



REVIEW ARTICLE

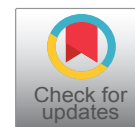
A Review of the Most Common Dermatologic Conditions and their Debilitating Psychosocial Impacts

Madeeha Mian, BA¹, Annika S Silfvast-Kaiser, MD², So Yeon Paek, MD^{1,2}, Dario Kivelevitch, MD² and Alan Menter, MD^{1,2*}

¹Texas A & M College of Medicine, Bryan-College Station, TX, USA

²Department of Dermatology, Baylor Scott and White - Dallas, Dallas, TX, USA

*Corresponding author: Alan Menter, MD, Department of Dermatology, Baylor Scott and White - Dallas, 3900 Junius St, Suite 145, Dallas, TX 75246, USA, Tel: (972) 386-7546



Abstract

The majority of skin conditions are not life-threatening; however, many can be severe and disfiguring enough to devastate a patient's quality of life. Skin diseases can significantly impact not only a patient's physical appearance, but also their social and emotional well-being. Even the smallest skin lesions have been shown to disrupt a person's level of overall wellness. Here, we aim to address the potential psychological and emotional impact of the most common and debilitating dermatologic conditions. We describe how skin disorders affect individuals and subsequently, how they are perceived by society. In addition, we review several dermatologic conditions that are not only skin-related, but are also linked to disorders of internal organs. Lastly, we weigh the importance of skin health and how clear skin not only increases an individual's satisfaction and quality of life, but also impacts their ability to reach their full potential.

Keywords

Psychosocial impact, Quality of life, Health related quality of life, Dermatology, Dermatological conditions, Dermatologic disease

Introduction

The way the world sees and knows a person by their skin is undeniable. The first impression a person makes is largely influenced by their outward appearance: Physical appearance has been shown to impact inferences about character, abilities, sociability, and intellectual competence [1]. Numerous studies demonstrate the impact of physical appearance in various domains of life: From securing employment [2,3] to obtaining higher socioeconomic outcomes [4,5]. Skin is one of our

most important physical characteristics, affecting how individuals judge and make decisions about others [6].

Regardless of culture, age, or socioeconomic status, conditions affecting the skin are among the most common medical complaints globally. In 2010, skin conditions were considered three of the top ten most prevalent diseases worldwide, and were the 4th leading cause of nonfatal disease burden globally [7]. Despite the prevalence of skin conditions and the importance that society places on physical appearance, dermatologic conditions are often viewed as medically trivial compared to diseases of internal organ systems. In reality, the psychosocial impairment of patients with dermatologic diseases can be immense, caused by actual physical pain and/or the inherent visibility of the condition. Multiple skin diseases also have underlying systemic associations.

A number of medical conditions, specifically dermatologic conditions, are stigmatizing to their sufferers, causing a person to feel devalued, different from the norm, or undesirable [8]. Herein, we describe a number of the most common conditions seen within the field of dermatology and how each can affect an individual beyond the level of the skin.

Acne

Background

Acne vulgaris, or acne, is one of the most common skin disorders treated by health care practitioners and

dermatologists. It is a chronic inflammatory disease of the skin, affecting 85% of individuals in their lifetime [9]. Acne commonly presents with closed comedones (i.e. whiteheads), open comedones (i.e. blackheads), pustules, papules, and deep nodules. Four key processes contribute to the development of acne: altered keratinization of hair follicles, increased sebum production, the proliferation of *Propionibacterium acnes* bacteria, and complex inflammatory mechanisms of both innate and acquired immunity [10]. Although it occurs primarily during adolescence, it is also prevalent in adulthood, especially in females.

Treatment

Acne treatment is wide-ranging and depends largely on the extent and severity of disease. For mild acne, topical treatments such as retinoids, benzoyl peroxide, and topical antibiotics are used alone or in combination. For moderate acne with inflammatory papules or deeper cystic lesions, an oral antibiotic is commonly added. For severe or treatment-resistant acne, isotretinoin is the optimal therapy. Oral contraceptives can also be used in women who exhibit hormonally induced acne breakouts [10].

Psychosocial impact

Acne lesions have the propensity to not only cause physical scarring, but also significant psychosocial impairment. Increasing severity of acne is associated with lower attachments to friends [11], perceptions of not thriving in school [11], and decreased work productivity [12]. Acne sufferers experience self-consciousness, frustration, and embarrassment [12], and report the same levels of social, psychological, and emotional problems as patients with other chronic disabling conditions, including asthma, epilepsy, diabetes, back pain, and arthritis [13].

A multi-national study evaluated the perceptions of the general population towards individuals with acne scars vs. clear skin. Participants were shown pictures of clear facial skin or digitally imposed acne scars (33% of the survey participants had acne scars themselves). In comparison to clear skin pictures, those individuals with acne scars were less likely to be considered attractive, confident, happy, and successful, and more likely to be perceived as shy and insecure [14]. Additionally, those with scars were perceived as less likely to have a promising future compared to those with clear skin [14]. In a similar study by Ritvo, et al. adults and teenagers were shown digitally altered photographs of teenagers with acne and clear skin. Both groups rated teenagers with clear skin higher on every favorable characteristic and lower on every unfavorable characteristic [15]. These results indicate that the first issue many individuals will notice on an acne sufferer is their skin [14,15]. Acne and acne scars are not as medically trivial as they appear, and their presence continues to be

negatively perceived by society. Even as today's culture increasingly promotes the acceptance of imperfections, the public stigma of acne remains.

Atopic Dermatitis

Background

Atopic dermatitis (AD), or eczema, is a pruritic, chronic inflammatory skin disease that affects 10-20% of children and 1-3% of adult's worldwide [16]. AD commonly presents on flexor surfaces, and lesions range from dry, scaly, erythematous patches to vesicular lesions and thin or thick plaques. Unlike psoriasis, the borders between affected and healthy skin are less distinct [17]. The key inflammatory mediators in atopic dermatitis are interleukin (IL)-4, IL-5, IL-13, and Th2 cells [18].

Treatment

First-line therapy for atopic dermatitis includes topical therapy with emollients, corticosteroids, calcineurin inhibitors, and phototherapy. More severe forms of AD are treated with steroid-sparing immunosuppressant medications [19] (i.e. cyclosporine, azathioprine, tacrolimus, mycophenolate mofetil) or biologics (dupilumab) to help control the inflammatory cascade. Other systemic therapies including anti-histamines and antibiotics, may also be necessary to help control symptoms and treat secondary infections, common in atopic dermatitis patients [20-22].

Psychosocial impact

There are many ways in which AD can compromise an individual's quality of life (QOL). The most prevalent and perhaps most troublesome feature of AD is itching, which can involve all body areas, and at its peak, is twice the severity of a mosquito bite itch [23]. Consequently, sleep is significantly affected. Up to 80% of AD patients have been shown to experience difficulty falling asleep and nocturnal awakening due to pruritus and subsequent itching and scratching [23]. In adults, AD has been shown to affect sleep in all sleep stages [24]. In pediatric patients, the results of home polysomnography confirmed disruption of sleep by both brief and longer awakenings associated with scratching episodes, compared to healthy controls [25]. Impairments with sleep result in daytime drowsiness and an inability to focus, impacting one's potential to perform maximally. Adults with AD have a higher work absenteeism rate compared to controls [26]. They are also 1.7 times more likely to report stress, depression, anxiety, and suicidal ideation than those without AD [27]. The likelihood of having comorbid asthma, hay fever, and food allergies is also higher in AD patients [28].

Like many chronic skin conditions, AD limits lifestyle, leads to avoidance of social interactions, and impedes activities [29]. Perhaps one of the most distressing consequences of AD is its potential to limit the growth and development of pediatric patients. Children with AD

more often face restrictions, unable to do certain activities or wear certain clothing due to special requirements for their disease [30]. Moreover, parents of young children with AD describe their children as clingy, fearful, frustrated [30], irritable, and hurtful to others during flare-ups of AD [31]. AD has been shown to cause as much impairment in a child's QOL as renal disease and cystic fibrosis, and a worse impact than other chronic diseases of childhood, including epilepsy, diabetes, and asthma [32].

Alopecia

Background

People use their hair to express their individuality. It can be a reflection of social class, religious beliefs, sex, profession, values, and group membership; for women, hair symbolizes femininity and attractiveness [33,34]. Hair has profound social and psychological importance beyond its basic biological function [33]. The symbolic importance of hair can be seen when required to cut it upon entering institutions such as prisons, psychiatric asylums, and armed forces [34,35], where this alteration is used as a sign of submission and forfeiture of personal identity [34].

The most common type of hair loss is androgenic alopecia (AGA), a genetically predisposed, patterned hair loss, mediated by androgen metabolism. Although it may also affect women, it most commonly occurs in Caucasian men before age 40, affecting 50% and 80% of men by age 50 and 70, respectively [36]. In men, it presents with receding and thinning of the frontotemporal hairline. In post-menopausal women, diffuse hair thinning on the crown with preservation of the frontal hairline is common [37]. Recent studies have linked a higher prevalence of cardiovascular risk factors, including obesity, diabetes, hypertension, dyslipidemia and coronary artery disease, to men with early-onset AGA [38].

Alopecia areata (AA), another common cause of hair loss, affects 0.1-0.2% of the general population. It is characterized by well-demarcated patches of non-scarring hair loss of the scalp, eyebrows, beard, or body hair [39]. It is an autoimmune disease driven by T-lymphocytes against the hair follicle [40] and equally affects both genders, all ages, and all skin types [41]. Its course is unpredictable with wide variations in extent and duration of disease [39]. AA is strongly associated with other autoimmune diseases such as vitiligo, psoriasis, rheumatoid arthritis, and thyroid disease [42].

Treatment

AGA treatments include topical therapy with minoxidil (men and women), systemic therapy with 5-alpha reductase inhibitors like finasteride (men only), low-level laser light therapy, and platelet rich plasma injections.

New therapies including JAK inhibitors are pending and likely to be of significant value. In some cases, patients opt for adjunctive therapy with surgery (i.e. scalp reduction or hair transplantation). In dealing with alopecia, many patients will also turn to wigs and scarves in an effort to disguise hair loss [43]. There is no cure for AA and no truly effective treatment to alter its natural course. Although spontaneous regrowth may occur within a year, this is often unacceptable for patients with affected areas of cosmetic importance. Topical or intralesional corticosteroids are frequently used in an attempt to stimulate hair growth [44,45]. Topical immunotherapy can also be used for milder disease. For extensive disease, systemic therapies, psoralen and ultraviolet A (PUVA) therapy, topical steroids plus minoxidil, or immunomodulators may be considered [43,46,47].

Psychosocial impact

In addition to physical harm (due to loss of protection), the psychosocial effects of hair loss can profoundly affect self-esteem and body image. Men with AGA are consistently rated as older, less physically and socially attractive, less likable, and less virile in studies of initial impressions of balding vs. non-balding men [48]. Patients with AA show poor health-related quality of life (hrQOL) scores, with lower scores associated with increased scalp involvement [49]. Both men and women with AA have decreased sexual QOL measures compared to controls [50]. Children of all ages with AA report bullying, and boys with AA specifically report increased physical bullying [51]. A high prevalence of anxiety and depression has also been seen in these patients [52].

It is worth noting that for many individuals, the most traumatic effect of chemotherapy is also alopecia [53]. Studies of women receiving treatment for breast cancer revealed that hair loss was harder to cope with than the loss of a breast [54]. Hair loss due to chemotherapy can result in loss of self-confidence, which may not return to normal even after hair regrowth [53].

Regardless of the etiology, loss of self-confidence and self-esteem, as well as heightened self-consciousness, are common responses to hair loss [55]. Moreover, the clinical severity of hair loss does not necessarily predict the impact on QOL that patients experience [56]. In a study assessing the QOL of patients with hair loss due to AA, AGA, or telogen effluvium, patients rated their hair loss as more severe than the dermatologist did, and their hair loss severity rating correlated more strongly with their QOL than the dermatologists' severity rating [56]. Despite increased understanding of the disease mechanisms, comorbidities, and the measurable detrimental impact on QOL, treatment for alopecia is still not considered medically necessary by many insurers and physicians [41].

Hirsutism

Background

On the opposite end of the hair disorder spectrum is hirsutism. Hirsutism - the growth of excess, coarse body hair - is a medical term used exclusively in women describing the growth of terminal hair in locations where it is usually minimal or absent. Approximately 5-10% of women worldwide are affected [57]. This “male-pattern” growth can be idiopathic or caused by increased levels of androgens or increased sensitivity of hair follicles to androgens. It can be a symptom of underlying medical conditions contributing to hyperandrogenism such as polycystic ovary syndrome, congenital adrenal hyperplasia, or Cushing disease [58].

Treatment

Treatment for hirsutism includes referral to the appropriate specialist (i.e. endocrinology or gynecology) to evaluate and treat any underlying pathology. In patients with hyperandrogenism, if a patient is pre-menopausal, first-line therapy usually includes oral contraceptives (OCPs) without androgenic progestins. Spironolactone can also be used in conjunction with OCPs. Spironolactone is first-line in post-menopausal females. Finasteride, flutamide, or a gonadotropin-releasing hormone (GnRH) agonist can be used for refractory hirsutism. Weight loss has also been shown to reduce hirsutism in some patients with hyperandrogenism. For those with idiopathic disease, topical or physical hair treatments are often employed [57,59].

Psychosocial impact

Previous research has identified that hairlessness on the bodies of adult women is strongly normative within contemporary Western culture [60]. Thus, any semblance of hairiness can be stigmatized. In 2017, 83% of recipients of laser hair removal procedures performed by members of the American Society of Plastic Surgery were women, with teenagers accounting for 6% [61].

Unwanted hair growth can be extremely distressing; hirsutism in adult women has been associated with greater dissatisfaction with body image, abnormal sexuality, heightened levels of anxiety, depression and social fears, a compromised QOL, and disordered eating [62,63]. Perhaps one of the most distressing effects of hirsutism is its potential to cause a lessened sense of femininity and confusion with gender identity. In a sample of 15 women with hirsutism, Zerssen and Meyer identified two common themes of emotional disturbances: A compromised gender identity and a tendency towards social and behavioral withdrawal-suggested to be linked to having a male characteristic [63].

Thus, many women with hirsutism face a biological inconsistency that is neither tolerated by themselves nor others, and the ability to remove unwanted hair, keeping their battle with hirsutism private, can enable

women with hirsutism to function more highly than their symptoms in the clinic may suggest [62]. Presently, insurance does not cover hair removal - even for preventing disease progression in chronic inflammatory skin disorders such as pilonidal sinus disease, hidradenitis suppurativa, dissecting cellulitis, and pseudofolliculitis barbae [64].

Hyperhidrosis

Background

Hyperhidrosis is characterized by excessive sweating, or perspiration beyond the needs of the environment or requirements of the body, usually affecting the axillae, palms, soles, and face. Hyperhidrosis is known to affect 3% of the population in the United States and 176 million individuals worldwide [65]. Overactivity of the sympathetic nervous system is suggested to contribute to primary Hyperhidrosis [66]. Hyperhidrosis can also be secondary to endocrine and metabolic conditions, febrile illness, infection, neurologic disorders, medications, and substance abuse [67].

Treatment

A number of treatments for hyperhidrosis exist, including topical antiperspirants, iontophoresis, intradermal botulinum toxin injections, systemic treatments, and surgical treatments such as focal curettage or liposuction of sweat gland-containing adipose tissue [68]. Newer prescription cloths embedded with glycopyrronium, an anticholinergic medication, are now available as well [69], offering a less invasive treatment option.

Psychosocial impact

Hyperhidrosis can interfere with social activities and cause significant stress and embarrassment. Because hyperhidrosis typically affects the axillae, palms of hands, soles of feet, face, and other areas of the body [66,67], patients regularly experience soiled clothing, sweat marks on shirts, damaged paperwork, and wet clothes [65]. In a society where strong handshakes create favorable effects in interactions, wet hands from hyperhidrosis can give an unappealing impression.

In one survey of patients with hyperhidrosis, a large proportion of patients reported sweating that was intolerable or barely tolerable and that interfered with daily activities [65]. Patients with hyperhidrosis commonly avoid social interactions and physical touch, and report decreased self-confidence and depressive symptoms [65]. Moreover, Mirkovic and colleagues found that hyperhidrosis had a highly negative impact on the QOL of pediatric patients, equivalent to the impairment that severe psoriasis and acne causes in adults [70]. Aside from emotional effects, functional limitations are also prevalent; for example, patients with palmo-plantar hyperhidrosis have functional impairments, such as not being able to grip pencils effectively, problems operating touch screens, and soiling ink and papers with sweat

[68].

Clinicians should recognize that the prevalence of hyperhidrosis is much higher than current estimates due to under diagnosis and underreporting. In one survey of patients with hyperhidrosis, a minority of patients (only 38%) had consulted a physician, despite the availability of a wide array of treatments [65]. This is likely because patients are often too ashamed to share their true feelings with physicians and family members regarding disease burdens that include avoidance of social events, career opportunities, jobs, or meeting a partner [70].

Hidradenitis Suppurativa

Background

Hidradenitis suppurativa (HS), also known as *acne inversa*, is a chronic and progressive inflammatory skin condition, primarily affecting intertriginous, apocrine-gland bearing areas of the body such as the axillae, groin, infra- and intermammary areas, perineal and perianal region, and buttocks [71,72]. HS presents with painful, subcutaneous nodules, which may rupture or coalesce, forming abscesses and sinus tracts [71,73]. It affects approximately 0.05-4% of the global population and is more common in obese women than in men. It typically occurs after puberty, during some of the most productive years in an individual's life, with the average age of onset in the second or third decade [74-76]. Chronicity and recurrence are the hallmark of HS [72]. The pathogenesis is complex, with genetic, microbial, and hormonal factors implicated in the etiology [71]. The primary defect is thought to involve follicular occlusion of the folliculopilosebaceous unit, which leads to follicular rupture and subsequent immune responses that lead to the development of typical lesions [77]. Dysregulation of cutaneous innate immunity, smoking, and obesity are contributory factors to the disease [71].

Recent data also points to a link between metabolic syndrome and hidradenitis suppurativa. Controlled trials have consistently identified an association between HS and dyslipidemia, diabetes, and obesity in patients of all ages and disease severity [71]. Similarly, incidence rate ratios for myocardial infarction, stroke, cardiovascular disease-associated death, major adverse cardiovascular events, and all-cause mortality are increased in patients with HS compared to age and sex matched controls [78]. HS patients may even have a higher risk of mortalities associated with cardiovascular disease compared to patients with severe psoriasis [78]. In morbidly obese females (BMI > 40), gastric bypass surgery can be very helpful in reducing disease severity [79].

Treatment

Treatment of HS is difficult. Therapy varies from topical treatments (cleansers and antibiotics), to systemic agents which include oral antibiotics (often used for their anti-inflammatory properties), hormonal agents,

and TNF-alpha inhibitors. Intralesional triamcinolone injection and incision and drainage can provide relief from acute flares. Surgical excision, including de-roofing and debridement of sinus tracts, is used in extensive, recurrent, or persistent areas of disease [80]. Weight loss and smoking cessation are important in reducing disease severity [81,82]. Certain exclusionary diets (e.g. avoiding brewer's yeast) have also shown some promise in limiting the extent and occurrence of disease flares [83].

Psychosocial impact

The physical pain of HS is significantly debilitating. Patients describe their pain as feeling like they are being stabbed by knives [84], severe enough to limit movement and impact activities of daily living, such as dressing, bathing, and walking. HS patients often experience foul odor and continuous drainage from their lesions as well, contributing to social isolation. In a large multicenter study, individuals with HS had one of the lowest self-reported health states on a measure of hrQOL compared to healthy controls and other dermatologic conditions; their hrQOL was similar to participants with rheumatoid arthritis pain, cardiovascular disease, cancer, liver disease, and chronic obstructive pulmonary disease [85]. Patients with HS have significant levels of depression, anxiety, and impaired QOL, strongly associated with perceptions of their HS [86].

In a survey that aimed to determine if skin disease or obesity was more distressing to obese patients who had hidradenitis suppurativa or psoriasis, obese patients with both skin conditions were willing to trade a significantly higher proportion of their life to live without skin disease than they were to live at a normal weight [87]. This is significant as obesity alone is associated with increased prejudice and negative effects on interpersonal relationships. Providers should be cognizant of the psychosocial ramifications of this disease, as HS patients have shown increased rates of suicide and depression, surpassing that of many other skin diseases [88].

Vitiligo

Background

Vitiligo is a common acquired skin depigmentation disorder, affecting all ages, races, and ethnic groups [89] and 0.5-1% of the population worldwide [90]. It presents as depigmented macules or patches on the face and body and is due to cell-mediated destruction of melanocytes in the skin. Vitiligo is associated with an increased incidence (up to 25%) of developing other auto-inflammatory conditions, such as thyroid disease, type I diabetes mellitus, rheumatoid arthritis, and inflammatory bowel disease [91]. It does not cause significant physical discomfort, itching, or pain.

The earliest reports of possible vitiligo date back to approximately 1500 BC in the *Ebers Papyrus*, an Egyptian compilation of medical texts [92,93]. Negative

societal beliefs of vitiligo-like diseases can be seen in Greek history as well. Greek historian Herodotus (484-425 BCE), reported that foreigners who suffered from “white spots” had “sinned against the sun” and had to leave the country immediately [93,94].

Treatment

First-line treatments for vitiligo include topical therapies such as corticosteroids or calcineurin inhibitors. Phototherapy, including narrow band UVB and PUVA, can be used in addition to topical treatment. Alternatives to these therapies include (but are not limited to) excimer laser, skin grafting, and topical vitamin D analogs. Oral corticosteroids are sometimes given in short courses to stabilize rapid disease progression. New topical therapies are currently in development with promising results in clinical trials. Some patients also choose to use cover up makeup for camouflaging cosmetically sensitive areas [95,96].

Psychosocial impact

Today, vitiligo upholds its ancient stigmatization. Numerous studies reveal how it impacts the mental state of those affected due to social and psychological pressures [89]. Approximately half of individuals affected with vitiligo develop it before age 20, with 25% affected before age 10 [97]. One study examined the psychosocial effects of vitiligo on parents of affected children. It concluded that these parents need as much care and attention as their affected children, and that these parents' QOL was significantly lower than that of parents of unaffected children [98]. When comparing their results with studies of atopic dermatitis-another predominantly pediatric condition that can profoundly affect family members - they found that vitiligo subjects tended to be more sensitive with more varied parental disturbances in dealing with the disease [98,99].

Surprisingly little is known about present day cultural beliefs of vitiligo. What is evident, however, is that across different cultures, individuals with vitiligo are often subject to isolation, rumors, and insults. Misconceptions associated with vitiligo may play a large role. Vitiligo is still confused with leprosy in some countries [100]. In a study surveying school children in Saudi Arabia with and without vitiligo, the cultural beliefs of eating certain foods and vitamin deficiencies in relation to causing vitiligo were studied. Even if the students were affected with vitiligo, the schoolchildren all shared local myths that certain foods (fish and milk) or dietary deficiencies could cause the disease [101]. In some Indian communities, this disease is associated with negative religious beliefs. Patients are often cast out from the family and society, delaying medical treatment and worsening patient outcomes [102].

Lastly, many societies have a cultural preference for specific skin tones, and desired pigmentation can be seen as a “passport” to society, with perceived defects

in pigmentation leading to devastating consequences [103]. Clinicians should question patients about their own underlying cultural preferences and beliefs regarding vitiligo, as well as their families' and communities', as these may be hurdles to providing treatment, and ultimately, to patient adherence to treatment.

Psoriasis

Background

Psoriasis is an ancient disease dating back more than 2,000 years [104]. In previous centuries, leprosy was the primary dermatologic disease associated with stigmatization. Individuals with leprosy were marginalized in society and forced to wear a bell as a distinctive sign. A significant number of these individuals were considered to have had psoriasis instead [104].

Psoriasis is a common immune-mediated, inflammatory disease affecting adults and children in approximately 3.2% of the population [105]. It traditionally affects the elbows, knees, and scalp; however, a considerable percentage of patients experience other manifestations, such as genital, nail, and joint involvement [106]. Frequently, patients go undiagnosed, untreated, or even undertreated [107].

Psoriatic patients with moderate-to-severe involvement also have a lower life expectancy due to a high prevalence of cardiovascular disease [108-112]. Coronary artery calcium scores of patients with moderate-to-severe psoriasis have revealed similar coronary artery disease risk to patients with type II diabetes mellitus, and significantly higher risk (3x) than healthy patients [109]. Psoriasis is associated with multiple comorbidities, including metabolic syndrome [113], inflammatory bowel disease [114], chronic kidney disease [115], and lymphomas [116], among others. Psoriatic arthritis is a well-known comorbidity of psoriasis and develops in approximately one-third of patients with skin disease, 10-15 years post the onset of their condition [117]. Shared inflammatory pathways, genetic susceptibility, and common risk factors are all suspected to contribute to the pathogenesis of these comorbidities [118].

Treatment

Psoriasis therapy ranges from topical to systemic treatments, depending on how widespread or debilitating the disease is. Numerous treatments are available including topical corticosteroids, vitamin D analogs, coal tar, calcineurin inhibitors, phototherapy, methotrexate, retinoids, cyclosporine, apremilast, and a number of biologic agents. Not infrequently, a combination of systemic, biologic, and topical agents are required to control symptoms and disease [119,120].

Psychosocial impact

Patients with psoriasis can have difficulty performing

daily tasks. Itching, pain, and cracked skin can cause challenges in self-care and walking [121,122]. The pain and discomfort can be severe enough to disturb sleep [121,123] and the stigmatization itself can lead to avoidance and decreased opportunities within social circles and careers [121,124]. Mood disorders are prevalent; depression occurs in over 30% of patients with suicidal ideation [125].

Especially debilitating are the subcategories of genital and palmoplantar psoriasis. Genital psoriasis is not routinely discussed by patients or clinicians during office visits, and physical exams of patients with psoriasis commonly do not include the genital region either [106]. Up to 63% of adult psoriasis patients experience genital psoriasis at some point in their lifetime. Often these patients are too embarrassed, feel stigmatized, or shy due to the sensitive location of their disease. Despite their avoidance of the topic, these patients often experience significant QOL impairment especially relating to romantic relationships, intimacy, and sexual relations [126]. Palmoplantar disease has been shown to cause greater suffering than in patients without palmoplantar involvement, even with much less body surface area involvement. These patients tend to have problems with activities of daily living and report significant functional impairments of mobility and self-care compared to their counter parts without palmoplantar involvement, greatly affecting their QOL [127].

Because psoriasis is as of yet an incurable disease with a chronic-relapsing course, clinicians should recognize that education about associated risks and conditions is extremely important and should offer appropriate counseling to patients regarding life-long disease control.

Skin Cancer

Background

Cancer is a major cause for death and disability worldwide [128], and skin cancer is the most common cancer in the United States [129]. Melanoma has a significantly higher poor prognosis. Melanoma is a malignant neoplasm that arises from melanocytes and has a high potential for metastasis. It frequently affects the skin, but can affect extra-cutaneous sites such as the eyes, gastrointestinal tract, and leptomeninges [130]. There is strong evidence that UV-A and UV-B radiation is associated with increased risk for cutaneous melanoma, especially intense intermittent sun exposure and repeated, severe sunburns [131]. On the other hand, non-melanoma skin cancers (NMSC) are far more common than melanoma and are the most common malignancy in humans [132]. The most frequently diagnosed non-melanoma skin cancers (NMSC) are basal cell carcinoma (BCC) and squamous cell carcinoma (SCC) [133]. The precursor lesions to SCC are actinic keratoses (AK) and Bowen's disease (BD), with 1-10%

and 3-5% risks of progression to SCC, respectively [134]. BCCs rarely metastasize, but can be locally destructive, whereas SCCs can metastasize to lymph nodes and other organs.

Treatment

Melanoma *in situ*, or stage 0 melanoma, is confined to the epidermis and is treated with local surgical excision. When melanoma spreads deeper, therapy is more complex. In addition to surgical excision, patients may also undergo lymphadenectomy, immunotherapy, chemotherapy, radiation therapy, and targeted therapy [135]. Newer therapies within the past five years have led to a much better prognosis in patients with metastatic melanoma. Treatment of NMSC includes excision and nonsurgical procedures such as topical chemotherapy treatment (e.g., 5-fluorouracil cream), photodynamic therapy, and liquid nitrogen [136]. Surgical treatments for NMSC include Mohs micrographic surgery, a specialized form of skin cancer surgery that is performed in more cosmetically sensitive areas (e.g., face). The aim of Mohs is to maximize the preservation of healthy tissue, while ensuring complete malignancy removal, achieving the best cosmetic and curative results [137]. AKs are generally treated with nonsurgical procedures, including topical chemotherapy agents, cryotherapy, and photodynamic therapy.

Psychosocial impact

It is estimated that more than 1 million Americans are living with melanoma [129]. Approximately 30% of all patients diagnosed with melanoma report levels of psychological distress requiring clinical intervention [138], particularly anxiety and depression [139]. Their level of clinical distress is equivalent to that identified in patients with breast and colon cancers [140]. Psychological distress with melanoma diagnosis is associated not only with impaired QOL [139,141], but also with delay in seeking medical advice [139,142], decreased adherence to treatment [139,143] decreased engagement in screening and preventive behaviors [139,144] and increased medical costs [139,145,146].

Despite low mortality rates, NMSC can also affect patients' quality of life. Forty percent of patients with their first NMSC develop at least 1 additional tumor within two years of initial diagnosis [134]. Thus, a diagnosis of NMSC is often chronic in nature and has the potential to cause significant cosmetic and emotional impairments. After surgery, patients report being faced with disfigurement from treatment, functional impairments, and a constant fear of tumor recurrence [133].

Even common, pre-cancerous lesions can negatively impact a patient's sense of well-being. AKs present as red, scaly lesions on sun-exposed skin, commonly on the face, balding scalp, and dorsal hands. They often itch and bleed, and rub on clothing. Their presence and cumbersome symptoms are bothersome to pa-

tients, and serve as a reminder of their possibility for malignant progression [147]. Moreover, treatment options for AKs place significant therapeutic burden on patients - including severe local skin reactions and the long duration of treatment courses [136]. Cryotherapy treatment with liquid nitrogen often results in blisters, often leaving patients with a hypo-pigmented scar in place of the AK. Topical chemotherapy (e.g. fluorouracil) medications are alternative therapies, and although they do not cause hypopigmentation, patients usually experience pronounced skin reactions characterized by pruritus, burning, crusting, ulceration, and pain of the affected sites resulting from therapy. As AKs generally happen in sun-exposed, cosmetically significant areas such as the face, these patients deal with clearly visible application site reactions during the treatment period, which can last over several days. A study investigating patient preferences for topical treatments for AKs found that most patients were willing to accept treatment with lower efficacy and lower reduction in skin cancer in order to reduce the intensity, length, and side effects (e.g., skin inflammation, pain, etc.) of the therapy [136].

Even with progress in the development of cancer therapies and increased survival rates, cancer is still a unique disease in its ability to generate profound feelings of fear in patients [148]. In addition to the burden of a cancer or pre-cancer diagnosis, clinicians must also consider the burden their treatment options may cause.

Sexually Transmitted Infections (HSV and HPV)

Background

Human papilloma virus (HPV) and herpes simplex virus (HSV) are common sexually transmitted infections (STIs). There are two kinds of HSV: HSV-1 and HSV-2. HSV-2 is more commonly associated with genital herpes, whereas HSV-1 is typically associated with oral herpes. Blisters or ulcers are the classic symptoms of HSV infection, although infected people often have no symptoms at all [149]. Those who do experience lesional outbreaks can experience a prodrome of a burning or tingling sensation. HPV presents as small bumps or warts in the genital area [150]. HPV infections generally resolve on their own but at advanced stages, they have the potential to cause cancer [150].

In the United States, 47.8% and 16.7% of the population between 14-49 years old have HSV-1 and 2, respectively [149]. HPV infections peak between ages 18 and 25, especially in women. It is estimated that more than 75% of sexually active women are infected with HPV during their lifetime [151]. HPV is screened in routine pap tests, and HSV is tested in STI tests. In general, HPV and HSV are commonly discussed in the medical community due to their high prevalence in the real world. Nevertheless, they are also highly stigmatized.

Treatment

Antiviral agents (acyclovir, famciclovir, or valacyclovir) are used for the treatment and prophylaxis of genital HSV. These agents are also used for the treatment and prophylaxis of oral HSV outbreaks. Initiation of antiviral therapy within 72 hours of an outbreak can decrease the severity and duration of disease as well as decrease the risk of complicated primary infection. There is no medicinal cure for HPV; however there are different modes of physical destruction (topical treatments or removal of the lesions through surgery) which can be performed [152]. In the US, there is a 9-valent vaccine series available for the high-risk phenotypes of HPV (6, 11, 16, 18 as well as types 31, 33, 45, 52, and 58) recommended for both male and female patients from ages 11-21 and 11-26, respectively [153].

The initial diagnosis of an STI typically happens in the medical setting. During these visits, reducing the stigma and addressing internalized negative social attitudes of STIs is important as this could lead to increased rates of disclosure to sexual partners, and also enhance the sexual well-being of patients and their partners.

Psychosocial impact

Literature shows that many individuals still have misconceptions about STIs. In a study that aimed to describe young women's beliefs about HSV, 302 women between the ages of 18-24 were asked about their beliefs regarding HSV. 30% believed that they could take a pill to cure the infection, and 15% indicated that it was likely they would die from HSV, both misconceptions. Concerns about the negative psychosocial consequences of an HSV diagnosis were also emphasized: 95% of survey participants indicated they would be depressed after an HSV diagnosis and 90% indicated concern about sex and partner notification [154]. The psychological burden of having HSV-2 has been shown to surpass the physical morbidity associated with it - those with recurrent genital herpes are more psychologically distressed and have lower QOL scores for physical and mental health compared to those experiencing their first outbreak [155], which is the most painful and severe.

Additionally, there is a strong association of STIs with morality. In a study that sought to identify stigma differences between HIV/AIDS infections and other STIs, respondents voted that genital herpes was one of the most damaging diagnoses to a person's reputation, second only to HIV/AIDS [156]. Acquiring genital herpes was also perceived to be blameworthy in terms of individual moral character traits - even more so than acquiring HIV/AIDS [156]. A similar sense of shame is seen with an HPV diagnosis. Women who test positive for HPV feel stigmatized, anxious and stressed, concerned about their sexual relationships, and worried about disclosing their results to others [157].

Herpes-related stigma is associated with non-dis-

closure of the diagnosis to sexual partners. Thus, the stigma of an STI-by promoting non-disclosure-can be a cause for increased transmission [156]. Additionally, the stigmatization associated with an HSV or HPV infection is the most important predictor of a patient's sexual well-being. Patients who perceive stigmatization to a greater extent report poorer sexual well-being [158].

Conclusion

The condition of our skin and hair greatly contributes to self and public perceptions of wellness, beauty, and health. Physicians must acknowledge that "benign" dermatologic conditions have profound negative psychosocial impacts. Patients should be treated not only according to the clinical severity of their disease, but also to the effect on their psychological well-being. In a society where great importance is placed on physical appearance, the emotional burden of a dermatological disease can surpass its physical impairments. Although clinicians may find it challenging to discuss how a dermatologic condition is impacting a patient socially and emotionally, a medical visit can also provide an opportunity for the clinician to educate a patient and de-stigmatize one of the conditions discussed above. Clinicians must recognize that they have the ability to positively affect a patient's quality of life in addition to a patient's physical well-being as it relates to their dermatologic disease.

References

- Jackson LA, Hunter JE, Hodge CN (1995) Physical attractiveness and intellectual competence: A meta-analytic review. *Social Psychology Quarterly* 58: 108-122.
- Tews MJ, Stafford K, Zhu J (2009) Beauty revisited: The impact of attractiveness, ability, and personality in the assessment of employment suitability. *Int J Select Assess* 17: 92-100.
- Mobius MM, Rosenblat TS (2006) Why beauty matters. *The American Economic Review* 96: 222-235.
- Benzeval M, Green MJ, Macintyre S (2013) Does perceived physical attractiveness in adolescence predict better socio-economic position in adulthood? Evidence from 20 Years of follow up in a population cohort study. *PLoS One* 8.
- Judge TA, Hurst C, Simon L (2009) Does it pay to be smart, attractive, or confident (or all three)? Relationships among general mental ability, physical attractiveness, core self-evaluations, and income. *JAP* 94: 742-755.
- Watkins LM, Johnston L (2000) Screening job applicants: The impact of physical attractiveness and application quality. *Int J Select Assess* 8: 76-84.
- Hay R, Johns N, Williams H, Bolliger IW, Dellavalle RP, et al. (2014) The global burden of skin disease in 2010: An analysis of the prevalence and impact of skin conditions. *J Invest Dermatol* 134: 1527-1534.
- Link BG, Phelan JC (2001) Conceptualizing stigma. *Annual Review of Sociology* 27: 363-385.
- Bhate K, Williams HC (2013) Epidemiology of acne vulgaris. *Br J Dermatol* 168: 474-485.
- Zaenglein AL, Pathy AL, Schlosser BJ, Alikhan A, Baldwin HE, et al. (2016) Guidelines of care for the management of acne vulgaris. *J Am Acad Dermatol* 74: 945-973.
- Halvorsen JA, Stern RS, Dalgard F, Thoresen M, Bjertness E, et al. (2011) Suicidal ideation, mental health problems, and social impairment are increased in adolescents with acne: A population-based study. *J Invest Dermatol* 131: 363-370.
- Tanghetti EA, Kawata AK, Daniels SR, Yeomans K, Burk CT, et al. (2014) Understanding the burden of adult female acne. *J Clin Aesthet Dermatol* 7: 22-30.
- Mallon E, Newton JN, Klassen A, Stewart-Brown SL, Ryan TJ, et al. (1999) The quality of life in acne: A comparison with general medical conditions using generic questionnaires. *Br J Dermatol* 140: 672-676.
- Dréno B, Tan J, Kang S, Rueda MJ, Torres Lozada V, et al. (2016) How people with facial acne scars are perceived in society: An online survey. *Dermatol Ther* 6: 207-218.
- Ritvo E, Del Rosso JQ, Stillman MA, La Riche C (2011) Psychosocial judgements and perceptions of adolescents with acne vulgaris: A blinded, controlled comparison of adult and peer evaluations. *Biopsychosoc Med* 5: 11.
- Leung DY, Bieber T (2003) Atopic dermatitis. *Lancet* 361: 151-160.
- Guttman-Yassky E, Krueger JG (2017) Atopic dermatitis and psoriasis: Two different immune diseases or one spectrum? *Curr Opin Immunol* 48: 68-73.
- Guttman-Yassky E, Waldman A, Ahluwalia J, Ong PY, Eichenfield LF (2017) Atopic dermatitis: Pathogenesis. *Semin Cutan Med Surg* 36: 100-103.
- Nowicki R, Trzeciak M, Wilkowska A, Małgorzata SW, Hanna ŁU, et al. (2015) Atopic dermatitis: Current treatment guidelines. *Postepy Dermatol Alergol* 32: 239-249.
- Eichenfield LF, Tom WL, Berger TG, Krol A, Paller AS, et al. (2014) Guidelines of care for the management of atopic dermatitis: Section 2. Management and treatment of atopic dermatitis with topical therapies. *J Am Acad Dermatol* 71: 116-132.
- Sidbury R, Davis DM, Cohen DE, Cordoro KM, Berger TG, et al. (2014) Guidelines of care for the management of atopic dermatitis: Section 3. Management and treatment with phototherapy and systemic agents. *J Am Acad Dermatol* 71: 327-349.
- He A, Feldman SR, Fleischer AB Jr (2018) An assessment of the use of antihistamines in the management of atopic dermatitis. *J Am Acad Dermatol* 79: 92-96.
- Yosipovitch G, Goon AT, Wee J, Chan YH, Zucker I, et al. (2002) Itch characteristics in Chinese patients with atopic dermatitis using a new questionnaire for the assessment of pruritus. *Int J Dermatol* 41: 212-216.
- Savin JA, Paterson WD, Oswald I (1973) Scratching during sleep. *Lancet* 2: 296-297.
- Stores G, Burrows A, Crawford C (1998) Physiological sleep disturbance in children with atopic dermatitis: A case control study. *Pediatr Dermatol* 15: 264-268.
- Eckert L, Gupta S, Amand C, Gadkari A, Mahajan P, et al. (2017) Impact of atopic dermatitis on health-related quality of life and productivity in adults in the United States: An analysis using the National Health and Wellness Survey. *J Am Acad Dermatol* 77: 274-279.
- Kwak Y, Kim Y (2017) Health-related quality of life and mental health of adults with atopic dermatitis. *Arch Psychiatr*

- Nurs 31: 516-521.
28. Silverberg JI, Simpson EL (2013) Association between severe eczema in children and multiple comorbid conditions and increased healthcare utilization. *Pediatr Allergy Immunol* 24: 476-486.
 29. Silverberg JI, Gelfand JM, Margolis DJ, Boguniewicz M, Fonacier L, et al. (2018) Patient burden and quality of life in atopic dermatitis in US adults: A population-based cross-sectional study. *Ann Allergy Asthma Immunol* 121: 340-347.
 30. Lawson V, Lewis-Jones MS, Finlay AY, Reid P, Owens RG (1998) The family impact of childhood atopic dermatitis: The dermatitis family impact questionnaire. *Br J Dermatol* 138: 107-113.
 31. Chamlin SL, Frieden IJ, Williams ML, Chren MM (2004) Effects of atopic dermatitis on young American children and their families. *Paediatrics* 114: 607-611.
 32. Beattie PE, Lewis-Jones MS (2006) A comparative study of impairment of quality of life in children with skin disease and children with other chronic childhood diseases. *Br J Dermatol* 155: 145-151.
 33. Cash TF (2001) The psychology of hair loss and its implications for patient care. *Clin Dermatol* 19: 161-166.
 34. Rosman S (2004) Cancer and stigma: Experience of patients with chemotherapy-induced alopecia. *Patient Educ Couns* 52: 333-339.
 35. Goffman E (1967) *Asile*. Paris: Minuit.
 36. Stough D, Stenn K, Haber R, Parsley WM, Vogel JE, et al. (2005) Psychological effect, pathophysiology, and management of androgenetic alopecia in men. *Mayo Clin Proc* 80: 1316-1322.
 37. Olsen EA (1994) *Androgenetic alopecia. Disorders of hair growth: Diagnosis and treatment*. McGraw-Hill, New York, 1994: 257-283.
 38. Vora R, Kota RK, Singhal RR, Anjaneyan G (2019) Clinical profile of androgenic alopecia and its association with cardiovascular risk factors. *Indian J Dermatol* 64: 19-22.
 39. Strazzulla LC, Wang EHC, Avila L, Lo Sicco K, Brinster N, et al. (2018) Alopecia areata: Disease characteristics, clinical evaluation, and new perspectives on pathogenesis. *J Am Acad Dermatol* 78: 1-12.
 40. Islam N, Leung PS, Huntley AC, Gershwin ME (2015) The autoimmune basis of alopecia areata: A comprehensive review. *Autoimmun Rev* 14: 81-89.
 41. Korta DZ, Christiano AM, Bergfeld W, Duvic M, Ellison A, et al. (2018) Alopecia areata is a medical disease. *J Am Acad Dermatol* 78: 832-834.
 42. Miller R, Conic RZ, Bergfeld W, Mesinkovska NA (2015) Prevalence of comorbid conditions and sun-induced skin cancers in patients with alopecia areata. *J Invest Dermatol Symp Proc* 17: 61-62.
 43. Lolli F, Pallotti F, Rossi A, Fortuna MC, Caro G, et al. (2017) Androgenetic alopecia: A review. *Endocrine* 57: 9-17.
 44. Hawit F, Silverberg NB (2008) Alopecia areata in children. *Cutis* 82: 104-110.
 45. Messenger AG, McKillop J, Farrant P, McDonagh AJ, Sladden M (2012) British Association of dermatologists' guidelines for the management of alopecia areata 2012. *Br J Dermatol* 166: 916-926.
 46. Roll S, Verinis JS (1971) Stereotypes of scalp and facial hair as measured by the semantic differential. *Psychol Rep* 28: 975-980.
 47. Moerman DE (1990) The meaning of baldness and implications for treatment. *Clin Dermatol* 6: 89-92.
 48. Cash TF (1990) Losing hair, losing points? The effects of male pattern baldness on social impression formation. *J Appl Soc Psychol* 20: 154-167.
 49. Liu LY, King BA, Craiglow BG (2016) Health-related quality of life (HRQoL) among patients with alopecia areata (AA): A systematic review. *J Am Acad Dermatol* 75: 806-812.
 50. Sara J Li, Kathie P Huang, Cara Joyce, Arash Mostaghimi (2018) The impact of alopecia areata on sexual quality of life. *Int J Trichology* 10: 271-274.
 51. Christensen T, Yang JS, Castela-Soccio L (2017) Bullying and quality of life in pediatric alopecia areata. *Skin Appendage Disord* 3: 115-118.
 52. Baghestani S, Zare S, Seddigh SH (2015) Severity of depression and anxiety in patients with alopecia areata in bandar abbas, Iran. *Dermatol Reports* 7: 6063.
 53. Münstedt K, Manthey N, Sachsse S, Vahrson H (1997) Changes in self-concept and body image during alopecia induced cancer chemotherapy. *Support Care Cancer* 5: 139-143.
 54. Freedman TG (1994) Social and cultural dimensions of hair loss in women treated for breast cancer. *Cancer Nursing* 17: 334-341.
 55. Williamson D, Gonzalez M, Finlay AY (2001) The effect of hair loss on quality of life. *J Eur Acad Dermatol Venereol* 15: 137-139.
 56. Reid EE, Haley AC, Borovicka JH, Rademaker A, West DP, et al. (2012) Clinical severity does not reliably predict quality of life in women with alopecia areata, telogen effluvium, or androgenic alopecia. *J Am Acad Dermatol* 66: 97-102.
 57. Mimoto MS, Oyler JL, Davis AM (2018) Evaluation and treatment of hirsutism in premenopausal women. *JAMA* 319: 1613-1614.
 58. Murat Atmaca, İsmet Seven, Rifki Üçler, Murat Alay, Veysi Barut, et al. (2014) An interesting cause of hyperandrogenemic hirsutism. *Case Rep Endocrinol* 2014: 987272.
 59. Yosipovitch G, DeVore A, Dawn A (2007) Obesity and the skin: Skin physiology and skin manifestations of obesity. *J Am Acad Dermatol* 56: 901-916.
 60. Toerien M, Wilkinson S, Choi PYL (2005) Body hair removal: The 'mundane' production of normative femininity. *Sex Roles* 52: 399-406.
 61. 2017 Plastic surgery statistics. American Society of plastic surgeons.
 62. Keegan A, Liao LM, Boyle M (2003) Hirsutism: A psychological analysis. *J Health Psychol* 8: 327-345.
 63. Morgan J, Scholtz S, Lacey H, Conway G (2008) The prevalence of eating disorders in women with facial hirsutism: An epidemiological cohort study. *Int J Eat Disord* 41: 427-431.
 64. Zerssen DV, Meyer AE (1960) Idiopathic hirsutism. *Journal of Psychosomatic Research* 4: 206-235.
 65. Strutton DR, Kowalski JW, Glaser DA, Stang PE (2004) US prevalence of hyperhidrosis and impact on individuals with axillary hyperhidrosis: Results from a national survey. *J Am Acad Dermatol* 51: 241-248.

66. Hashmonai M, Kopelman D, Assalia A (2000) The treatment of primary palmar hyperhidrosis: A review. *Surg Today* 30: 211-218.
67. Atkins JL, Butler PE (2002) Hyperhidrosis: A review of current management. *Plast Reconstr Surg* 110: 222-228.
68. Gordon JRS, Hill SE (2013) Update on pediatric hyperhidrosis. *Dermatologic Ther* 26: 452-461.
69. Voelker R (2018) Another option for hyperhidrosis. *JAMA* 320: 431.
70. Mirkovic SE, Rystedt A, Balling M, Swartling C (2018) Hyperhidrosis substantially reduces quality of life in children: A retrospective study describing symptoms, consequences and treatment with botulinum toxin. *Acta Derm Venereol* 98: 103-107.
71. Ergun T (2018) Hidradenitis suppurativa and the metabolic syndrome. *Clin Dermatol* 36: 41-47.
72. Jemec G, Revuz J, Leyden J (2006) *Hidradenitis suppurativa*. Springer-Verlag, Berlin.
73. Alikhan A, Lynch PJ, Eisen DB (2009) Hidradenitis suppurativa: A comprehensive review. *J Am Acad Dermatol* 60: 539-561.
74. Jemec GB, Kimball AB (2015) Hidradenitis suppurativa: Epidemiology and scope of the problem. *J Am Acad Dermatol* 73: 4-7.
75. Gill L, Williams M, Hamzavi I (2014) Update on hidradenitis suppurativa: Connecting the tracts. *F1000 Prime Rep* 6: 112.
76. Smith MK, Nicholson CL, Parks-Miller A, Hamzavi IH (2017) Hidradenitis suppurativa: An update on connecting the tracts. *F1000 Res* 6: 1272.
77. Napolitano M, Megna M, Timoshchuk EA, Patruno C, Balato N, et al. (2017) Hidradenitis suppurativa: From pathogenesis to diagnosis and treatment. *Clin Cosmetol Invest Dermatol* 10: 105-115.
78. Egeberg A, Gislason GH, Hansen PR (2016) Risk of major adverse cardiovascular events and all-cause mortality in patients with hidradenitis suppurativa. *JAMA Dermatol* 152: 429-434.
79. Kromann CB, Ibler KS, Kristiansen VB, Jemec GB (2014) The influence of body weight on the prevalence and severity of hidradenitis suppurativa. *Acta Derm Venereol* 94: 553-557.
80. Andersen RK, Jemec GB (2017) Treatments for hidradenitis suppurativa. *Clinics in Dermatology* 35: 218-224.
81. Sartorius K, Emtestam L, Jemec G, Lapins J (2009) Objective scoring of hidradenitis suppurativa reflecting the role of tobacco smoking and obesity. *Br J Dermatol* 161: 831-839.
82. Martorell A, García FJ, Jiménez-Gallo D, Pascual JC, Pe-reyra-Rodríguez J, et al. (2005) Update on hidradenitis suppurativa (Part II): Treatment. *Actas Dermosifiliogr* 106: 716-724.
83. Cannistrà C, Valerio F, Angelo T, Tambasco D (2013) New perspectives in the treatment of hidradenitis suppurativa: Surgery and brewer's yeast-exclusion diet. *Surgery* 154: 1126-1130.
84. Gardner Maggie (2017) What it's like having hidradenitis suppurativa. *The mighty*.
85. Balieva F, Kupfer J, Lien L, Gieler U, Finlay AY, et al. (2017) The burden of common skin diseases assessed with the EQ5D: A European multicentre study in 13 countries. *Br J Dermatol* 176: 1170-1178.
86. Pavon BA, Turner MA, Petrof G, Weinman J (2019) To what extent do disease severity and illness perceptions explain depression, anxiety and quality of life in hidradenitis suppurativa? *Br J Dermatol* 180: 338-345.
87. Storer MA, Danesh MJ, Sandhu ME, Pascoe V, Kimball AB (2018) An assessment of the relative impact of hidradenitis suppurativa, psoriasis, and obesity on quality of life. *Int J Womens Dermatol* 4: 198-202.
88. Thorlacius L, Cohen AD, Gislason GH, Jemec GBE, Egeberg A (2018) Increased suicide risk in patients with hidradenitis suppurativa. *J Invest Dermatol* 138: 52-57.
89. Grimes PE, Miller MM (2018) Vitiligo: Patient stories, self-esteem, and the psychological burden of disease. *Int J Womens Dermatol* 4: 32-37.
90. Kruger C, Schallreuter KU (2012) A review of the worldwide prevalence of vitiligo in children/adolescents and adults. *Int J Dermatol* 51: 1206-1212.
91. Elbuluk N, Ezzedine K (2017) Quality of life, burden of disease, co-morbidities, and systemic effects in vitiligo patients. *Dermatol Clin* 35: 117-128.
92. Nair BK (1978) Vitiligo-a retrospect. *Int J Dermatol* 17: 755-757.
93. Kopera D (1966) Historical aspects and definition of vitiligo. *Clin Dermatol* 15: 841-843.
94. Goldman L, Moraites RS, Kitzmiller KW (1966) White spots in biblical times. A background for the dermatologist for participation in discussions of current revisions of the bible. *Arch Dermatol* 93: 744-753.
95. Ezzedine K, Whitton M, Pinart M (2016) Interventions for vitiligo. *JAMA* 316: 1708-1709.
96. Rodrigues M, Ezzedine K, Hamzavi I, Pandya AG, Harris JE, et al. (2017) Current and emerging treatments for vitiligo. *J Am Acad Dermatol* 77: 17-29.
97. Palit A, Inamadar AC (2012) Childhood vitiligo. *Indian J Dermatol Venereol Lepro* 78: 30-41.
98. Amer AA, Mchepange UO, Gao XH, Hong Y, Qi R, et al. (2015) Hidden victims of childhood vitiligo: Impact on parents' mental health and quality of life. *Acta Derm Venereol* 95: 322-325.
99. Jirakova A, Vojackova N, Gopfertova D, Hercogova J (2012) A comparative study of the impairment of quality of life in Czech children with atopic dermatitis of different age groups and their families. *Int J Dermatol* 51: 688-692.
100. Ezzedine K, Eleftheriadou V, Whitton M, van Geel N (2015) Vitiligo. *Lancet* 386: 74-84.
101. Sharaf FK (2014) Prevailing misconceptions of vitiligo among Saudi school children. *Int J Health Sci* 8: 33-38.
102. Abraham S, Raghavan P (2015) Myths and facts about vitiligo: An epidemiological study. *Indian J Pharm Sci* 77: 8-13.
103. Grimes PE (2008) *Aesthetics and cosmetic surgery for darker skin types*. Beauty: A historical and societal perspective. Lippincott, New York City, 3-14.
104. Tampa M, Sarbu MI, Georgescu SR (2018) Brief history of psoriasis. *Transylvanian Review* 27: 273-286.
105. Rachakonda TD, Schupp CW, Armstrong AW (2014) Psoriasis prevalence among adults in the United States. *J Am Acad Dermatol* 70: 512-516.

106. Meeuwis KAP, Potts Bleakman A, van de Kerkhof PCM, Dutronc Y, Henneges C, et al. (2018) Prevalence of genital psoriasis in patients with psoriasis. *J Dermatolog Treat* 29: 754-760.
107. Kurd SK, Gelfand JM (2009) The prevalence of previously diagnosed and undiagnosed psoriasis in US adults: Results from NHANES 2003-2004. *J Am Acad Dermatol* 60: 218-224.
108. Kivelevitch D, Schussler JM, Menter A (2017) Coronary plaque characterization in psoriasis. *Circulation* 136: 277-280.
109. Mansouri B, Kivelevitch D, Natarajan B, Joshi AA, Ryan C, et al. (2016) Comparison of coronary artery calcium scores between patients with psoriasis and type 2 diabetes. *JAMA Dermatol* 152: 1244-1253.
110. Armstrong AW, Harskamp CT, Ledo L, Rogers JH, Armstrong EJ (2012) Coronary artery disease in patients with psoriasis referred for coronary angiography. *Am J Cardiol* 109: 976-980.
111. Santilli S, Kast DR, Grozdev I, Cao L, Feig RL, et al. (2016) Visualization of atherosclerosis as detected by coronary artery calcium and carotid intima-media thickness reveals significant atherosclerosis in a cross-sectional study of psoriasis patients in a tertiary care center. *J Transl Med* 14: 217.
112. Osto E, Piasterico S, Maddalozzo A, Forchetti G, Montisci R, et al. (2012) Impaired coronary flow reserve in young patients affected by severe psoriasis. *Atherosclerosis* 221: 113-117.
113. Sommer DM, Jenisch S, Suchan M, Christophers E, Weichenthal M (2006) Increased prevalence of the metabolic syndrome in patients with moderate to severe psoriasis. *Arch Dermatol Res* 298: 321-328.
114. Cohen AD, Dreiher J, Birkenfeld S (2009) Psoriasis associated with ulcerative colitis and crohn's disease. *J Eur Acad Dermatol Venereol* 23: 561-565.
115. Wan J, Wang S, Haynes K, Michelle RD, Daniel BS, et al. (2013) Risk of moderate to advanced kidney disease in patients with psoriasis: Population based cohort study. *Br J Dermatol* 347.
116. Gelfand JM, Shin DB, Neimann AL, Wang X, Margolis DJ, et al. (2006) The risk of lymphoma in patients with psoriasis. *J Invest Dermatol* 126: 2194-2201.
117. Henes JC, Ziupa E, Eisfelder M, Adamczyk A, Knaut B, et al. (2014) High prevalence of psoriatic arthritis in dermatological patients with psoriasis: A cross-sectional study. *Rheumatol Int* 34: 227-234.
118. Takeshita J, Grewal S, Langan SM, Mehta NN, Ogdie A, et al. (2017) Psoriasis and comorbid diseases: Epidemiology. *J Am Acad Dermatol* 76: 377-390.
119. Menter A, Strober BE, Kaplan DH, Kivelevitch D, Prater EF, et al. (2019) Joint AAD-NPF guidelines of care for the management and treatment of psoriasis with biologics. *J Am Acad Dermatol* 80: 1029-1072.
120. Lebwohl M, Ting PT, Koo JY (2005) Psoriasis treatment: Traditional therapy. *Ann Rheum Dis* 64: 83-86.
121. Soltandehgan K, Najafi-Ghezalje T (2017) Relationship between quality of life and disease severity in patients with psoriasis. *Nurs Pract Today* 4: 143-153.
122. Manjula VD, Sreekiran S, Saril PS, Sreekanth MP (2011) A study of psoriasis and quality of life in a tertiary care teaching hospital of Kottayam, Kerala. *Indian J Dermatol* 56: 403-406.
123. Ljosaa TM, Rustoen T, Mörk C, Stubhaug A, Miskowski C, et al. (2010) Skin pain and discomfort in psoriasis: An exploratory study of symptom prevalence and characteristics. *Acta Derm Venereol* 90: 39-45.
124. Horn EJ, Fox KM, Patel V, Chiou CF, Dann F, et al. (2007) Association of patient-reported psoriasis severity with income and employment. *J Am Acad Dermatol* 57: 963-971.
125. Kimball A, Gieler U, Linder D, Sampogna F, Warren R, et al. (2010) Psoriasis: Is the impairment to a patient's life cumulative? *J Eur Acad Dermatol Venereol* 24: 989-1004.
126. Yang EJ, Beck KM, Sanchez IM, Koo J, Liao W (2018) The impact of genital psoriasis on quality of life: A systematic review. *Psoriasis* 8: 41-47.
127. Chung J, Callis Duffin K, Takeshita J, Shin DB, Krueger GG, et al. (2014) Palmoplantar psoriasis is associated with greater impairment of health-related quality of life compared with moderate to severe plaque psoriasis. *J Am Acad Dermatol* 71: 623-632.
128. Hekmatpou D, Mehrabi F (2018) Exploratory study on diagnosed cancers and quality of life of hospitalized patients. *J Nurs Midwifery Sci* 5: 109-115.
129. Skin cancer. American Academy of Dermatology.
130. Schub T, Holle MN (2017) Melanoma. CINAHL nursing guide.
131. Kulichová D, Dánová, J, Kunte C, Ruzicka T, Celko AM (2014) Risk factors for malignant melanoma and preventive methods. *Cutis* 94: 241-248.
132. García-Montero P, de Gálvez-Aranda MV, de TroyaMartina M (2018) Quality of life in nonmelanoma skin cancer. *Actas Dermosifiliogr* 109: 649-650.
133. GaulinC, Sebaratnam DF, Fernández-Peñas P (2015) Quality of life in non-melanoma skin cancer. *Australas J Dermatol* 56: 70-76.
134. Madan V, Lear JT, Szeimies RM (2010) Non-melanoma skin cancer. *Lancet* 20: 673-685.
135. Melanoma: Diagnosis and treatment. American Academy of Dermatology.
136. Kopasker D, Kwiatkowski A, Matin RN, Harwood CA, Ismail F, et al. (2019) Patient preferences for topical treatment of actinic keratoses: A discrete-choice experiment. *Br J Dermatol* 180: 902-909.
137. Mansouri B, Bicknell LM, Hill D, Walker GD, Fiala K, et al. (2017) Mohs micrographic surgery for the management of cutaneous malignancies. *Facial Plast Surg Clin North Am* 25: 291-301.
138. Kasparian N, McLoone J, Butow PN (2009) Psychological responses and coping strategies among patients with malignant melanoma: A systematic review of the literature. *Arch Dermatol* 145: 1415-1427.
139. Kasparian NA (2013) Psychological stress and melanoma: Are we meeting our patients' psychological needs? *Clin Dermatol* 31: 41-46.
140. Zabora J, Brintzenhofeszoc K, Curbow B, Hooker C, Piantadosi S (2001) The prevalence of psychological distress by cancer site. *Psychooncology* 10: 19-28.
141. Butow PN, Coates AS, Dunn SM (1999) Psychosocial predictors of survival in metastatic melanoma. *J Clin Oncol* 17: 2256-2263.
142. Spiegel D (1996) Cancer and depression. *Br J Psychiatry* 30: 109-116.

143. Di Matteo MR, Lepper HS, Croghan TW (2000) Depression is a risk factor for noncompliance with medical treatment: Meta-analysis of the effects of anxiety and depression on patient adherence. *Arch Intern Med* 160: 2101-2107.
144. Kittler H, Weitzdorfer R, Pehamberger H, Wolff K, Binder M (2001) Compliance with follow-up and prognosis among patients with thin melanomas. *Eur J Cancer* 37: 1504-1509.
145. Manning WG, Wells KB (1992) The effect of psychological distress and psychological well-being on use of medical services. *Med Care* 30: 541-553.
146. Simon G, Ormel J, Von Korff M, Barlow W (1995) Health care costs associated with depressive and anxiety disorders in primary care. *Am J Psychiatry* 152: 352-357.
147. Tennvall GR, Norlin JM, Malmberg I, Erlendsson AM, Hædersdal M (2015) Health related quality of life in patients with actinic keratosis-an observational study of patients treated in dermatology specialist care in Denmark . *Health Qual Life Outcomes* 13: 111.
148. Lee A, Wu HY (2002) Diagnosis disclosure in cancer patients-when the family says "no!" *Singapore Med J* 43: 533-538.
149. Genital herpes-CDC fact sheet. Centers for disease control and prevention.
150. Human papillomavirus (HPV). Centers for disease control and prevention.
151. Frazer IH, Cox JT, Mayeaux EJ, Franco EL, Moscicki AB, et al. (2006) Advances in prevention of cervical cancer and other human papillomavirus-related diseases. *Pediatr Infect Dis J* 25: 65-81.
152. Lacey C, Woodhall S, Wikstrom A, Ross J (2013) 2012 European guideline for the management of anogenital warts. *J Eur Acad Dermatol Venereol* 27: 263-270.
153. Markowitz LE, Dunne EF, Saraiya M, Chesson HW, Curtis CR, et al. (2014) Human papillomavirus vaccination: Recommendations of the Advisory Committee on Immunization Practices (ACIP). *MMWR Recomm Rep* 63: 1-30.
154. Royer HR, Falk EC, Heidrich SM (2013) Genital herpes beliefs: Implications for sexual health. *J Pediatr Adolesc Gynecol* 26: 109-116.
155. Goldmeier D, Johnson A, Byrne M, Barton S (1988) Psychosocial implications of recurrent genital herpes simplex virus infection. *Genitourin Med* 64: 327-330.
156. Neal TM, Lichtenstein B, Brodsky SL (2010) Clinical implications of stigma in HIV/AIDS and other sexually transmitted infections. *Int J STD AIDS* 21: 158-160.
157. McCaffery K, Waller J, Nazroo J, Wardle J (2006) Social and psychological impact of HPV testing in cervical screening: A qualitative study. *Sex Transm Infect* 82: 169-174.
158. Foster LR, Byers ES (2016) Predictors of the sexual well-being of individuals diagnosed with herpes and human papillomavirus. *Arch Sex Behav* 45: 403-414.