

Research Article

# New Proposed Classification for Psychodermatosis Based on the Complex Interaction Between the Brain and Skin

**Cristiane Amaria Caldas Queiroz<sup>1,2</sup>, Josiane Dantas Viana Barbosa<sup>2</sup>, Milena Soares<sup>2</sup>, Leticia de Alencar Pereira Rodrigues<sup>2</sup>, Robert Schooley<sup>3</sup>, Roberto Badaro<sup>2,\*</sup>**

<sup>1</sup>Dermatology Clinic of Salvador, Bahia, Brazil

<sup>2</sup>Institute of Health Technologies, University SENAI CIMATEC, Salvador, Bahia, Brazil

<sup>3</sup>Division of Infectious Diseases and Global Public Health, University of California San Diego, San Diego Ca, USA

## Abstract

The literature describes several dermatological conditions that are not caused by external agents but result from the complex interaction between the brain and the skin. This interaction gives rise to a variety of dermatological lesions, which can be broadly classified into two major categories: psychogenic dermatoses and psychosomatic dermatoses. In this article, we present three cases of Psychodermatosis to illustrate a proposed detailed classification based on the underlying mechanisms and clinical manifestations of these conditions. The cases include: (1) crusty, greasy, brownish facial lesions; (2) excoriated lesions with post-inflammatory hypopigmentation, alopecia, and fractured hairs—characteristic of trichotillomania; and (3) lichenified plaques on the dorsum of the feet, leaving hyperpigmented and atrophic hypopigmented scars, typical of factitious dermatitis. We propose a refined dermatological classification of Psychodermatosis, encompassing two primary categories: (1) cutaneous diseases associated with psychiatric disorders and (2) psychiatric conditions linked to specific cutaneous disorders known to be influenced by psychosomatic factors.

## Keywords

Psychodermatosis, Dermatophobia, Trichotillomania

## 1. Introduction

The associations between the mind and skin in the genesis or manifestations of dermatological diseases are well established and classified in the area known as psychodermatology, a relatively new medical field [1, 2].

Pharmacological and psychological interventions in the treatment of psychodermatological disorders are standard medical practices [3]. When patients experience any alterations in their skin, their initial step is usually to consult a

dermatologist. Dermatologists, on the other hand, when confronted with uncharacterized skin lesions, often link the condition to mental and emotional states such as fear, anger, terror, and shame that patients with dermatological diseases frequently report. [4]. One of the most common psychodermatological conditions is Dermatitis Artefactual (DA), a factitious skin disorder caused by patients deliberately producing skin lesions due to underlying psychological issues, with

\*Corresponding author: badaro@fieb.org.br (Roberto Badaro), rbadaro884@gmail.com (Roberto Badaro)

**Received:** 28 January 2025; **Accepted:** 22 February 2025; **Published:** 21 March 2025



Copyright: © The Author(s), 2025. Published by Science Publishing Group. This is an **Open Access** article, distributed under the terms of the Creative Commons Attribution 4.0 License (<http://creativecommons.org/licenses/by/4.0/>), which permits unrestricted use, distribution and reproduction in any medium, provided the original work is properly cited.

many patients being unaware of the self-inflicted nature of their condition, especially among children [5].

In clinical practice, dermatologists frequently encounter diseases where emotional factors significantly contribute to the condition (Psychodermatosis) [1, 6-8]. These conditions can be challenging to diagnose, and successful treatment often involves modifying the patient's behavior regarding their dermatosis [3].

Herein, we present descriptions of three unique cases of Psychodermatosis and an alternative option of the treatment, also a propose of a dermatological classification of skin psychiatric condition.

## 2. Methods

All three cases were followed up at the Private Dermatological Clinic located in Salvador, Bahia registered at the medical council with the number CNPJ 050894770001/09. This clinic is one of the reference clinics for the treatment and diagnosis of dermatological disease in Salvador Bahia since 2000. It registered a total of 14761 cases of dermatological diseases and a total of 452 cases of Psychodermatosis cases were documented. These three selected cases were the best examples of Psychodermatosis. We review the literature using the platform PubMed and Web of Science database. We performed a systematic review in the platforms to select a total of 200 references to acquire the basis for the proposition of this dermatological classification of Psychodermatosis. Each patient signed the informed consent to permit the case presentation in a dermatological meeting as well as publication in a scientific journal of dermatology with the stipulation that their names would not be disclosed.

## 3. A-Cases Reports

General aspects of the case related Psychodermatosis reported here

Case 1: A 71-year-old white, single male born and residing in Rio de Janeiro, Brazil, complained of the appearance of asymptomatic crusts on the face for five years.

He reported having undergone several topical treatments, improving the condition; however, a relapse occurred a few weeks after discontinuing the treatment. From the family social history, it was possible to document risk factors associated with Psychodermatosis behavior. Her mother was a heavy drinker of alcohol, and her father abandoned her family when she was a child (5 years old). Upon dermatological examination, crusty, unctuous, brownish lesions are located on the lateral regions of the face (Figure 1).

He was referred to hospitalization for a better evaluation, where the crusts were removed with saline solution and a spatula (Figure 2). After total removal of the crusts, only acne-prone skin was seen, with no other changes (Figure 3). The scabs were an accumulation of sebum, dust, and grime.

We started therapy with 2% salicylic acid discs twice daily to adapt to the patient, as he did not accept washing his face. During hospitalization, a fact that drew attention of the dermatologist and psychiatrist was the scratched faces of people in the magazines he was reading. We asked him why he was reading that magazine and he said: *Those people are wrong!* Upon being discharged from the hospital, the patient progressed with remission of the condition. He was referred to psychotherapy, but he initially refused treatment. He subsequently agreed to be seen on an outpatient basis. Due to the good doctor-patient relationship with the patient, he accepted washing his face and reported getting a job. Based on the clinical presentation, investigations, and psychiatric evaluation, the final diagnosis was Darier's disease (DN).

In this case, our differential diagnosis included pemphigus foliaceus, Darier's disease (DN), or seborrheic dermatitis on both cheeks.



**Figure 1.** Shows crusty, unctuous, brownish lesions are located on the lateral regions of the face.



**Figure 2.** The crusts lesions were removed easily with sa line solution and a spatula.



**Figure 3.** Shows the picture of total removal of the crusts, only acne-prone skin was seen, with no alteration.

#### Case 2:

A 28-year-old female patient, who was single and worked as a home domestic, presented with localized hair loss in the occipital region for three years and a feeling of itching in the pre-sternal region for two months with subsequent appearance of erythematous papular lesions. She was born in the state of Bahia and was living in the state of Rio de Janeiro, Brazil. In the past medical history, nothing is of note. It should be noted that in social history, there was a departure from socializing with family members for financial reasons.

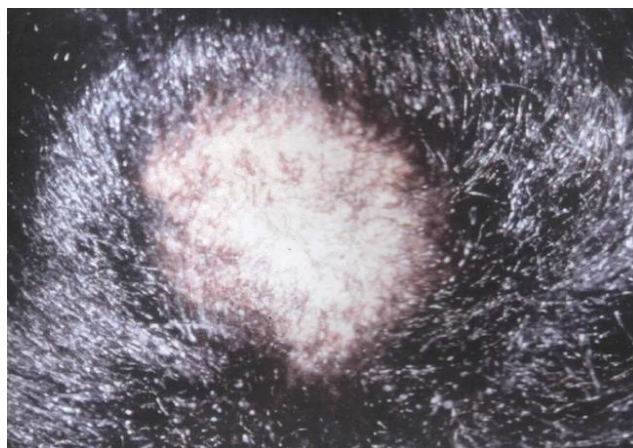
On dermatological examination, excoriated lesions with residual post-inflammatory hypochromic lesions in the pre-sternal region (Figure 4) and the presence of an ill-defined area of alopecia with fractured hair of varying sizes in the occipital region (Figure 5), in addition to onychophagia (Figure 6).

In complementary exams, direct mycology and culture of the scalp lesion were negative. The histopathology of the pre-sternal region and scalp lesion of the head skin was compatible with lichen simplex chronicum and trichotillomania (Figure 7), respectively.

Once the clinical and histopathological diagnoses of trichotillomania, neurotic action, and onychophagia were confirmed, therapy was started with a Minoxidil solution and topical corticoid twice daily on the scalp in the pre-order area. She was monitored every two weeks. Aft two months, there was a complete remission of the lesions.



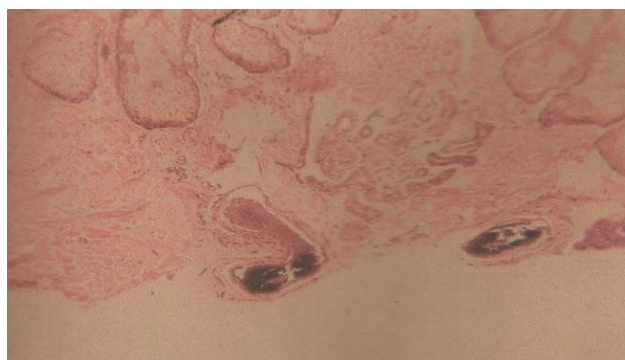
**Figure 4.** Typical excoriated lesions with residual post-inflammatory hypochromic lesions in the pre-sternal region.



**Figure 5.** The presence of an ill-defined area of alopecia with fractured hair of varying sizes in the occipital region typical of hand manipulation.



**Figure 6.** Typical nail lesions of onychophagia.



**Figure 7.** Histopathology compatibles with lichen simplex chronicum.

The histopathologic examination of the pre-sternal region and scalp lesion of the head skin was compatible with lichen simplex chronicum and scratch disease due to trichotillomania (Figure 7).

#### Case 3:

A 2x year old female presented with a foot wound of 2 years duration. She was a single housewife who was born and



lived in Rio de Janeiro, Brazil. The past medical history included cutaneous lesions characteristic of factitious dermatitis or artefact dermatitis for 4 years. (Figures 8 and 9). In the social history, feelings of inferiority and rejection by family members were observed. On physical examination, a 1 cm mobile left cervical lymph node was noted which was painful on palpation. On dermatological examination, an ulcerated lesion with irregular, well-defined edges, with sero-purulent secretion was noted in the right plantar region (Figure 10). Lichenified plaques on the dorsum of the feet with residual hyperchromic and atrophic hypochromic scars were noted on the lower third of the legs and both feet (Figure 11). Histopathological evaluation of several biopsies (Figures 8 and 9) was categorized as nonspecific dermatological disease. Biopsies revealed pseudo-carcinomatous epidermal hyperplasia with mixed superficial and deep infiltrate with granulation tissue compatible with nonspecific ulcerated chronic inflammatory process in repair process.

Treatment was started with cephalexin 2 g/day, topical corticosteroids twice a day, dressings with acetic acid and gentamicin and symptomatic patients. An improvement in the infection was noted when the limb was bandaged, thus confirming the diagnosis of factitious dermatitis.



**Figure 8.** Is a typical lesion of a factitious dermatitis caused by manipulation of the lateral right feet with the pen cap.



**Figure 9.** A typical scars lesions of artefact dermatitis.



**Figure 10.** Lichenified plaques on the dorsum of the feet with residual hyperchromic and atrophic hypochromic scars.

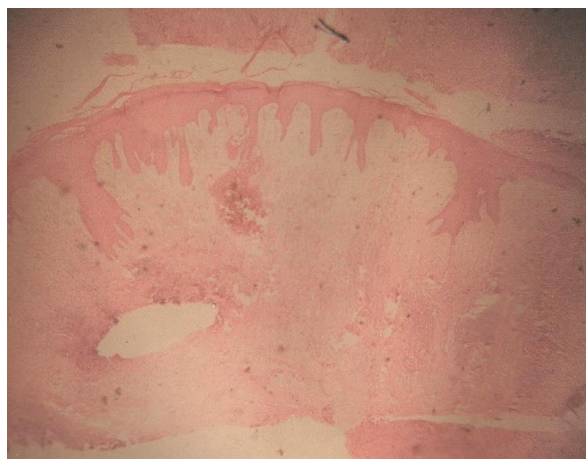


**Figure 11.** Ulcerated irregular sera-purulent lesion with well-defined edges, in the toes of right plantar foot region.



**Figure 12.** Pseudo-carcinomatous epidermal hyperplasia with mixed superficial and deep infiltrate with granulation tissue.

(Figures 12 and 13) was categorized as nonspecific dermatological disease. Biopsies revealed pseudo-carcinomatous epidermal hyperplasia with mixed superficial and deep infiltrate with granulation tissue compatible with nonspecific ulcerated chronic inflammatory process in repair process.



**Figure 13.** Classical pseudo carcinomatous epidermal hyperplasia with mixed superficial and deep granulation infiltrates.

#### *B-Proposal of a detailed dermatological classification for Psychodermatosis.*

Throughout various civilizations and cultures, the connection between health and illness and one's emotional equilibrium has been widely acknowledged [9]. While mental states can influence the course of some diseases, they do not solely determine the genesis of specific pathologies, but they could be more important in the disease manifestation than the apparently body disease manifestation [10]. This understanding dates back to the teachings of the Father of Medicine, Hippocrates (460-322 BC) He describes patients that tore their hair in responses to emotional distress also he emphasized the importance of emotional calmness for physical recovery [11, 12]. Nevertheless, the illness, as a concept of "becoming ill," arises because of a historical-biological process developed in adverse conditions [13]. Diagnosing a disease goes beyond identifying a morbid state; it involves recognizing a unique way of existence of a disease state [14]. It is essential to approach illnesses from a psychosomatic perspective, delving into the human condition and personal aspects of the patient [14]. The interplay between mind and body plays a crucial

role in determining the overall health of an individual [15]

At least one-third of dermatology patients with skin disorders are associated with emotional factors [16]. In this manuscript, we illustrated psycho-dermatosis by describing three cases focusing on the clinical aspects of the self-induced dermatological disease. There are two different groups of psychodermatosis:

Cutaneous diseases associated with psychiatric disorders and (2) Psychiatric diseases associated with certain cutaneous disorders that are known to be influenced by psychosomatic factors. This classification is well-described by M. A. Gupta and A. K. Gupta in an update for psychodermatosis [1].

The literature shows many variations in the Facial flushing classification of Psychodermatosis" [1, 6]. Avoiding them, we tried to relate psycho-dermatoses by grouping them into a broader systematic classification, as follows:

#### 1. Psychogenic Dermatoses

Psychogenic dermatosis is defined as a skin condition of which the dermatitis is one of the manifestations, possibly the initial or most obvious one, of the symptomatology which are in general classified by the physicians in a variety of terminology: factitious dermatitis, Neurotic excoriations, Dermatophobia. Dermato-compulsions. (Trichotillomania, Cheilophagia, onychophagy, cutisphagia, Excessive washing).

#### 2. Psychosomatic Dermatoses

Psychosomatic dermatoses is an interaction between organogenetic cutaneous manifestations and emotional factors, also classified by the physicians with a numerous of terminologies such as: Generalized pruritus, Anogenital pruritus, Simple lichen or localized neurodermatitis, Acne excoriata Atopic eczema, Alopecia areata, Psoriasis, vitiligo, chronic urticaria, Rosacea, seborrheic dermatitis, Acne Vulgaris, Hyperhidrosis, Lichen Planus Dyshidrotic eczema, Facial flushing, Glossodynia, aphthous, herpes simplex, warts. Table 1 below group these specific terminologies associated with the two major groups of Psychodermatosis: *Psychogenic dermatoses and Psychosomatic dermatoses*

**Table 1.** Classification of Psychodermatological disorders.

Psychogenic dermatoses	Psychosomatic dermatoses
Trichotillomania Factitious dermatitis or Artefacta	
Neurotic excoriations	Generalized pruritus, Anogenital pruritus
	Simple lichen, lichen or localized neurodermatitis, Atópica eczema, Alopecia areata, Psoriasis, Vitiligo Chronic urticaria, Rosaceae, seborrheic dermatitis Acne Vulgaris, Hyperhidrosis, Lichen Planus Dyshidrotic eczema
Dermatophobia	Facial flushing
	Glossodynia,
	Viral dermatitis: Herpes simplex, warts



There are several specific diagnoses that we consider to be important manifestations of Psychogenic dermatoses and Psychosomatic dermatosis:

#### *Psychogenic dermatoses*

##### *Trichotillomania*

Trichotillomania, characterized by compulsive hair pulling, primarily affects females and often leads to significant psychosocial difficulties [17]. Its prevalence is around 0.6% to 3.6% of adults more frequently in women and young children and resolves spontaneously [18, 19]. In adulthood, it indicates severe psychological problems that progress worse [20-23]. It can involve pulling hair from various body parts, resulting in noticeable hair loss. The disorder is associated with psychiatric conditions like depression and may be categorized under impulse control or obsessive-compulsive disorders. Diagnosis is clinical, with notable histopathological features distinguishing it from other conditions like alopecia areata. Treatment typically involves psychoanalytic, pharmacological, and behavioral approaches, with behavioral techniques like habit-reversal therapy showing promising results in controlled trials.

**Factitious dermatitis or Artefacta** Another important psychodermatosis is the Dermatitis artefacta (DA) [24, 25]. Dermatitis artefacta (DA) is a classical factitious skin disorder caused by the deliberate production of skin lesions by the patients with a history of underlying psychological problems [26]. It is an artificial skin disorder characterized by self-inflicted skin lesions, often stemming from underlying psychological issues that usually the patients such as case 3 presented here denied to produce the lesions. The patient may be unaware of their actions, and the true extent of this disorder, especially in children, is currently unknown [26]. Management of these patients is challenging as many fail to engage effectively with their dermatologist. Self-induced dermatoses are self-inflicted skin lesions, whose occurrence patient denies responsibility for. Dermatitis artefacta (DA) is a classical factitious skin disorder caused by the deliberate production of skin lesions by the patients with a history of underlying psychological problems [26]. In a retrospective descriptive study at the University of Campania Luigi Vanvitelli, Naples, Italy about DA, the most frequent type of lesions were erosions/excoriations and ulcers (14/46, 30.4% and 13/46, 28.3% respectively) followed by ecchymoses (9/46, 19.5%), vasculitis-like lesions (5/46, 10.9%), crusted plaques (3/46, 6.5%), scales (1/46, 2.2%) and erythema (1/46, 2.2%). Thirty-three percent of the medical records generically referred to the presence of psychiatric disorder, but none of them included a specific psychiatric diagnosis [27]. To investigate the various clinical presentations of DA and the strategies employed for treatment in a local population and evaluate our management approach's effectiveness on patients who attended the regional psycho-dermatology clinic at the Royal London Hospital from January 2003 to December 2011 [26]. The majority of the 28 identified DA patients were female, with the face and

upper body being the most common sites for lesions. Anxiety, depression, and personality disorders were frequent underlying psychiatric diagnoses. Ninety-three percent of patients were successfully managed—meaning their DA was resolved or in remission through a combined psycho-dermatology clinic using a multidisciplinary psychiatric and cutaneous medicine team. In addition, thirty-two percent of the cases were children (under 16 years), with one referring to local child protection services. Additionally, 46% of patients had a concurrent mental health disorder at the time of presenting, which suggests that this multidisciplinary approach leads to higher treatment success rates for DA, and we are the first to report on this important service model in the U.K



**Figure 14.** Typical self-inflict cigarette burns lesions.

This Figure 14 is a typical picture published about artefacta dermatitis [28]. A 22-year-old male was referred to the dermatology clinic with multiple grouped erythematous-to-hyperpigmented plaques over the right forearm. He denied any history of self-inflicted injuries. However, the lesions were caused by self-inflict cigarette burns under the influence of alcohol whenever he remembered her and felt sad. Sometimes the psychiatric problem of the patients makes the patient denied to do the lesions.

#### *Neurotic excoriations.*

Neurotic Excoriations is a psych cutaneous disorder that is characterized by an uncontrollable urge to pick at normal skin or skin with mild irregularities [29]. Like dermatitis artefacta both neurotic excoriations and dermatitis artefacta cause significant disfigurement and anxiety for the patient. Since patients often present to dermatologists first, it is important for dermatologists to be aware of the nature of each condition and the available treatment options.

Another important aspect it is the recognizable signs of child physical abuse on the skin include bruises, abrasions,

lacerations, bite marks, burns, and oral injuries, that most time are provoked in childrens by neurotic caregivers [30]. Self-inflicted skin picking, or neurotic excoriation, can also be linked to emotional stress, underlying psychiatric conditions, or substance abuse. Parental neurotic excoriation inflicted on children has not previously been documented as a form of physical abuse. But, is one of etiology in childrens caused by neurotics caregivers [30].

#### *Dermatophobia*

Entomophobia or acarophobia, parasitic Dermatophobia (PD) or delusional parasitosis (DP) is a disorder in which affected individuals have the mistaken but unshakable belief (delusion) that insects, spiders, scorpions, ticks, mites, parasitic worms, bacteria, or other living organisms infect them. As with all delusions, reasoning, persuasion, or logical argument cannot correct this belief [31, 32]. To avoid them, they may always clean rooms, floors, doors, and windows and scratch them. Many affected individuals are quite functional; for the minority, delusions of parasitic infection may interfere with usual activities [33]. However, most insects are not harmful to humans and pose no threat. Those with this phobia experience are extreme anxiety at the mere thought or sight of an insect [32]. Most patients consult dermatologists, veterinarians, pest control specialists, or entomologists; many patients seen in dermatology practices have underlying psychological issues associated with their skin diseases [34]. The DP cases are increasing worldwide; it remains a highly unrepeatable disorder.

#### *Psychoanalytic*

Psychoanalytic treatment includes Intervention with psychoactive drugs in cases of marked mental changes such as personality disorder, bipolar disorder, narcissistic personality disorder, depressive disorders, anxiety disorders, posttraumatic stress disorder, schizophrenia, obsessive-compulsive disorder, should be conducted by psychiatrist in consultation with dermatology because it involves psychiatric medications. [35].

#### *Pharmacological treatment of Psych dermatological disorders*

The most commonly prescribed class of medication for adults with TTM are the SSRIs. Case studies have reported positive results treating trichotillomania using a variety of medications, including lithium [18, 36], chlorpromazine [37], amitriptyline [38], buspirone [39], Isocarboxazid [40] fenfluramine [41], and progestin [42] Because patients diagnosed with trichotillomania do not report experiencing pain while pulling [43], some researchers have tried using medications to decrease pain thresholds in the treatment of trichotillomania [44]. One patient whose hair-pulling behavior was resistant to behavior techniques, successfully treatment was improved by using a topical cream that increased physical sensitivity [44]. In another case report, naltrexone was used successfully to augment therapeutic effects of fluoxetine [45]. Antidepressant medications with serotonergic properties are the most extensively researched, and the most prescribed pharmacological

treatment for trichotillomania [46] Clomipramine is a tricyclic antidepressant medication with serotonergic properties. In a study was found that treatment effects of clomipramine were superior to drug placebo [47]. In a controlled double-blind crossover design study, the comparison of clomipramine with the tricyclic antidepressant desipramine, a predominantly noradrenergic agent, for the treatment of trichotillomania, clomipramine was superior to desipramine in reducing hair-pulling symptoms at post treatment and became a specific “anti-trichotillomania” treatment [48]. However, individual long-term response to clomipramine varied widely, with an overall 40% reduction in symptoms maintained at 4-year follow-up [49] Patients with comorbid anxiety or borderline personality disorders were least likely to maintain treatment response [50]. Trichotillomania is characterized by chronic hair-pulling resulting in noticeable hair loss. In a preliminary study, cerebrospinal fluid (CSF) measures in 8 medication-free, female, trichotillomania patients were compared to those of matched, normal controls. There was no difference between patients and controls in measures of CSF cortisol, 5-hydroxyindoleacetic acid (5-HIAA), homovanillic acid (HVA) and 3-methoxy-4-hydroxyphenylglycol (MHPG) [47]. CSF measures did not correlate with measures of trichotillomania symptomatology. However, degree of response to treatment with serotonin re-uptake inhibitors significantly correlated with baseline CSF 5-HIAA. This suggests that central serotonin turnover is specifically relevant to treatment response to serotonin re-uptake inhibitors in trichotillomania. CSF 5-HIAA as a predictor of treatment response in trichotillomania. number of case reports, with progressively more systematic and controlled investigations in recent years.

#### *Behavioral therapy*

The two modalities that have undergone the most rigorous scientific investigation, and that offer the most promise at present, are pharmacotherapy and behavior therapy [49, 51, 52]. In the first controlled trial of comprehensive behavioral (ComB) treatment of trichotillomania (TTM) [53], after 38 weeks a parallel-group design, participants were randomly assigned to (a) Immediate ComB (12 treatment sessions) or (b) Minimal Attention Control (MAC), followed by delayed ComB after week 12. ComB provides individualized treatment based on factors triggering and maintaining hair pulling. ComB was significantly more likely than MAC (27% vs. 0%) to lead to complete abstinence from hair pulling at week 12. Follow-ups showed good maintenance of effects. So, we conclude that depending on the degree of dermato-compulsion, may psychiatric evaluation and psychotherapy be necessary. This review delves into various facets of trichotillomania pertinent to both understanding the condition and its clinical management. It concludes that recent years have seen significant advancements in research elucidating the phenomenology and comorbidity patterns of trichotillomania [54]. However, the current diagnostic classifications do not adequately capture the complexity of

trichotillomania [55-57]. Studies involving nonclinical populations indicate a higher prevalence than previously recognized, underscoring the need for further epidemiological investigation. Moreover, there is a call for ongoing refinement of etiological models drawing from diverse theoretical frameworks. Body-focused repetitive behavior disorders (BFRBs) include Trichotillomania (TTM; Hair pulling disorder) and Excoriation (Skin Picking) Disorder (SPD). These conditions are prevalent, highly heterogeneous, under-researched, and under-treated [58].

Enhancing the assessment of trichotillomania necessitates the continued development of reliable and valid standardized measures. The article also evaluates pharmacological and psychological interventions, with particular attention to habit-reversal training. While certain interventions show short-term efficacy, high relapse rates underscore the imperative for research aimed at improving long-term treatment outcomes.

Despite recent research endeavors, significant challenges persist in understanding and treating trichotillomania, posing ongoing hurdles for researchers and clinicians alike. Drawing from both the literature review and clinical insights, this paper proposes avenues for future research aimed at addressing the needs of this underserved psychiatric population.

#### *Psycho-neuro-immunology of the skin diseases*

The immune system possesses unique self-regulatory properties and functions, similar to the nervous and endocrine systems [59]. Each of these systems has evolved to respond to specific stimuli from both the internal and external environments, making the immune system comparable to an additional sensory organ. As a protective interface between internal organs and the environment, the skin encounters a host of toxins, pathogenic organisms, and physical stresses [60]. Research indicates that immunoregulatory processes are part of an integrated defense system, an idea central to the field of psychoneuroimmunology, which studies the interactions between behavioral, neural, endocrine, and immune systems [61]. The close embryonic origin of the epidermis and the nervous system from the ectoderm might underlie the psychogenic parallels between the skin and psyche. [62]. Psycho-neuro-immuno-endocrinology (PNIE) has further elucidated the intricate relationships between the immune system, endocrine system, and psychological factors [63, 64]. The skin's role as an immunological organ and its influence on body image and behavior underscores the importance of addressing both physical and psychological aspects when treating dermatological conditions [59]. Understanding that it is the individual who falls ill, rather than just their skin, is crucial for effective treatment and holistic care. [65].

The skin plays an essential role in body image [35]. An individual with compromised skin, especially in exposed areas, often experiences feelings of embarrassment, anxiety, and changes in social behavior. This can lead to disturbances in the perception of one's body and ideals [63, 66]. Conversely, some individuals may exploit these differences to their ad-

vantage or benefit [67]. Regardless of the specific disease, it is crucial to approach treatment with a bidirectional perspective, considering the relationship between the body and the mind. It is important to recognize that it is the individual who becomes ill, not solely their skin, as there is no skin condition that does not affect the psyche. [68].

Currently, numerous studies in the field of psycho-neuro-immuno-skin diseases have explored the correlation between dermatological manifestations and T cell immune disorders [59].

Although only fragments of this complex puzzle are currently understood, we have chosen to review the reciprocal relationships between neural and immune function, endocrine and immune function, and behavior and immune function, following a conventional and somewhat arbitrary approach. Some studies indicating that epidermal Langerhans cells are critical for many immune responses involving the skin. keratinocytes play an important role in epidermal immunologic functions. They secrete factors that modulate various types of skin reactions. the skin is considered as an organ of immunity [65]. Two pathways link the brain and the immune system: the autonomic nervous system and neuroendocrine outflow via the pituitary [60]. Both routes provide biologically active molecules capable of interacting with cells of the immune system.

In allergic contact dermatitis and other delayed type hypersensitivity reactions, Langerhans cells are critical for many immune responses involving the skin and that keratinocytes, they play a role in epidermal immunologic functions by secreting factors that modulate various types of skin reactions. The interaction between keratinocytes cells and secreting factors and lymphoid cells indicates that the skin is an organ of immunity [65].

## 4. Conclusion

The skin and the psyche are an entity that in most of the dermatological disease we are unable to separate one from the other. Dermatologists and psychiatry should work together to better provide care to patients and the dermatological entities discussed in this case presentation of Psychodermatosis and the review of specific treatment and proposed classification. Enhancing the assessment of trichotillomania necessitates the continued development of reliable and valid standardized measures and more appropriated clinical trials exploring treatment options for Psychodermatosis, a complex disease resulting from the interactions between the brain and the skin as genesis of a dermatological disease.

All authors have read and agreed to the published version of the manuscript.

## Acknowledgments

The authors thanks the Santa Casa da Misericordia do Rio



de Janeiro, Brazil where the patients described here were treated.

## Funding

This research received no external funding.

## Conflicts of Interest

The authors declare no conflicts of interest.

## References

- [1] Gupta, M. A. and A. K. Gupta, Psychodermatology: an update. *J Am Acad Dermatol*, 1996. 34(6): p. 1030-46. [https://doi.org/10.1016/s0190-9622\(96\)90284-4](https://doi.org/10.1016/s0190-9622(96)90284-4)
- [2] Yadav, S., T. Narang, and M. S. Kumaran, Psychodermatology: a comprehensive review. *Indian J Dermatol Venereol Leprol*, 2013. 79(2): p. 176-92. <https://doi.org/10.4103/0378-6323.107632>
- [3] Azambuja, R. D., The need of dermatologists, psychiatrists and psychologists joint care in psychodermatology. *An Bras Dermatol*, 2017. 92(1): p. 63-71. <https://doi.org/10.1590/abd1806-4841.20175493>
- [4] Dantzer, R., et al., From inflammation to sickness and depression: when the immune system subjugates the brain. *Nat Rev Neurosci*, 2008. 9(1): p. 46-56. <https://doi.org/10.1038/nrn2297>
- [5] Wilton, E. P., et al., A Neurocognitive Comparison of Pediatric Obsessive-Compulsive Disorder and Trichotillomania (Hair Pulling Disorder). *J Abnorm Child Psychol*, 2020. 48(5): p. 733-744. <https://doi.org/10.1007/s10802-020-00627-6>
- [6] Fitzpatrick, T. B. E., AZ; Wolf, K; Freedberg, IM and Austen, KF, *Dermatology in General Medicine*. New York: McGraw-Hill, 1994. 5 ed: p. 475-486.
- [7] Gate, J., [Psychosomatic medicine and dermatology]. *J Med Lyon*, 1951. 32(757): p. 655-9.
- [8] Koo, J. Y., Psychodermatology update. *West J Med*, 1989. 151(6): p. 652-3.
- [9] Guy, W. B., Psychosomatic dermatology circa 400 B. C. *AMA Arch Derm*, 1955. 71(3): p. 354-6. <https://doi.org/10.1001/archderm.1955.01540270066008>
- [10] Jafferany, M. and K. Franca, Psychodermatology: Basics Concepts. *Acta Derm Venereol*, 2016. 96(217): p. 35-7. <https://doi.org/10.2340/00015555-2378>
- [11] Gryglewski, R. W., [Philosophy of medicine by Ferdynand Karol Dworzaczek]. *Arch Hist Filoz Med*, 2006. 69(1-2): p. 41-6.
- [12] Franca, K., et al., Psychodermatology: a trip through history. *An Bras Dermatol*, 2013. 88(5): p. 842-3.
- [13] Lyons, A. C. C., K, *Becoming ill*. Cambridge University Press, 2006 (Health Psychology A Critical Introduction): p. 140-180.
- [14] 2014., A. I. o. H. a. W. A. s. h. and A. s. h. s. n. C. n. A. C. AIHW., *Health and illness. Australia's health 2014.*, 2014. 14(Australia's health series no. 14. Cat. no. AUS 178. Canberra: AIHW.): p. 1-7.
- [15] Perestrello, D., *A medicina da pessoa*. 4 ed Livraria Athnenu, 1974. 1: p. 102.
- [16] Jafferany, M., B. R. Ferreira, A. Abdelmaksoud, and R. Mkhoyan, Management of psychocutaneous disorders: A practical approach for dermatologists. *Dermatol Ther*, 2020. 33(6): p. e13969. <https://doi.org/10.1111/dth.13969>
- [17] Woods, D. W. and D. C. Houghton, Diagnosis, evaluation, and management of trichotillomania. *Psychiatr Clin North Am*, 2014. 37(3): p. 301-17. <https://doi.org/10.1016/j.psc.2014.05.005>
- [18] Christenson, G. A., R. L. Pyle, and J. E. Mitchell, Estimated lifetime prevalence of trichotillomania in college students. *J Clin Psychiatry*, 1991. 52(10): p. 415-7.
- [19] Rothbaum, B. O., L. Shaw, R. Morris, and P. T. Ninan, Prevalence of trichotillomania in a college freshman population. *J Clin Psychiatry*, 1993. 54(2): p. 72-3.
- [20] Pereyra, A. D. and A. Saadabadi, *Trichotillomania*, in *StatPearls*. 2023: Treasure Island (FL).
- [21] Lin, A., et al., Characteristics of trichotillomania and excoriation disorder across the lifespan. *Psychiatry Res*, 2023. 322: p. 115120. <https://doi.org/10.1016/j.psychres.2023.115120>
- [22] Diefenbach, G. J., et al., Trichotillomania: impact on psychosocial functioning and quality of life. *Behav Res Ther*, 2005. 43(7): p. 869-84. <https://doi.org/10.1016/j.brat.2004.06.010>
- [23] Diefenbach, G. J., S. Mouton-Odum, and M. A. Stanley, Affective correlates of trichotillomania. *Behav Res Ther*, 2002. 40(11): p. 1305-15. [https://doi.org/10.1016/s0005-7967\(02\)00006-2](https://doi.org/10.1016/s0005-7967(02)00006-2)
- [24] Mukundu Nagesh, N., et al., Dermatitis artefacta. *Clin Dermatol*, 2023. 41(1): p. 10-15. <https://doi.org/10.1016/j.clindermatol.2023.02.005>
- [25] Torales, J., et al., Dermatitis Artefacta: A Practical Guide for Diagnosis and Management. *Acta Dermatovenerol Croat*, 2023. 31(1): p. 17-23.
- [26] Mohandas, P., A. Bewley, and R. Taylor, Dermatitis artefacta and artefactual skin disease: the need for a psychodermatology multidisciplinary team to treat a difficult condition. *Br J Dermatol*, 2013. 169(3): p. 600-6. <https://doi.org/10.1111/bjd.12416>
- [27] Di Brizzi, E. V., et al., Dermatitis Artefacta: A Retrospective Descriptive Study on 46 Patients. *Dermatol Pract Concept*, 2024. 14(2). <https://doi.org/10.5826/dpc.1402a53>

- [28] Kothari, R., D. Vashisht, and D. Madhab Tripathy, Dermatitis Artefacta. *Indian J Dermatol Venereol Leprol*, 2023: p. 1. [https://doi.org/10.25259/IJDVL\\_922\\_2022](https://doi.org/10.25259/IJDVL_922_2022)
- [29] Koblenzer, C. S. and R. Gupta, Neurotic excoriations and dermatitis artefacta. *Semin Cutan Med Surg*, 2013. 32(2): p. 95-100. <https://doi.org/10.12788/j.sder.0008>
- [30] Hines, L., et al., Parental neurotic excoriation injury of children: A case series of hidden physical abuse. *Pediatr Dermatol*, 2021. 38(4): p. 859-863. <https://doi.org/10.1111/pde.14623>
- [31] Leclercq, M. and M. Musalek, [Infestational delirium: entomophobia, acarophobia, parasitic dermatophobia. Psychopathology and therapy]. *Rev Med Liege*, 1992. 47(6): p. 305-13.
- [32] Sabry, A. H., M. A. Fouad, and A. T. Morsy, Entomophobia, acarophobia, parasitic dermatophobia or delusional parasitosis. *J Egypt Soc Parasitol*, 2012. 42(2): p. 417-30. <https://doi.org/10.12816/0006328>
- [33] Suganthan, J. S., et al., Delusional parasitosis over dermatological morbidity: diagnostic and therapeutic challenges. *Trop Doct*, 2009. 39(1): p. 49-50. <https://doi.org/10.1258/td.2008.080021>
- [34] Schrut, A. H. and W. G. Waldron, Psychiatric and Entomological Aspects of Delusory Parasitosis. Entomophobia, Acarophobia, Dermatophobia. *JAMA*, 1963. 186: p. 429-30. <https://doi.org/10.1001/jama.1963.63710040008018b>
- [35] Gupta, M. A., A. K. Gupta, C. N. Ellis, and C. S. Koblenzer, Psychiatric evaluation of the dermatology patient. *Dermatol Clin*, 2005. 23(4): p. 591-9. <https://doi.org/10.1016/j.det.2005.05.005>
- [36] Christenson, G. A., M. K. Popkin, T. B. Mackenzie, and G. M. Realmuto, Lithium treatment of chronic hair pulling. *J Clin Psychiatry*, 1991. 52(3): p. 116-20.
- [37] Childers, R. T., Jr., Report of two cases of trichotillomania of long standing duration and their response to chlorpromazine. *J Clin Exp Psychopathol*, 1958. 19(2): p. 141-4.
- [38] Snyder, S., Trichotillomania treated with amitriptyline. *J Nerv Ment Dis*, 1980. 168(8): p. 505-7. <https://doi.org/10.1097/00005053-198008000-00011>
- [39] Reid, T. L., Treatment of generalized anxiety disorder and trichotillomania with buspirone. *Am J Psychiatry*, 1992. 149(4): p. 573-4. <https://doi.org/10.1176/ajp.149.4.573b>
- [40] Krishnan, R. R., J. Davidson, and R. Miller, MAO inhibitor therapy in trichotillomania associated with depression: case report. *J Clin Psychiatry*, 1984. 45(6): p. 267-8.
- [41] Mahr, G., Fenfluramine and trichotillomania. *Psychosomatics*, 1993. 34(3): p. 284. [https://doi.org/10.1016/S0033-3182\(93\)71897-6](https://doi.org/10.1016/S0033-3182(93)71897-6)
- [42] Perciaccante, M. and R. G. Perciaccante, Progestin treatment for obsessive-compulsive disorder. *Psychosomatics*, 1993. 34(3): p. 284-5. [https://doi.org/10.1016/S0033-3182\(93\)71898-8](https://doi.org/10.1016/S0033-3182(93)71898-8)
- [43] Christenson, G. A., T. B. Mackenzie, and J. E. Mitchell, Characteristics of 60 adult chronic hair pullers. *Am J Psychiatry*, 1991. 148(3): p. 365-70. <https://doi.org/10.1176/ajp.148.3.365>
- [44] Ristvedt, S. L. and G. A. Christenson, The use of pharmacologic pain sensitization in the treatment of repetitive hair-pulling. *Behav Res Ther*, 1996. 34(8): p. 647-8. [https://doi.org/10.1016/0005-7967\(96\)00032-0](https://doi.org/10.1016/0005-7967(96)00032-0)
- [45] Carrion, V. G., Naltrexone for the treatment of trichotillomania: a case report. *J Clin Psychopharmacol*, 1995. 15(6): p. 444-5. <https://doi.org/10.1097/00004714-199512000-00012>
- [46] Christenson, G. A. and S. J. Crow, The characterization and treatment of trichotillomania. *J Clin Psychiatry*, 1996. 57 Suppl 8: p. 42-7; discussion 48-9.
- [47] Ninan, P. T., et al., A placebo-controlled trial of cognitive-behavioral therapy and clomipramine in trichotillomania. *J Clin Psychiatry*, 2000. 61(1): p. 47-50. <https://doi.org/10.4088/jcp.v61n0111>
- [48] Swedo, S. E., et al., A double-blind comparison of clomipramine and desipramine in the treatment of trichotillomania (hair pulling). *N Engl J Med*, 1989. 321(8): p. 497-501. <https://doi.org/10.1056/NEJM198908243210803>
- [49] Swedo, S. E., M. C. Lenane, and H. L. Leonard, Long-term treatment of trichotillomania (hair pulling). *N Engl J Med*, 1993. 329(2): p. 141-2. <https://doi.org/10.1056/NEJM199307083290220>
- [50] Lenane, M. C., et al., Rates of Obsessive-Compulsive Disorder in first degree relatives of patients with trichotillomania: a research note. *J Child Psychol Psychiatry*, 1992. 33(5): p. 925-33. <https://doi.org/10.1111/j.1469-7610.1992.tb01966.x>
- [51] Diefenbach, G. J., et al., Group treatment for trichotillomania: behavior therapy versus supportive therapy. *Behav Ther*, 2006. 37(4): p. 353-63. <https://doi.org/10.1016/j.beth.2006.01.006>
- [52] Rahman, S. M., M. Jafferany, and R. Barkauskaite, Habit Reversal Training: A psychotherapeutic approach in treating Body-Focused Repetitive Behavior Disorders. *Clin Exp Dermatol*, 2023. <https://doi.org/10.1093/ced/llad247>
- [53] Carlson, E. J., et al., Comprehensive Behavioral (ComB) Treatment of Trichotillomania: A Randomized Clinical Trial. *Behav Ther*, 2021. 52(6): p. 1543-1557. <https://doi.org/10.1016/j.beth.2021.05.007>
- [54] Diefenbach, G. J., D. Reitman, and D. A. Williamson, Trichotillomania: a challenge to research and practice. *Clin Psychol Rev*, 2000. 20(3): p. 289-309. [https://doi.org/10.1016/S0272-7358\(98\)00083-x](https://doi.org/10.1016/S0272-7358(98)00083-x)
- [55] Lamothe, H., J. M. Baleyte, L. Mallet, and A. Pelissolo, Trichotillomania is more related to Tourette disorder than to obsessive-compulsive disorder. *Braz J Psychiatry*, 2020. 42(1): p. 87-104. <https://doi.org/10.1590/1516-4446-2019-0471>

- [56] Maraz, A., B. Hende, R. Urban, and Z. Demetrovics, Pathological grooming: Evidence for a single factor behind trichotillomania, skin picking and nail biting. *PLoS One*, 2017. 12(9): p. e0183806.  
<https://doi.org/10.1371/journal.pone.0183806>
- [57] Snorrason, I., et al., Hair pulling disorder and skin picking disorder have relatively limited associations with negative emotionality: A meta-analytic comparison across obsessive-compulsive and related disorders. *J Anxiety Disord*, 2023. 98: p. 102743.  
<https://doi.org/10.1016/j.janxdis.2023.102743>
- [58] Grant, J. E., et al., Identifying subtypes of trichotillomania (hair pulling disorder) and excoriation (skin picking) disorder using mixture modeling in a multicenter sample. *J Psychiatr Res*, 2021. 137: p. 603-612.  
<https://doi.org/10.1016/j.jpsychires.2020.11.001>
- [59] Ader, R., N. Cohen, and D. Felten, Psychoneuroimmunology: interactions between the nervous system and the immune system. *Lancet*, 1995. 345(8942): p. 99-103.  
[https://doi.org/10.1016/s0140-6736\(95\)90066-7](https://doi.org/10.1016/s0140-6736(95)90066-7)
- [60] Salmon, J. K., C. A. Armstrong, and J. C. Ansel, The skin as an immune organ. *West J Med*, 1994. 160(2): p. 146-52.
- [61] Krueger, G. G. and G. Stingl, Immunology/inflammation of the skin--a 50-year perspective. *J Invest Dermatol*, 1989. 92(4 Suppl): p. 32S-51S.
- [62] Bos, J. D. and M. L. Kapsenberg, [The immune system of the skin]. *Ned Tijdschr Geneesk*, 1995. 139(31): p. 1587-91.
- [63] Klionsky, D. J., et al., Guidelines for the use and interpretation of assays for monitoring autophagy (4th edition) (1). *Autophagy*, 2021. 17(1): p. 1-382.
- [64] Tomaszewska, K., A. Slodka, B. Tarkowski, and A. Zalewska-Janowska, Neuro-Immuno-Psychological Aspects of Chronic Urticaria. *J Clin Med*, 2023. 12(9).  
<https://doi.org/10.3390/jcm12093134>
- [65] Katz, S. I., The skin as an immunologic organ. A tribute to Marion B. Sulzberger. *J Am Acad Dermatol*, 1985. 13(3): p. 530-6. [https://doi.org/10.1016/s0190-9622\(85\)70195-8](https://doi.org/10.1016/s0190-9622(85)70195-8)
- [66] Blalock, S. J., B. J. Bunker, and R. F. DeVellis, Psychological distress among survivors of burn injury: the role of outcome expectations and perceptions of importance. *J Burn Care Rehabil*, 1994. 15(5): p. 421-7.  
<https://doi.org/10.1097/00004630-199409000-00008>
- [67] Rasmussen, J., Psychosomatic Dermatology. *Arch Dermatol*, 1990. 126: p. 90-93.
- [68] Lee, H. G., C. Stull, and G. Yosipovitch, Psychiatric disorders and pruritus. *Clin Dermatol*, 2017. 35(3): p. 273-280.