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PSORIASIS AND MENTAL HEALTH: A PSYCHODERMATOLOGICAL APPROACH WITH AN EMPHASIS ON PSYCHOTHERAPY

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Summary

Psoriasis is a multifactorial, inflammatory, chronic disease caused by the complex interaction of genetic and environmental factors, including psychosocial distress. This review reasons the importance of the biopsychosocial model and why it should be considered when treating patients with psoriasis. We aimed to provide current evidence for the psychological etiopathogenesis, psychosocial comorbidities, psychosocial assessment, and psychological therapeutic interventions in psoriasis. The main pathways linking stress to psoriasis involve the hypothalamic–pituitary–adrenal axis, sympathetic–adrenal–medullary axis, peripheral nervous system, and immune system. Fear of embarrassment and social stigma is reported to be one of the main stressful factors in the onset or worsening of psoriasis. Mental disorders are the most common comorbidity in psoriatic patients, but they are still often overlooked and undertreated. Previous research has shown increased rates of sleep disorders, depression, anxiety, borderline personality disorder, and alcohol use disorder. Biological treatment of psoriasis could reduce symptoms of depression, anxiety, and insomnia in patients with psoriasis. According to research, psoriasis patients may have certain psychological characteristics, including type D personality, alexithymia, high vulnerability to stress, and escape-avoidance coping strategy. Mental and social health should be part of psoriasis severity assessment, especially in patients who carry an increased risk of mental illness. Cognitive behavioral therapy, mindfulness-based cognitive therapy, and relaxation therapy could be used to decrease psoriasis severity and improve the quality of life of psoriasis patients. Psychoanalytic evaluation can contribute to dermatologic practice by typifying unconscious conflicts, detecting the defense mechanisms for stress coping, and choosing the treatment on unconscious preferences. The collaboration between the dermatologist, family medicine specialist, psychologist, and psychiatrist can help to break the psychosomatic and somatopsychic vicious circles.

Keywords: *psoriasis, psychodermatology, mental health, psychosocial assessment, psychotherapy*

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INTRODUCTION

Psoriasis is a multifactorial, inflammatory, chronic relapsing dermatosis with a high prevalence in Western industrialized countries (2-4%) (Gieler et al. 2020). Along with genetic predisposition, mental disorders and various stressors might have a key role in the occurrence of this disease (Biljan et al. 2009). Due to close bidirectional interaction between psoriasis and psychosocial factors, it is classified as a psychodermatological condition within two categories: psychosomatic and secondary psychiatric disorders (Šitum & Kolić 2016). Modern psychodermatology relies on the bio-psycho-social disease model in psychosomatics, according to which biological, psychological and social factors play a major role in the disease pathogenesis through complex, non-linear interactions over the entire disease course (Gieler et al. 2020). Patients often describe a fear of a changed appearance and social stigma as the main stressful factors in the onset or worsening of psoriasis (Šitum et al. 2008). Psoriasis poses a substantial threat to several dimensions of a patient's quality of life. It influences working habits, poses a significant financial burden, and most of all, significantly impairs their quality of life and psychological status (Bulat et al. 2020). A physician's holistic approach should encompass interdependence of the biological, psychological and social factors, which should be adequately taken into account when taking anamnesis and making a diagnosis (Gieler et al. 2020). Despite the refinement of novel therapies, psoriasis remains a treatable but so far not curable disease (Rendon & Schäkel 2019). Patients feel that the current treatment, although often effective, does not provide a satisfactory long-term solution (Bulat et al. 2020). Thus, to relieve the chronic strain created by this incurable disease, the development of multifactorial interventions is desirable (Rapp et al. 1997).

This review aimed to provide current evidence on the psychological factors in etiopathogenesis, psychosocial comorbidities, psychosocial assessment, and psychological therapeutic interventions in psoriasis.

PSYCHOLOGICAL FACTORS IN THE ETIOPATHOGENESIS OF PSORIASIS

Psoriasis is a multifactorial disease caused by the complex interaction of genetic and environmental factors, including psychosocial distress (Yang & Zheng 2020). Psychological factors are an essential part of psoriasis etiopathogenesis. The first reported case of psychodermatosis was described in 1700 BC when a Persian prince's physician hypothesized that the prince's psoriasis outbreak was spurred on by anxiety regarding his father taking over the kingdom (Shafii 1979). Moreover, Hippocrates addressed the correlation between stress and its effects on the skin in his writings, while Aristotle claimed that the mind and body were not two independent, but rather complementary and indivisible (Katlein et al. 2013). In 1998 the neuro-immuno-cutaneous-endocrine model was proposed as an explanation for the mind-body relationship. That model describes how stress variables, such as psychological stress and social environment, can cause or worsen numerous inflammatory dermatoses, including psoriasis (O'Sullivan et al. 1998). Later, other studies have also indicated that psychosocial stress plays a critical role in the pathogenesis of psoriasis (Tampa et al. 2018, Yang & Zheng 2020). The main pathways linking stress to psoriasis involve the hypothalamic–pituitary–adrenal (HPA) axis, sympathetic–adrenal–medullary axis, peripheral nervous system, and immune system (Srivastava et al. 2021, Marčinko et al. 2021, Kroflin et al. 2020). Studies have suggested that exacerbation of psoriasis occurs a few weeks to months after a stressful event, which might be related to the alteration of the HPA axis and the release of neuropeptides (Kim & Park 2011). It has been indicated that hyporesponsiveness of HPA axis function during exposure to an acute stressor could result in an exaggerated clinical picture due to the diminished suppressive effect of the low level of cortisol (Kim & Park 2011). Another study found that acute elevated and then rapidly declining cortisol levels lead to the induction of Th1 response and the release of proinflammatory cytokines that are associated with psoriasis onset and subsequent flare-ups (Marek-Jozefowicz et al. 2022). Corticotropin-releasing hormone (CRH) was found to be an important factor for developing an immunoactive inflammatory state in psoriasis patients (Srivastava et al. 2021) CRH may activate mast cells, resulting in the release of histamine and proinflammatory cytokines IL1, IL-6, and TNF-α, which are up-regulated in psoriatic skin (Lugović-Mihić et al. 2013). Moreover, Schmid-Ott et al (2009) proved that after psychosocial stress, psoriatic patients showed an increased number of activated T cells with a shift towards Th1-cytokines and an increased number of cutaneous lymphocyte-associated T cells and natural killer (NK) cells. Studies have shown that depression, due to increased proinflammatory cytokines, could also precede the onset of psoriasis (Dowlati et al. 2010). This is evident from the fact that patients with moderate to severe depression have a significantly increased risk of psoriasis (Chen et al. 2020). Most of the patients are aware that psychological distress is one of the main causes of psoriasis, and they openly attribute it to their psoriasis outbreaks (Bulat et al. 2020). The National Psoriasis Foundation survey on factors that aggravate psoriasis showed that more than half of respondents (52%) considered emotional stress as the most essential factor (Martín-brufau & Ulnik 2012, Kušević et al. 2021). It is important to emphasize the existence of a two-way connection between somatic illness and psychosocial discomfort, which is the reason why psoriasis is classified as a psychosomatic and somatopsychic disease (Torales et al. 2020).

PSYCHOSOCIAL COMORBIDITIES IN PATIENTS WITH PSORIASIS

Mental disorders are the most common comorbidity in psoriatic patients, (Srivastava et al. 2021) but despite this, they are still often overlooked and undertreated (Daugaard et al. 2022). Research has shown that some psoriasis patients are more prone to the development of psychological disturbances. The ''at risk'' subgroup includes women, younger patients, war veterans, patients with severe psoriasis, and those with lesions on visible or anogenital areas (Kwan et al. 2018, Da Silva et al. 2022, Kušević et al. 1999). This finding is confirmed by the high incidence of psychiatric disorders in pediatric psoriasis patients, with a 6.65-fold greater risk of depression and a 9.21-fold greater risk of anxiety, compared with the healthy controls (Kara et al. 2018). Sleep disorders are the most common psychiatric comorbidity of psoriasis patients with an average prevalence of 62% (Ferreira et al. 2017). According to prior studies, psoriasis patients have a higher frequency of depression than the general population (Ferreira et al. 2017, Feldman et al. 2018, Srivastava et al. 2021). Between 9% and 55% of psoriasis patients report having depressive symptoms, (Korman et al. 2016) while moderate to severe depression was found in 13.9% of them (Tian et al. 2019). Psoriasis and depression may interact in a vicious cycle, with psoriasis causing depression, and depression exacerbating psoriasis (González-Parra & Daudén 2018). Psoriasis patients also have a higher risk of suicidal thoughts, behavior, and suicide completion (Daugaard et al. 2022). According to

a comprehensive analysis, patients with psoriasis were more likely to experience anxiety than healthy individuals (OR: 2.91, 95% CI: 2.01-4.21) (Fleming et al. 2017). Another study found that up to 82.8% of psoriasis patients experience anxiety symptoms, while generalized anxiety disorder was present in up to 33% of patients (Karelson et al. 2013, Biljan et al. 2009). Depression and anxiety can aggravate psoriasis or cause resistance to treatment, which can lead to expensive and prolonged treatment (Kouris et al. 2017, Kušević et al. 2020). Furthermore, research indicates that individuals with psoriasis, have a higher risk of developing bipolar disorder than matched controls (Leisner et al. 2019). Borderline personality disorder was also found to be an important psychiatric comorbidity in these patients, with a prevalence of 17.5% (Ferreira et al. 2017). Alcohol use disorder is more common in patients with psoriasis (Wolf et al. 1999, Dediol et al. 2009), and is related to the worsening of psoriasis and poorer response to treatment (De Oliveira et al. 2015). It is important to note that besides influence on physical and psychological health, psoriasis affects all other aspects of a patient's life, including social, sexual, and occupational (Finlay & Khan 1994, Bulat et al. 2020). In a study of 369 patients with psoriasis, 59,3% reported that their condition affected their careers due to lost working days, and 33,9% of unemployed attributed not working to their psoriasis (Finlay & Khan 1994). Many patients report shame or embarrassment with resultant secretiveness and avoidance of common social activities (McKenna & Stern 1997). Moreover, they often have feelings of physical and sexual unattractiveness as well as helplessness, anger, and frustration (McKenna & Stern 1997). According to a study, stress caused by anticipating other people's reactions to their psoriasis contributes more to the patients' disability in everyday life than any other health status variable (Fortune et al. 1997). Consequently, psoriasis significantly decreases the quality of life, thus increasing the importance of the biopsychosocial approach.

PSYCHIATRIC EFFECTS OF ANTI-PSORIATIC THERAPY

Advances in the knowledge of pathophysiology, the interaction of autoinflammation, and clinical phenotypes have led to the development of highly effective targeted therapeutic agents (Thakur & Mahajan 2022). Selection of the right treatment for an individual patient still remains challenging, especially for patients with coexisting comorbidities (Thakur & Mahajan 2022). Studies have shown that biological treatment of psoriasis could reduce symptoms of depression; however, treatment of psoriasis does not always equal better odds for remission of mental disorders (Daugaard et al. 2022). Anti-TNF-α biologics have been proposed to play a role in stabilizing or ameliorating affective disorders, possibly due to the association of TNF-α with major depressive and bipolar affective disorder (Bassukas et al. 2008). Control trials demonstrated improvements in the symptoms of depression in patients treated with adalimumab, etanercept, or ustekinumab, compared with placebo groups (Fleming et al. 2015). Additionally, the results from phase III clinical trials for guselkumab and ustekinumab showed significant therapeutic efficacy in reducing the symptoms of depression and anxiety (Gordon et al. 2018). It is indicated that etanercept and adalimumab are successful in mitigating insomnia associated with psoriasis (Gupta et al. 2016). Meta-analysis identified no increased risk for depression, anxiety, or suicidality with secukinumab treatment in patients with moderate-to-severe psoriasis (Strober et al. 2018). In addition to drugs that have a positive effect on mental health, adverse psychiatric events during anti-psoriatic treatment have also been reported. Some patients in clinical trials for brodalumab experienced suicidal thoughts and behavior, including a small number who committed suicide (Lebowitz & Lebwohl 2019). A history of depression and/or suicidality was found to be a major risk factor for suicidal ideation and behavior (SIB) during brodalumab treatment (Lebowitz & Lebwohl 2019). Furthermore, apremilast has also been associated with an increased risk of depression and SIB (Lebowitz & Lebwohl 2019). Therefore, in patients receiving brodalumab or apremilast, thorough medical histories should be obtained to closely monitor patients and to determine whether alternative therapies should be considered. Additionally, those patients should be appropriately counseled to seek medical assistance if they develop symptoms of depression or suicidal ideation (Lebowitz & Lebwohl 2019).

PSYCHOLOGICAL PROFILE OF PSORIASIS PATIENTS

Studies have shown that psoriasis patients may have certain psychological characteristics. They are more likely to possess type D (distressed) personality which is characterized by high levels of negative affectivity and social inhibition (Basińska & Woźniewicz 2013). Another study indicated the specific configuration of psychological profiles in the form of the neurotic triad in patients with psoriasis of late onset (Kotrulja et al. 2010). Elevated scores on depression, hypochondriasis, and hysteria scales were found in their Minnesota Multiphasic Personality

Inventory profile. Persons with this profile frequently show psychosomatic symptoms resulting from prolonged physiological reactions that naturally accompany negative emotion (Kotrulja et al. 2010). Furthermore, it has been shown that patients with early-onset psoriasis had a significantly higher incidence of four personality traits including embitterment, trait irritability, mistrust, and verbal trait aggression (Remröd et al. 2013).

Subsequent studies have reported their decreased ability to express anger and suppressed communication of negative emotions to avoid being rejected (Ginsburg & Link 1993). It has been demonstrated that fear of being rejected has a greater impact on a person's quality of life than the severity or localization of the psoriatic lesions (Fortune et al. 1997). Mizara et al (2012) found that psoriasis patients tend to demonstrate early maladaptive schemes, such as emotional inhibition and social isolation.

The presence of emotional inhibition often causes individuals to have difficulties expressing their emotions, which is consistent with the high prevalence of alexithymia in patients with psoriasis (Dehghani et al. 2017). The prevalence of alexithymia in psoriasis patients has been reported to be between 36.2% and 67.7%, compared to approximately 10% in the general population (Holmes & Rodriguez 2022). Additionally, these patients had poorer self-management of disease, and increased somatization compared to non-alexithymic patients (Larsen et al. 2017, Larsen et al. 2022). Alexithymia is also shown to be a risk factor for suicide attempts (Kusevic et al. 2015). Furthermore, studies suggested that psoriasis patients tend to have a high vulnerability to stress, described as psoriasis-associated psychological vulnerability (Valverde et al. 2005). It has also been noted that they have a reduced ability to adapt to the environment and impaired emotional regulation (Martín-brufau & Ulnik 2012). Poor stress management may be the cause of their tendency to avoid conflict with others which has been reported in some studies (Dors et al. 2006). Da Silva et al (2022) demonstrated specific coping strategies that psoriasis patients use to cope with the high levels of stress they often experience. The escape-avoidance coping strategy was the one of most commonly used, and it has been associated with high anxiety scores and greater disability in those patients (Dors et al. 2006). Patients with psoriasis might also exhibit other destructive coping mechanisms, such as drinking alcohol, smoking, and overeating (Basavaraj et al. 2011). Given the all abovementioned dysfunctional personality traits of patients with psoriasis, it is important to emphasize the necessity of assessing their psychological profile and providing appropriate interventions.

ASSESSMENT OF MENTAL AND SOCIAL HEALTH IN PSORIASIS PATIENTS

Psoriasis has a profound impact on mental health and well-being which is often under-recognized by clinicians (Dalgard et al. 2017). Recognizing mood disorders may prove troublesome for non-psychiatric physicians with the consequent delay of the illness outcome and administration of the appropriate therapy (Fabrazzo et al. 2022). Mental health should be part of psoriasis severity assessment, especially in the aforementioned "at-risk" patients who carry an increased risk of mental illness (Daugaard et al. 2022). We have selected measurements and questionnaires that have been used so far in the screening of mental disorders and the examination of functioning in everyday life. The essential component of the psoriasis severity assessment is the measurement of quality of life (QoL), which is defined as the subjective perception of one's own well-being within a sociocultural context (Feldman & Krueger 2005). It is important because some patients have lots of lesions but are not bothered by them, and some patients have very few lesions and are greatly bothered by them (Feldman & Krueger 2005)Therefore improving patients' quality of life should be the primary goal of therapy (Kirby et al. 2001). The Dermatology Life Quality Index (DLQI) (Finlay & Khan 1994) and the Children's Dermatology Life Quality Index (CDLQI) (Finlay & Lewis-Jones 1995) have been the most widely used measures for assessing the quality of life related to skin disease. This instrument consists of 10 questions covering six domains (symptoms and feelings, daily activities, leisure, work, and school, personal relationships, and bother with psoriasis treatment) (Feldman & Krueger 2005). Skindex-29 is also a validated QoL instrument for patients with skin diseases which has 3 scales addressing emotions, symptoms, and functioning (Chren et al. 1997). QoL can also be assessed with the Psoriasis Disability Index (PDI) questionnaire, which is effective in demonstrating the effects of treatment interventions (Lewis & Finlay 2005). Another score that includes psychological impact along with the severity of the skin lesions is the Salford Psoriasis Index (SPI) (Kirby et al. 2000). This holistic measure includes the extent of psoriasis, the psychosocial impact of the disease, and the intensity of previous psoriasis treatments (Kirby et al. 2000). The psychosocial stress associated with psoriasis could be evaluated by the psoriasis life stress inventory (PLSI) questionnaire (Eftekhari & Amookhteh 2017). According to a study, DLQI as a means to assess the impact of disease misses clinically important psychiatric disorders (Lamb et al. 2017). In order to detect depression and anxiety additional screening

tools could be used. Patient Health Questionnaire (PHQ) has been shown to be a reliable measure of depression severity in primary (Kroenke et al. 2001) and secondary care (Monahan et al. 2009), while the Generalised Anxiety Disorder-7 (GAD-7) proved to be a valid measure of anxiety (Lamb et al. 2017). Whooley's "Two-Questions Test" is a case-finding instrument for depression for dermatological practice that is recommended by the German National Conference on Healthcare in Psoriasis. Referral to the psychiatrist or psychotherapist is indicated in situations of answering both questions with ''yes'' (Whooley et al. 1997). In patients with moderate to severe disease, clinicians should ask about mood, sleep quality, energy, pleasurable activities, and, where appropriate, sexuality. Broad screening questions such as ''Are you depressed?'' and ''Do you worry a lot?'' have acceptable sensitivity and specificity. If suicidality is suspected, an appropriate sequence of questions would be ''Do you sometimes feel as though your life is not worth living?'', ''Have you thought about ending your life?'' and ''What have you thought of doing?'' (Russo et al. 2004). Broad screening of patients with psoriasis for psychological disorders in general is not yet well established in Europe which could be the explanation for the lack of mental health screening in the clinical routine (Dalgard et al. 2017). Accordingly, the application of an easy-to-use screening tool would be an important addition to the routine clinical practice of primary care physicians and dermatologists, ensuring the detection of affected patients (Feldman et al. 2017). As psychosocial comorbidities are a major source of disability and may also hamper successful dermatological treatment, an accurate diagnosis of psychiatric disorders and their appropriate treatment is essential. It is therefore suggested to refer these patients to a comprehensive psychological testing, or a psychiatric evaluation which involves a complete review by a consultant psychiatrist.

PSYCHOANALYTIC PERSPECTIVE ON THE SKIN IN PSORIASIS

The skin is a sensitive marker of mental and physical states (Connor 2004), some even say that people are "marked" by life experiences which are reflected on, in, and under the skin (Ulnik 2013). The skin has been linked with some states of mourning where lesions can appear after a loved person's death or separation (Ulnik & Linder2016). It is hypothesized that experiences of infantile helplessness and loss of protection could result in skin disorders in the somatic plane (Fernández 1978). Furthermore, the poorly resolved Oedipus complex is often attributed to patients with psoriasis (Pomey-Rey 2016). According to research, the more altered the ego of the patient, the deeper and more serious the skin disease he or she might suffer could be (Ulnik 2013). Psoriasis, while undoubtedly deeply distressing, can achieve the semblance of some sort of consolidation of self (Chapman 2011). Thus, psoriasis always sets in train a process in which dermatologists are consulted, but psychoanalysts are often rejected (Chapman 2011). It has been shown that psychoanalytic evaluation can contribute to the dermatologic practice at many different levels such as establishing the level of psychological functioning during the consultation, by typifying the kind of unconscious conflicts and emotions that the patient expresses through his or her complaints and symptoms, and by detecting the defense mechanisms that the patient uses to cope with stress and disease (Ulnik 2013).

Additionally, psychoanalytic evaluation contributes by choosing the treatment while taking into account the unconscious preferences and meanings of the prescriptions, and by giving skills to improve the doctor-patient relationship (Ulnik 2013). For example, by analyzing the patient's way of speaking, it may be that the way they talk about their disease is reflecting their emotional status, such as: „a wound that does not heal" (Ulnik & Linder 2016). Additionally, if the family atmosphere or environment is hostile or anxious, the dermatological complaint is usually accompanied by expressions such as "I cannot take it anymore, I cannot stand it, I feel all itchy" (Ulnik 2013). The work of psychotherapy aims at helping patients become aware of their feelings and express them, rather than through their bodies, through the process of emotional work (Ulnik2013). Ulnik (2013) divides the psychoanalytic work regarding psychosomatic problems of the skin into three groups. The first considers the disease as a sign that can be interpreted. The second group interprets skin disease as a regression, a crisis, or stress. A third group emphasizes immature defense mechanisms, poor symbolization capacity, or narcissistic vulnerability (Ulnik 2013). If psychoanalytic psychotherapy is used with the right skin treatment prescribed by the dermatologist, it may assist dermatology patients deal with their condition and, in some situations, may even help them improve or heal (Ulnik 2013). The cases in which psychoanalytic psychotherapy could be of most help are those in which the disease has become a form of emotional expression, a substitute for their true identity, or psychological distress they feel unable to handle (Ulnik 2013).

PSYCHOLOGICAL INTERVENTIONS FOR PSORIASIS

Even to this day, despite advances in pharmacotherapy, psoriasis remains to be difficult to manage in the long term, especially if there are coexisting psychological comorbidities (Fordham et al. 2013). Therefore, the approach to the psychodermatological patient should be individual, holistic, and interdisciplinary which implies standard dermatological treatment with psychotherapy and, if necessary, psychopharmacotherapy (Šitum et al. 2016). Many studies investigating the effectiveness of psychological interventions for psoriasis reported a positive impact on the patient's psychological well-being and skin condition (Janowski & Pietrzak 2008). Psychological intervention can improve not just therapeutic efficacy and quality of life, but also compliance (Li et al. 2020). Janowski and Pietrzak (2008) proposed indications for psychological intervention in patients with psoriasis that may help clinicians in taking decisions concerning such referrals. Some indications suggested were depression, anxiety disorders, suicidal ideation, significantly decreased quality of life, increased pruritus, feelings of stigmatization, and psoriasis in childhood or adolescence (Janowski & Pietrzak 2008). The majority of psychodermatological disorders can be treated with cognitive-behavioral psychotherapy, psychotherapeutic stress-and-anxiety-management techniques, and psychotropic drug (Buljan et al. 2008). We have created Table 1 for presenting studies of psychotherapy use and their measured outcomes for patients with psoriasis. There are a variety of psychological intervention methods that were widely applied nowadays, among which cognitive behavioral therapy (CBT) was more widely recognized in the field (Xiao et al. 2019). Xiao et al (2019) found that the effect size of CBT among patients with moderate-to-severe psoriasis is larger than the effect among those with mild psoriasis. The 6-week multidisciplinary management approach, the Psoriasis Symptom Management Programme (PSMP), proved that adjunctive psychological therapies may be effective in the clinical management of psoriasis (Fortune et al. 2002). Impressively, 64% of patients in the PSMP achieved >75% clearance of their psoriasis compared with 23% of standard care patients at 6 months follow-up (Fortune et al. 2002). Fordham et al (2015) compared a group of patients with mindfulness-based cognitive therapy as an adjunctive to a control group with regular therapy. At posttreatment, the adjunctive therapy group had a 39% decrease in psoriasis severity with a significant improvement in quality of life. Neerackal et al (2020) found that relaxation therapy could also decrease psoriasis severity. In the study, 70% of cases achieved a 50% reduction in the PASI at the end of 2 months, while only 13.3% of the control group achieved the same during the same period (p=0.03). It has been demonstrated that family stress influences the psychological well-being more than other types of daily stress events and also has an important role on the psychiatric and dermatological status (Campolmi et al. 2012). Preferable type of psychotherapy in these cases should be systemic family therapy, which has been shown to be beneficial for obtaining clinical remission in those patients (Campolmi et al. 2012). Moreover, Bialuhina et al (2017) found that family therapy is an essential therapeutic part for patients with psoriasis who show traits of social maladaptation. Research has shown that treatment of psoriasis patient group should also include education on coping skills which strengthens the patients' optimistic and confronting strategies (Wahl et al. 1999). Furthermore, it has been indicated that the presence of psychiatric comorbidity in the clinical picture of psoriasis might require additional psychotropic medications (Chamoun et al. 2015). Matiushenko et al (2020) demonstrated that, when compared to traditional therapy, combined treatment with psychopharmacological agents is more effective and affects the positive course of both psychoemotional disorders and dermatoses. This is evidenced by a decrease in the level of anxiety and depression by 1.7 times and an improvement in clinical manifestations of psoriasis (regression of the PASI50 index, PASI75) in patients who received additional psychopharmacotherapy. Pharmacotherapy for the major psychopathological conditions in psoriasis patients mainly includes anxiolytics, antidepressants, and sometimes 'second-generation' antipsychotics (Lee et al. 2003). Despite their positive impact on symptoms, it is important to note that these agents have side effects and interactions that can be harmful in the long run and sometimes do not result in a solution to the problem they are used for (Lee et al. 2003, Kroflin et al. 2021). Therefore, a prudent approach to prescribing psychotropic drugs is needed to ensure a balance between potential benefits and adverse effects (Kroflin et al. 2021). The much-needed multidisciplinary approach should include primary care physicians, dermatologists, psychiatrists, and psychologists (Šitum et al. 2016, Buljan et al. 2008). Psychologists need to be advised by dermatologists on key physical disease variables, and dermatologists guided by psychologists to appreciate and measure appropriate core psychological concepts (Fordham et al. 2013). Physicians applying the biopsychosocial model to skin diseases will be rewarded with improved therapeutic outcomes and with grateful patients who would experience improved quality of life (Barakin et al. 2002).

Table 1. Studies of psychotherapy use and their measured outcomes for patients with psoriasis

Authors	Year of publication	Intervention studied	Measured outcomes
Price et al.	1991	Group psychotherapy	The study participants were noticeably less anxious by the end of the psychotherapy.
Zachariae et al.	1996	Cognitive-behavioral therapy, relaxation therapy, symptom control imagery training	Psychologic intervention suggested that it may have a moderate beneficial effect on psoriasis activity.
Kabat-Zinn et al.	1998	Mindfulness therapy	Brief mindfulness meditation-based stress reduction intervention delivered by audiotape during ultraviolet light therapy can increase the rate of resolution of psoriatic lesions.
Fortune et al.	2002	Cognitive-behavioral therapy	The physical and psychological aspects of psoriasis were improved after a 6-week integrated multidisciplinary approach.
Bundy et al.	2013	Cognitive-behavioral therapy	First online CBT for people with psoriasis showed improvement in anxiety and quality of life.
Fordham et al.	2015	Mindfulness therapy	The mindfulness group reported statistically lower psoriasis severity, thus these pilot results suggested that a full randomised control trial would be justified.
Xiao et al.	2019	Meta-analysis	CBT is effective in the treatment of psoriasis in terms of area and severity reduction.
Neerackal et al.	2020	Relaxation therapy	Relaxation therapy can decrease psoriasis severity and improve quality of life.

CONCLUSION

The purpose of this review was to identify evidence for using the psychodermatological approach when treating patients with psoriasis. To address the interaction between mind and skin we provided an analysis of psychosocial etiopathogenesis, comorbidities, assessment, and therapies for psoriasis. Our paper reasons the importance of the biopsychosocial model and why it should be considered when treating patients with psoriasis.

Given the visibility of skin lesions, psychosocial comorbidity, and chronicity of psoriasis, a significant psychological burden associated with the disease can be assumed. The psychological burden emphasizes the need for clinicians to provide appropriate screening for psychological comorbidities and mental health support for patients with psoriasis. Moreover, social aspects should be included when conducting a patient history. The collaboration between the dermatologist, family medicine specialist, psychologist, and psychiatrist can help to break the psychosomatic and somatopsychic vicious circles. Primary care physicians and dermatologists are often the first to suspect and assess the emotional burden of psoriasis. Thus, early adequate referrals may contribute to improving the quality of life for patients with psoriasis. Patients need an individualized approach, and in our review, we listed possible psychological interventions and the importance of psychoanalytic theories. Lastly, evidence in our article supports the quote from famous physician William Osler: ‘’The good physician treats the disease; the great physician treats the patient who has the disease.’’ (Centor 2007).

Ethical Considerations: Does this study include human subjects? NO

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Authors contributions: Kristina Krstanović developed the original idea, wrote the first draft, performed a literature search, and collected and analyzed data. Karla Kroflin developed the original idea, wrote the first draft, performed a literature search, and collected and analyzed data. Lara Kroflin developed the original idea, wrote the first draft, performed a literature search, and collected and analyzed data. Zorana Kušević developed the original idea, wrote and revised the first draft, collected and analyzed data, supervised all phases of reporting, and was in charge of correspondence.

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