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REVIEW

Multidisciplinary Management of Psoriasis: Integrating Diet, Exercise, Psychological Support, and Sleep Interventions

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Background: Psoriasis is a chronic inflammatory disease frequently associated with metabolic comorbidities, psychological distress, and reduced quality of life. Its multifactorial nature and frequent overlap with other conditions pose substantial challenges in clinical management.

Purpose: This narrative review emphasizes the importance of a multidisciplinary approach to psoriasis care, integrating dietary counseling, physical activity promotion, psychological support, and sleep interventions. While multidisciplinary care models such as integrated clinics and coordinated care pathways have been proposed, to our knowledge, this is the first review to comprehensively synthesize evidence across these interrelated domains.

Methodology: A comprehensive literature search was conducted using PubMed, Scopus, Cochrane, and Web of Science to identify studies addressing psoriasis in the context of lifestyle, nutrition, mental health, and interdisciplinary collaboration.

Results: Lifestyle modifications, including weight management, anti-inflammatory dietary patterns, stress reduction strategies, regular physical activity, and sleep optimization, may significantly reduce disease severity and improve patient-reported outcomes. Mental health disorders and sleep disturbances are common among individuals with psoriasis and are increasingly recognized as important determinants of disease progression and treatment response.

Conclusion: Psoriasis management should extend beyond pharmacotherapy to address modifiable lifestyle-related factors. Integrating care from dermatologists, dietitians, psychologists, and physiotherapists facilitates a more comprehensive and individualized approach. This model has the potential to improve not only clinical outcomes but also sleep quality, psychological well-being, and long-term self-management in patients with psoriasis.

Keywords: psoriasis, patient-centered care, non-pharmacological treatment, lifestyle factors, multidisciplinary approach

Introduction

Psoriasis is a chronic, non-contagious, systemic inflammatory disease characterized by specific skin lesions (scales, red patches, pruritus), resulting from excessive keratinization of the epidermis.[1] According to 2019 data, the number of new psoriasis cases exceeded 4.6 million, affecting approximately 40.8 million people globally, while the number of disability-adjusted life years (DALYs) surpassed 3.5 million. Various factors, including geographical region, age, sex, genetic predisposition, and environmental factors, influence the prevalence of psoriasis. The highest incidence is observed among individuals in middle age (40–64 years). Projections indicate that by 2030, the number of cases per 100,000 population may rise from the current 423–487 to 551, primarily due to population ageing and overall population growth. However, after adjusting for age, the incidence rate may show a declining trend.[2]

Beyond cutaneous manifestations, psoriasis is associated with an increased risk of cardiovascular diseases, metabolic disorders (including obesity and diabetes), as well as diminished quality of life and deteriorated mental health.[3,4] A recently

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published meta-analysis found that 30.29% of patients with psoriasis were diagnosed with metabolic syndrome, compared with 21.7% in the control group.[5] Importantly, obesity, a key component of metabolic syndrome, is associated not only with increased odds of metabolic syndrome but also with a more severe clinical course of psoriasis.[6,7] Studies also indicate a strong correlation between the severity of psoriasis and depressive and anxiety symptoms. Among patients with psoriatic arthritis, the prevalence of depression ranged from 9% to 22% and the prevalence of anxiety from 15% to 30%.[8]

The etiology of the disease remains complex and not fully understood. Both genetic and environmental factors, such as stress, infections, and the use of certain medications, play a significant role in its pathogenesis. However, autoimmune mechanisms are considered central to the disease, which is characterized by excessive activation of the immune system and stimulation of keratinocytes, leading to the formation of skin lesions and the persistence of chronic inflammation.[9,10]

Pharmacological therapy alone is insufficient to address the multisystem and psychosocial aspects of this condition; achieving personalized, effective care requires a coordinated, multidisciplinary team approach. Due to the systemic nature of psoriasis and the frequent coexistence of other conditions, its management presents a significant clinical challenge. Consequently, increasing emphasis is placed on a multidisciplinary approach, which - alongside physicians - entails active collaboration with specialists from other areas of medicine and health sciences, including dietitians, psychologists, and physiotherapists.[11,12] General practitioners (GPs) and dermatologists play a key role in the diagnosis and treatment of psoriasis. GPs are often the first point of contact for patients presenting with undiagnosed skin changes and can establish a preliminary diagnosis based on the clinical picture.[13] Current guidelines emphasise the need for comprehensive patient assessment, encompassing skin condition, mood, quality of life, and joint evaluation.[14] GPs are also responsible for initiating differential diagnoses, identifying comorbidities, and referring patients to specialists when necessary. Dermatologists manage moderate and severe forms of the disease and coordinate the activities of the therapeutic team, making treatment decisions in partnership with the patient.[15] The inflammatory process underpinning the pathophysiology of psoriasis affects not only the skin but also other organs and systems, making a multidisciplinary approach not merely an option but a necessity. Within this framework, it is essential to address central lifestyle-related concerns for patients with psoriasis, particularly sleep quality and mental health, alongside diet and physical activity, as these factors can significantly influence both disease progression and treatment outcomes.

Several models of multidisciplinary care have been described for the management of psoriasis. Among existing multidisciplinary care models, combined dermatology and rheumatology clinics are some of the best known and most widely used, allowing specialists from multiple disciplines to assess patients and plan treatment together during the same visit.[16] Studies conducted in such centers, including those in Portugal and Germany,[17,18] demonstrate that this type of collaboration leads to faster diagnosis, greater patient satisfaction, and more effective selection of optimal therapies. What is more, organizations such as PPACMAN support the development of combined clinics and dedicated psoriasis centers, promoting a multi-level approach that enhances disease awareness, shortens time to treatment initiation, and improves coordination of.[19] The literature emphasizes that multidisciplinary care should not be limited to a single medical specialty, such as dermatology or rheumatology. The evolving and increasingly patient-centered model requires the involvement of both physicians and specialists from other disciplines to address the growing complexity of treatment. In this context, the creation of teams spanning multiple areas of medicine is strongly encouraged.[16]

To the best of our knowledge, this is the first narrative review to integrate current evidence from multiple domains - nutrition, physical activity, mental health, and sleep - within the context of psoriasis care. The aim is to underscore the importance of the multidisciplinary approach and to outline the roles of individual members of the therapeutic team (beyond the leading roles of the internist and dermatologist) in delivering comprehensive, personalized care that unites previously disparate aspects of management.

Methodology

This article is a narrative review. The following databases were searched: PubMed, Scopus, Cochrane, and Web of Science. A combination of the following keywords was used: “psoriasis”, “multidisciplinary team”, “obesity”, “stress”, “psychological stress”, “diet”, “nutrition”, “gut microbiota”, “physical activity”, “stimulants”, “sleep”, “smoking”, “alcohol”, “physiotherapist”, “dietitian”, “psychologist”, “general practitioner”. Papers published between 2010 and 2025 were included; however, where appropriate, older studies that were considered relevant for a full and accurate representation of the issues discussed were also

cited. Additionally, the bibliographies of the selected articles were analyzed to identify any publications that may have been overlooked during the initial database search. Studies were considered eligible for inclusion if they met the following criteria: meta-analyses, systematic reviews, randomized clinical trials, observational studies, human studies, animal studies, in vivo and in vitro studies, reviews, narrative reviews, and books relevant to the topic. Only studies published between 2010 and 2025 in English or Polish with full-text access were included. Additionally, eligible studies had to involve adult patients with psoriasis, including those with metabolic or psychological comorbidities. Exclusion criteria were as follows: case studies, commentaries, letters to the editor, non-peer-reviewed publications, and review-of-reviews. Studies were also excluded if they did not meet quality criteria, were not specifically related to psoriasis or its multidisciplinary management, focused exclusively on pharmacological treatment, or involved children and adolescents with psoriasis. An overview of the search and selection process for this narrative review is shown in Figure 1.

Obesity and Psoriasis. The Role of Cytokine Signaling Pathways in Psoriasis Pathogenesis

The form of manifestation and the severity of symptoms in psoriasis are associated with the presence of obesity. There is also evidence of interconnections between psoriasis and the occurrence of obesity complications such as hypertension, diabetes

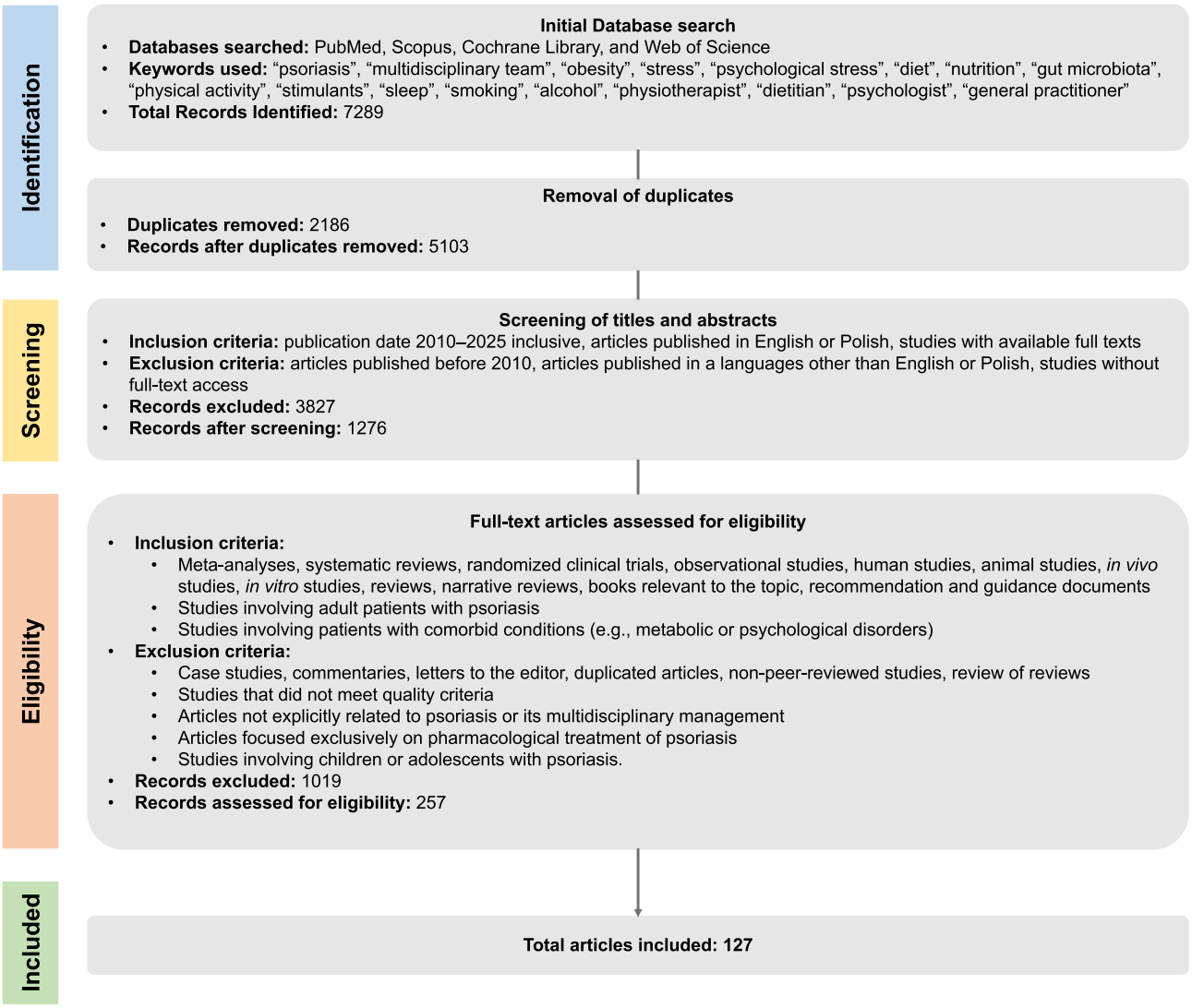

Figure 1 Methodology selection flowchart.

mellitus, dyslipidemia, and metabolic fatty liver disease.[20,21] These connections appear to be bidirectional. Furthermore, obesity is associated with a reduced response to systemic treatments used in patients with psoriasis. Conversely, loss of fat tissue excess improves the response to systemic pharmacological treatments.[22] The relationship between psoriasis and coexisting metabolic disorders is not completely known yet. One of the associations is a different course of diabetes in patients with psoriasis. It was shown that patients with diabetes and with psoriasis experience microvascular and macrovascular complications compared with patients without psoriasis.[23] Also, diabetes develops more often in patients with psoriasis than in control groups.[24] A similar association was found for dyslipidemia, because disturbances in the lipid profile are also more common in patients with psoriasis.[25] The pathomechanism underlying the association between psoriasis and metabolic comorbidity is closely associated with shared common underlying immunological mechanisms, particularly related to the activation of T-helper 1 and T-helper 17 cells.[26] Recent studies revealed that the "inflammatory environment" may be common for obesity and psoriasis, particularly tumor necrosis factor-alpha (TNF-α) and interferon-gamma (IFN-γ).[27] Based on transcriptome analysis, IFN-γ and TNF-α have been identified as the two top inflammatory mediators shared between the two disease processes. It has also been identified that psoriatic lesions may release some cytokines important for the development of metabolic obesity complications as TNF-α, IFN-α, IFN-γ, interleukin (IL)-1, IL-6, and IL-17.[27] A systemic inflammatory state in psoriasis may act synergistically with the inflammation generated by excessive fat tissue, and as a consequence, may lead to earlier and more severe cardiometabolic complications. Another phenomenon observed in patients with psoriasis is the increase in the serum levels of adipokines. Adipokines are signaling substances secreted by adipose tissue. In obesity, the profile of their production and secretion is changed and is related to the development of complications. Substances such as chemerin, adiponectin, resistin, visfatin, and C-reactive protein are released by macrophages and T cells infiltrating visceral adipose tissue.[28] Higher leptin and resistin and lower adiponectin concentrations in psoriasis can be proof of a close relationship between skin inflammation and metabolic status in psoriasis patients.[29] Additionally, patients with psoriasis often possess specific common genetic variants that have multi-faceted functions and a potential role in susceptibility to psoriasis and Type 2 Diabetes, and cardio-metabolic comorbidities.[30]

The treatment of psoriasis coexisting with obesity is a complex process that requires the involvement of multiple fields of medicine and health sciences. The traditional model of care, where individual specialists manage the patient independently without coordinated collaboration, carries the risk of a fragmented approach and the omission of important diagnostic and therapeutic aspects. In contrast, the multidisciplinary team (MDT) model emphasizes integrated, patient-centered care, where all specialists share therapeutic goals and exchange information regarding treatment progress.[11,31] The dermatologist remains a key specialist in treating skin and joint lesions but also acts as a "gatekeeper" for comorbidities - conducting screenings for obesity, diabetes, hypertension, and other conditions, and subsequently referring the patient to relevant experts (eg, dietitians, endocrinologists, psychologists, physiotherapists, etc.) at the appropriate time.[11,32,33] Recent studies and guidelines highlight the importance of a comprehensive approach to psoriasis treatment, including regular monitoring of body weight and metabolic parameters, as well as systematic patient education on lifestyle modifications. Recommendations emphasize the combination of dietary interventions, exercise programs, mental health support, and, in justified cases, pharmacotherapy aimed at weight reduction.[33,34] Preliminary evidence suggests that multidisciplinary treatment yields better outcomes for patients with psoriasis and comorbid metabolic disorders. A Spanish clinical-control study compared care in a combined dermatology-internal medicine clinic (MDT) with exclusive dermatological care for patients with psoriasis and metabolic disorders.[35] In the MDT, in addition to monitoring skin disease, body weight, blood pressure, waist circumference, body mass index (BMI), SCORE index (Systematic Coronary Risk Evaluation), laboratory test results, diet, physical activity, and health habits were regularly assessed. Patients also received health education. Compared to the control group, MDT provided greater improvement in disease severity (Psoriasis Area Severity Index (PASI), body surface area), quality of life (Dermatology Life Quality Index, DLQI), metabolic parameters, and inflammatory markers, as well as better control of body weight, lipid profile, vitamin D levels, insulin sensitivity, and lower predicted cardiovascular risk.

An Explanation of the Diet for Psoriasis

In recent years, there has been a growing interest among both patients and healthcare professionals in exploring the potential of diet therapy as a means to manage psoriasis. Although scientific evidence in this area is still limited, several

dietary models - such as gluten-free, vegetarian, Mediterranean, and calorie-reduced diets - have gained particular attention due to their potential impact on disease outcomes. In this section, we focus specifically on these approaches, as they are the most frequently studied and cited in both the literature and clinical guidelines. Rather than providing an exhaustive review of all possible diets, our aim is to highlight the dietary patterns and specific components that currently show the greatest relevance in psoriasis research and patient care.[36–41]

Gluten-Free Diet

Asymptomatic celiac disease is more frequently observed in individuals with psoriasis than in the general population. A meta-analysis examining the association between psoriasis and celiac disease revealed that patients with the dermatosis have a risk approximately three times higher of developing celiac disease.[40,42] Furthermore, the prevalence of psoriasis is elevated among patients with celiac disease in comparison to the general population.[43] The National Psoriasis Foundation's Medical Board carried out a systematic review in 2018 to create dietary recommendations for individuals with psoriasis or psoriatic arthritis. The board's statement indicates that they "suggest a gluten-free diet (GFD) for patients who have positive serologic markers of gluten sensitivity, although the recommendation is not strong".[41] This recommendation applies specifically to a subset of patients with psoriasis who test positive for serologic markers of gluten sensitivity, even in the absence of biopsy-confirmed celiac disease, and should not be interpreted as a general dietary guideline for all individuals with psoriasis.

Per a 2018 report by Kolchak et al, individuals with very high levels of IgA against gliadin peptides (>30 U/mL, n = 5) experienced a 56% enhancement in PASI score after adhering to a GFD for one year. In the same study, those with high levels of IgA against gliadin peptides (11.5–30.0 U/mL, n = 8) saw a 36% improvement in PASI score following the one-year gluten-free intervention.[44]

A study conducted in Italy investigated the impact of a GFD on patients with both psoriasis and celiac disease. After three months, nine patients in the study saw significant improvements in their PASI.[45]

One hypothesis suggests that increased intestinal mucosal permeability in gluten intolerance may lead to the migration of microorganisms, acting as superantigens, and causing the onset or exacerbation of psoriasis lesions.[40]

It is important to note that antibodies to tissue transglutaminase and gliadin are more commonly found in patients with psoriasis compared to controls. Additionally, a correlation was observed between the presence of these antibodies and the severity of psoriatic lesions.[40] There is evidence demonstrating that individuals who have psoriasis along with the presence of serum anti-α-gliadin antibodies (AGA, IgG or IgA) experience clinical improvement when adhering to a GFD.[42,43] Upon returning to a traditional gluten-containing diet, these patients experienced a worsening of psoriatic lesions. Conversely, there was no observed improvement in skin lesions among psoriasis patients without the presence of antibodies. Notably, studies assessing the serum presence of other antibodies specific to coeliac disease in patients with psoriasis have not definitively clarified whether gluten consumption may contribute to the development of this disease.[40]

Although the evidence indicates that psoriasis patients with gluten-related antibodies could benefit from a GFD, larger trials are still needed to confirm these findings.

Consultation with a registered dietitian can aid these patients in adhering to this dietary model for 3 months. Afterward, the doctor and dietitian should jointly evaluate whether it is advisable to persist with this dietary regimen.[40,46,47]

Vegetarian Diet

A vegetarian diet may reduce the formation of inflammatory eicosanoids that can be harmful to individuals with psoriasis by lowering the intake of arachidonic acid (AA). Furthermore, it may lead to increased cortisol release due to a higher potassium intake, resulting in effects on psoriatic plaques that are similar to those achieved through the administration of synthetic glucocorticoids.[48]

Elevated levels of arachidonic acid, which serves as a precursor for prostaglandin E2 (PGE2) and leukotriene B4 (LTB4) with pro-inflammatory properties, have been identified in psoriatic lesions. Arachidonic acid plays a role in promoting the production of IL-1 and heightening tissue responsiveness to this cytokine. The primary dietary origins of arachidonic acid are meat and animal products.[49] Vegetarians typically incorporate significant quantities of pulses, groats, unprocessed cereals, vegetables, fruits, nuts, and mushrooms into their dietary regimen. This habit results in a diet that is

abundant in polyunsaturated fatty acids and antioxidants. Additionally, a vegetarian diet can serve to offset potassium deficiencies.[49] Increasing the intake of this mineral can boost cortisol synthesis, leading to anti-inflammatory effects.[40,50]

Soy products may also enhance the beneficial effects of a vegetarian diet in psoriasis. The isoflavones, especially genistein, display strong anti-inflammatory properties. In vitro research has shown that genistein decreases inflammation in psoriasis by preventing the production of free radicals and stimulating antioxidant enzymes.[51] These properties suggest a potential role for soy-based foods in regulating oxidative stress and immune dysfunction associated with psoriatic disease.

While the existing literature contains limited scientifically valuable material for recommendations, the overall health benefits, ethical considerations, and environmental implications support the promotion of this dietary approach. For those with psoriasis, incorporating fish as a meat substitute is advisable due to its rich omega-3 fatty acid content, specifically EPA (eicosapentaenoic acid) and DHA (docosahexaenoic acid), which possess anti-inflammatory properties that can help alleviate skin lesions. Linseed oil and rapeseed oil are also recommended as alternative sources of omega-3.[52]

Mediterranean Diet

A study conducted by Barrea et al[53] examined the link between adherence to a Mediterranean diet and the severity of psoriasis. The study found that the PASI value had a negative correlation with adherence to the Mediterranean diet and higher consumption of extra-virgin olive oil, vegetables, fruits, legumes, fish, and nuts, and a positive correlation with higher consumption of red meat. Additionally, the study revealed that patients with psoriasis were less likely to adhere to a Mediterranean diet compared to the control group. Furthermore, other studies also support these findings,[54–57] confirming an inverse relationship between patients' adherence to a Mediterranean diet and the severity of psoriasis or psoriatic arthritis.

Low-Calorie Diet

The effectiveness of low-calorie dietary plans, such as the ketogenic diet, in accelerating the improvement of psoriasis has been conclusively confirmed by interventional RCTs.[58] Moreover, it has been shown that a low-calorie dietary plan enhances the response to systemic treatments like low-dose cyclosporine, biologics, or phototherapy.[59]

Weight loss resulting from a low-calorie diet has been demonstrated to lead to better PASI scores, dermatology life quality index (DLQI), and serum lipid levels. This was evidenced by prospective RCTs, where psoriatic patients with a BMI greater than 27 experienced significant clinical improvements after being on a low-energy diet (800–1000 kcal/day) for 8 weeks, with recurrences observed upon reintroduction of a normal diet.[60]

Fatty Acids

Research indicates a positive relationship between psoriasis severity and the omega-3/omega-6 ratio, as well as a negative correlation between the PASI index value and the concentration of EPA and DHA.[49,50,61]

In a study by Barrea et al,[62] an analysis of the dietary fatty acid content was conducted. They compared the daily food rations of 41 men with psoriasis to those of the control group and found that the patients with psoriasis had a higher intake of omega-6 fatty acids and a lower intake of omega-3 fatty acids. They also discovered that an abnormal ratio of omega-3 to omega-6 fatty acids was correlated with higher PASI scores. Furthermore, individuals with psoriasis who consumed a diet rich in marine fish (such as salmon, mackerel, herring, and sardines) experienced an increase in EPA concentration in their blood serum, leading to improvements in psoriatic lesions. Similar effects were observed with the use of fish oils rich in EPA and DHA, corn oil, and omega-3 acid supplementation. Additionally, in another study by Balbás et al,[63] individuals using topical treatment with vitamin D analogues showed faster improvement in PASI and DLQI with daily oral supplementation of a preparation containing 640 mg of EPA and DHA, compared to those who used only local treatment. Similar results were obtained in the study by Adil et al.[64] In a review by Millsop et al,[65] 12 analyzed studies demonstrated a beneficial effect of omega-3 supplementation in patients with psoriasis, while 3 studies showed no significant improvement in the course of the disease.

Oily sea fish such as herring, sardines, salmon, tuna, and mackerel are rich sources of omega-3 fatty acids, which have beneficial anti-inflammatory effects for individuals with psoriasis. While a 2019 meta-analysis of 13 randomized trials by Yang et al[66] did not confirm the benefits of fish oil supplementation for psoriasis patients, a 2020 systematic review of 18 randomized trials by Chen et al[67] confirmed the effectiveness of using fish oil in combination with conventional treatment for psoriasis.

Antioxidants

Research has shown that a diet rich in these components, found in green vegetables, carrots, tomatoes, and fruits, can help improve skin lesions in individuals with psoriasis. Therefore, it is recommended that people with psoriasis increase their intake of fresh fruits and vegetables and incorporate polyphenol-rich foods such as tea, coffee, herbs, and spices into their diet. Additionally, selenium deficiency, often observed in patients, may be a risk factor for the development of psoriasis. Studies have shown that supplementation with selenium inhibits TNF-α secretion.[50,53] Selenium compounds have also demonstrated the ability to prevent the release of UVB-induced pro-inflammatory cytokines in human keratinocytes based on in vitro studies. However, while selenium supplements have not been shown to improve psoriasis symptoms, a diet rich in selenium, coenzyme Q10, and vitamin E improved clinical outcomes in patients with psoriatic erythroderma and joint involvement.[68,69]

Vitamin D

Amidst the high prevalence of vitamin D deficiency in European countries, individuals with severe psoriasis exhibit notably lower serum levels of the active vitamin D metabolite compared to those with mild or moderate forms of the disease, as well as to healthy individuals. It is estimated that about 50% of psoriasis patients experience vitamin D deficiency in the summer, a number that increases to 80% in the winter. Furthermore, research indicates that the symptoms of psoriasis worsen during the winter months when cutaneous vitamin D synthesis is significantly reduced.[70]

Vitamin D plays a crucial role in the normal growth and differentiation of keratinocytes. It inhibits their proliferation and increases the synthesis of various proteins in the skin, including keratin, transglutaminase, involucrin, loricrin, and filaggrin. Moreover, vitamin D3 is involved in regulating the synthesis of glycosylceramides, which are essential for maintaining the skin barrier's integrity and permeability in the stratum corneum.[50,65,68,71]

A pilot study by Finamor et al[72] demonstrated improvement in PASI scores in all subjects with psoriasis after six months of treatment with high doses of vitamin D (35,000 IU/day). Tajjour et al[73] also found lower serum vitamin D levels in psoriasis subjects compared to controls and observed a negative correlation between serum vitamin D levels and PASI values. It has been suggested that vitamin D deficiency in psoriasis may be associated with obesity and concomitant cardiovascular disease. Supplementation with vitamin D may help alleviate psoriasis-induced symptoms and improve the patient's overall condition as well as symptoms of other diseases.[70,71] It is important to assess serum 25-hydroxyvitamin D [25(OH)D] levels before initiating supplementation. Values within the range of 30 to 50 ng/mL are generally considered optimal for health. The therapeutic dose should be determined by the physician. Following 2–3 months of vitamin D preparations, the concentration of the active metabolite should be re-evaluated to assess the efficacy of supplementation and adjust the dose if necessary. However, large population-based studies indicating specific doses of vitamin D supplementation in patients with psoriasis are currently lacking. Supplementation with vitamin D is not advised for patients undergoing treatment with topical vitamin D analogues due to potential side effects, including hypercalcemia and hypercalciuria.[71]

Role of the Gut Microbiota

Significant disparities in the gut bacteria of psoriasis patients compared to healthy individuals suggest a potential association between imbalanced gut bacteria and the onset of the disease. Recent reports have illustrated the positive effects of probiotics in psoriasis patients. Additionally, substances with prebiotic properties, such as polysaccharides found in dietary fiber, have been shown to play a beneficial role. For instance, a study by Takahashi et al[74] revealed the health benefits of fucoidan, a compound found in brown seaweed, including anticoagulant, anticancer, immunomodulatory, and apoptosis-inducing effects. Fucoidan has been found to have a positive impact on the intestinal barrier, gut

bacteria composition, and improvement of psoriasis. Moreover, seaweed serves as a sustainable source of bioactive lipids containing high concentrations of beneficial omega-3 fatty acids and vitamin D, both of which have been previously associated with positive effects for psoriasis patients.[75,76]

Alcohol Intake

Excessive alcohol consumption can severely limit treatment options for psoriasis, as certain medications like acitretin and methotrexate can have harmful liver effects in heavy drinkers.[77,78] Additionally, heavy drinking can worsen psoriasis by increasing skin irritation, susceptibility to infections, and disrupting the immune system.[7] Research has shown that heavy drinkers tend to have more severe psoriasis symptoms and drink more frequently than those without the condition.[79] Svanström et al[80] also observed that people with psoriasis consume more alcohol than average, and that heavy drinking is linked to more severe and frequent psoriasis outbreaks. Additionally, the authors suggested that skin lesions in alcohol-abusing psoriasis patients tend to appear on specific areas like the face, groin, knees, and elbows.[81]

Zhu et al[82] conducted a comprehensive search of published studies and a meta-analysis to investigate the link between drinking and the risk of developing psoriasis. They found that drinking increased the risk of psoriasis by 53% compared to non-drinkers (OR = 1.531, p = 0.002). The biological mechanism behind this link remains unclear. Research suggests that alcohol and its byproducts may trigger or worsen psoriasis. While alcohol tends to suppress inflammation and immune responses overall, it can have contrasting effects on inflammatory cell activation, with acute consumption stimulating and chronic consumption suppressing it.[83] One theory is that excessive drinking can weaken the immune system, leading to reduced immunity. Additionally, alcohol may stimulate the production of pro-inflammatory chemicals and growth factors that promote excessive skin cell growth, potentially exacerbating psoriasis symptoms.[81]

In the context of multidisciplinary management, all members of the healthcare team should consistently advise patients with psoriasis to completely eliminate alcohol consumption, as any intake can worsen treatment outcomes and increase the risk of associated comorbidities. Alcohol use should be routinely assessed and considered when developing individualized treatment plans. Furthermore, patients experiencing alcohol dependence or misuse should be promptly referred to appropriate specialists (eg, addiction medicine physicians, psychologists, or counselors) to ensure comprehensive and coordinated support.

Coffee Consumption

Caffeine is the most extensively studied component of coffee. This alkaloid inhibits the proliferation of Th1/Th2 cells and the release of pro-inflammatory cytokines such as IL-1, IL-6, IL-11, and TNF-α, while also inhibiting the release of anti-inflammatory markers like IL-4, IL-10, and adiponectin. Additionally, caffeine inhibits cyclic adenosine monophosphate (cAMP) phosphodiesterase, stimulating the release of anti-inflammatory cytokines and acting as an adenosine receptor antagonist. According to Hall et al,[84] the anti-inflammatory effect of coffee is attributed to the presence of polyphenols in its composition, especially chlorogenic acid and its metabolites, which have strong inhibitory effects on pro-inflammatory cytokines. Coffee acid reduces nitrite concentrations and inhibits inflammatory processes, while arabinogalactan proteins found in coffee have an immunosuppressive effect, stimulating splenocytes and peritoneal macrophages, reducing skin inflammation, and decreasing the severity of allergic reactions.[85]

While research on coffee's role in psoriasis treatment is unclear, one study suggests that high levels of coffee consumption may worsen symptoms. The study found that people who drank more than 200 mL of coffee per day had higher levels of inflammatory markers IL-6, CRP, and TNF-α, which corresponded to more severe psoriasis symptoms.[86] In contrast, research by Li et al[87] found that coffee enhanced the effectiveness of psoriasis treatments, particularly when combined with medications like methotrexate or sulfasalazine. Notably, decaf coffee had no impact on psoriasis risk.[87] Research by Sharif et al[88] and Hall et al[84] found that regular coffee consumption boosts anti-inflammatory agents and decreases pro-inflammatory markers, such as TNF-α, which can help alleviate the severity of psoriasis symptoms. An interventional study of 64 patients with psoriasis and psoriatic arthritis found that the amount of coffee consumed (low, moderate, or high) did not impact the dosage of methotrexate medication required during treatment.[89] Other studies confirmed that the impact of coffee on psoriasis is dependent on the quantity consumed. Moderate coffee consumption (up to 3 cups per day) appears to alleviate psoriasis symptoms and have an anti-inflammatory effect. In contrast, higher consumption of coffee, especially more than 4 cups per day, exacerbates the clinical symptoms of psoriasis by increasing the secretion of pro-inflammatory substances.[53,90]

Smoking

Evidence has consistently linked smoking to an increased risk of developing psoriasis, with studies showing that smokers are nearly twice as likely to develop the condition compared to non-smokers (RR 1.88, 95% CI 1.66–2.13).[91] Most studies have linked smoking to more severe psoriasis symptoms. For example, a study of 818 patients found that heavy smokers (smoking more than 20 cigarettes a day) were nearly three times more likely to have more severe psoriasis than light smokers (smoking 10 cigarettes or less a day).[92] A study by Bø et al[93] also analyzed the relationship between smoking and psoriasis in a group of patients with psoriasis (n=1144), including both current and former smokers. The results showed that both groups had a higher risk of developing psoriasis compared to non-smokers.[93] A meta-analysis analyzed data from 25 studies and found that smokers were more likely to have psoriasis, with current smokers having a 78% higher risk and former smokers having a 62% higher risk.[94] While the impact of smoking on treatment response is unclear,[26,95] evidence suggests that smoking can reduce the effectiveness of biologics in treating the condition.[96] The mechanism behind this relationship may involve the formation of free radicals, which stimulate pathways involved in psoriasis development.[97] Smoking has also been linked to changes in the gut microbiome, which may contribute to the development and exacerbation of psoriasis.[98] Overall, smoking worsens psoriasis severity and associated comorbidities, making quitting essential for patients with psoriasis who smoke.[26] All members of the multidisciplinary team should recognize that smoking can worsen psoriasis symptoms, reduce treatment effectiveness, and increase the risk of comorbidities. Smoking status should be routinely assessed, and patients needing support to quit should be referred to addiction specialists.

The Role of the Dietitian in the Multidisciplinary Team

Among the members of the multidisciplinary team, it is recommended that a leading role in providing nutritional care be assigned to qualified dietitians. The dietitian conducts a comprehensive assessment of the patient's nutritional status, including anthropometric measurements (with particular attention to abdominal obesity indicators), body composition analysis, evaluation of dietary habits, and identification of risk factors for metabolic disorders.[99] In the context of psoriasis, monitoring visceral fat is particularly important, as its excess is often associated with increased disease severity.[100] Based on the collected data, the dietitian develops an individualized dietary intervention plan aimed not only at reducing the intensity of psoriasis symptoms but also at improving overall health, particularly in the presence of comorbidities.[99] In parallel, the dietitian provides patient education, offering practical guidance on meal planning, selecting appropriate food products, and interpreting nutrition labels. An essential component of the dietitian's work is the regular monitoring of the intervention's effectiveness and the continuous adjustment of dietary recommendations to meet the patient's current needs. This personalized approach supports patient adherence and enhances the overall effectiveness of nutritional therapy.

Table 1 summarizes the key dietary recommendations for patients with psoriasis.

Table 1 Recommendations for Patients with Psoriasis

Recommendation	Details
Avoid alcohol and smoking	It is recommended to completely eliminate alcohol and stop smoking.[26,101]
Omega-3 fatty acids	Consume approximately 1–2 g/day, particularly from oily sea fish and seaweed.[40]
Avoid certain animal products	Recommended to avoid red meat, animal fats, and offal.[40,68]
Increase antioxidant intake	Include antioxidant-rich foods or supplements: selenium (400 µg/day), Coenzyme Q10 (100–200 mg/day), vitamin E (50 mg/day).[68]
Limit processed foods and caffeine	Reduce highly processed food intake and limit caffeine to 200 mg/day.[50,86]
Follow an anti-inflammatory diet	Adopt a diet with a low glycaemic index, similar to the Mediterranean diet.[40,50,68]
Consider plant-based diets	Vegetarian or well-balanced vegan diets, under dietitian supervision, can be beneficial.[40,50]
Try a gluten-free diet (if coeliac antibodies are present)	Patients with positive coeliac antibodies (AGA, tTGA, EMA) may try a gluten-free diet for 3 months as an exploratory measure.[40,46,47]

Stress and Psoriasis

Psoriasis is a condition that is often associated with a decline in psychological functioning. Patients struggling with the disease experience lowered self-esteem, reduced quality of life, and symptoms of anxiety and depression. They also experience difficult emotions related to the experience of the disease, also in the social dimension, related to fear of rejection, negative perceptions from others, and withdrawal from social life.[102,103]

On the other hand, psychosocial factors, led by the stress response, are significantly associated with the occurrence of the illness. Studies indicate that the stress experienced by patients leads to both the appearance and exacerbation of psoriasis symptoms.[104,105] Thus, it is possible to speak of a bidirectional relationship, in which the experience of the disease affects poorer psychological functioning, but at the same time, poorer functioning and severe stress lead to an exacerbation of disease symptoms.[106] It creates a vicious circle of disease and stress reaction, which is very difficult to interrupt without support from trained specialists (psychologists and psychiatrists).

Certain impacts on human skin and the inflammatory response have been discovered to be related to the HPA axis (hypothalamic-pituitary-adrenal axis), the body's central stress response system. In response to stress, the hypothalamus releases corticotropin-releasing hormone (CRH), which stimulates the pituitary to secrete adrenocorticotropic hormone (ACTH), ultimately inducing cortisol release from the adrenal cortex. Cortisol exerts potent anti-inflammatory and immunomodulatory effects that help maintain immune homeostasis.[102] However, under chronic psychological stress, HPA axis regulation may become impaired, resulting in hyper- or hypocortisolism - both of which have been associated with the onset or exacerbation of inflammatory skin disorders. Dysregulation of this axis reduces its anti-inflammatory capacity and contributes to immune imbalance at both systemic and cutaneous levels.[107]

Beyond its systemic role, the skin expresses a functional equivalent of this axis, with keratinocytes and other skin cells capable of producing CRH, ACTH, and even cortisol locally, thereby enabling an autonomous cutaneous stress-response system. The local HPA-equivalent is considered a component of the broader brain–skin axis, a bidirectional communication system linking psychological stress with cutaneous responses. This pathway enables stress-induced modulation of local immune activity, skin barrier function, and inflammatory signaling.[108]

Evidence suggests that excessive activation of the cutaneous HPA-equivalent may contribute to pathological changes in the skin.[109] This local axis likely evolved as an adaptive mechanism to respond to diverse environmental stressors affecting the integument. Research on POMC-derived peptides in the skin, including CRH, ACTH, and others, further supports this idea.[110] The pro-inflammatory protein complex known as NF≈B, or nuclear factor kappa-light-chain-enhancer of activated B cells, is triggered by CRH. CRH successfully induces an immunoreactive state in keratinocytes through all of these modifications, which may lead to inflammatory skin diseases like psoriasis.[102] Indeed, in psoriatic lesions, elevated CRH expression and impaired cortisol signaling have been observed, contributing to NF-κB overactivation and increased production of pro-inflammatory cytokines such as IL-17 and TNF-α - central mediators in psoriasis.[111]

Psychological stress, whether prolonged or recurrent, has an impact on all human organs, including the skin. There is currently a dearth of information on the mechanical underpinnings of the psychological stress response in the skin. Crucially, skin that is "battered" by inflammatory dermatological conditions (such as psoriasis, acne, urticaria, and atopic dermatitis) is more vulnerable to the effects of stress. Reduced skin response threshold compared to healthy skin is observed, most likely as a result of both lesional and non-lesional skin constantly accumulating and becoming aroused by activated immune cells, proinflammatory mediators, and chemokines.[112]

The Importance of the Psychologist in the Multidisciplinary Team

Psychological stress can exacerbate psoriasis and be a consequence of it, creating a vicious cycle of deterioration.[106] Psychological support, particularly in the form of cognitive behavioral therapy (CBT), relaxation techniques, and mind-fulness-based therapy, is effective in reducing stress levels, improving mental functioning, and alleviating symptoms.[113] Despite these documented benefits, however, access to such support remains limited among people with psoriasis.[114] Support led by a qualified professional is an important part of comprehensive psoriasis management (Table 2).

Table 2 The Role of Psychological Support in the Comprehensive Management of Psoriasis

Component	Description
Psychological Support in Psoriasis Treatment	Involvement of psychologists in interdisciplinary teams is essential.
Identification of Stress	Necessary to detect high or prolonged stress using psychological tools.
Stress Reduction Interventions	Aim to reduce stress to non-harmful levels.
Types of Interventions	• Diagnosis of psychological functioning • Psychoeducation • Motivational dialogue • Support for effective coping (situation re-evaluation) • Relaxation techniques • Cognitive Behavioural Therapy (CBT) • Mindfulness training
Benefits of Interventions	• Improved patient functioning • Lower stress levels • Reduced psoriasis symptom intensity
Current Availability	Support and identification of psychological needs are still very limited.

The Influence of Lifestyle in the Management of Psoriasis. The Role of Physical Activity and Sleep. The Importance of the Physiotherapist and Physical Activity Specialist in the Multidisciplinary Team

Lifestyle habits, including level of physical activity or quality of sleep, can significantly impact psoriasis clinical presentation, severity, and course. Patients with psoriasis are advised to adopt a healthy lifestyle, including regular physical activity and abstinence from stimulants, in conjunction with conventional treatment. While lifestyle changes alone do not replace conventional treatment, they can serve as a valuable adjunct. Physiotherapists can play a vital role by educating patients on the benefits of a healthy lifestyle and providing reliable guidance on physical activity advice, ultimately promoting better overall management of the condition.[115] A study utilizing UK Biobank data from 500,000 participants investigated the interplay between genetic and lifestyle factors in relation to psoriasis risk. The findings indicate that lifestyle factors can independently predict the risk of psoriasis, with a greater impact than genetic risk. However, the study's applicability is limited by the lack of verification in other independently ascertained populations.[116]

Physical Activity

Physical inactivity is a significant factor in obesity and abdominal fatness, leading to an imbalance of pro-inflammatory adipokines and cytokines that can contribute to psoriasis development.[117,118]

While exercise has been shown to improve psoriasis symptoms, people with psoriasis are often less likely to engage in moderate-to-vigorous physical activity. A review of 28 studies found that psoriasis patients have lower levels of physical activity, engage in less exercise, and are less likely to participate in vigorous activities. The study showed a negative correlation between exercise and quality of life for psoriasis patients. Patients reported discomfort, skin sensitivity, and difficulty managing their condition as obstacles to regular exercise. As a result, over 50% of patients with psoriasis do not meet the World Health Organization's physical activity recommendations.[118] A meta-analysis conducted by Zheng et al,[119] which included 13 observational studies, revealed that individuals with severe psoriasis engaged in intense physical activity 32% less frequently than the control group. In contrast, they participated in moderate-intensity exercise 60% more often and carried out regular physical activity 12% less frequently compared to the control group. The authors of the study suggested that individuals with more severe psoriasis, who are more conscious of their condition, tended to engage in less-intense physical exercise.[119] A 14-year study of 86,655 female nurses found that vigorous physical activity was linked to a reduced risk of developing psoriasis. The study showed that subjects who were most

physically active had a 28% lower risk of developing psoriasis compared to those who were least active. Studies have shown that engaging in vigorous-intensity physical activity (at least 6 METs (metabolic equivalents of task) is associated with a significant reduction in the risk of developing psoriasis, with a risk reduction of approximately 34%.[120]

Another reason for limiting physical activity in people with psoriasis could be physical limitations that make exercise difficult, or it can significantly reduce the quality of life and worsen the mood of patients, resulting in reduced physical activity,[121] poor overall health, higher risk of developing cardiovascular disease and obesity.[122] Excess weight is linked to metabolic syndrome and various diseases, as well as worsened psoriasis symptoms.[123] Research has shown that engaging in physical activity can have a range of benefits, including reducing symptoms of psoriasis, as well as improvement of cardiovascular, metabolic, and psychological coexisting conditions.[124]

Studies suggest that regular physical activity reduces skin lesions by decreasing inflammation and increasing anti-inflammatory cytokines.[125] Studies also suggest that physical activity can reduce the risk of psoriasis development and improve quality of life.[120,121] In 2019, a Cochrane review affirmed that incorporating physical activity and weight loss into the treatment plan can be beneficial. This approach helps in reducing oxidative stress and PASI score, particularly in patients with overweight and obesity, who are undergoing biologics or oral/traditional treatments.[126] In addition, a study involving 303 patients with overweight or obesity, with moderate-to-severe chronic plaque psoriasis found that increasing physical activity through aerobic exercise for a minimum of 40 minutes three times a week, combined with a 20-week dietary intervention, effectively decreased psoriasis severity compared to providing only information about the benefits of weight loss for managing psoriatic disease clinically.[125]

Patients with psoriasis are recommended to engage in regular exercise according to current guidelines. However, the American Academy of Dermatology (AAD) and National Psoriasis Foundation (NPF) guidelines for managing psoriasis do not detail the specific amount and frequency of exercise.[127] Psoriasis is linked to various cardiovascular diseases, and engaging in physical activity is one of the most straightforward ways to prevent these conditions. As a result, there appears to be a complex relationship between psoriasis, its comorbidities, and physical activity. Psoriasis increases the risk of cardiometabolic disorders, which can be mitigated by regular exercise. However, this may be difficult due to the skin condition, a negative mindset, or psoriatic arthritis.[26]

Sleep Disturbances

A comprehensive review of studies published between 1980 and 2020 reveals that psoriasis patients commonly experience sleep disturbances, with prevalence rates varying widely across studies, from 0.05% to 77.1%. The NPF's 2005 study found that nearly half of patients experienced sleep disturbances at least once a month, with over 11% experiencing episodes lasting more than 15 days.[128] Several studies have linked the clinical severity of psoriasis to an increased risk of developing sleep disorders. Specifically, research has shown that psoriasis patients with more severe symptoms (measured by the PASI) are more likely to experience sleep disorders, likely due to factors such as pain and itching.[129–132] However, not all studies have found a correlation between psoriasis severity and sleep disorders, suggesting that individual results may vary.[133–135] A meta-analysis of 15 studies found that patients with psoriasis experience poorer sleep quality and a higher risk of sleep disturbances compared to healthy controls. The analysis revealed that psoriasis was particularly associated with poor sleep quality among patients with psoriatic arthritis, severe psoriasis, shorter disease duration, and younger age. Additionally, patients with psoriasis were more likely to experience insomnia, restless legs syndrome, and depression.[136]

The relationship between sleep deprivation and psoriasis is complex, with sleep deprivation exacerbating psoriasis symptoms through the modulation of cytokine secretion and skin physiology. Inflammation plays a key role, with increased levels of proinflammatory cytokines such as TNF-α and interleukin-6 contributing to keratinocyte hyperproliferation and skin inflammation. Neurotransmitters like substance P also play a role, promoting keratinocyte multiplication and skin inflammation. The autonomic nervous system's activation due to sleep deprivation can also contribute to metabolic syndrome in dermatological conditions.[137] A review of existing research by Myers et al found that an imbalance of the gut microbiome, characterized by an increased Firmicutes to Bacteroidetes ratio and reduced levels of short chain fatty acid-producing bacteria, is linked to both psoriasis and sleep dysfunction, which may in turn contribute to the development of cardiometabolic diseases through systemic inflammation.[138]

Psoriasis patients should be thoroughly questioned about sleep disturbances, including the type of disturbance, any triggering factors, duration, and impact on daily life. A comprehensive assessment should also involve specialized questionnaires and a sleep diary or calendar to track symptoms over several weeks. In cases of severe sleep disturbances or suspected sleep disorders like sleep apnea or restless leg syndrome, patients should be referred to a sleep specialist for further evaluation using diagnostic tests such as polysomnography or actimetry.[128]

Recent evidence suggests that chronic insomnia and obstructive sleep apnea (OSA) are among the most clinically relevant sleep disorders in patients with psoriasis, and their pathophysiology extends well beyond nocturnal itching or discomfort. Chronic insomnia has a significantly higher prevalence among individuals with psoriasis compared to the general population.[136,139] This association is thought to reflect a complex interplay of inflammatory, metabolic, and psychological factors. Elevated systemic levels of pro-inflammatory cytokines - particularly TNF-α and IL-6 - have been shown to disrupt circadian rhythms and sleep regulation, both centrally and peripherally.[137] Furthermore, mood disorders such as anxiety and depression, frequently coexisting with psoriasis, further contribute to the risk of chronic insomnia.

Another critical but under-recognized condition in this population is OSA. Evidence showed that OSA is significantly more prevalent among individuals with psoriasis (pooled OR 2.60). Conversely, patients with OSA have been found to carry an increased risk of developing psoriasis (adjusted OR 13.31), suggesting a bidirectional relationship.[140] The pathophysiological link is thought to involve intermittent nocturnal hypoxia and systemic oxidative stress, both of which promote inflammatory cytokine release and may contribute to keratinocyte hyperproliferation. Additionally, obesity, a major risk factor for both conditions, is associated with metabolic syndrome, insulin resistance, and increased visceral adiposity, all of which have been independently implicated in psoriasis pathogenesis.[20,136]

Importantly, these sleep disorders can significantly affect treatment outcomes and quality of life. Chronic sleep deprivation has been shown to increase psoriasis severity, reduce pain thresholds, and worsen comorbid depression. OSA, in particular, may worsen cardiovascular risk profiles and reduce the efficacy of systemic therapies due to heightened inflammatory load.[135]

Given these clinical implications, it is essential that healthcare providers screen all psoriasis patients for chronic sleep disorders. Symptoms such as persistent non-restorative sleep, excessive daytime sleepiness, loud snoring, or witnessed apneas should prompt referral to a sleep specialist for formal evaluation. A comprehensive summary of major sleep disorders observed in psoriasis patients, their underlying mechanisms, clinical implications, and tailored physical activity recommendations is presented in Table 3.

The Importance of the Physiotherapist and Physical Activity Specialist in the Multidisciplinary Team

The physiotherapist and physical activity specialist play a significant role in the multidisciplinary team treating psoriasis patients. Physiotherapists collaborate with other healthcare professionals to create a multidisciplinary treatment approach that considers the intricate relationships between physical, emotional, and social factors affecting patients with psoriasis. Physiotherapists help patients maintain range of motion, reduce stiffness, and alleviate joint pain and swelling associated with psoriasis. They also educate patients on the recommended level of physical activity, proper exercise techniques, and guide developing an exercise routine that is tailored to their individual needs. The physical activity specialist focuses on promoting overall physical fitness and well-being, which can help improve mental health and overall quality of life. By incorporating physical activity into their treatment plan, patients with psoriasis can reduce their risk of developing comorbidities and improve their overall health outcomes. Furthermore, physiotherapists can also use physical agents such as ultraviolet A light therapy or laser therapy to alleviate symptoms and reduce inflammation. By incorporating these interventions into their treatment plans, physiotherapists can help patients with psoriasis achieve better management of their condition and improved overall health.

Table 4 presents general recommendations on physical activity and sleep for patients with psoriasis, based on the current scientific literature.

Table 3 Sleep Disorders and Physical Activity Recommendations in Psoriasis.[128,134,139,141,142]

Main Sleep Disorder	Pathophysiological Mechanisms in Psoriasis	Clinical Consequences	Physical Activity Recommendations
Chronic insomnia	• Elevated systemic inflammation: increased pro-inflammatory cytokines (TNF-α, IL-6) disturbing sleep regulation. • Dermatological symptoms: pruritus and pain interfering with sleep onset and continuity. • Psychological factors: depression and stress are common and contribute to insomnia.	• Daytime fatigue, reduced concentration, cognitive impairment. • Worsening of anxiety and depressive symptoms. • Increased risk of hypertension, obesity, and insulin resistance due to chronic sleep loss.	• Regular moderate-intensity aerobic exercise (for 30 min, 3×/week) improves sleep quality. • Avoid vigorous activity late in the evening. • Maintain sleep hygiene: regular rhythm, morning or afternoon exercise.
Obstructive Sleep Apnea	• Obesity and metabolic syndrome common in psoriasis contribute to upper airway obstruction during sleep. • Chronic inflammation and oxidative stress increase airway reactivity (↑TNF-α, IL-6). • Anatomical factors: increased neck circumference and fat tissue in upper body.	• Daytime sleepiness, unrefreshing sleep, morning headaches. • Higher risk of cardiovascular events. • Worsened psoriasis control due to sleep-related inflammation.	• Weight reduction through diet and exercise. • Minimum 150 min/week of aerobic training. • Resistance training to improve respiratory muscle strength. • Physical activity supports continuous positive airway pressure therapy adherence.
Restless Legs Syndrome	• Chronic inflammation: ~90% of conditions associated with RLS are inflammatory or infectious. • Possible iron deficiency in central nervous system, despite normal ferritin levels in serum. • Dopaminergic system dysregulation triggered by immune activation.	• Difficulty falling asleep due to uncomfortable sensations in the legs. • Daytime fatigue due to fragmented sleep. • Associated with increased risk of hypertension, coronary artery disease, and diabetes.	• Daily moderate exercise: walking, cycling, stretching, yoga may alleviate symptoms. • Avoid vigorous exercise before bedtime (can worsen symptoms). • Combine physical activity with leg stretching or massage to improve sleep.

Table 4 Sleep and Physical Activity Recommendations for Patients with Psoriasis

Recommendation	Details
Aim to maintain 7–9 hours of uninterrupted, restful sleep per night	Adequate sleep duration and quality help reduce systemic inflammation, potentially improving psoriasis control and lowering the risk of comorbidities. Sleep deprivation may worsen disease severity.[143,144]
Practice good sleep hygiene	Keep the bedroom cool, dark, and quiet; limit screen use 1–2 hours before bedtime; avoid alcohol and caffeine in the evening; reserve the bed for sleep and intimacy only. These strategies support healthy sleep and may reduce systemic inflammation, improving overall disease control.[145]
Aim for ≥150 minutes/week of moderate-intensity physical activity (eg, 30 minutes, 5 days/week) plus muscle-strengthening exercises	Regular activity improves metabolic parameters, reduces systemic inflammation, and may lessen psoriasis severity, particularly in patients with overweight or obesity.[118,146]
Engage in any form of regular physical activity rather than none; if high-intensity exercise is contraindicated, choose low-impact activities (eg, swimming, cycling, walking, yoga, tai chi)	Low-impact exercise reduces the risk of skin injury and joint overuse, especially in psoriatic arthritis. Aquatic exercise unloads joints, while yoga can alleviate stress, improve mobility, and enhance sleep quality.[146,147]
In patients with overweight or obesity, aim for a 5–10% weight reduction through dietary change and increased physical activity	Adipose tissue promotes inflammation in psoriasis (adipocytes secrete TNF-α, IL-6). A 5–10% weight loss is associated with reduced disease severity and improved treatment response.[22,125,148]

Conclusions

Psoriasis is a chronic, immune-mediated systemic disease with cutaneous and extracutaneous manifestations and a substantial burden of metabolic, cardiovascular, and psychological comorbidity. Findings in the literature underscore the need for an integrated model of care for patients with psoriasis - one that addresses not only cutaneous symptoms but also extra-cutaneous dimensions of the disease. Optimal care extends beyond pharmacotherapy and requires an integrated management strategy that simultaneously targets lifestyle, mental health, and physical functioning. It is essential that the integration of multidisciplinary teams becomes a standard component of everyday clinical practice, rather than a purely theoretical concept. Therefore, collaboration among healthcare professionals - including physicians (eg, dermatologists), dietitians, psychologists, and physiotherapists - is essential within a structured multidisciplinary team to address patients' diverse needs. Within this model (Figure 2), the physician leads diagnosis, risk stratification, and pharmacologic treatment and coordinates care; the dietitian provides nutritional assessment, individualized dietary counseling, and weight-management support; the psychologist delivers

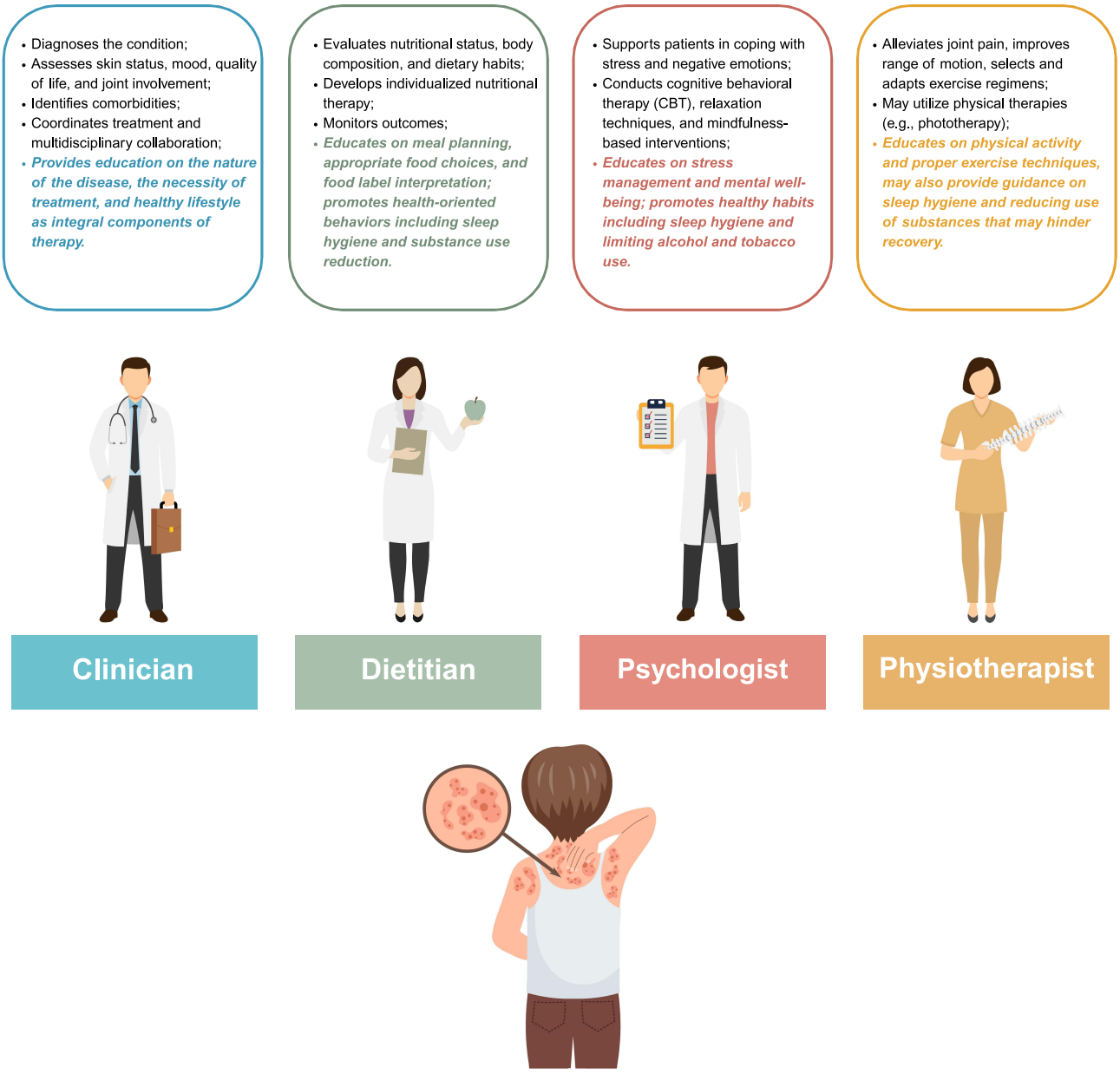

Figure 2 Multidisciplinary Management of Psoriasis.

evidence-based psychological interventions and stress-management training; and the physiotherapist prescribes and supervises physical activity and rehabilitation to maintain function and reduce pain. Lifestyle modification is a central, cross-cutting component of this strategy. Enhancing diet quality, reducing or ceasing tobacco and alcohol use, attaining a healthy body weight, adopting stress-reduction practices, engaging in regular physical activity, and improving sleep hygiene are all credible levers to attenuate symptoms and improve health-related quality of life. Equally important is patient education, delivered by all members of the team, which reinforces engagement in the therapeutic process and supports treatment efficacy. To ensure that multidisciplinary care is both practical and effective, it is essential to provide ongoing professional training for all team members and to maintain clear, efficient communication among them. Furthermore, additional research is warranted to refine this collaborative approach, particularly by tailoring interventions to each patient's clinical profile, needs, and preferences. Integrated actions undertaken by the multidisciplinary team facilitate a comprehensive understanding of the patient's condition and allow for tailoring the therapeutic strategy to individual needs. This approach increases the likelihood of sustained clinical improvement, reduces the risk of disease relapse, and improves long-term treatment outcomes.

Disclosure

The authors report no conflicts of interest in this work.

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