syndrome for at least one year by Gynaecologist and were unmarried were included in the study.

The females with injuries in recent 3 months and the females suffering from any neurological condition were excluded from the study. The participants have been explained about the research and written consent has been signed by them.

Outcome measures used were:

International physical activity questionnaire scale

Hamilton anxiety rating scale

Hamilton depression rating scale

Statistical Analysis

Data collected from 100 young females aged 18–25 years diagnosed with polycystic ovarian syndrome (PCOS) for at least one year were subjected to statistical analysis. Descriptive statistics, including mean, standard deviation, frequencies, and percentages, were used to summarize

demographic variables and scale scores. Correlation analysis (Pearson or Spearman) was performed to evaluate the relationship between physical activity levels, anxiety, and depression scores. A significance level of $p < 0.05$ was considered statistically significant.

RESULT

Table 1: International Physical Activity Questioner (IPAQ) wise distribution of cases in study group

IPAQ	No of cases	Percentage
Low	95	95
Moderate	5	5
High	0	0
Total	100	100

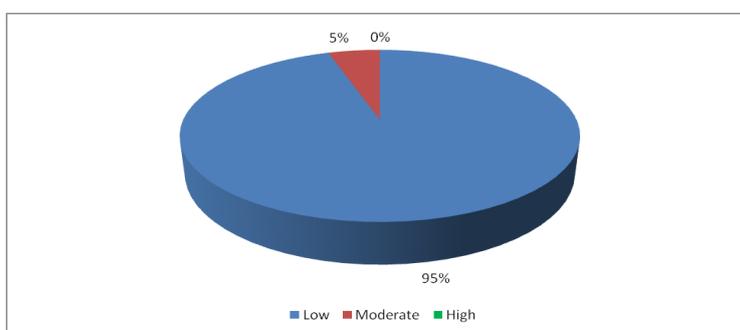


Table 1 graph 1: shows the distribution of females according to their Physical activity assessed using the International Physical Activity Questionnaire (IPAQ).

Table 2: Descriptive statistics of HAM-A and HAM-D in study group

Parameters	Mean	SD	Minimum	Maximum
HAM-A	21.69	7.37	10	46
HAM-D	18.25	6.13	8	41

Table 2 shows the distribution of anxiety and depression in young females using Hamilton anxiety rating scale and Hamilton depression rating scale.

Table 3: Correlation between Hamilton Anxiety Rating scale (HAM-A) and Hamilton Depression Rating scale (HAM-D) in study group

Correlation between HAM-A	r Value	P Value
HAM-D	0.49	0.037

Table 3 shows the significant correlation($r=0.49$) of the anxiety and depression symptoms in young femlaes with PCOS.

Table 4: Correlation between Hamilton Anxiety Rating scale (HAM-A) and International Physical Activity Questioner (IPAQ) in study group

Correlation between HAM-A	R Value	P Value
IPAQ	0.5	0.88

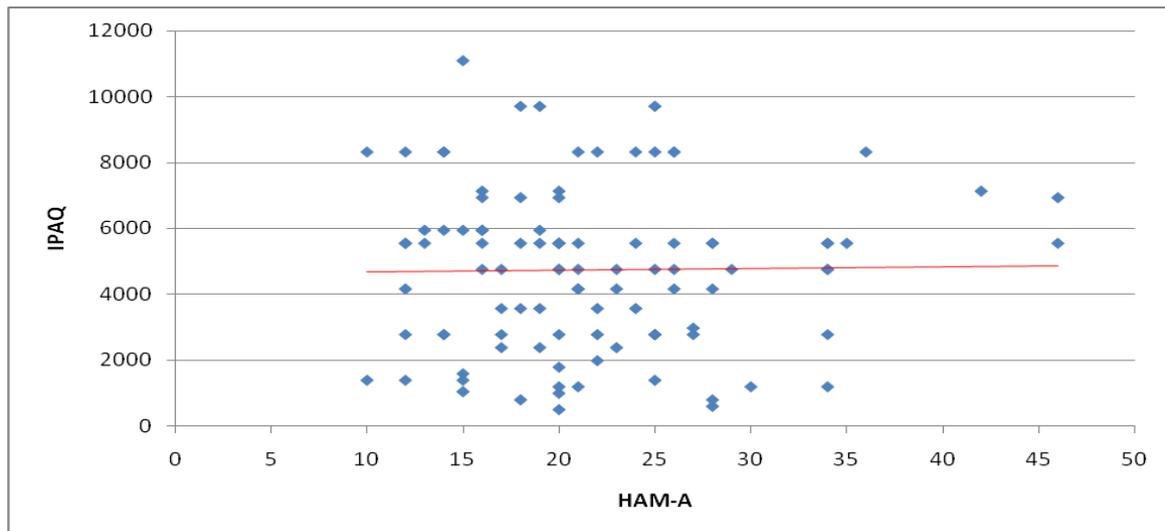


Table 4 shows moderate correlation of anxiety measured on the Hamilton anxiety rating scale with Physical activity measured on the international physical activity questionnaire. Young females who had low physical activity exhibited more symptoms of anxiety ($r=0.5$)

Table 5: Correlation between Hamilton Depression Rating scale (HAM-D) and International Physical Activity Questioner (IPAQ) in study group

Correlation between HAM-D	R Value	P Value
IPAQ	0.6	0.43

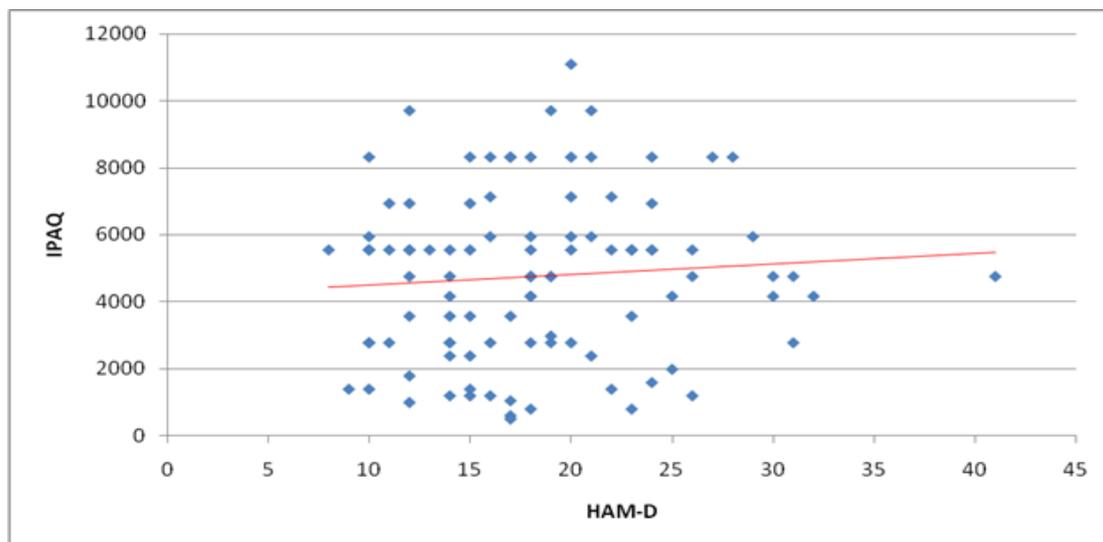


Table 5 shows strong Correlation between depression measured on Hamilton Depression Rating scale (HAM-D) with physical activity measured on International Physical Activity Questionnaire

Table & graph 1 shows the distribution of females according to their Physical activity assessed using the International Physical Activity Questionnaire (IPAQ). From the

sample population, 95% females were involved in low physical activity, while 5% females were involved in moderate physical activity. It was observed that the average time spent in activities like fast walking, bicycling, heavy lifting, gym, strengthening are low which suggests that the overall physical activity of the female is low hence, the maximum uptake of oxygen i.e. VO₂

max consumed for the activities is also low, which is a major cause for Obesity.

Table 2 shows the distribution of anxiety and depression in young females using Hamilton anxiety rating scale and Hamilton depression rating scale.

The mean score of anxiety was 21.69 ± 7.37 , whereas that of Depression was 18.25 ± 6.13 , suggesting that anxiety is more common in young females with PCOS than depression.

Table 3 shows the significant correlation ($r=0.49$) between anxiety and depression symptoms in young females with PCOS.

Table 4 shows A moderate correlation of anxiety measured on the Hamilton anxiety rating scale with Physical activity measured on the international physical activity questionnaire. Young females who had low physical activity exhibited more symptoms of anxiety ($r=0.5$)

Table 5 shows strong Correlation between depression measured on Hamilton Depression Rating scale (HAM-D) with physical activity measured on International Physical Activity Questionnaire. Young females who had low physical activity exhibited more depression.

DISCUSSION

The purpose of the study was to assess the correlation of level of Physical Activity and Anxiety-Depression in Polycystic Ovarian Syndrome in young females. The physical activity of 100 young females in the age group 18-25 years, diagnosed with Polycystic ovarian disease by a Gynaecologist since past 1 year was examined using the international physical activity questioner Scale, also the anxiety and depression in these females was observed using the Hamilton anxiety rating scale & Hamilton depression rating scale.

According to our current study, 95% of females had minimum the physical activity, whereas only 5% females had moderate physical activity when measured on the International Physical activity Scale, which indicates that very few females with PCOS are physically active. Lauren Banting et al conducted a similar study to assess the

motivators, barriers and support providers to physical activity in women with PCOS. The study also reported lesser physical activity in women with PCOS as compared to women without PCOS, with fatigue, low level of confidence, fear of injury, body image as amongst the barriers to physical activity. From our study, it was evident that the average time spent by women with PCOS in activities like fast walking, bicycling, heavy lifting, gym, strengthening are low which suggested that the overall physical activity of the female is low hence, the maximum uptake of oxygen i.e VO₂ max consumed for the activities is also low, which is a major cause for Obesity.

The mean score of anxiety was 21.69 ± 7.37 , whereas that of Depression was 18.25 ± 6.13 , suggesting that anxiety is more common in young females with PCOS than depression.

Several Studies have reported higher level of anxiety in amongst women who face difficulty in child bearing. Stressors like irregular menstrual cycles, infertility, increasing body weight, alterations in body image tend to hike the anxiety symptoms in women. According to the study conducted by Alur Gupta S et al on “Body image distress is increased in Women with polycystic Ovary Syndrome and mediates depression and anxiety”, women with PCOS have negative body image and dissatisfaction over their appearance as compared to young females without PCOS.⁽¹⁷⁾

Similarly, a moderate negative correlation was found in between anxiety and physical activity, whereas a significant negative correlation between depression and physical activity was noted. Thus, Young females who had low physical activity exhibited more symptoms of anxiety ($r=-0.5$) and depression. ($r=-0.6$)

Farnaz Shishehgar et al reported low physical activity by 59.2% as compared to non-Hirsute women in study titled, “Factors influencing Physical activity in women with Polycystic Ovary Syndrome in comparison to Eumenorrhic Non-Hirsute women”.⁽¹⁸⁾

There was also high association of low

physical activity with BMI and hence it was concluded that lowering BMI can effectively help to reduce the symptoms of PCOS. Traditionally, weight loss and physical activity have been suggested as the first line of treatment for PCOS. The study also reported that women with PCOS are not aware of importance of physical activity in managing PCOS symptoms.

Young females especially in the adolescent age group are more concerned about their body physique and reproductive physiology. Impaired Waist Hip ratio, High BMI causing demoralization of these females and indicate depression and stress leading to social withdrawal.⁽¹⁹⁾

Hussain A conducted a Study titled "Prevalence of psychiatric disorders in patients with a diagnosis of polycystic ovary syndrome in Kashmir", in 2015 on 110 PCOS Patients and 40 normals.⁽²⁰⁾ The prevalence of depression and generalized anxiety disorder (GAD) was 23.64% and 15.45% in PCOS Patients, while that in normal was 7.5% and 0% respectively.

Similarly, In our current study, physical activity is minimally associated with anxiety in young females. Many studies have identified that along with obesity as a major cause of Depression in PCOS, central 5 HT System dysregulation is one of major physiological cause for depression. Weber et al in study titled, "Testosterone, Androstenedione and dihydrotestosterone concentrations are elevated in female patients with major depression: psychoneuroendocrinology" suggested that increase in secretion of adrenal hormones in depression is due to the increased activity of the HPA system.⁽²¹⁾

According to our current study, it was evident that women with PCOS who were involved in moderate to severe physical activity, who valued the importance of physical activity in their routine exhibited lower anxiety & depression as compared to women who were not physically active.⁽²²⁾ Several studies have claimed that Physical activity is known to have numerous health benefits. Optimum physical activity helps to

activate the stress arousal system, improves cognitive performance, decreases the probability of metabolic syndrome, prevents other cardiovascular diseases and is known to improve the release of hippocampal brain derived neurotrophic factor (BDNF) and serotonin, which helps to improve the mental health of Individuals.⁽²³⁾

Women with PCOS should be involved in Physical activities in order to improve their mental well-being. As practice, exercise prescription along with dietary alterations are prescribed as the management for women with PCOS.⁽²⁴⁾

PCOS is a condition with cluster of metabolic syndromes, hormonal imbalance, fertility problems eventually hampering the mental health. Along with an array of various pharmacological and non-pharmacological treatments, Lifestyle modifications are the primary therapy.

Lifestyle modification strategies include dietary interventions with alterations in diet composition as well as physical activity can play a crucial role in the management of PCOS.

Several Studies have indicated that exercises of moderate intensity (~ 50-85% of one's maximal oxygen uptake (VO₂ Max) improves insulin sensitivity, cardiovascular risk factors and improves fertility. Regular, moderate physical activity (at least three to five times per week) has been shown to regulate blood pressure, weight and reduce the risk of Type 2 diabetes in high risk PCOS Women. Resistance exercise training with or without aerobic exercise are known to improve health.⁽²⁵⁾

Women those are involved in moderate to severe physical activity showed lesser traces of anxiety and depression disorders as compared to women who are sedentary or are involved in minimum physical activity.⁽²⁶⁾ Exercises directed to weight loss help not only help to improve the self-esteem and body image but also help in release of cytokines at the molecular level which helps to reduce depression.⁽²⁷⁾

CONCLUSION

Despite a strong case for physical activity and exercise, exists to enhance mental wellbeing in polycystic ovarian syndrome, the results of the current research do indicate that physical activity is a positive approach for these women with polycystic ovarian syndrome, physical and mental health. Recent studies have shown conclusively that women with PCOS are more likely to experience higher levels of anxiety and depression as well as lower Health related quality of life. Thus, physical activity is linked to anxiety and depression, and that women with PCOS were less likely to be physically active than those without PCOS.

Declaration by Authors

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REFERENCES

1. Meier RK. Polycystic Ovary Syndrome. *Nurs Clin North Am.* 2018 Sep;53(3):407-420. doi: 10.1016/j.cnur.2018.04.008. Epub 2018 Jul 11. PMID: 30100006.
2. Ganie MA, Vasudevan V, Wani IA, Baba MS, Arif T, Rashid A. Epidemiology, pathogenesis, genetics & management of polycystic ovary syndrome in India. *The Indian journal of medical research.* 2019 Oct;150(4):333.
3. Tan S, Scherag A, Janssen OE, Hahn S, Lahner H, Dietz T, Scherag S, Grallert H, Vogel CI, Kimmig R, Illig T. Large effects on body mass index and insulin resistance of fat mass and obesity associated gene (FTO) variants in patients with polycystic ovary syndrome. *BMC medical genetics.* 2010 Dec;11(1):1-9.
4. Kumrapeli 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 Feb;118(3):319-28.
5. Conte F, Banting L, Teede HJ, Stepto NK. Mental health and physical activity in women with polycystic ovary syndrome: a brief review. *Sports Medicine.* 2015 Apr;45(4):497-504.
6. Cinar N, Kizilarslanoglu MC, Harmanci A, Aksoy DY, Bozdog G, Demir B, Yildiz BO. Depression, anxiety and cardiometabolic risk in polycystic ovary syndrome. *Human Reproduction.* 2011 Dec 1;26(12):3339-45.
7. Ghazeeri G, Fakih A, Abbas HA, Harajly S, Awwad J. Anxiety, cognitive, and depressive assessment in adolescents with polycystic ovarian syndrome: a pilot study. *Journal of Pediatric and Adolescent Gynecology.* 2013 Oct 1;26(5):269-73.
8. Balıkcı A, Erdem M, Keskin U, Zincir SB, Guelsuen M, Oezcelik F, Akgül EÖ, Akarsu S, Öztosun M, Erguen A. Depression, anxiety, and anger in patients with polycystic ovary syndrome. *Nöro Psikiyatri Arşivi.* 2014 Dec;51(4):328.
9. Patten RK, Pascoe MC, Moreno-Asso A, Boyle RA, Stepto NK, Parker AG. Effectiveness of exercise interventions on mental health and health-related quality of life in women with polycystic ovary syndrome: a systematic review. *BMC public health.* 2021 Dec;21(1):1-2.
10. Chainani E. Analyzing the Correlation Between Polycystic Ovarian Syndrome and Anxiety, Depression and Quality of Life in Indian Students.
11. Cooney LG, Dokras A. Depression and anxiety in polycystic ovary syndrome: etiology and treatment. *Current psychiatry reports.* 2017 Nov;19(11):1-0.
12. Banting LK, Gibson-Helm M, Polman R, Teede HJ, Stepto NK. Physical activity and mental health in women with polycystic ovary syndrome. *BMC women's health.* 2014 Dec;14(1):1-9.
13. Zehravi M, Maqbool M, Ara I. Depression and anxiety in women with polycystic ovarian syndrome: a literature survey. *International Journal of Adolescent Medicine and Health.* 2021 Dec 1;33(6):367-73.
14. Zangeneh FZ, Jafarabadi M, Naghizadeh MM, Abedinia N, Haghollahi F. Psychological distress in women with polycystic ovary syndrome from Imam Khomeini Hospital, Tehran. *Journal of reproduction & infertility.* 2012 Apr;13(2):111.

15. Thapa DK, Subedi S. Exercise and mental wellbeing. *Journal of Psychiatrists' Association of Nepal*. 2017;6(1):1-2.
16. Ee C, Pirootta S, Mousa A, Moran L, Lim S. Providing lifestyle advice to women with PCOS: an overview of practical issues affecting success. *BMC endocrine disorders*. 2021 Dec;21(1):1-2.
17. Alur-Gupta S, Chemerinski A, Liu C, Lipson J, Allison K, Sammel MD, Dokras A. Body-image distress is increased in women with polycystic ovary syndrome and mediates depression and anxiety. *Fertil Steril*. 2019 Nov;112(5):930-938.e1. doi: 10.1016/j.fertnstert.2019.06.018.
18. Shishehgar F, Tehrani FR, Mirmiran P, Hajian S, Baghestani AR, Moslehi N. Factors Influencing Physical Activity in Women with Polycystic Ovary Syndrome in Comparison to Eumenorrhic Non-Hirsute Women. *Glob J Health Sci*. 2016 Oct 1;8(10):56382. doi: 10.5539/gjhs.v8n10p127.
19. Ganesan S, Ravishankar SL, Ramalingam S. Are Body Image Issues Affecting Our Adolescents? A Cross-sectional Study among College Going Adolescent Girls. *Indian J Community Med*. 2018 Dec;43(Suppl 1): S42-S46. doi: 10.4103/ijcm.IJCM_62_18.
20. Hussain A, Chandel RK, Ganie MA, Dar MA, Rather YH, Wani ZA, Shiekh JA, Shah MS. Prevalence of psychiatric disorders in patients with a diagnosis of polycystic ovary syndrome in kashmir. *Indian J Psychol Med*. 2015 Jan-Mar;37(1):66-70. doi: 10.4103/0253-7176.150822.
21. Weber B, Lewicka S, Deuschle M, Colla M, Heuser I. Testosterone, androstenedione and dihydrotestosterone concentrations are elevated in female patients with major depression. *Psychoneuroendocrinology*. 2000 Nov;25(8):765-71. doi: 10.1016/s0306-4530(00)00023-8.
22. Woodward A, Klonizakis M, Broom D. Exercise and polycystic ovary syndrome. *Physical Exercise for Human Health*. 2020:123-36.
23. Pedersen BK, Saltin B. Exercise as medicine—evidence for prescribing exercise as therapy in 26 different chronic diseases. *Scandinavian journal of medicine & science in sports*. 2015 Dec; 25:1-72.
24. Harrison CL, Lombard CB, Moran LJ, Teede HJ. Exercise therapy in polycystic ovary syndrome: a systematic review. *Human reproduction update*. 2011 Mar 1;17(2):171-83.
25. Bahrami H, Mohseni M, Amini L, Karimian Z. The effect of six weeks yoga exercises on quality of life in infertile women with polycystic ovary syndrome (PCOS). *The Iranian Journal of Obstetrics, Gynecology and Infertility*. 2019 Jul 23;22(5):18-26.
26. Veale DD. Exercise and mental health. *Acta Psychiatrica Scandinavica*. 1987 Aug;76(2):113-20.
27. Donaghy ME. Exercise can seriously improve your mental health: Fact or fiction? *Advances in physiotherapy*. 2007 Jan 1;9(2):76-88.
28. Klaperski S, Koch E, Hewel D, Schempp A, Müller J. Optimizing mental health benefits of exercise: The influence of the exercise environment on acute stress levels and wellbeing. *Mental Health & Prevention*. 2019 Sep 1; 15:200173.

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