

# Exploring the Impact of Nutritional Interventions on Polycystic Ovary Syndrome (PCOS) Symptom Management and Metabolic Health: A Systematic Review and Meta-Analysis

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## Abstract

Research has indicated the various health complications of Polycystic Ovary Syndrome (PCOS), an endocrine disorder prevalent in women. Throughout the different research that has been conducted, it is obvious that the health complications that are caused by PCOS such as infertility, obesity, insulin resistance, cardiovascular problems, and a host of other health problems are all brought on by this condition. PCOS is an autoimmune illness that is a polygenic, polyfactorial, systemic, inflammatory, and dysregulated steroid state. There is not solely one main cause for PCOS but many risk factors that can lead to its development overtime. The ability to detect PCOS in affected females has been made possible by the development of biochemical tests and ultrasound screening. As a result, a great deal of knowledge about PCOS has been gathered recently, but there is still a lot that can be done. In fact, there are still gray areas that should be investigated when it comes to PCOS and finding the best methods that healthcare professionals can give to women who are affected by it. To prevent or counteract the negative effects of PCOS, treatments such as hormone therapy, metformin, and oral contraceptives have been developed. However, modifying one's lifestyle and integrating a nutritional intervention approach can be beneficial to manage the symptoms.

## Introduction

- PCOS an endocrine disorder affecting women of reproductive age.
- Characteristics: Hyperandrogenism, irregular menstruation, and weight gain.
- Can lead to health complications such as metabolic syndrome, infertility, increased risk for type 2 diabetes, and cardiovascular disease (Joham et al., 2022).
- Etiology remains unclear but experts believe that it is caused by a multitude of risk factors such as hormonal, genetic, and environmental (Goodarzi et al., 2011).
- Diagnosis: Family history, physical examination, biochemical tests, and ultrasound.

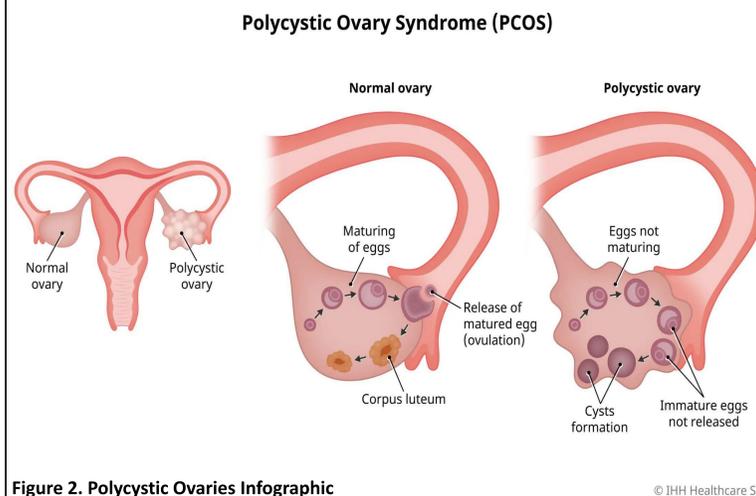


Figure 2. Polycystic Ovaries Infographic

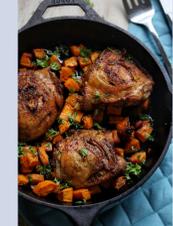
Breakfast	Lunch	Snack	Dinner
<b>Egg and Veggie Omelet</b> <ul style="list-style-type: none"> <li>• 3 eggs</li> <li>• ¼ C chopped mushrooms</li> <li>• ½ C spinach</li> <li>• Salt and pepper to taste</li> <li>• ¼ avocado</li> </ul> 	<b>Baked chicken with roasted sweet potatoes and broccoli</b> <ul style="list-style-type: none"> <li>• 4 oz chicken breast</li> <li>• ½ C sweet potatoes</li> <li>• 1 C roasted broccoli</li> <li>• 1 tbsp olive oil</li> <li>• ½ tsp garlic powder</li> <li>• ½ tsp paprika</li> <li>• Salt and pepper to taste</li> </ul> 	<b>Greek yogurt with berries</b> <ul style="list-style-type: none"> <li>• ¾ C low fat Greek yogurt</li> <li>• ¼ C blueberries</li> <li>• ¼ raspberries</li> <li>• 1 tbsp. chopped almonds</li> <li>• 1 oz. melted dark chocolate</li> </ul> 	<b>Lentil and kale salad with feta cheese</b> <ul style="list-style-type: none"> <li>• ½ C cooked lentils</li> <li>• 1 C chopped kale</li> <li>• ¼ C crumbled feta cheese</li> <li>• 1 tbsp olive oil</li> <li>• ½ tsp salt and pepper</li> <li>• ¼ avocado</li> <li>• 1 dinner roll</li> </ul> 

Figure 1. Meal Plan For A PCOS Diet

## Method

This meta-analysis followed PRISMA guidelines to effectively analyze the role of nutrition for women with Polycystic ovary syndrome (PCOS). A search was conducted in PubMed using keywords related to PCOS (e.g., nutrition, ovary, disorder). Articles and studies were chosen if they focused on women with PCOS and examined the importance of nutrition intervention with managing the multitude of symptoms (e.g., insulin sensitivity, weight gain, irregular menstruation). With the data collected from randomized controlled trials, cohort studies, and clinical trials a meal plan was created that would taken into consideration the dietary needs of women with PCOS to help them manage their symptoms better.

## Dietary needs

- Omega-3 Fatty Acids
- Antioxidant rich foods
- Vitamin D
- Inositol
- Chromium
- Low Glycemic Index (GI) foods
- Adequate consumption of lean proteins
- < 30% of fat from total calories

## Lifestyle changes

- 150 minutes of moderate- intensity of physical activity per week (e.g., aerobic or muscle strengthening)
- Weight management
- Stress management
- Adequate sleep schedule (>6 hours)

## Conclusion

Nutrition intervention plays a vital role in helping to manage the symptoms of PCOS, since there is no cure for it. Nutrition invention can help to address health problem that are caused by PCOS such as insulin resistance, inflammation, and hormonal imbalance. A diet that is rich in low GI foods can help to regulate blood sugar levels and improve insulin sensitivity. Too add on, there certain supplements and herbal medicine that have been proven to provide benefits in helping manage PCOS symptoms. Myo-Inositol and D-Chiro Inositol are naturally occurring compounds that are part of the vitamin B complex which play a role in insulin signaling. Research shows that these two supplements can lead a to a more regular menstrual cycle and improve insulin sensitivity. Berberine, which is a bioactive compound extracted from various plants that has been traditionally used in Chinese Medicine for lowering blood glucose levels. Comparative studies have shown that berberine is as effective as metformin, a common pharmaceutical treatment that is used to treat high blood sugar levels. Based on menu created, it emphasizes the nutrient and dietary guidelines that women with PCOS should take into consideration when creating their dietary habits to be able manage their symptoms and improve long term health.

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