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Review Article

Mind-Skin Health: The Association of Psychopathologies with Various Skin Disorders; A Systematic Review

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ABSTRACT

The skin has several functions summarized in protecting the human body against several chemical and mechanical injuries. The skin and nervous system develop alongside each other in the fetus and remain interconnected throughout life. It is necessary to understand the psychological and occupational context of skin diseases to optimally manage psychodermatologic conditions. Study was conducted to investigate the most common cutaneous manifestations among patients with psychiatric disorders by reviewing the previously available studies conducted on this subject. The Google scholar database was explored for searching purposes to obtain literature articles starting from 2010 till 2021. The included searching terms were a combination of "Cutaneous manifestations and psychiatric disorders," Common dermal conditions and psychiatric diseases," prevalence of dermal conditions and psychiatric disorders," and "Dermatological problems and psychiatric disorders." The inclusion criteria included original articles published between the selected duration, full text- articles, and available articles. A total of 30 articles were obtained, only seven pieces were eligible for the inclusion criteria. The seven studies were published between 2020 and 2013 and included a total number of 18447 participants. Cutaneous manifestations were common among psychiatric disorders suggesting a positive association between psychiatric disorders and dermatological diseases.

Keywords: Cutaneous Manifestations, Psychiatric Disorders.

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INTRODUCTION

The skin is an organ of the human body surrounding the body surface by a solid stuck membrane.[1] The skin has several functions, including protecting the body from mechanical, chemical, electrical, and thermal injuries. It also protects from radiation of solar origin or other energy sources, as well as against exposure to infectious and contagious diseases.[2]

The skin is divided into three layers, from the outermost to the innermost, the epidermis, the dermis, and the sub-dermis. The epidermis involves the nerve fibrils of pain, dendritic cells which serve as antigen-presenting cells, and Merkel discs which carry light touch sensation.[3,4] The correlation between the skin, nerves, and brain is constructively a similar entity of the cell. The mind, which is the core of communications, communicates with the skin's cellular membrane via nerve cells, resulting in complete harmony and communication.[3,5] Psychodermatology is a subspecialty of dermatology and psychiatry; it treats and deals with dermatological disorders affected by psychological factors.[1] It is necessary to understand the psychological and occupational context of skin diseases to manage psychodermatologic conditions optimally. The management requires evaluating the cutaneous manifestations and the social, occupational, and familial issues underlying these complications. The diagnosis of psychodermatologic disorders involves three major categories; psychophysiological disorders, primary and secondary psychiatric disorders. Psychophysiologic conditions affect acne, psoriasis, rosacea, urticaria, atopic dermatitis, and alopecia. The primary psychiatric disorders involve delusions of parasitosis, whereas vitiligo and psoriasis belong to the secondary psychiatric disorders.[5]

This systematic review investigates and identifies the prevalence of dermatological manifestations and skin disorders among psychiatric patients and the possible association.

METHOD

The PRISMA checklist guidance for systematic review and meta-analysis[6] was followed to write this systematic review. We revised the Google scholar electronic database to search for original articles and select eligible research articles between 2010 and 2021.

Search Strategy

Several keywords were used for searching purposes, including a combination of "Cutaneous manifestations and psychiatric disorders," Common dermal conditions and psychiatric diseases," prevalence of dermal conditions and psychiatric disorders," and "Dermatological problems and psychiatric disorders." After obtaining the articles, all the titles and abstracts produced from this primary exploration were revised thoroughly to prevent missing potential studies. The findings were then examined to choose only original research articles conducted on our subject and reject the review articles. All the original articles and writing in the English language were eligible and then included in the second stage.

Eligibility Criteria

The second step was deciding on the inclusion criteria to select the eligible studies. Abstracts were assessed manually to choose the relevant studies for revision. The inclusion criteria were original articles of any study design conducted on psychiatric patients or individuals visiting the psychiatric clinic. The final stage was gathering the pre-defined information from the last record of eligible articles and summarized them. Studies that had incomplete or overlapped data were excluded. Also, unavailable full-text articles were excluded. The full description of the search strategy is shown in figure 1.

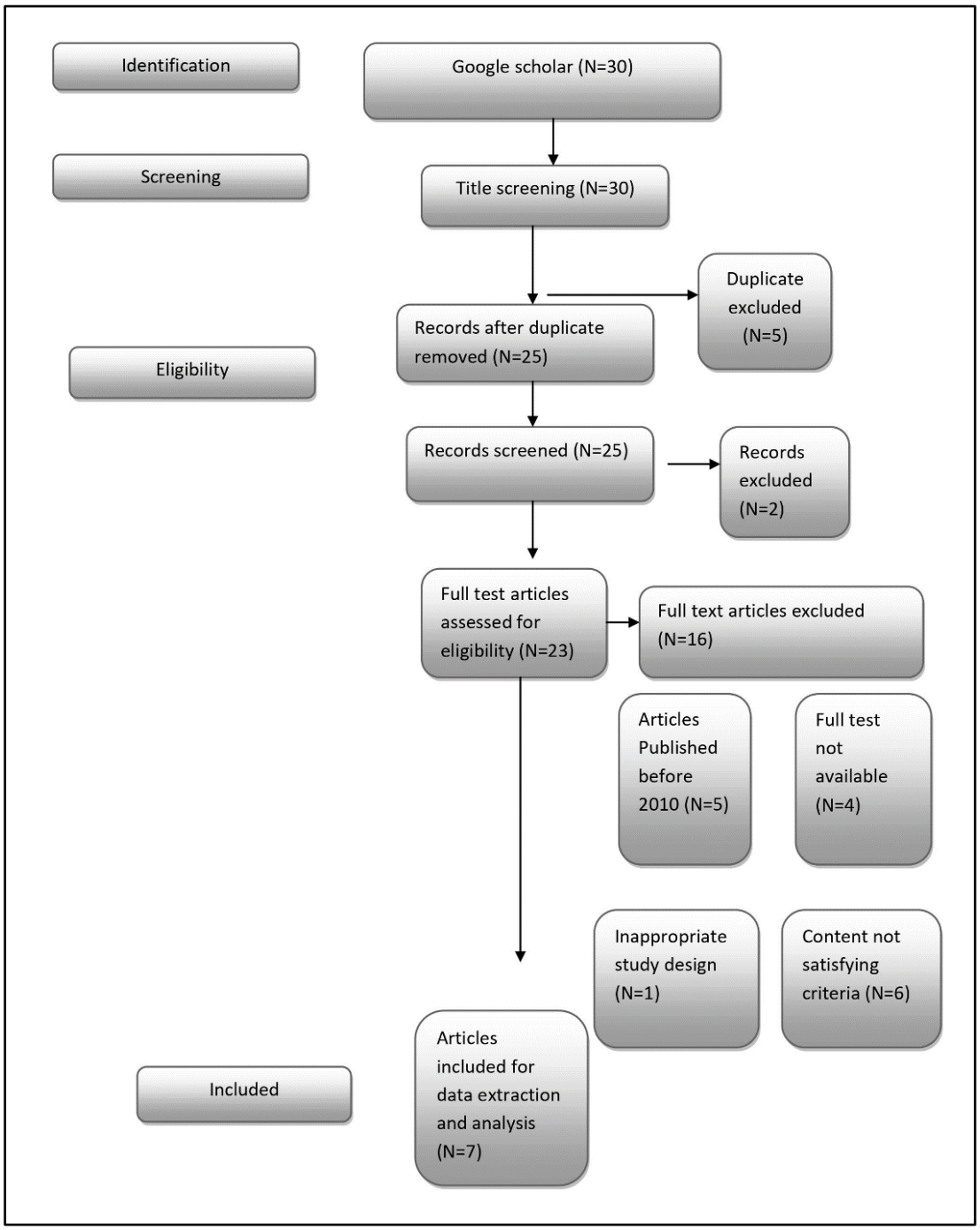

Fig 1: Search strategy

Data Review and Analysis

The data were extracted and summarized in a table under specific titles. Chosen data from eligible research articles were then revised. Any research articles published by one research group examining similar variables were reviewed for any potential duplication.

RESULTS

This systematic review included seven articles (table 1) that met the eligible criteria. [7-13] All the studies aimed to investigate the dermatological manifestations and diseases among psychiatric patients. Regarding the study design, three studies were cross-sectional[7,11,13], one of them[13] was an analytic cross-sectional hospital-based study. The other studies were of different design; one was descriptive explorative and retrospective[8], another one was observational hospital-based[9], one didn't mention the method[10], and the last one was case-control hospital-based study.[12] As the study design varied, the seven studies included different study groups; the participants were 18447 individuals. Of them, 350 (1.89%) were healthy control suffer no psychiatric disorders, whereas the remaining participants, 18097(98.1%), were suffering from psychiatric disorders.

Regarding the patients' characteristics, one study reported that patients with neurotic disease represented more than one-half of patients (60.7%), followed by psychotic diseases (33.3%) and substance use diseases (5.9%).[7] The other study reported that mood disorders were the major psychiatric diseases among patients (45.3%) and depression comprised the central mood disorder; in the second rank, there was neurotic stress-related and somatoform disorders (19.3%), followed by psychoactive drugs induced psychiatric disorders (13.7%), the collection of diseases from the spectrum of schizophrenia, delusional and schizotypal disorders (11.8%).[8] In a hospital-based study, Schizophrenia was the major psychiatric illness among patients (25.7%), followed by major depressive disorders (23.8%), then bipolar mood disorder (23.3%), and then psychosis (11.9%), and finally generalized anxiety disorder (10%).[9] One study divided the patients into categories according to the psychiatric illness they suffer; 29% were suffering psychophysiological disorders, 21% were suffering second psychiatric disorders, whereas only 18% were suffering primary psychiatric disorders.[10] Schizophrenia was also the major psychiatric illness among patients (36.7%), followed by major depressive disorders (30.2%), bipolar I disease (11.9%), obsessive-compulsive disorder (10.6%), and finally anxiety (10.6%) as reported in a study from Egypt.[11] The last two studies[12,13] included control groups, the two studies said that Schizophrenia was the major psychiatric diseases among psychiatric patients; 25.3% and 38%[12,13], respectively, followed by depression (18.7% and 33.5%)[12,13], respectively, followed by generalized anxiety (17.3%), and bipolar affective disorder (10.7%) in one study.[12] In contrast, the other study reported that mood disorders (12.5%), obsessive-compulsive disorder (8.5%), and anxiety (7.5%) were following depression.[13] Schizophrenia was the major psychiatric illness of psychiatric patients in four studies[9,11-13], mood disorders, depression, and bipolar were the primary psychiatric disease in one study[8] and were in the second rank in four studies.[9,11-13]

The prevalence of the dermatological condition among psychiatric patients ranged from 1.24% to 88.4%.[8,11] Only two studies reported the overall cutaneous manifestations[7,9], with the highest prevalence of cutaneous manifestations of 314 cutaneous manifestations.[9]

There were four studies reported the dermatological conditions without categorization[7,8,10,13], whereas three studies categorized the dermatological diseases into infectious and non-infectious diseases.[9,11,12] Regarding categorization, the highest prevalence of dermatological conditions was found regarding infections (28.72), Eczema (23.4%)[7], psoriasis (35.4%), atopic dermatitis (22.6%)[8], chronic urticaria (34.4%), psoriasis (27.58%), alopecia areata (17.27%), pruritis (61.1%), vitiligo (33.3%)[10], and parasitic infections (42.7%).[13] Regarding the infectious diseases, the prevalence of infectious dermatological diseases ranged from36.94% to 49.8%[9,11]; the most common infectious dermatological diseases were fungal skin infection which represented 33.8%, and 24%[9,11] and tinea (29.5%)[12], and regarding the non-infectious dermatological disease, the prevalence ranged from 50.2% to 63.06%[9,11]; the most prevalent non-infectious dermatological diseases were eczema (24.8%)[9], (22%)[12], acne (10.5%), diffuse hair loss (5.6%).[11]

Atopic dermatitis (eczema) was reported to be prevalent among psychiatric patients in five studies[7-9,11,12] with a prevalence range of 4.5%to 24.8%to %; psoriasis was said to be affecting psychiatric patients in three studies[8,10,11] with a prevalence range of 2.2% to 35.4%.

DISCUSSION

Psychiatric disorders are associated with dermatological problems and vice versa. Although psychiatric disorders seem different from somatic diseases and have no connection, a deep relationship between the two entities has been proven.[14-16] It was reported that skin disorders might be associated with specific psychiatric diseases, and in fact, 30-60% of dermatological disease patients have some psychiatric issues.[17,18]

It seems that psychiatric and dermatological conditions interact despite the fact that temporality between the two remain an area of investigation, so we aimed to assess the prevalent dermatological manifestations associated with psychiatric diseases in this systematic review.

Among seven studies included in this systematic review, a total of 408 cutaneous manifestations have been observed among 345 psychiatric patients. Moreover, it should be noted that these cutaneous manifestations were detailed in only two studies.[7,9] The prevalence of dermatological disorders among psychiatric patients varied among studies, ranging from 1.24% to 88.4%. in addition, non-infectious diseases represented a higher proportion (50.2% - 63.06%) than Infectious dermatological diseases (36.94% -49.8%) among the subjects referring that non-infectious skin diseases are more common among psychiatric patients than those caused by an underlying infection. This also showed that as psychiatric patients tended to suffer from non-infectious dermatological conditions, these dermatological conditions appear to be due to their primary psychiatric disorders. Interestingly, one of the included seven studies reported that infectious parasitic dermatoses were rare among psychiatric inpatients.[8]

However, there was only one study[12] that reported that psychiatric patients showed a significantly higher prevalence of infective skin diseases compared to their controls. However, this can be explained by the fact that non-infectious skin diseases are more

prevalent among psychiatric patients reflecting the role of the psychopathology itself in developing the various skin manifestations. Moreover, when comparing psychiatric patients to matched healthy individuals, these patients show a higher prevalence of infectious skin diseases implying the potential effect of these pyschopathologies on the immunity of their patients, so they are more vulnerable to multiple contagious skin diseases. This was indeed reported in one of our included studies[13], where it was found that there was a significant increase in the prevalence of skin disorders among psychiatric patients compared to healthy controls, and there was a substantial increase in disorders due to an infectious etiology.

The following skin pathologies were the most recognized among the study subjects: atopic dermatitis, psoriasis, acne, and alopecia areata. Atopic dermatitis or eczema is a chronic inflammatory pruritic skin disease.[19] Psoriasis is an ancient disorder results from an immune-mediated process affecting 3.2% of the population.[20] Psoriasis has been associated with other conditions such as inflammatory bowel disease[21], chronic kidney disease[22], and metabolic syndromes.[23] Acne is one of the most common skin conditions affecting 85% of individuals in their lifetime.[24] Alopecia areata is a common cause of hair loss that affects 0.1-0.2% of the general population. It is characterized by well-demarcated patches or non-scaring hair loss of the body hair, beard, or scalp.[25] In our included studies, the most frequently reported dermal condition was eczema with a range of 4.5% to 24.8% and psoriasis with a prevalence range of 2.2% to 35.4%. In addition, acne and alopecia (hair loss) were prevalent as well. Also, the current systematic review showed that fungi were the leading cause of infectious dermatological diseases among psychiatric patients**.** In this systematic review, we found that Schizophrenia was the major and significant psychiatric disorder with association to secondary skin disorders as it was reported to be the most prevalent psychiatric illness in four studies[9,11-13], followed by mood disorders like depression and bipolar which were the major psychiatric illnesses in one study[8] and were in the second rank in the previous four studies.[9,11-13]

On the hand, depression was associated with primary dermatological conditions, where one study said that 32% of dermatology patients were suffering from depression.[8,26] Excessive hair loss was classically linked with major depression.[27] Depression was also found to be independently associated with the risk of psoriasis.[28,29]

CONCLUSION

Cutaneous manifestations were common among psychiatric disorders suggesting a positive association between psychiatric disorders and dermatological diseases. By comparing the psychiatric patients with their peers of healthy control, psychiatric patients showed a significantly higher prevalence of skin diseases in general. They were more prone to suffer infectious skin diseases compared to their peers of healthy controls. This also suggests the impact of psychiatric diseases on the immunity of psychiatric patients, which requires further investigation. In addition, clinicians should consider the association of these psychiatric and dermatologic diseases while treating their patients which will allow for a more comprehensive and thorough patient care.

Appendix: Table of included studies

Author and Publication year	Study design	Aim	Patients/population characteristics	Results and main findings
Vivek Arun Kumar et al 2020 [7]	Cross-sectional	To estimate the prevalence of skin disorders in primary psychiatric outpatients attending the outpatient department of a tertiary medical college hospital in India	-135 patients of psychiatric diseases; 70(51.9) males, 65 (48.1) females -Psychiatric diseases: -82(60.7%) had neurotic disease -45(33.3%) had psychotic disease -8(5.9%) had substance use disease	*There were 88(65.1%) had co-existing dermatological conditions *94 cutaneous manifestations were found among the 88 patients. -46(52.27%) of patients with dermatological conditions were females *The prevalence of dermatological disorders: -Infection 27(28.72%), Eczemas 22(23.4%), Appendageal disorders 14(14.89%), incidental dermatoses 13(13.82%), papulosquamous disorders 10(10.63%), pigmentary disorders 8(8.51%) * Skin disorders were highly prevalent in patients attending the psychiatric outpatient department
Mavrogiorgou et al 2020 [8]	Descriptive-explorative and retrospective	To examine patients with a primary mental disorder in regard to dermatological comorbidities	- 17,000 patients with primary psychiatric disorders were examined; 212 were having primary mental disease and dermatological diseases - Psychiatric diseases: - 96(45.3%) mood disorder; 90(42.5%) depression -41(19.3%) neurotic stress-related and somatoform disorders -29(13.7%) psychoactive drugs-induced psychiatric disorders -25(11.8%) had disease from the spectrum of schizophrenia, schizotypal and delusional disorders -12(5.7%) symptomatic mental disorders -6(2.8%) personality and behavioural disorders	*the prevalence of dermatological diseases among 17000 patients with primary psychiatric disorders was 212(1.24%) *The prevalence of dermatological diseases: -psoriasis 75(35.4%), atopic dermatitis 48(22.6%), infectious dermatoses 28(13.2%), rosacea 12(5.66%), intolerancy 9(4.24%), acne 8(3.77%), alopecia 3(1.4%). * 29 of these psoriasis patients had depression and four suffered from a bipolar (manic-depressive) disorder * Of the atopic dermatitis patients, 23 had depression and two suffered from manic-depressive disorder * There was a frequent association of depression with psoriasis and atopic dermatitis, indicating the need for the early detection and treatment of such comorbid patients * Psychiatric inpatients do not appear to suffer from predominantly infectious-parasitic dermatoses
George et al 2018 [9]	Hospital-based observational	To determine the pattern of cutaneous	- A total of 210 patients suffering from various psychiatric disorders along with associated skin disease	* A total of 314 cutaneous manifestations were observed *The prevalence of dermatological diseases: -63.06% noninfective dermatoses, 36.94% infective dermatoses -

	study.	manifestations in patients with primary psychiatric disorders	were recruited; 88(41.9%) males, 122(58.1%) females - Psychiatric diseases: -25.7% schizophrenia -23.8% major depressive disorder -23.3% bipolar mood disorder -11.9% psychosis not otherwise specified -10% generalized anxiety disorder	33.8% Fungal skin infections, 24.8% eczema, 15.2% pigmentory disorders. 13.3% acne * cutaneous manifestations were quite common in primary psychiatric disorders
Samanthula et al 2018 [10]	-----	To identify skin manifestations in individuals suffering from psychiatric disorders	-100 patients; 46(46%) males, 54(54%) females - Psychiatric diseases: -29% Psychophysiological -21% Second psychiatric disorders -18% Primary psychiatric disorders	*The prevalence of skin diseases regarding Psychophysiological disorders: -chronic urticaria 10(34.4%), psoriasis 8(27.58%), alopecia areata 5(17.27%) * The prevalence of skin diseases regarding Primary psychiatric disorders: -pruritis 11(61.1%), delusions of parasitosis 4(22.2%) * The prevalence of skin diseases regarding Second psychiatric disorders: -7(33.33%) vitiligo, 6(28.57%) acne scars, 4(19.04%) alopecias, 3(14.28%) facial melanosis *There was a positive association of skin diseases with psychiatric illnesses
Mostafa et al 2018 [11]	Cross-sectional	To study the prevalence and distribution of skin diseases among patients with psychiatric disorders in Beni Suef Governorate	- A total of 302 patients with psychiatric disorders were assessed for psychiatric and dermatological diseases - Psychiatric diseases: -11(36.7%) schizophrenia -91(30.2%) major depressive disorder -36(11.9%) bipolar I disorder -32(10.6%) obsessive compulsive disorder -32(10.6%) anxiety	*The prevalence of dermatological disorders was 267(88.4%); infectious dermatological disorders 49.8% of total skin diseases *Prevalence of infectious dermal diseases was 133(49.8%): -fungal infections 64(24%), bacterial infections 34(12.7%) *Prevalence of non-infectious dermal diseases was 134(50.2%): -acne 28(10.5%), diffuse hair loss 15(5.6%), itching 12(4.5%), eczema 12(4.5%), vitiligo 7(2.6%), psoriasis 6(2.2%) * Skin diseases particularly those of infectious pattern were prevalent among patients with psychiatric disorder
Manish et al 2017 [12]	Hospital based, case control	To document the incidence of cutaneous disorders in patients with primary psychiatric conditions	-150 patients with primary psychiatric disease& 150 control individuals - Psychiatric diseases: -38(25.3%) schizophrenia -28(18.7%) depression -26(17.3%) generalized anxiety -16(10.7%) bipolar affective disorder	*The prevalence of Dermatological disorder was 124 (82.67%) among cases. *Infective dermatoses 65(43.4%): -Tinea 29.5%, scabies 26.6%, pediculosis13.4% *The prevalence of non-infective dermatoses 59(39.3%): -Eczema 22%, pruritus 19.4%, xerosis 15.7%, acne 10.3% *The prevalence of dermal diseases among control group: -Infectious 46(30.6%): Tinea 14.6%, scabies 6.67% -Non-infectious 19(12.7): Eczema 7.3%, pruritus 1.33% * There is a definite association of skin disease and primary psychiatric illness of which infective skin diseases are significantly higher in psychiatric patient
Moftah et al 2013 [13]	Analytic cross-sectional hospital-based study	To detect the frequency and type of cutaneous disorders among patients with primary psychiatric conditions	-200 patients with primary psychiatric disorders & 200 age and sex matched individuals free from primary psychiatric disorders - Psychiatric diseases: -76(38%) schizophrenia -67(33.5%) depression -25(12.5%) mood disorders -17(8.5%) obsessive compulsive -15(7.5%) anxiety	*The prevalence of infectious skin disease was 48% of all psychiatric patients and 66.9% of psychiatric patients with skin diseases * There was a significant statistical increase in the prevalence of skin diseases in general and infectious skin diseases in particular in psychiatric patients compared with non-psychiatric patients (71.5% versus 22%) and (48% versus 11%), respectively. * Parasitic infestations (42.7%) were the most common infectious skin diseases in psychiatric patients * Infectious skin diseases in psychiatric patients were seen most in patients diagnosed with schizophrenia (83.6%) and least in obsessive compulsive disorders (30%) * Psychogenic skin disorders were found in 8.4% of psychiatric patients with skin diseases; delusional parasitosis was the most common (50%)

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