

ISSN 2063-5346



# JUNK FOOD ADDICTION: CAUSING INCREASED PREVALENCE OF POLYCYSTIC OVARY/OVARIAN SYNDROME (PCOS)

Saloni Kamboj<sup>1</sup>, Spondita<sup>2</sup>

---

Article History: Received: 10.05.2023

Revised: 29.05.2023

Accepted: 09.06.2023

---

## Abstract

PCOS is a hormonal disorder that affects women of childbearing age. In recent years, the prevalence of PCOS has increased, posing a significant health risk. Multiple factors most importantly lifestyle changes are causing the rising prevalence of PCOS. Growing evidence suggests a connection between junk food addiction and the onset and progression of PCOS. The consumption of highly processed junk foods, which are high in carbohydrates, unhealthy fats, and artificial additives, may contribute to hormonal imbalances and insulin resistance, are causing PCOS. Understanding this connection is essential for managing the disease and prevent adverse cardiometabolic long term consequences.

**Keywords:** *Junk food, PCOS.*

---

<sup>1</sup>Aiims, Obstetrics and gynaecology, salonikamboj17@gmail.com

<sup>2</sup>Aiims, Obstetrics and gynaecology, spondita1907@gmail.com

DOI:10.48047/ecb/2023.12.9.72

## Introduction

PCOS is a hormonal disorder that affects women of childbearing age. It is caused by cysts on the ovaries, irregular menstrual cycles, and elevated levels of androgens (male hormones) in the body.<sup>1</sup> PCOS can cause a wide range of symptoms, including acne, weight gain, and fertility issues.<sup>2</sup> In recent years, the prevalence of PCOS has increased, posing a significant health risk. Approximately 5-10% of women of childbearing age are afflicted by this condition, according to estimates.<sup>3</sup> Multiple factors, including lifestyle changes, genetic predisposition, and environmental influences, can be attributed to the rising prevalence of PCOS.<sup>4</sup>

Growing evidence suggests a connection between junk food addiction and the onset and progression of PCOS.<sup>5</sup> The consumption of highly processed and unhealthy foods, which are high in carbohydrates, unhealthy fats, and artificial additives, may contribute to hormonal imbalances and insulin resistance, which are important PCOS risk factors.<sup>6</sup> Understanding this connection is essential for managing and averting the syndrome's progression. The purpose of this review is to delve deeper into the connection between

junk food addiction and PCOS, investigating the potential mechanisms and impact of poor dietary choices on the onset and management of the syndrome.<sup>7</sup> This review seeks to cast light on the significance of adopting a healthy diet and lifestyle in the prevention and treatment of PCOS by analysing existing research and literature. This review's findings can aid in the development of targeted interventions and strategies to enhance the overall health outcomes of individuals with PCOS.

## Polycystic Ovary Syndrome

PCOS is a complex hormonal disorder that primarily impacts reproductive-aged women. It is characterised by an array of signs and symptoms, including irregular menstrual cycles, elevated androgen levels, and the prevalence of ovarian follicles. The diagnostic criteria for PCOS include the Rotterdam criteria, which require the presence of at least two of three essential characteristics: irregular or absent menstrual cycles, clinical or biochemical indications of hyperandrogenism, and ultrasound evidence of polycystic ovaries.<sup>8</sup> PCOS manifests with a variety of features and symptoms that can differ from individual to individual. Common PCOS

<sup>1</sup> Ndefo UA, Eaton A, Green MR. Polycystic ovary syndrome: a review of treatment options with a focus on pharmacological approaches. *P & T: a peer-reviewed journal for formulary management* [Internet]. 2013; 38(6):336–55. Available from: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3737989/>

<sup>2</sup> Eunice Kennedy Shriver National Institute of Child Health and Human Development - NICHD [Internet]. [www.nichd.nih.gov](http://www.nichd.nih.gov). [cited 2023 May 27]. Available from: <https://www.nichd.nih.gov/health/topics/factsheets/pcos#:~:text=Polycystic%20ovary%20syndrome%2C%20or%20PCOS>

<sup>3</sup> Deswal R, Narwal V, Dang A, Pundir CS. The Prevalence of Polycystic Ovary Syndrome: A Brief Systematic Review. *Journal of Human Reproductive Sciences* [Internet]. 2020 Dec 28; 13(4):261–71. Available from: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7879843/>

<sup>4</sup> Supra note 1.

<sup>5</sup> Hajivandi L, Noroozi M, Mostafavi F, Ekramzadeh M. Food habits in overweight and obese adolescent girls with Polycystic ovary syndrome (PCOS): a qualitative study in Iran. *BMC Pediatrics*. 2020 Jun 4; 20(1).

<sup>6</sup> Szczuko M, Kikut J, Szczuko U, Szydłowska I, Nawrocka-Rutkowska J, Ziętek M, et al. Nutrition Strategy and Life Style in Polycystic Ovary Syndrome—Narrative Review. *Nutrients*. 2021 Jul 18; 13(7):2452.

<sup>7</sup> Xenou M, Gourounti K. Dietary Patterns and Polycystic Ovary Syndrome: a Systematic Review. *Maedica - A Journal of Clinical Medicine*. 2021 Sep 15; 16(3).

<sup>8</sup> Hajivandi L, Noroozi M, Mostafavi F, Ekramzadeh M. Food habits in overweight and obese adolescent girls with Polycystic ovary syndrome (PCOS): a qualitative study in Iran. *BMC Pediatrics*. 2020 Jun 4;20(1).

characteristics include menstrual cycles that are irregular or absent, excessive hair growth (hirsutism), acne, and obesity.<sup>9</sup> In addition, people with PCOS may experience infertility, insulin resistance, and metabolic disturbances such as elevated cholesterol levels and an increased risk of type 2 diabetes. PCOS is also associated with emotional and psychological effects, such as depression and anxiety.<sup>10</sup> PCOS can have far-reaching effects on overall health and well-being, extending beyond reproductive health. PCOS increases the risk of long-term complications, including infertility, gestational diabetes during pregnancy, and pregnancy complications such as pre-eclampsia. PCOS is also linked to an increased risk of cardiovascular diseases, including hypertension and dyslipidemia.<sup>11</sup> Insulin resistance and metabolic disturbances can contribute to the development of obesity and type 2 diabetes in women with polycystic ovary syndrome (PCOS). In addition, PCOS is associated with a higher prevalence of mental health issues, such as anxiety and depression. In order to provide comprehensive care for individuals with PCOS, it is vital to

recognise and manage these health implications and complications.<sup>12</sup>

### **Junk Food Consumption and its Impact on Hormonal Imbalance**

Repetitive and compulsive consumption of highly processed, palatable, and harmful foods is referred to as junk food addiction. Although not formally recognised as a diagnosis, it shares similarities with substance addiction.<sup>13</sup> Intense craving and loss of control over consumption, continued consumption despite negative health consequences, and withdrawal-like symptoms when attempting to reduce or abstain from junk food are characteristics of junk food addiction. Complex neurobiological processes underlie the addiction to unhealthy food.<sup>14</sup> Dopamine, a neurotransmitter associated with pleasure and reinforcement, is released in response to the consumption of highly rewarding and palatable foods, according to research. Repeated consumption of junk food can result in neuroadaptations, such as the downregulation of dopamine receptors, which reduces the pleasurable response and encourages increased consumption to attain the same level of satisfaction.<sup>15</sup>

<sup>9</sup>Ramanand S, Ramanand J, Ghanghas R, Ghongane B, Jain S, Patwardhan M. Clinical characteristics of polycystic ovary syndrome in Indian women. *Indian Journal of Endocrinology and Metabolism* [Internet]. 2013 [cited 2019 Nov 10];17(1):138. Available from: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3659881/>

<sup>10</sup>Sadeeqa S, Mustafa T, Latif S. Polycystic ovarian syndrome-related depression in adolescent girls: A Review. *Journal of Pharmacy And Bioallied Sciences*. 2018;10(2):55.

<sup>11</sup>Choudhury AA, Rajeswari VD. Polycystic ovary syndrome (PCOS) increases the risk of subsequent gestational diabetes mellitus (GDM): A novel therapeutic perspective. *Life Sciences* [Internet]. 2022 Oct 13 [cited 2022 Oct 16];121069. Available from: <https://www.sciencedirect.com/science/article/abs/pii/S002432052200769X?via%3Dihub>

<sup>12</sup>Rojas J, Chávez M, Olivar L, Rojas M, Morillo J, Mejías J, et al. Polycystic Ovary Syndrome, Insulin Resistance, and Obesity: Navigating the

Pathophysiologic Labyrinth. *International Journal of Reproductive Medicine* [Internet]. 2014;2014:1–17. Available from: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4334071/>

<sup>13</sup>Zawertailo L, Attwells S, deRuiter WK, Le TL, Dawson D, Selby P. Food Addiction and Tobacco Use Disorder: Common Liability and Shared Mechanisms. *Nutrients*. 2020 Dec 15;12(12):3834.

<sup>14</sup>Adams RC, Sedgmond J, Maizey L, Chambers CD, Lawrence NS. Food Addiction: Implications for the Diagnosis and Treatment of Overeating. *Nutrients* [Internet]. 2019 Sep 1;11(9):2086. Available from: <https://www.mdpi.com/2072-6643/11/9/2086/html>

<sup>15</sup>Volkow ND, Wang GJ, Baler RD. Reward, Dopamine and the Control of Food Intake: Implications for Obesity. *Trends in Cognitive Sciences* [Internet]. 2011 Jan;15(1):37–46. Available from:

Involvement of other brain regions, including the prefrontal cortex and the limbic system, also contributes to the reinforcing and addictive properties of junk food. In addition to neurobiological factors, junk food addiction is also influenced by behavioural aspects.<sup>16</sup> Environment-based cues, such as food advertisements or the mere site or scent of unhealthy food, can induce cravings and impulsive eating. In addition to stress, emotional factors and social influences contribute to the development and maintenance of junk food addiction.<sup>17</sup> In addition, processes of conditioned learning contribute to the association between specific situations or emotions and unhealthy food consumption. These behavioural aspects interact with the underlying neurobiological mechanisms to form a complex interplay that sustains fast food addiction.<sup>18</sup>

Repetitive and compulsive consumption of highly processed, palatable, and harmful foods is referred to as junk food addiction. Although not formally recognised as a diagnosis, it shares similarities with substance addiction.<sup>19</sup> Intense craving and loss of control over consumption, continued consumption despite negative health consequences, and withdrawal-like symptoms when attempting to reduce or abstain from junk food are characteristics of junk food addiction. Complex neurobiological processes underlie the

addiction to unhealthy food.<sup>20</sup> Dopamine, a neurotransmitter associated with pleasure and reinforcement, is released in response to the consumption of highly rewarding and palatable foods, according to research. Repeated consumption of junk food can result in neuroadaptations, such as the downregulation of dopamine receptors, which reduces the pleasurable response and encourages increased consumption to attain the same level of satisfaction.<sup>21</sup> Involvement of other brain regions, including the prefrontal cortex and the limbic system, also contributes to the reinforcing and addictive properties of junk food.<sup>22</sup> In addition to neurobiological factors, junk food addiction is also influenced by behavioural aspects. Environment-based cues, such as food advertisements or the mere site or scent of unhealthy food, can induce cravings and impulsive eating. In addition to stress, emotional factors and social influences contribute to the development and maintenance of junk food addiction.<sup>23</sup> In addition, processes of conditioned learning contribute to the association between specific situations or emotions and unhealthy food consumption. These behavioural aspects interact with the underlying neurobiological mechanisms to

---

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3124340/>

<sup>16</sup> Koob GF, Volkow ND. Neurobiology of addiction: a neurocircuitry analysis. *The Lancet Psychiatry* [Internet]. 2016 Aug;3(8):760–73. Available from: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6135092/>

<sup>17</sup> Yau YHC, Potenza MN. Stress and eating behaviors. *Minerva endocrinologica* [Internet]. 2013 Sep;38(3):255–67. Available from: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4214609/>

<sup>18</sup> Adams RC, Sedgmond J, Maizey L, Chambers CD, Lawrence NS. Food Addiction: Implications for the Diagnosis and Treatment of Overeating. *Nutrients* [Internet]. 2019 Sep 1;11(9):2086.

Available from: <https://www.mdpi.com/2072-6643/11/9/2086/htm>

<sup>19</sup> Supra note 13.

<sup>20</sup> Adams RC, Sedgmond J, Maizey L, Chambers CD, Lawrence NS. Food Addiction: Implications for the Diagnosis and Treatment of Overeating. *Nutrients* [Internet]. 2019 Sep 1;11(9):2086. Available from: <https://www.mdpi.com/2072-6643/11/9/2086/htm>

<sup>21</sup> Supra note 15.

<sup>22</sup> Supra note 16.

<sup>23</sup> Boston 677 HA, Ma 02115 +1495-1000. Cravings [Internet]. The Nutrition Source. 2021. Available from: <https://www.hsph.harvard.edu/nutritionsource/cravings/>

form a complex interplay that sustains fast food addiction.<sup>24</sup>

### **Inflammation and Oxidative Stress: Connecting Junk Food Addiction and PCOS**

Significant roles are played by inflammation and oxidative stress in the pathophysiology of Polycystic Ovary Syndrome (PCOS). PCOS is characterised by chronic low-grade inflammation and increased oxidative stress, which is an imbalance between the production of reactive oxygen species (ROS) and the antioxidant defences of the body.<sup>25</sup> This dysregulation can contribute to the development and progression of PCOS symptoms by causing cellular injury. There is a correlation between junk food addiction and elevated levels of inflammatory markers in the body.<sup>26</sup> Inflammation can be triggered by the consumption of highly processed and unhealthy foods, which are frequently high in saturated fats, trans fats, and refined carbohydrates. Symptoms include the release of pro-inflammatory cytokines and the activation of immune cells. Consuming unhealthy food for an extended period of time can perpetuate this inflammatory state, contributing to the development of chronic inflammation and possibly exacerbating PCOS symptoms.<sup>27</sup>

PCOS development and progression are substantially influenced by oxidative stress. Overproduction of reactive oxygen species (ROS) and weakened antioxidant defence mechanisms can result in oxidative injury to cells and tissues. Oxidative stress can impede follicular development and contribute to the formation of ovarian follicles in women with PCOS.<sup>28</sup> In addition, oxidative stress can exacerbate PCOS-related metabolic disturbances by promoting inflammation and insulin resistance.

In PCOS patients, junk food consumption is known to exacerbate inflammation and oxidative stress. By increasing ROS production and impairing antioxidant systems, the unhealthy components of junk food, such as high levels of saturated fats, added carbohydrates, and artificial additives, can induce oxidative stress.<sup>29</sup> Furthermore, the pro-inflammatory nature of unhealthy food can prolong the inflammatory state associated with PCOS. The combined effects of unhealthy food on inflammation and oxidative stress can exacerbate PCOS and its associated complications. Individuals with PCOS must avoid or reduce their consumption of unhealthy food to effectively manage inflammation, oxidative stress, and improve their overall health.<sup>30</sup>

---

<sup>24</sup> Singh M. Mood, food, and Obesity. *Frontiers in Psychology* [Internet]. 2014 Sep 1;5(925). Available from: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4150387/>

<sup>25</sup> Mohammadi M. Oxidative stress and polycystic ovary syndrome: A brief review. *International Journal of Preventive Medicine*. 2019;10(1):86.

<sup>26</sup> Aboeldalyl S, James C, Seyam E, Ibrahim EM, Shawi HED, Amer S. The Role of Chronic Inflammation in Polycystic Ovarian Syndrome—A Systematic Review and Meta-Analysis. *International Journal of Molecular Sciences* [Internet]. 2021 Mar 8;22(5). Available from: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7962967/>

<sup>27</sup> Ma X, Nan F, Liang H, Shu P, Fan X, Song X, et al. Excessive intake of sugar: An accomplice of inflammation. *Frontiers in Immunology*. 2022 Aug 31;13(13).

<sup>28</sup> Supra note 25.

<sup>29</sup> Mizgier M, Jarzabek-Bielecka G, Wendland N, Jodłowska-Siewert E, Nowicki M, Brożek A, et al. Relation between Inflammation, Oxidative Stress, and Macronutrient Intakes in Normal and Excessive Body Weight Adolescent Girls with Clinical Features of Polycystic Ovary Syndrome. *Nutrients*. 2021 Mar 10;13(3):896.

<sup>30</sup> González F. Inflammation in Polycystic Ovary Syndrome: Underpinning of insulin resistance and ovarian dysfunction. *Steroids*. 2012 Mar;77(4):300–5.



## Gut Microbiota Alterations: A Potential Link between Junk Food Addiction and PCOS

The diverse community of microorganisms residing in our digestive tract, the gut microbiota, is essential for metabolic health. The gastrointestinal microbiota contributes to a variety of functions, including nutrient metabolism, energy extraction, immune modulation, and vitamin synthesis.<sup>31</sup> A balanced and diverse microbiota in the intestine is associated with enhanced metabolic processes, such as glucose regulation, lipid metabolism, and inflammation control. Obesity, insulin resistance, and metabolic syndrome have been linked to alterations in the composition and diversity of the intestinal microbiota.<sup>32</sup> Addiction to junk food can significantly alter the composition of the intestinal microbiota. The consumption of highly processed and unhealthy foods, which are frequently low in fibre and high in carbohydrates and harmful lipids, can cause an imbalance in the intestinal microbiome.<sup>33</sup> In the intestines, processed food consumption has been linked to a decrease in beneficial bacteria and an increase in detrimental bacteria, according to studies. This disparity, known as dysbiosis, can have detrimental effects on

metabolic health and contribute to the development of metabolic disorders.<sup>34</sup>

The gut-brain axis is the communication pathway between the digestive tract and the central nervous system.<sup>35</sup> It involves a network of neural, hormonal, and immune signalling mechanisms. In this communication, the intestinal microbiota plays a crucial role, influencing brain function, behaviour, and even reproductive health. In the context of polycystic ovary syndrome (PCOS), disturbances in the gut-brain axis can contribute to hormonal imbalances and the development of PCOS symptoms.<sup>36</sup> The gut-brain axis influences PCOS through interactions between the gut microbiota, the hypothalamic-pituitary-gonadal (HPG) axis, and additional regulatory pathways.

Emerging evidence suggests that changes in the gut microbiota may mediate the association between fast food addiction and PCOS. Unhealthy dietary patterns, such as excessive snack food consumption, can alter the composition and function of the intestinal microbiota. In turn, these modifications can affect metabolic processes, hormone regulation, and inflammation, which are all associated with PCOS.<sup>37</sup> Investigating the role of altered

<sup>31</sup> Rowland I, Gibson G, Heinken A, Scott K, Swann J, Thiele I, et al. Gut microbiota functions: metabolism of nutrients and other food components. *European Journal of Nutrition*. 2017 Apr 9;57(1):1–24.

<sup>32</sup> Musso G, Gambino R, Cassader M. Obesity, Diabetes, and Gut Microbiota: The hygiene hypothesis expanded? *Diabetes Care* [Internet]. 2010 Sep 28 [cited 2019 Feb 28];33(10):2277–84. Available from: <http://care.diabetesjournals.org/content/33/10/2277>

<sup>33</sup> Nouvelle MG. Decoding the Role of Gut-Microbiome in the Food Addiction Paradigm. *International Journal of Environmental Research and Public Health* [Internet]. 2021 Jun 25 [cited 2022 Apr 15];18(13):6825. Available from: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8297196/>

<sup>34</sup> Singh RK, Chang HW, Yan D, Lee KM, Ucmak D, Wong K, et al. Influence of diet on the gut microbiome and implications for human health.

*Journal of Translational Medicine*. 2017 Apr 8;15(1).

<sup>35</sup> Carabotti M, Scirocco A, Maselli MA, Severi C. The gut-brain axis: interactions between enteric microbiota, central and enteric nervous systems. *Annals of Gastroenterology : Quarterly Publication of the Hellenic Society of Gastroenterology* [Internet]. 2015;28(2):203–9. Available from: [https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4367209/#:~:text=The%20gut%2Dbrain%20axis%20\(GBA](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4367209/#:~:text=The%20gut%2Dbrain%20axis%20(GBA)

<sup>36</sup> Zhao X, Jiang Y, Xi H, Chen L, Feng X. Exploration of the Relationship Between Gut Microbiota and Polycystic Ovary Syndrome (PCOS): a Review. *Geburtshilfe und Frauenheilkunde*. 2020 Feb;80(02):161–71.

<sup>37</sup> Fernandes AE, Rosa PWL, Melo ME, Martins RCR, Santin FGO, Moura AMSH, et al. Differences in the gut microbiota of women according to ultra-

gut microbiota in this relationship can yield valuable insights into potential mechanisms and therapeutic targets for managing PCOS and its associated complications.

### **Lifestyle Modifications to Address Junk Food Addiction**

To address junk food addiction, specific lifestyle modifications are crucial. Increasing awareness of the addictive nature and detrimental effects of junk food is the first step. Creating a healthy eating environment by removing or limiting junk food and opting for nutritious, whole foods is important.<sup>38</sup> Meal planning and preparation, seeking support from professionals, building healthy coping mechanisms, and establishing a balanced eating pattern are essential for long-term success in overcoming this addiction.

### **Dietary Recommendations for PCOS Management**

Managing PCOS requires dietary guidelines that promote hormonal balance and metabolic health. A balanced diet with whole, unprocessed foods is emphasized, along with choosing low glycemic index (GI) foods to regulate insulin and glucose metabolism.<sup>39</sup> Including fiber-rich foods, moderating carbohydrate and sugar intake, incorporating adequate protein, managing portion sizes, and staying hydrated are key dietary recommendations for individuals with PCOS.

### **Importance of Physical Activity and Exercise**

Physical activity and exercise play a significant role in managing PCOS. Regular exercise improves insulin

sensitivity, supports weight management, enhances cardiovascular health, boosts mood, and promotes ovulation and fertility.<sup>40</sup> Incorporating physical activity into the management plan can lead to improved overall health, hormonal balance, and quality of life for individuals with PCOS.

### **Psychological Interventions for Overcoming Junk Food Addiction**

Overcoming junk food addiction often requires psychological interventions to address underlying behavioral and emotional factors. Effective strategies include cognitive-behavioral therapy (CBT), mindfulness-based techniques, emotional regulation skills, support groups or counseling, and developing healthy habits and routines.<sup>41</sup> These interventions help individuals challenge negative thoughts, develop coping skills, manage emotions, and establish healthier alternatives, ultimately aiding in the recovery process.

### **Recommendations<sup>42</sup>**

This review summarises the significant effects of unhealthy food dependency on PCOS and metabolic health. Unhealthy, highly processed foods contribute to hormonal imbalances, insulin resistance, inflammation, oxidative stress, and dysbiosis of the intestinal microbiota. These variables are strongly associated with the onset and progression of PCOS symptoms. In addition, the review highlights the significance of lifestyle modifications, dietary modifications, physical activity, and psychological

---

processed food consumption. *Nutrition, Metabolism and Cardiovascular Diseases*. 2022 Oct;

<sup>38</sup> 1.Romero-Blanco C, Hernández-Martínez A, Parra-Fernández ML, Onieva-Zafra MD, Prado-Laguna M del C, Rodríguez-Almagro J. Food Addiction and Lifestyle Habits among University Students. *Nutrients*. 2021 Apr 18;13(4):1352.

<sup>39</sup> Supra note 7

<sup>40</sup> Woodward A, Klonizakis M, Broom D. Exercise and Polycystic Ovary Syndrome. *Physical Exercise*

for Human Health [Internet]. 2020;1228:123–36. Available from: [https://link.springer.com/chapter/10.1007%2F978-981-15-1792-1\\_8](https://link.springer.com/chapter/10.1007%2F978-981-15-1792-1_8)

<sup>41</sup> Menon J, Kandasamy A. Relapse prevention. *Indian Journal of Psychiatry* [Internet]. 2018 Feb 1 [cited 2020 May 16];60(Suppl 4):S473–8. Available from:

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5844157/>

<sup>42</sup> Supre note 7

interventions in the management of both junk food addiction and PCOS. There are two implications of this review. First, it emphasises the need for targeted interventions to combat fast food addiction as a PCOS contributor. By raising awareness about the negative effects of junk food on hormonal regulation and metabolic health, healthcare professionals can assist individuals in making healthier dietary decisions and overcoming addictive eating patterns. Second, the review emphasises the potential for holistic approaches in PCOS management that incorporate lifestyle modifications, dietary adjustments, and psychological interventions to address the intricate relationship between junk food addiction and PCOS symptoms.

Future research should concentrate on multiple crucial regions. First, longitudinal studies are required to better comprehend the causal connection between fast food addiction, PCOS, and associated metabolic disturbances. In addition, investigating the specific mechanisms by which junk food affects hormonal regulation, intestinal microbiota composition, inflammation, and oxidative stress in the context of PCOS will yield insightful information. In addition, further research is required to determine the efficacy of various interventions, such as personalised dietary approaches, exercise programmes, and psychological therapies, in addressing junk food addiction and enhancing PCOS outcomes.

## **Conclusion**

This review concludes by highlighting the negative effects of snack food addiction on PCOS and metabolic health. It emphasises the significance of adopting healthier dietary patterns, engaging in regular physical activity, and addressing psychological factors in PCOS symptom management. This review's findings have significant implications for public health policies designed to promote healthy eating practises and reduce the consumption of

highly processed and toxic foods. Policymakers can contribute to the prevention and management of PCOS and related metabolic disorders by instituting policies that prioritise nutrition education, access to affordable and nutritious foods, and the regulation of food advertising. It is essential to address the multifaceted nature of junk food addiction and its impact on PCOS in order to enhance the well-being of PCOS patients as a whole.