


Non-suicidal self-injury in trichotillomania and skin picking disorder

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Original Research

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Abstract

Background. Trichotillomania and skin picking disorder have been characterized as body-focused repetitive behavior (BFRB) disorders (i.e., repetitive self-grooming behaviors that involve biting, pulling, picking, or scraping one's own hair, skin, lips, cheeks, or nails). Trichotillomania and skin picking disorder have also historically been classified, by some, as types of compulsive self-injury as they involve repetitive hair pulling and skin picking, respectively. The question of the relationship of these disorders to more conventional forms of self-injury such as cutting or self-burning remains incompletely investigated. The objective of this study was to examine the relationship of these two disorders with non-suicidal self-injury (NSSI).

Methods. Adults with trichotillomania ($n = 93$) and skin picking ($n = 105$) or both ($n = 82$) were recruited from the general population using advertisements and online support groups and completed an online survey. Participants completed self-report instruments to characterize clinical profiles and associated characteristics. In addition, each participant completed a mental health history questionnaire.

Results. Of the 280 adults with BFRB disorders, 141 (50.1%) reported a history of self-injury independent of hair pulling and skin picking. Participants with a history of self-injury reported significantly worse pulling and picking symptoms ($p < .001$) and were significantly more likely to have co-occurring alcohol problems ($p < .001$), borderline personality disorder ($p < .001$), buying disorder ($p < .001$), gambling disorder ($p < .001$), compulsive sex behavior ($p < .001$), and binge eating disorder ($p = .041$).

Conclusions. NSSI appears common in trichotillomania and skin picking disorder and may be part of a larger constellation of behaviors associated with impulse control or reward-related dysfunction.

Introduction

Trichotillomania and skin picking disorder were originally characterized by an impaired ability to resist impulses to engage in ultimately self-destructive behavior (or behavior with deleterious long-term consequences) and were categorized in the Diagnostic and Statistical Manual (DSM) as impulse control disorders. This category underwent changes over the years and, in DSM-5, these disorders were moved to the category of obsessive-compulsive disorder and related disorders.¹ Trichotillomania and skin picking disorder were included within the obsessive-compulsive spectrum disorders due to evidence showing both disorders' relatedness to obsessive-compulsive disorder (OCD) in terms of shared phenomenology, patterns of familial aggregation, and data on etiologic mechanisms.¹ Alternatively, and perhaps more importantly though, the co-occurrence of these disorders with other disorders having self-destructive features of impulsivity may have treatment implications.

Several years ago, authors referred to trichotillomania quite explicitly as a form of self-injurious behavior² and theorized that it perhaps belonged in a self-harm continuum.³ The question remains whether there is any evidence supporting this relationship. One way to better understand this relationship would be to look for evidence of co-occurring overlap. An examination of comorbid overlap, however, would appear to also rely, to some degree, on knowing the prevalence of self-injury in the general population. Klonsky⁴ examined the prevalence and nature of non-suicidal self-injury (NSSI) (defined as the deliberate, self-directed damage of body tissue without suicidal intent, often by cutting, burning, scratching, or hitting oneself) using random-digit dialing (RDD) in a sample of 439 adults in the United States. The lifetime prevalence of NSSI was 5.9%, and the 12-month prevalence was 0.9%. Similarly, a recent meta-analysis showed that the prevalence of NSSI is 5.5% among adults.⁵ The problem for our current purposes is that many NSSI studies (e.g., ref. 4) include skin picking within the options of self-injury, thereby complicating our interpretation of prevalence rates. This is not uncommon as many researchers have adopted a broad definition of NSSI that includes skin picking, hair pulling, and other

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body-focused repetitive behavior disorders such as lip biting and nail biting (body-focused repetitive behavior disorders being defined as repetitive self-grooming behaviors that involve biting, pulling, picking, or scraping one's own hair, skin, lips, cheeks, or nails).^{6–8} Some have argued that there may be considerable phenomenological overlap between trichotillomania, skin picking disorder, and NSSI.⁹

If there is some biopsychosocial overlap between these disorders, one might expect NSSI to be more commonly observed in the histories of people with trichotillomania or skin picking. In one unpublished study, the authors found that in a sample of 186 adults with trichotillomania, 6.9% reported intentionally cutting,¹⁰ a rate slightly higher than that reported in two previous studies of the general population.^{4,5} Snorrason and colleagues examined the prevalence and correlates of trichotillomania and skin picking disorder in an acute psychiatric sample of 599 patients in a psychiatric partial hospital and found that neither trichotillomania nor skin picking disorder was significantly associated with NSSI, borderline personality disorder, or major depressive disorder.¹¹

Another means of understanding any possible relationship between NSSI and trichotillomania/skin picking is to examine features of these disorders to see whether commonality exists. Toward that end, Mathew and colleagues¹² examined clinical characteristics and symptom features of 165 adults with NSSI compared to 1358 adults with a range of body-focused repetitive behavior disorders (including trichotillomania and skin picking, but the majority were people who bit their nails or bit their cheeks). The NSSI group was more likely than the body-focused repetitive behavior disorders group to report engaging in the behavior for social-affective reasons or to regulate tension and feelings of emptiness. In contrast, individuals in the body-focused repetitive behavior disorders group were more likely to engage in the behavior automatically, to reduce boredom, or to fix appearance.

Despite some potentially common clinical symptoms and comorbidity overlap, there has been little research into the relationship of NSSI and trichotillomania or skin picking disorder. Comorbidity studies in trichotillomania and skin picking disorder have not generally screened for NSSI. Our understanding of the comorbidity of NSSI with trichotillomania and skin picking disorder may have nosological importance, as well as implications for models of possible pathophysiology and for treatment. This study therefore had two main purposes: first, to determine the rates of NSSI in adults with trichotillomania and/or skin picking disorder and, second, to examine how the comorbidity of NSSI relates to clinical features of trichotillomania and skin picking (by examining a range of clinical measures, e.g., the severity of hair pulling and skin picking symptoms), as well as other comorbidities, to see whether the comorbidity may provide clues to distinct subtypes of trichotillomania and skin picking disorder.

Methods

Participants

Participants included 280 adults recruited from the general population via media advertisements and support websites who completed an online survey. The inclusion criteria for the clinical sample were as follows: a) DSM-5 diagnosis of trichotillomania or skin picking disorder, b) aged 18–65 years, c) fluency in English, and d) capable of providing informed consent. Participants were excluded if they were unable to give informed consent or to understand/undertake the study procedures.

The Institutional Review Board of the University of Chicago approved the study and the consent statement (IRB ethical approval number: IRB21–1267). The authors assert that all procedures contributing to this work comply with the ethical standards of the relevant national and institutional committees on human experimentation and with the Helsinki Declaration of 1975, as revised in 2008.

Survey

Participants were first required to view the IRB-approved online informed consent page, at which point an individual could choose to participate in the survey or opt out. The survey asserted that all information was confidential. The survey was open from April 20, 2023, to May 11, 2023. Compensation was offered at the end of the survey by random prize drawings. Participants were informed that those completing the survey would be entered into a prize draw, whereby 15 people would be randomly chosen to receive a \$100 gift certificate. Participants were assured that their contact details for the prize draw would be stored completely separately from their survey responses, in order to ensure that their responses were kept completely confidential. Only those individuals completing all measures were reported in the analyses. REDCap was used to collect survey responses. Quality checks were performed through rule logic used throughout the survey, which automatically vetted responses for inclusion/exclusion criteria and checked for discrepancies. REDCap also disconnected and excluded users from the survey who had already completed the survey on a particular device. It also captured the time taken by the participants to complete the survey, and people who completed it in <10 minutes were flagged. The data comparison module on REDCap was also used after data collection to assess for duplicate/very similar responses. Each response was also reviewed individually to check for inconsistency or very bizarre responses.

Assessments

The online survey collected data regarding demographic characteristics, along with questions related to trichotillomania and skin picking disorder, and previously diagnosed psychiatric comorbidities (participants were given a list of psychiatric disorders and asked to mark the ones with which they had been diagnosed). Each participant completed the self-report version of the Minnesota Impulsive Disorders Interview version 2.0 (MIDI 2.0)¹³, to verify the diagnosis of trichotillomania and/or skin picking disorder (using questions that mirror the DSM-5 criteria) and to identify other relevant impulsive/compulsive conditions (beyond trichotillomania/skin picking).

Participants were asked a single question regarding whether during their lifetimes, they had engaged in NSSI: Have you ever engaged in non-suicidal self-injurious behavior (this does not include picking, pulling, or biting behaviors)? NSSI was defined for the survey as the deliberate, self-directed damage of body tissue without suicidal intent, often by cutting, burning, scratching, or hitting oneself.⁴

Additionally, participants completed the following scales: Generic BFRB Scale-8¹⁴ (a reliable and valid global measure of symptom severity and impairment due to behaviors such as hair pulling and skin picking)—the scale had very good internal consistency in the present study ($\alpha = 0.80$); *Alcohol Use Disorders Identification Test*¹⁵ (to assess alcohol use and its effects)—the scale had excellent internal consistency in the present study ($\alpha = 0.93$);

Primary Care PTSD Screen¹⁶ (a screen for post-traumatic stress disorder (PTSD); a score of ≥ 5 indicates likely PTSD)—the PTSD screen had excellent internal consistency in the present study ($\alpha = 0.92$); Dissociative Experiences Scale (DES)¹⁷ (to measure the frequency of dissociative experiences)—the scale had excellent internal consistency in the present study ($\alpha = 0.97$); and the Personality Assessment Inventory—BPD module¹⁸ (screens for borderline personality disorder)—the scale had good internal consistency in the present study ($\alpha = .88$).

Statistics

The percentage of participants who answered the NSSI affirmatively was determined. Between-group differences were tested

Table 1. Clinical Characteristics of the Participants with Trichotillomania and Skin Picking Disorder

| | Trichotillomania (N = 175) | Skin picking disorder (N = 187) | All participants (N = 280) |
|--|-------------------------------|---------------------------------------|----------------------------------|
| Age, mean (SD) | 28.39 (6.55) | 29.39 (8.35) | 29.10 (7.87) |
| Sex | | | |
| Female | 135 (77.1) | 158 (84.5) | 223 (79.6) |
| Male | 40 (22.9) | 27 (14.4) | 55 (19.6) |
| Intersex | 0 (0) | 2 (1.1) | 2 (0.7) |
| Race, n (%) | | | |
| Caucasian | 132 (75.4) | 167 (89.3) | 232 (82.9) |
| African American | 13 (7.4) | 4 (2.1) | 15 (5.4) |
| Asian | 11 (6.3) | 4 (2.1) | 11 (3.9) |
| Native American | 1 (0.6) | 0 (0) | 1 (0.4) |
| Other/mixed race | 8 (4.6) | 12 (6.4) | 21 (7.5) |
| NSSI, n (%) who screened positive | 93 (53.1) | 98 (52.4) | 141 (50.1) |
| GBS-8, mean (SD) | 16.86 (4.19) | 16.73 (4.16) | 16.81 (4.25) |
| DES, mean (SD) | 33.85 (22.61) | 28.39 (8.35) | 30.53 (21.70) |
| PAI-BPD screen, n (%) who screened positive | 71 (40.6) | 70 (37.4) | 105 (37.5) |
| Psychiatric comorbidities, n (%) | | | |
| ADHD | 55 (31.4) | 57 (30.5) | 83 (29.6) |
| Alcohol use disorder | 10 (5.7) | 11 (5.9) | 17 (6.1) |
| Generalized anxiety disorder | 86 (49.2) | 116 (62.0) | 149 (53.2) |
| Major depressive disorder | 90 (51.4) | 109 (58.3) | 143 (51.1) |
| OCD | 33 (18.9) | 39 (20.9) | 53 (18.9) |
| PTSD | 22 (12.6) | 29 (15.5) | 37 (13.2) |
| Substance use disorder | 7 (4.0) | 8 (4.3) | 11 (3.9) |

Note: "All participants" includes those with trichotillomania, skin picking disorder, or both. The category of trichotillomania includes all participants with trichotillomania as well as both trichotillomania plus skin picking and the category of skin picking disorder includes those with skin picking disorder plus trichotillomania.

Abbreviations: ADHD, attention deficit hyperactivity disorder; DES, dissociative experiences scale; GBS-8, generic BFRB scale-8; NSSI, non-suicidal self-injury; PAI-BPD, personality assessment inventory—BPD module; PTSD, post-traumatic stress disorder.

using the Pearson chi-square for categorical variables and two-tailed independent sample t-tests for continuous variables. Demographics and current comorbid psychiatric diagnoses were presented as frequencies. Variables assessing the severity of hair pulling and skin picking symptoms (Generic BFRB Scale-8 scores) were calculated as mean values accompanied by standard deviations. The level of significance for all statistical tests was set at 0.05.

Results

The study comprised 280 adults with trichotillomania or skin picking disorder (mean age = 29.1 [SD = 7.87] years [range 18 to 58 yrs]; 79.6% female), of whom 93 had trichotillomania, 105 had skin picking disorder, and 82 had both. All participants (100%) who self-reported diagnoses of skin picking disorder and trichotillomania had diagnoses confirmed through the MIDI. For the entire sample of 280, the number and percentages of people in different racial-ethnic categories were as follows: Caucasian—232 (82.9%), Black—15 (5.4%), Asian—11 (3.9%), Native Hawaiian or Pacific Islander—1 (0.4%), and other/mixed race—21 (7.5%).

Of the 280 adults with BFRB disorders, 141 (50.4%) screened positive for having a history of NSSI unrelated to body-focused repetitive behaviors. Rates of NSSI did not differ between those with trichotillomania compared to those with skin picking disorder [$X^2(1) = 0.020, p = 0.89$] (see Table 1).

The BFRB adults with NSSI did not significantly differ from those without NSSI in terms of age, gender, or race/ethnicity (all $p > .05$). There were, however, important clinical differences between the two groups (see Table 2). It can be seen that having NSSI was significantly associated with worse symptom severity of hair pulling or skin picking according to the Generic BFRB Scale [17.49 (4.11) compared to 16.13 (4.28); $t(278) = -2.71; p = .007$], greater dissociative symptoms [36.84 (23.19) compared to 24.05 (17.96); $t(278) = -4.90; p < .001$], a greater likelihood to screen positive for borderline personality disorder [$X^2(1) = 29.84; p < .001$], a greater likelihood to have problematic alcohol use [$X^2(1) = 7.41; p = .006$], and a greater likelihood to screen positive for a compulsive buying disorder [$X^2(1) = 12.27; p < .001$], gambling disorder [$X^2(1) = 11.93; p < .001$], compulsive sexual behavior [$X^2(1) = 14.23; p < .001$], and binge eating disorder [$X^2(1) = 4.16, p = .041$] based on the MIDI. Rates of other disorders, including PTSD, did not significantly differ between groups (Table 2).

When we examined the relationship between NSSI and hair pulling and skin picking symptom severity, we found that after controlling for borderline personality disorder comorbidity, this relationship was no longer significant [ANCOVA, controlling for probable borderline personality disorder diagnosis, $F(2, 277) = 1.80, p = .18$]. Symptom severity of skin picking/hair pulling was significantly higher in individuals who had probable borderline personality disorder than in those who did not have borderline personality disorder [$t(278) = -4.62, p < .001$].

Discussion

Participants with trichotillomania and skin picking disorder appear to suffer from high rates of lifetime NSSI. The rate of NSSI in this sample (50.4%) is considerably higher than the rate reported in the general population (5.9%)⁴ and higher than the rates found in eating disorders (27.3%),¹⁹ mood disorders (43.3%),²⁰ and Tourette's syndrome (39.49%),²¹ but lower than rates seen in personality disorders (52–67%).^{22,23}

Table 2. Clinical Differences in Adults with Trichotillomania/Skin Picking plus NSSI Compared to Those without non-suicidal self-injury (NSSI)

| | NSSI (N = 141) | No NSSI (N = 139) | Statistic |
|--|-------------------|----------------------|-------------------------------------|
| Age, mean (SD) | 28.77 (7.60) | 29.345 (8.15) | $t(278) = .72$, $p = .47$ |
| Sex | | | $\chi^2(2) = 5.42$, $p = .066$ |
| Female | 107 (75.9) | 116 (83.5) | |
| Male | 34 (24.1) | 21 (15.1) | |
| Intersex | 0 (0) | 2 (1.1) | |
| Race, n (%) | | | $\chi^2(4) = 4.28$, $p = .37$ |
| Caucasian | 112 (79.4) | 120 (86.3) | |
| African American | 9 (6.4) | 6 (4.3) | |
| Asian | 6 (4.3) | 5 (3.6) | |
| Native American | 0 (0) | 1 (0.7) | |
| Other/mixed race | 14 (9.9) | 7 (5.0) | |
| GBS-8, mean (SD) | 17.49 (4.11) | 16.13 (4.28) | $t(278) = -2.71$, $p = .007$ |
| DES, mean (SD) | 36.84 (23.19) | 24.05 (17.96) | $t(278) = -4.90$, $p < .001$ |
| PAI-BPD screen, n (%) who screened positive | 75 (53.2) | 30 (21.6) | $\chi^2(1) = 29.84$, $p < .001$ |
| Psychiatric comorbidities, n (%) | | | |
| ADHD | 48 (34.0) | 35 (25.2) | $\chi^2(1) = 29.84$, $p = .10$ |
| Alcohol use disorder | 14 (9.9) | 3 (2.1) | $\chi^2(1) = 7.41$, $p = .006$ |
| Generalized anxiety disorder | 70 (49.7) | 79 (56.8) | $\chi^2(1) = 1.45$, $p = .228$ |
| Major depressive disorder | 79 (56.0) | 64 (46.0) | $\chi^2(1) = 2.79$, $p = .095$ |
| Obsessive-compulsive disorder | 27 (19.2) | 26 (18.7) | $\chi^2(1) = .009$, $p = .92$ |
| PTSD | 19 (13.5) | 18 (13.0) | $\chi^2(1) = .017$, $p = .90$ |
| Substance use disorder | 8 (5.7) | 3 (2.2) | $\chi^2(1) = 2.29$, $p = .13$ |
| Compulsive buying disorder ^a | 32 (23.4) | 12 (9.5) | $\chi^2(1) = 12.27$, $p < .001$ |
| Kleptomania ^a | 6 (4.5) | 2 (1.6) | $\chi^2(1) = 1.85$, $p = .17$ |
| Intermittent explosive disorder ^a | 1 (0.8) | 2 (1.6) | $\chi^2(1) = 0.39$, $p = .53$ |
| Gambling disorder ^a | 17 (12.7) | 2 (1.6) | $\chi^2(1) = 11.93$, $p < .001$ |
| Compulsive sexual behavior ^a | 29 (21.6) | 7 (5.5) | $\chi^2(1) = 14.23$, $p < .001$ |
| Binge eating disorder ^a | 23 (17.2) | 11 (8.7) | $\chi^2(1) = 4.16$, $p = .041$ |

Abbreviations: ADHD, attention deficit hyperactivity disorder; DES, dissociative experiences scale; GBS-8, generic BFRB scale-8; NSSI, non-suicidal self-injury; PAI-BPD, personality assessment inventory—BPD module; PTSD, post-traumatic stress disorder.

^aBased on a sample size of $n = 261$ due to missing data for the MIDI.

Perhaps more important than the elevated rate of NSSI among adults with trichotillomania and skin picking disorder is the idea that NSSI comorbidity appears to be significantly associated with certain important clinical phenomena, specifically worse symptom severity and higher rates of behavioral and substance addictions and borderline personality disorder. Of these findings, an association with probable borderline personality disorder may be one of the most important findings clinically. The relationship between NSSI and pulling/picking symptom severity was significant in those cases with borderline personality disorder comorbidity, and therefore, picking/pulling in some cases may be reflective of deficits in impulsive control, coping skills, or identity disturbance. Understanding the specific criterion, or clusters of criteria, of borderline personality disorder that may underpin the severity of pulling/picking will need larger samples but may provide valuable clinical clues for developing new treatments. Some initial evidence for understanding this approach to trichotillomania and skin picking comes from early studies that found dialectical behavior therapy (typically used in borderline personality disorder) as effective for trichotillomania when added to standard habit reversal therapy.^{24,25}

The comorbidity with a range of impulsive behaviors may further suggest a subtype of trichotillomania and skin picking defined by higher levels of impulsivity and possible dysregulation of the reward circuitry or the circuitry of top-down control in a particular subset of people with trichotillomania and skin picking disorder.²⁶ All of these co-occurring behaviors could all stem from a difficulty in inhibiting oneself when urges to pick, pull, cut, burn, and so forth are experienced. These explanations might suggest that treatments focusing on shared cognitive deficits such as inhibition or reward deficiency might be useful targets for those with trichotillomania and skin picking when they co-occur with NSSI.

The comorbidity with NSSI also suggests provocatively that perhaps a subtype of people with trichotillomania and skin picking disorder has some sort of altered pain sensitivities. Although hair pulling would likely be painful for healthy individuals, those with trichotillomania and skin picking usually do not report pulling-/picking-related pain.²⁷⁻³⁰ In some of these people, however, it may be possible that NSSI is engaged in purposes or feelings other than pain sensation. Thus, this comorbidity may hold clues to future pain research in this subset of people with trichotillomania and skin picking.

While this is one of the first published studies we are aware of that examined rates of NSSI in trichotillomania and skin picking, several limitations should be considered. A primary limitation of this study is that participants were recruited solely through an online survey, thus bypassing clinical evaluation. Moreover, the screening for NSSI was a single question framed as a lifetime question. Frequency, severity, and chronic nature of the NSSI are therefore unknown. Furthermore, we recognize that some caution is needed when comparing the rate of NSSI reported here to that reported in previous studies carried out in other settings due to different methods used for measuring NSSI. Another limitation is that while we collected data using many validated instruments, the psychiatric comorbidity data were collected simply as self-report. This may have led to an under- or overestimation of various psychiatric disorders. Additionally, approximately 80% of the sample were female. While this percentage mirrors some studies in trichotillomania and skin picking disorder,²⁵ there have been other reports suggesting that the gender ratio is perhaps more evenly distributed.³¹ Given this potential issue, this study may not reflect all members of the population with trichotillomania and skin

picking disorder. Finally, some of the cell sizes for chi-square were relatively small, but given that the group differences were nearly all highly significant, this may not have affected the results.

In conclusion, we found that adults with trichotillomania and skin picking disorder endorsed a high lifetime rate of NSSI and that the comorbidity with NSSI was associated with unique clinical features. What this implies about the nosology of the trichotillomania and skin picking disorder (at least in a subset of people with these disorders) awaits replication of these findings. The clinical aspects of NSSI may suggest new targets for treatment. Future work should explore the interactive effects of NSSI, borderline personality disorder, and alcohol use disorder with hair pulling and skin picking to better understand possible pathophysiology of this subset of people.

Author contribution. Data curation: M.C., J.E.G.; Formal analysis: M.C.; Methodology: M.C., J.E.G.; Project administration: M.C., J.E.G.; Writing – review & editing: M.C., J.E.G.; Conceptualization: J.E.G.; Investigation: J.E.G.; Resources: J.E.G.; Writing – original draft: J.E.G.

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