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The Role of Diet in Psoriasis Management: A Focus on Mediterranean, Ketogenic, and Plant-Based Dietary Approaches

1. Krystian Zukierski

Szpital Morski im. PCK in Gdynia, Powstania Styczniowego 1, 81-519 Gdynia, Poland
krystian.zukierski@gmail.com
https://orcid.org/0009-0008-1428-5744
2. Weronika Jarych

Szpital Morski im. PCK in Gdynia, Powstania Styczniowego 1, 81-519 Gdynia, Poland
weronikajarych@gumed.edu.pl
https://orcid.org/0009-0009-1335-8072
3. Katarzyna Michalak

Szpital Morski im. PCK in Gdynia, Powstania Styczniowego 1, 81-519 Gdynia, Poland
kamichalak3@wp.pl
https://orcid.org/0009-0005-0856-1536
4. Michał Mazur

Saint Adalbert Hospital in Gdańsk, aleja Jana Pawła II 50, 80-462 Gdańsk, Poland
michal98mazur.med@gmail.com
https://orcid.org/0009-0007-8157-5293

Abstract

Introduction and aim:

Psoriasis is a chronic immune-mediated skin disease that is increasingly recognized as a systemic inflammatory condition linked to various comorbidities, including metabolic syndrome and cardiovascular disease. Lifestyle factors, particularly diet, are receiving growing attention for their potential to influence disease activity and treatment outcomes. This review explores current evidence on the role of nutrition in the clinical management of psoriasis, with a particular focus on dietary patterns such as the Mediterranean, Ketogenic, and Plant-Based diets, and their potential to improve both skin symptoms and overall systemic health.

Methods and materials:

This literature review draws upon sources accessed through the PubMed and Google Scholar databases, targeting publications from the last 15 years (2010–2025). The objective was to compile a wide range of scholarly works exploring the impact of dietary patterns on the management of psoriasis, with particular attention to Mediterranean, ketogenic, and plant-based diets. Search queries included terms such as “psoriasis,” “nutrition,” “Mediterranean diet,” “ketogenic diet,” and “plant-based diet.” The studies were selected based on their scientific credibility, relevance to the topic, and methodological integrity, ensuring that only high-quality and pertinent research was included in the final analysis.

Results and conclusion:

Diet may serve as an important adjunct to pharmacological treatment of psoriasis, influencing both the course of the disease and associated metabolic disorders. Anti-inflammatory dietary patterns, such as the Mediterranean, ketogenic, and plant-based diets, show promising therapeutic potential. Personalized nutritional recommendations and interdisciplinary care are essential for the effective and safe implementation of dietary interventions in clinical practice.

Keywords

psoriasis, nutrition, Mediterranean diet, ketogenic diet, plant-based diet

Introduction

Psoriasis is a chronic, immune-mediated skin disorder marked by dysregulation of the tumor necrosis factor-α (TNF-α), interleukin-23 (IL-23) and interleukin-17 (IL-17) signaling pathways. This dysregulation contributes to excessive keratinocyte proliferation and their abnormal differentiation within the epidermis **(1)**. Clinically, the disease is manifested by sharply demarcated, erythematous papules or plaques, frequently covered with characteristic silvery-white scales **(2)**. Various clinical subtypes of psoriasis have been identified, and approximately 30% of patients develop psoriatic arthritis, an inflammatory joint condition associated with the skin manifestations **(3)**. Beyond the skin and joints, psoriasis is increasingly recognized as a systemic condition with potential involvement of other organ systems, including ocular, cardiovascular and gastrointestinal systems **(4)**. Patients with moderate to severe forms of the disease often experience substantial impairment in the quality of life, attributed both the visible skin lesions and chronic joint pain **(3,5)**. The global prevalence of psoriasis varies significantly, ranging from 0.09% to 11.43%, with higher prevalence noted in more developed nations, where it affects approximately 1.5% to 5.0% of the population **(6)**. The condition is multifactorial in origin, involving a complex interplay between genetic susceptibility, immune system dysregulation and environmental triggers **(6,7)**. Lifestyle factors, including stress, smoking, alcohol consumption, and particularly diet, are increasingly recognized for their influence on disease severity, frequency of flare-ups, and therapeutic response **(7)**. Importantly, psoriasis is now widely acknowledged as a systemic inflammatory disorder associated with a range of comorbidities, such as metabolic syndrome, obesity, cardiovascular disease, type 2 diabetes and inflammatory bowel disease. These conditions are thought to share overlapping pathogenic mechanisms, especially chronic low-grade inflammation **(7,1,4)**. Consequently, a holistic management approach that targets systemic inflammation may yield broader therapeutic benefits. Emerging evidence suggests that nutritional interventions may serve as valuable adjuncts in the management of psoriasis and its

related comorbidities. Individuals with psoriasis often exhibit suboptimal dietary patterns – characterized by excessive fat consumption and insufficient intake of dietary fiber and omega-3-rich foods like fish – compared to healthy controls **(1)**. Given the role of diet in modulating inflammatory processes, targeted dietary modifications may help reduce disease activity, mitigate comorbid risks, and enhance overall quality of life **(6,8)**. This review aims to evaluate current scientific findings on the role of nutrition in the pathogenesis and clinical management of psoriasis. Emphasis will be placed on examining various dietary strategies, their anti-inflammatory potential, and their efficacy in alleviating both cutaneous symptoms and systemic burden. Ultimately, we seek to highlight the most promising nutritional approaches that could be integrated into comprehensive, patient-centered care for individuals living with psoriasis.

Materials and method of research

This literature review draws upon sources accessed through the PubMed and Google Scholar databases, targeting publications from the last 15 years (2010–2025). The objective was to compile a wide range of scholarly works exploring the impact of dietary patterns on the management of psoriasis, with particular attention to Mediterranean, ketogenic, and plant-based diets. Search queries included terms such as “psoriasis,” “nutrition,” “Mediterranean diet,” “ketogenic diet,” and “plant-based diet.” The studies were selected based on their scientific credibility, relevance to the topic, and methodological integrity, ensuring that only high-quality and pertinent research was included in the final analysis.

Psoriasis, Obesity, and Metabolic Syndrome

The contemporary understanding of psoriasis has evolved from perceiving it as a condition confined to the skin toward recognizing it as a chronic, systemic inflammatory disease associated with a number of serious comorbidities **(9)**. In recent decades, the systemic nature of psoriasis has become increasingly evident, and its link to metabolic disturbances has emerged as a subject of intensive research. The relationship between psoriasis, obesity, and metabolic syndrome is complex and bidirectional. Obesity (a body mass index of 30 kg/m² or higher) not only increases the risk of developing psoriasis but may also contribute to a more severe clinical course of the disease **(10)**. Prospective studies have demonstrated that excess body weight and an elevated amount of visceral fat significantly double the risk of psoriasis **(11,12)**. Psoriasis, obesity, and metabolic syndrome share a common pathophysiological pathway—chronic,

systemic inflammation **(13)**. Adipocytes and immune cells residing in adipose tissue produce pro-inflammatory mediators (such as IL-23, IL-17, TNFα), which maintain systemic inflammation and may trigger or worsen psoriatic processes **(13)**.

Metabolic syndrome, a cluster of conditions including insulin resistance, hypertension, dyslipidemia, and abdominal obesity, is considered a significant risk factor in the context of psoriasis. Its presence in psoriatic patients is associated not only with more severe dermatological manifestations but also with an increased risk of cardiovascular disease. The chronic inflammatory state that characterizes psoriasis may play a key role in the pathogenesis of insulin resistance and lipid abnormalities, further intensifying the interplay between these disorders. Weight reduction interventions, particularly those based on a low-calorie diet, are recommended for overweight or obese individuals with psoriasis **(13,11)**. Studies have shown that weight loss can lead to a noticeable improvement in psoriatic symptoms **(11,12)**, while normalizing body weight contributes to better overall health and enhances the efficacy of pharmacological treatment **(13)**. Therefore, an interdisciplinary approach that combines dermatological treatment with metabolic management appears essential for the comprehensive care of patients with psoriasis.

The Gut Microbiome and Its Role in Psoriasis

The gut microbiome—a complex ecosystem of microorganisms inhabiting the gastrointestinal tract—is increasingly recognized as a key factor in modulating systemic inflammatory processes, including psoriasis **(14)**. According to recent scientific reports, significant alterations in the gut flora have been observed in patients suffering from psoriasis **(15,16)**. These microbiome changes in individuals with psoriasis resemble those found in inflammatory bowel diseases, obesity, and certain cardiovascular conditions **(15)**. Diet plays a fundamental role in shaping the composition of the gut microbiota and, consequently, influences the course of psoriasis **(17)**. The Western diet, rich in saturated fats and simple sugars, may exacerbate disease symptoms—partly by promoting the growth of pro-inflammatory bacterial strains such as *Escherichia coli*, while simultaneously reducing beneficial *Firmicutes* populations. This phenomenon has been confirmed in animal model studies **(15)**. Conversely, appropriate dietary interventions may help restore microbial balance and reduce inflammatory markers, which in turn can alleviate clinical symptoms of psoriasis. Interestingly, changes in the microbiome can occur within just 24 to 48 hours of dietary modification **(16)**, highlighting the microbiota's

responsiveness and adaptability. In this context, diet emerges as the most effective and readily accessible tool for influencing microbial diversity. Research suggests that certain dietary patterns—such as the Mediterranean, ketogenic, or vegetarian diets—hold immunomodulatory potential, as they positively affect the gut microbiota and reduce inflammation. The consumption of specific food groups alters the microbiome composition in ways that can either support overall health or, conversely, promote pro-inflammatory pathways and increase the risk of insulin resistance and obesity **(18)**. It is also noteworthy that up to 70% of the immune system resides within the gastrointestinal tract, emphasizing the gut's central role in immune regulation **(16)**. Strategies aimed at modulating the gut microbiota—whether through dietary interventions or via the administration of probiotics and prebiotics—are increasingly being explored as innovative therapeutic avenues **(19)**.

Psoriasis and Specific Diets

Due to the systemic inflammatory nature of psoriasis, there has been a growing interest in dietary strategies as complementary methods for disease control. A number of nutritional models—such as the Mediterranean diet, the ketogenic diet, and plant-based dietary patterns including vegetarian and vegan approaches—have been examined for their potential to influence the pathogenesis and clinical progression of psoriasis through immunomodulatory and anti-inflammatory mechanisms **(20,7)**.

1. The Mediterranean Diet and Psoriasis

The Mediterranean Diet (MD) represents a nutritionally balanced dietary pattern traditionally observed in countries bordering the Mediterranean Sea. It is primarily characterized by high consumption of plant-based foods such as fresh fruits and vegetables, legumes, whole grains, nuts, and seeds, complemented by frequent intake of fish and seafood, and the predominant use of extra virgin olive oil (EVOO) as the main source of fat. Conversely, this diet is low in red meat, processed foods, dairy, and simple carbohydrates **(21)**. The health benefits of the Mediterranean diet are well-documented, particularly in the prevention and management of metabolic syndrome, cardiovascular diseases, and chronic inflammatory conditions. These effects are believed to stem largely from the anti-inflammatory and antioxidant properties of its core components—especially polyphenols, monounsaturated fatty acids (MUFAs), and dietary fiber **(21,20)**. In the context of psoriasis, emerging evidence suggests a protective role of the Mediterranean dietary pattern. Several studies have reported an inverse relationship between

adherence to the MD and psoriasis severity, indicating that individuals who closely follow this diet tend to experience milder disease symptoms **(22,7)**. A significant contribution to this outcome appears to be the high intake of MUFAs derived from EVOO, which exert less pro-inflammatory effects than saturated fats **(7)**. Moreover, individual food groups typical of the Mediterranean diet—such as fruits, vegetables, sea fish, and whole grains—have been associated with reductions in systemic inflammatory markers, including C-reactive protein (CRP), a commonly used biomarker of inflammation **(20)**. These findings support the diet's potential not only in reducing general inflammation but also in modulating immune responses relevant to psoriatic pathology. In recognition of this evidence, the Medical Board of the National Psoriasis Foundation recommends considering a trial of the Mediterranean diet in patients with psoriasis, particularly emphasizing the use of EVOO as the primary lipid source and encouraging daily intake of fresh fruits and vegetables **(21)**.

2. The Ketogenic Diet and Psoriasis

The Ketogenic Diet is a nutritional regimen primarily defined by a significant reduction in carbohydrate intake—typically below 30 to 50 grams per day—paired with a proportionally increased consumption of fats and proteins **(21)**. This dietary shift induces a metabolic state known as ketosis, wherein the body transitions from utilizing glucose as its primary energy source to metabolizing ketone bodies derived from fat **(20)**. Emerging evidence suggests that ketogenic diets may have therapeutic potential for individuals with psoriasis. Specifically, research has demonstrated that a low-calorie ketogenic diet can lead to a reduction in pro-inflammatory cytokines such as interleukin-2 (IL-2) and interleukin-1β (IL-1β), which in turn may result in a decreased Psoriasis Area and Severity Index (PASI) score—a measure of disease severity **(20)**. Furthermore, ketogenic diets are often associated with weight loss, a particularly relevant benefit considering the high prevalence of obesity among individuals with psoriasis. Obesity not only serves as a common comorbidity but is also known to exacerbate psoriatic symptoms **(12)**. Despite these potential advantages, the ketogenic diet is not without its drawbacks. The restrictive nature of the diet can lead to nutrient deficiencies, as it excludes or limits several food groups that are typically important sources of vitamins and minerals **(6)**. Therefore, careful monitoring of nutritional status is essential, and supplementation should be considered when necessary. Additionally, this dietary approach may not be suitable for individuals with specific medical conditions, such as hepatic or renal disorders **(23)**.

3. The Plant-Based Diets and Psoriasis

Plant-based dietary patterns, including vegetarian and vegan diets, have gained increasing interest for their potential role in the management of psoriasis **(24,7)**. These diets are typically low in saturated fats and cholesterol, while being rich in essential micronutrients such as vitamins, minerals, and antioxidants **(20)**. Emerging evidence suggests a range of beneficial effects associated with the adoption of plant-based diets among individuals with psoriasis, including anti-inflammatory action, improved therapeutic outcomes, better weight regulation, and clinical symptom relief. Vegetarian diets may help reduce systemic inflammation by limiting the intake of arachidonic acid, a precursor to pro-inflammatory eicosanoids **(7)**. Furthermore, adherence to a strict vegan diet has been associated with enhanced response to phototherapy, indicating a possible synergistic effect between dietary practices and conventional treatment strategies **(7)**. Individuals following vegetarian diets also tend to have lower body mass indices, which is advantageous given the well-documented association between obesity and the worsening of psoriasis symptoms **(20)**. A notable case study reported significant clinical improvements after the implementation of a plant-based regimen. Following a period of water-only fasting, the patient adopted a vegan and vegetarian diet that excluded salt, sugar, and oil. This transition led to substantial improvement in psoriasis plaques, reduction in nailbed pain and psoriatic arthritis, as well as considerable weight loss. Continued adherence to this whole-food, plant-based diet was associated with the absence of new lesions and ongoing improvement of existing ones **(24)**. Despite these promising findings, certain risks should be considered when adopting a meat-free diet. Without adequate planning, vegetarian and vegan diets may lack essential nutrients such as vitamin B12, vitamin D, calcium, iron, and omega-3 fatty acids **(6)**. Thus, careful dietary planning and supplementation are crucial to avoid nutritional deficiencies. Additionally, it is important to acknowledge that the effectiveness of dietary interventions may vary significantly among individuals; what proves beneficial for one person may not yield similar results in another.

Conclusion

Psoriasis is increasingly understood as a systemic inflammatory disorder influenced not only by genetic and immunological factors but also by modifiable lifestyle determinants—most notably, diet. The chronic nature of the disease, its frequent comorbidities such as obesity, metabolic syndrome, and cardiovascular conditions, and the shared inflammatory mechanisms underlying these conditions underscore the importance of a holistic therapeutic approach.

Nutritional strategies are emerging as effective adjuncts to standard pharmacological therapies in alleviating both cutaneous and systemic manifestations of psoriasis. Among the dietary patterns evaluated, the Mediterranean diet appears particularly promising due to its high content of anti-inflammatory and antioxidant components. Evidence supports its role in reducing disease severity and improving overall metabolic health. The ketogenic diet, while potentially beneficial in lowering systemic inflammation and promoting weight loss, requires cautious implementation due to its restrictive nature and risk of nutritional deficiencies. Plant-based diets—including vegetarian and vegan regimens—also offer anti-inflammatory benefits and have shown promise in both clinical studies and case reports, especially when accompanied by weight reduction and lifestyle changes. Nevertheless, dietary interventions must be personalized and supervised to ensure nutritional adequacy. Individual responses to diet may vary, and nutritional modifications should be viewed as complementary rather than alternative treatments. Ongoing research and interdisciplinary collaboration are essential to fully elucidate the therapeutic potential of diet in psoriasis management. Integrating evidence-based dietary guidance into routine clinical care could significantly enhance the quality of life and long-term outcomes for individuals living with psoriasis.

Author's contribution:

Conceptualization: Krystian Zukierski, Weronika Jarych, Michał Mazur
Methodology: Krystian Zukierski, Weronika Jarych, Katarzyna Michalak
Investigation: Krystian Zukierski, Katarzyna Michalak, Michał Mazur
Software: Weronika Jarych
Check: Michał Mazur, Katarzyna Michalak
Data Curation: Katarzyna Michalak, Krystian Zukierski
Visualization: Katarzyna Michalak
Project Administration: Krystian Zukierski, Weronika Jarych
Writing - Rough Preparation: Krystian Zukierski, Weronika Jarych
Formal Analysis: Katarzyna Michalak, Michał Mazur
Writing - Review and Editing: Michał Mazur
Resources: Michał Mazur, Krystian Zukierski, Weronika Jarych
Supervison: Krystian Zukierski
All authors have read and agreed with the published version of the manuscript.

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