

Original Article

## Cure of PMOS with Intervention of Physical Exercise

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### Abstract

PMOS is a complicated endocrinopathy that affects mutually the breakdown and reproductive systems of women of reproductive age. The occurrence series is from 6.1 to 19.9%, depending on the analytic criteria utilized. Around 80% of women who know about anovulatory infertility are affected by PMOS, which causes multiple stages of disruption to the reproductive axis. According to the evidence, lifestyle changes must be the primary route of treatment for people with PMOS. Numerous lessons have looked at the effect of exercise treatments on reproductive purpose, with results showing that exercise improves menstruation and/or ovulation frequency. The processes through which exercise improves reproductive purpose are underpinned by increased insulin sensitivity. A collection of metabolic abnormalities that are CVD risk factors is present in PMOS. Exercise is helpful, and this is beyond dispute.

**Keywords:** polycystic ovary syndrome, workout, routine alteration, load, insulin conflict

### Introduction

PMOS (polycystic ovarian syndrome) is a predominant endocrine illness that disturbs 8-12% of women. A change in routine, including more bodily exercise, is the primary strategy for treating PMOS. A thorough evaluation was done to classify and label the impact of a workout as an autonomous interference on medical consequences in PMOS [1].

The most predominant endocrine illness in women of reproductive age is polycystic ovarian syndrome (PMOS), with occurrence rates ranging from 5% to 15%, depending on the diagnostic standards used. For the first time, Stein and Leventhal recognized PMOS as a syndrome with polycystic ovaries and oligomenorrhoea that was sporadically accompanied by hirsutism, acne, and obesity [2]. Although polycystic ovaries were discovered to be inconsistently associated with the signs and symptoms that characterize PMOS, polycystic ovaries became necessary for PMOS diagnosis, which needed gynecologic expertise. Proven on the three essential components of PMOS – anovulation, hyperandrogenism, and polycystic ovaries – four phenotypes have been recognized by the health community that can be regarded as variations of the condition. Laterally aligned

metabolic and ovarian dysfunction, the four phenotypes constantly vary from the most severe (phenotype A) to the least severe (phenotype D) [2], [3].

Because there is presently no cure for PMOS, care of overweight/obese women with PMOS centers on weight loss by systematic exercise and nutrition, with the area of alleviating clinical indications and lowering the danger of T2DM and cardiovascular sickness (CVD). Given the advantages of exercise treatments in other IR groups that are not related to weight decline, adding moderate-intensity exercise into PMOS therapy may be especially beneficial. Although most exercise trials in women with PMOS demonstrate little or no weight decline, exercise can have beneficial benefits on IR, body fat distribution, and CVD risk in these individuals. As the number of research studies on the special effects of workouts and food on PMOS grows, it is critical to synthesize this information [4], [5].

The biological defining feature of PMOS is hyperandrogenemia, which manifests clinically as hirsutism, acne, and alopecia. High amounts of androgens are present in

75–90% of PMOS patients with oligomenorrhoea, and these levels often increase as the phenotypic brutality increases. The adrenal glands and ovaries produce too much androgen, which leads to hyperandrogenism [6], [7], [8].

It is problematic to regulate the underlying reason for this multifactorial illness due to its multipart interrelated pathophysiology. The phenotype of PMOS as well as its origin, prevalence, and modulation may be affected by ecological contaminants, food and lifestyle choices, hereditary factors, obesity, and gut dysbiosis. These features could have a part in the progression of metabolic syndrome, the onset of insulin resistance, the termination of partial folliculogenesis, excessive androgen secretion from the ovaries, and the ongoing low-grade issue of inflammatory mediators from white blood cells [9].

Huffman reported the existence of PMOS in young females for the first time in 1976. Initially, research in this stage ranged, concentrating mostly on menstruation dysfunction; however, scientific attention subsequently expanded to metabolic concerns associated with obesity, hyperandrogenism, and insulin resistance, which are examples of the syndrome [9], [10]. Although the influence of environmental variables on the emergence and development of the condition has recently been firmly highlighted, it is unclear if the existence of obesity in the overall population has altered the occurrence of polycystic ovaries. Franks believed that PMOS in teenagers is caused by a genetically programmed abnormality of ovarian function, resulting in androgen hypersecretion; nevertheless, he believes that environmental variables impact the clinical and biochemical phenotype. Changes in the amount, kind, and quality of dietary intake as well as the level and kind of physical exercise are predicted to have a momentous impact on reducing the prevalence of obesity among females with PMOS [11].

Numerous studies have demonstrated the negative effects of environmental pollutants on human health and reproduction, including heavy metals, pesticides, and endocrine-disrupting chemicals (EDCs). In fact, there is increasing evidence that ecological contaminants contribute to the emergence of PMOS. In comparison to non-hyperandrogenic PCOS patients and healthy controls, serum BPA levels were greater in hyperandrogenic PCOS patients [2].

## Methodology

### ❖ Study Design

This study will utilize a cross-sectional research design to collect data from women attending various gyms in Peshawar.

### ❖ Settings

The study will take place in Peshawar, located in the Khyber Pakhtunkhwa province of Pakistan.

The study will be conducted in the different gyms.

### ❖ Duration of study

The duration of the study will be about 4–6 months, depending upon the availability of participants and resources.

### ❖ Sample Selection

Convenience sampling will be employed to select participants from different women's gyms in Peshawar. Gym owners or managers will be contacted to seek permission to distribute the questionnaire among their female members. The sample size should be determined based on the desired level of statistical power and the available resources.

### ❖ Sample Size

Based on the cure of PMOS with intervention of exercise in the study location. We will ask people through a questionnaire. A sample size of at least 109 patients will be selected; it is calculated by using online software RAOSOFT.

### ❖ Data collection procedure

A self-structured questionnaire which contains both open-ended and close-ended questions will be used to capture the required information based on exercise habits, PMOS symptoms, and the perceived impact of exercise on PMOS management. Data will be collected by distributing questionnaires in person or by online platforms. The consent form will be provided to the study participants in order to ensure that they understand the study purpose and their rights as participants.

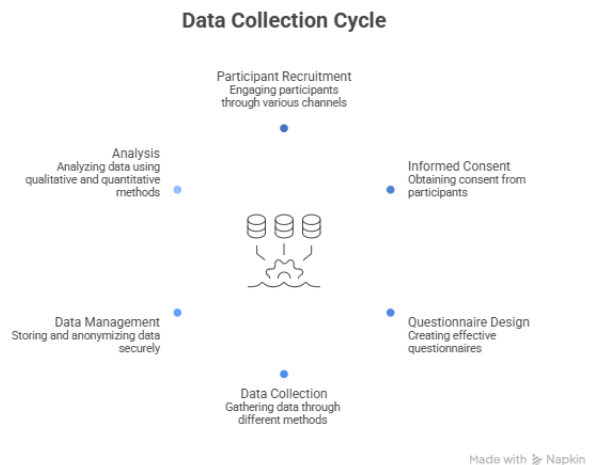


Figure 1.0 Demonstration of data collection process

## Results

The following are the results with a total of 109 samples that were generated from the survey done at Iqra National University and Gym. It contains descriptive data on PMOS.

The study's goals included examining how workout drill affected IR and body structure in overweight PMOS and non-PMOS women in order to better understand the mechanisms causing IR. An academic medical Centre hosted the study. 109 women were participants. This study used a prospective exercise intervention. An etiological role for VF in intrinsic IR in PMOS was suggested by the link between higher IR and

greater VF in that condition; however, changes following an exercise intervention did not establish a causal relationship. In PMOS women compared to non-PMOS women, exercise training regulated triglycerides more. Without significant weight loss, within-group exercise-induced decreases in cardiometabolic risk variables, such as IR, triglycerides, and VF in PMOS, were seen. If validated in subsequent controlled studies, this suggests that weight loss should not be the exclusive goal of workout programmers.

**Table no. 1 Gender:** A total of 109 participant from Gyms in Hayatabad, Peshawar, were involved (Table 1.0 Gender)

Gender				
		Frequency	Percent	Cumulative Percent
Valid	female	109	100.0	100.0

**Table no. 2 Religion:** 100 per cent of the respondents, in terms of religion, were Muslim (109, or 91.7%), and a total of 9 (8.3%) responded as non-Muslims.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	muslim	100	91.7	91.7	91.7
	non muslim	9	8.3	8.3	100.0
	Total	109	100.0	100.0	

**Table no. 3 Marital Status:** 100 per cent of the respondents, in terms of marital status, were unmarried (a total of 100, or 91.7%), and a total of 9 (8.3%) responded as married.

Marital Status				
		Frequency	Percent	Cumulative Percent
Valid	Married	9	8.3	8.3
	Unmarried	100	91.7	100.0
	Total	109	100.0	100.0

**Table No. 4 Age and Education:** 100 per cent of the respondents in terms of age: a total of 81 (74.3%) were 20-year-old respondents, a total of 18 (16.3%) responded that they are 21 years old, and a total of 10 (9.2%) respondents are 23 years old.

Age				
		Frequency	Percent	Cumulative Percent
Valid	20	81	74.3	74.3
	21	18	16.5	90.8
	23	10	9.2	100.0
	Total	109	100.0	100.0

**Table no 5 Education:** 100 percent of the respondent in term of Education, A Total of 73 (67.0%) were Bachelor's respondent and a total of 17 (15, 6%) responded were Master and Total of respondent 19 (17.4 %) were MPhil.

Education				
		Frequency	Percent	Cumulative Percent
Valid	Bachelors	73	67.0	67.0
	Master	17	15.6	82.6
	Mphil	19	17.4	100.0
	Total	109	100.0	100.0

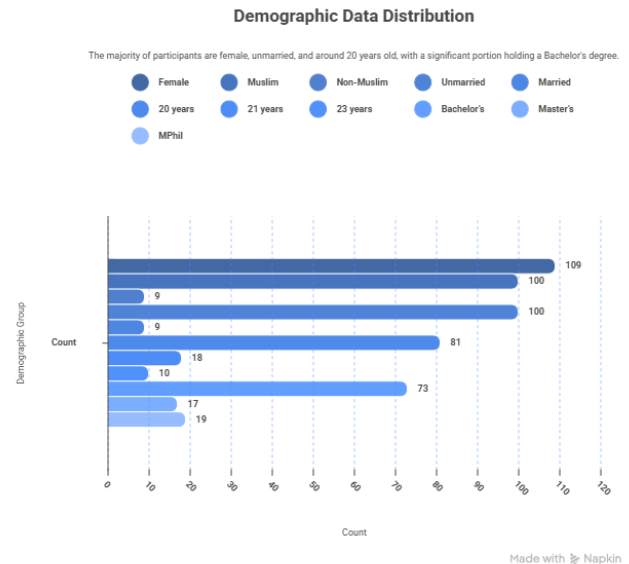


Figure 2.0 Demographic distribution among different factors

## Discussion

In PMOS, the ovaries overproduce androgens, the male sex hormones that are typically present in very little amounts in women. The numerous little cysts (fluid-filled sacs) in the ovaries are referred to as 'polycystic ovarian syndrome'. But both those who have the condition and those who don't create cysts in some women. A mature egg is released from an ovary during ovulation. This happens so that male sperm can fertilize it. The egg is eliminated during your period if it is not fertilized [7].

Rarely, a woman might not make enough of the hormones necessary for ovulation. The ovaries may develop if ovulation is unsuccessful. This study set out to evaluate the possible health benefits of physical activity in women with polyendocrine metabolic ovarian syndrome (PMOS), as well as the prevalence and determinants of physical activity in this group. A cross-sectional analysis of 109 PMOS-afflicted women was conducted [12]. Regarding demographic, psychosocial, and health aspects, active women (those who satisfied Department of Health and Human Services [DHHS] criteria for exercise) were contrasted with sedentary women. Women with PMOS who adhered to the DHHS physical activity recommendations were more likely to have a number of health advantages. Our research identifies a number of populations at risk for insufficient physical activity [3].

A prevalent and complex endocrinopathy involving reproductive and metabolic symptoms is Polycystic Ovarian

Metabolic Syndrome (POMS). Women with PMOS who participate in exercise training have been shown to have better clinical outcomes, although there are clear flaws in exercise prescription. This systematic review and meta-analysis's objective were to pinpoint the elements of exercise interventions that benefit PMOS-affected women. Exercise training for PMOS control is becoming more and more common [5], [13], [14]. The results of our investigation demonstrate the positive impacts of exercise, with vigorous exercise possibly having the greatest effects on body composition, insulin resistance, and cardiorespiratory fitness. Our findings indicate that for PMOS-afflicted women, a minimum of 120 minutes per week of vigorous exercise is required. Longer-term studies are required to determine the effects of continual exercise [4].

Women with PMOS have greater rates of insulin resistance than women without the illness. Insulin conflict is a condition that impairs your body's bulk to utilize blood sugar for energy. According to the National Institute of Diabetes and Digestive and Kidney Diseases Trusted Source, doctors have linked a lack of physical exercise and high body weight as probable contributing factors to insulin resistance. Not all PMOS ladies are overweight. The good news is that you can exercise for your health if you have PMOS, regardless of your weight [15]. Our research on PMOS indicated that high-intensity aerobic exercise was the most likely to reduce body mass index (BMI) and insulin resistance in women with PMOS. In this, we mentioned those women who routinely exercise. We also revealed that strenuous activity and a nutritious diet resulted in the biggest reductions in BMI [4], [16].

Clinically speaking, PMOS is a complicated ailment with lifetime implications that is increasingly common in females of reproductive age. The vague diagnostic criteria and enormous intricacy of this syndrome's characteristics present its most difficult aspects. PMOS management will be improved overall, comorbidities will be reduced, and quality of life will increase with the prompt application of tailored therapy techniques. For females who may mature with infertility during their reproductive years, early revealing and management are crucial to enhance their prognosis [17], [18]. For the early diagnosis and screening of PMOS subtypes, key gene polymorphisms may be helpful. Finding both efficient preventative tactics and therapy modalities will require further research on the genetics and pathophysiology of PMOS. Further investigation is necessary to determine whether steroid variations and the mechanisms underlying them in PMOS patients influence the makeup of gut microorganisms. Prebiotic, probiotic, and symbiotic supplementation appears to enhance a number of biochemical outcomes and have positive benefits for women with PMOS, while the underlying mechanisms are not yet understood [19]. The importance of these drugs in PMOS treatment or perhaps prevention requires further study. To understand the processes behind the link between gut microbiota dysbiosis and PMOS, randomized clinical trials are required. The targeted, individualized alteration of gut microbiota will progress the research, and complete, functional research in

the future will enable the use of gut microbiota as a biomarker for PMOS. Since treatments have been focused on symptoms rather than the underlying cause of the illness, there is currently no cure. To improve treatment and prevent the catastrophic long-term effects of the disease on patients' health, extensive efforts should be made to completely investigate the syndrome [20], [21].

## Conclusion

Since Stein and Leventhal (1935) first described PMOS, extensive knowledge has been gained in this area. However, there is still much that we don't understand about it, such as its beginning, course through life, variety of symptoms, and many morbidities. Uncontrolled steroidogenesis, insulin resistance, oxidative stress, and hereditary factors may all have a role in the pathophysiology of PMOS, which may begin during pregnancy. To connect the numerous susceptibility factors that might cause PMOS, additional research is required. The present diagnostic recommendations are still nebulous and may fail to identify people with less severe non-classical characteristics. The recommendations for adolescents lack specificity since they might not be able to distinguish between disease and normal development, as accurate diagnosis is a crucial first step in initiating therapy and preventing further morbidities; future clinical research should seek to not only update and harmonies guidelines but also provide a solid justification for diagnostic tools that can detect all PMOS phenotypes. Morbidities, which are more prevalent in the frank PMOS phenotype, highlight the disease's complexity as a syndrome that impacts numerous bodily systems, including the endocrine, gynecological, cardiac, and psychological ones. This diverse entity must therefore be managed by a trained and informed interdisciplinary team in order to provide the best possible care for patients. It is crucial to keep in mind that PMOS therapy varies with age and should be determined by symptoms. A key component of the care of this disorder is the early diagnosis of long-term morbidities by suitable screening tests. Changes in lifestyle are highly encouraged by recommendations as an essential component of management. The primary treatment of choice for anovulation and hyperandrogenism is an OCP, while the treatment of choice for infertility is clomiphene citrate. We conclude by expressing our hope that this analysis has offered an updated summary that clarifies the complexity of PMOS. In order for doctors to give patients the best care possible, future research must concentrate on the gaps in our knowledge of this disorder.

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**Conflict of Interest:** NIL

**Funding Sources:** NIL

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## Declarations:

## Authors' Contribution:

- <sup>a</sup>conceptualized the study, designed the methodology, performed formal analysis, and wrote the original draft; <sup>b</sup>supervised the project, validated the data, handled resources, and reviewed and edited the manuscript; <sup>c</sup>managed data curation, investigation, and visualization; <sup>d</sup>conducted formal analysis, investigation, and validation; <sup>e</sup>administered the project, handled software, and contributed to writing and visualization.
- All authors reviewed and approved the final manuscript.
- The authors agree to take responsibility for every facet of the work, making sure that any concerns about its integrity or veracity are thoroughly examined and addressed

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