

# Is Trichotillomania a Stereotypic Movement Disorder? An Analysis of Body-Focused Repetitive Behaviors in People with Hair-Pulling

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**Background.** *Stereotypic movement disorder (SMD) is characterized by nonfunctional repetitive movements, is typically diagnosed in people with intellectual disability, and by definition excludes people with trichotillomania (TTM). Nevertheless, hair-pulling may be one of a number of body-focused repetitive behaviors (BFRBs) that are seen in the general population. Comorbidity of symptoms might support the idea that they are indicative of an underlying stereotypic disorder, and we therefore explored their frequency in people with hair-pulling.*

**Methods.** *Participants were recruited with the help of the Trichotillomania Learning Center, the largest advocacy group for people with hair-pulling. Participants completed a self-report survey on the Internet, which included questions about the presence of both hair-pulling and other BFRBs. Measures included the Massachusetts General Hospital Hairpulling Scale (MGH-HS), the Milwaukee Inventory for Subtypes of Trichotillomania-Adult Version (MIST-A), the Depression and Anxiety Stress Scale (DASS), and the Sheehan Disability Scale (SDS).*

**Results.** *The majority of participants with hair-pulling (70%) report the presence of other BFRBs, most commonly skin-picking and nail-biting. There were particularly strong associations between the total number of BFRBs and increased scores on ratings of focused hair-pulling, depression, anxiety, stress, and functional impairment. Similar results were found in participants who met more rigorous criteria for trichotillomania.*

**Conclusions.** *This study is limited by its self-report nature, and by the lack of detailed information on the phenomenology of comorbid BFRBs. While further nosological research is needed, the high rates of these behaviors in people with hair-pulling, and their association with increased disability, is consistent with previous clinical observations, and supports the*

*argument that trichotillomania can usefully be conceptualized as a stereotypic disorder. Speculatively, this argument may be especially valid in trichotillomania patients with more focused hair-pulling symptoms.*

**Keywords** Stereotypic Movement Disorder, Trichotillomania, Body-Focused Repetitive Behaviors, Hair-Pulling, Nail-Biting, Skin-Picking

Stereotypic movement disorder (SMD) is characterized by repetitive, non-functional, motor movements such as hand-wringing, head-banging, or lip-biting (1). Although the disorder has typically been diagnosed in patients with intellectual disability, there is also evidence of its existence in intellectually normal people (2,3). DSM-IV-TR diagnostic criteria for SMD emphasize the medical complications of SMD, and currently exclude patients with trichotillomania.

Despite the classification of trichotillomania (TTM) as an impulse control disorder, it has much in common with SMD. Hair-pulling is often repetitive, and apparently non-functional (although, at a deeper level of analysis it may allow affect regulation (4). Hair-pulling and other body-focused repetitive behaviors (BFRBs) such as skin-picking and nail-biting, are relatively common and can be disabling (5–9). They may also have other shared features, such as onset in adolescence. In addition, in clinical populations, these conditions may respond to habit reversal therapy (10).

Observations that TTM is phenomenologically and psychobiologically dissimilar both from other impulse control disorders, as well as from obsessive-compulsive disorder (11–13), strengthen the argument that TTM can be understood as a stereotypic disorder. These distinctions are not merely theoretical, as they impact treatment choice; current approaches to the pharmacotherapy of trichotillomania, for example, are influenced by the hypothesis that it is an OCD spectrum disorder (14).

Increased comorbidity of hair-pulling with other BFRBs or self-injurious habits, such as nail-biting and skin-picking, might support the idea that they are indicative of an underlying stereotypic disorder. In this paper, we explore a large database of participants with self-reported hair-pulling, in order to determine the comorbidity of BFRBs in TTM, as well as their association with disability.

## **METHODS**

### **Participants**

Study methods have been reported elsewhere in more detail (15). In brief, the Trichotillomania Impact Project (TIP) was designed to assess the phenomenology of hair-pulling and its associated functional impact. Participants were recruited with the help of the Trichotillomania Learning Center, a large advocacy group, via a link on its home page ([www.trich.org](http://www.trich.org)). During a 2-month period in 2005, participants completed an anonymous self-report survey on the Internet; this included questions about both hair-pulling and other body-focused repetitive behaviors. Approval for the study was obtained from the University of Wisconsin-Milwaukee's Institutional Review Board. Prior to, and after completing the online study

survey, participants were informed that survey submission indicated formal consent to participate in the research.

A total of 2,558 responses to the survey were received. One hundred and six duplicate responses (defined as those responses containing identical information on all items) were excluded. Of the remainder, 990 respondents were  $\geq 18$  years of age and satisfied the more rigorous diagnostic criteria for TTM. Thus, these participants endorsed the following survey questions: (1) hair pulling resulting in noticeable hair loss, (2) increased physical tension or an "urge" immediately before pulling or when trying to resist pulling at least "a little of the time" (i.e., 11–29%), (3) pleasure, gratification, or relief after pulling at least "a little of the time" (i.e., 11–29%), (4) pulling hair "never/almost never" (0–10% of the time) in response to voices others may not hear or due to beliefs that bugs/insects were crawling on their skin, and (5) experiencing at least "moderate" impairment (a score of 5 or greater on a 9-point Likert scale) in day-to-day personal, social, occupational, or academic functioning.

### **Assessment**

The web-based Trichotillomania Impact Survey (TIS) included questions assessing demographics (e.g., gender, age, income, education, ethnicity, and marital status). History of prior TTM diagnosis, as well as treatment for TTM and other psychiatric problems, were queried. Lastly, aspects of psychopathology were explored, using the Massachusetts General Hospital Hairpulling Scale (MGH-HS) (16), the Milwaukee Inventory for Subtypes of Trichotillomania—Adult Version (MIST-A) (17) which assesses "focused" and "automatic" hair-pulling, the Depression Anxiety and Stress Scale (DASS) (18), and the Sheehan Disability Scale (SDS) (19). The entire survey took approximately 45 minutes for completion.

#### *Massachusetts General Hospital-Hairpulling Scale (MGH-HS; 16)*

The MGH-HS is a 7-item self-report instrument designed to assess hair pulling severity over the past week. Individual items assessing urge to pull, actual pulling, and distress associated with hair pulling are rated from 0 to 4.

#### *Milwaukee Inventory for Subtypes of Trichotillomania—Adult Version (MIST-A; 17)*

The MIST-A is a 15-item scale assessing the degree to which an individual engages in "automatic" and/or "focused"

pulling and consists of a 10-item “focused” scale and a 5-item “automatic” scale. Each item on the MIST-A is rated from 0 (*not true of any of my hair pulling*) to 9 (*true for all of my hair pulling*) with higher scores suggesting increasingly “focused” or “automatic” pulling, respectively.

#### *Depression Anxiety Stress Scale-21 Item Version (DASS-21;18)*

The DASS-21 is a 21-item scale which provides separate scores for the empirically derived factors of Depression, Anxiety, and Stress. Each factor consists of 7 items measured on a 4-point Likert scale ranging from 0 (*did not apply to me at all*) to 3 (*applied to me very much, or most of the time*). Each scale has a minimum score of 0 and a maximum score of 42.

#### *Sheehan Disability Scale (SDS; Leon et al., 19)*

The SDS is a three item scale designed to assess perceived disability across home, work, and social settings. Items are measured using a 10-point Likert scale ranging from 1 (*not at all*) to 10 (*very severely*) with higher scores indicating greater perceived disability. Items can be summed to provide an overall perceived disability scale ranging from 3–30.

### **Statistics**

Summary statistics were calculated to determine the frequency of different BFRBs in participants with hair-pulling and with TTM. Participants with and without such BFRBs were compared on psychopathology measures using the Mann-Whitney U-test. Pearson product moment correlations were undertaken to assess the association between total number of stereotypic symptoms and demographic and clinical variables.

## **RESULTS**

### **Sample Characteristics**

The sample was 93.2% female ( $n = 1581$ ) and 6.5% male ( $n = 110$ ). Six participants (0.3%) failed to report their gender. Participants ranged in age from 18 to 69 ( $M = 30.9$ ,  $SD = 10.17$ ) years. Fifty-four percent ( $n = 909$ ) were single/never married, 36.8% ( $n = 624$ ) were currently married, 8.9% ( $n = 151$ ) were divorced or separated, 0.4% ( $n = 6$ ) were widowed, and 7 participants did not respond to the question. Participants represented a range of ethnicities including 87.1% ( $n = 1478$ ) Caucasian, 3.1% ( $n = 53$ ) African-American, 3.7% ( $n = 62$ ) Hispanic/Latino, 2.1% ( $n = 36$ ) multi-racial, 1.9% ( $n = 32$ ) Asian-American, 1.4% ( $n = 23$ ) “other,” 0.5% ( $n = 9$ ) Native-American, and 0.002% ( $n = 4$ ) non-respondents.

The median annual income was \$30,000–\$49,999. Participants completed a median of 4 years of education post high

school and the modal degree completed was “high school or GED.” Nine hundred and sixty (56.6%) participants reported being previously diagnosed with TTM. Seven hundred and thirty (43.0%) participants lacked a prior TTM diagnosis, and seven participants failed to respond to this survey item. Five hundred and forty four (32.1%) participants reported seeking help for a psychosocial problem other than TTM in the past.

### **Body-Focused Repetitive Behaviors**

1176/1678 (70%) of participants with hair-pulling indicated that they engaged in repetitive body-focused behaviors others than hair-pulling. The most common were skin-picking (51%), and nail-biting (30%) (Table 1). Similar proportions of these behaviors were found in participants meeting criteria for TTM (Table 1). Under the category “other repetitive self-damaging behaviors,” participants noted behaviors involving other parts of the body including the mouth (e.g., sucking), eye (e.g. fishing for eye mucus), skin (e.g., cutting, rubbing), and skeleton (e.g., cracking knuckles / bones, head-banging).

The number of BFRBs was significantly associated with female gender, with lower age, and with lower income. In addition, participants with such symptoms scored significantly higher than participants without such symptoms on the MGH-HS, on the “focused” scale but not the “automatic” scale of the MIST-A, on the DASS, and on the SDS (Table 2). Furthermore, there were significant associations between the number of stereotypic symptoms, and scores on the MGH [ $r(1454) = 0.06$ ,  $p = 0.029$ ], the MIST-A “focused” scale [ $r(1442) = 0.14$ ,  $p \leq 0.001$ ], the DASS [Anxiety,  $r(1455) = 0.24$ ,  $p \leq 0.001$ ; Depression,  $r(1478) = 0.23$ ,  $p \leq 0.001$ ; Stress,  $r(1476) = 0.24$ ,  $p \leq 0.001$ ], and the SDS [ $r(1488) = 0.17$ ,  $p \leq 0.001$ ], but no significant associations with the MIST-A “automatic” scale [ $r(1462) = 0.03$ ,  $p = 0.228$ ]. Similar findings were obtained in participants who met criteria for TTM (Table 2).

## **DISCUSSION**

The main findings of this study were that the majority of participants with hair-pulling, whether or not they met strict

**Table 1** Frequency of Body-Focused Repetitive Behaviors in Participants With Hair-Pulling or Meeting Diagnostic Criteria for Trichotillomania

Behavior	Hair-pulling ( $n = 1,697$ )	Trichotillomania ( $n = 990$ )
Skin picking	837/1,648 (50.8%)	514/961 (53.5%)
Nail biting	487/1,634 (29.8%)	301/955 (31.5%)
Lip/cheek biting	415/1,624 (25.6%)	249/947 (26.3%)
Nose picking	196/1,622 (12.1%)	122/949 (12.9%)
Other	137/1,613 (8.5%)	75/947 (7.9%)
Any	1178/1,678 (70%)	724/981 (73.8%)

*Note:* sample sizes are discrepant across body-focused repetitive behaviors because some participants failed to complete each survey item.

**Table 2** Psychopathology in Participants With Hair-Pulling or Meeting Diagnostic Criteria for Trichotillomania, With and Without Body-Focused Repetitive Behaviors

Measure	Hair-pulling (n = 1,697)	Trichotillomania (n = 990)
MGH		
w/ BFRBs	16.6 (5.2)*	17.4 (5.1)
w/o BFRBs	16.0 (5.1)	17.0 (5.1)
MIST-A: "focused" scale		
w/ BFRBs	46.4 (16.3)**	49.7 (15.5)**
w/o BFRBs	42.5 (15.5)	45.1 (16.1)
MIST-A: "automatic" scale		
w/ BFRBs	25.4 (9.3)	25.3 (9.0)
w/o BFRBs	25.1 (9.2)	25.2 (8.5)
DASS: Depression scale		
w/ BFRBs	17.6 (12.3)**	19.1 (12.0)**
w/o BFRBs	13.6 (11.6)	15.4 (12.1)
DASS: Anxiety scale		
w/ BFRBs	11.2 (9.4)**	12.0 (9.7)**
w/o BFRBs	7.9 (8.5)	9.2 (9.2)
DASS: Stress scale		
w/ BFRBs	22.0 (10.5)**	23.2 (10.3)**
w/o BFRBs	18.0 (10.9)	19.7 (11.1)
SDS		
w/ BFRBs	10.6 (6.1)**	12.2 (6.1)**
w/o BFRBs	8.8 (5.2)	10.5 (5.5)

\* $p = 0.01$ .\*\* $p \leq 0.001$ .

criteria for trichotillomania, had comorbid repetitive, self-injurious behaviors. The most common of these were skin-picking and nail-biting, but a broad range of other behaviors were seen, including self-injurious habits involving the mouth, the nose, the eyes, the skin, and the skeleton. There was a significant association between the number of such symptoms, and scores on ratings of "focused" hair-pulling severity, depression, anxiety, stress, and functional impairment.

There is a relative paucity of rigorous research on hair-pulling to date, and the large sample size surveyed here is therefore an important advantage. Due caution is warranted in interpreting data obtained from Internet self-reports. However, there is evidence that with appropriate methodology, Internet research can have good validity (20). Indeed, a study by Wetterneck et al. (21) found that TTM samples ascertained directly or via the Internet are quite similar. Furthermore, the data here are consistent with previous studies of stereotypic symptoms or self-injurious habits in college students documenting their comorbidity (6,8,22), and with systematic clinical research demonstrating a high frequency of body-focused repetitive behaviors in patients presenting with trichotillomania (23,24).

The high comorbidity of body-focused repetitive behaviors in participants with hair-pulling, and the association of these behaviors with various measures of the severity of psychopathology and of disability, is consistent with what one would expect if TTM is best conceptualized as a stereotypic disorder, rather than as an impulse control disorder or as an obsessive-compulsive

disorder. Certainly, many of the habit disorders share phenomenological features (e.g., repetitive nature), functional characteristics (e.g., they may help optimize levels of arousal), and treatment response (e.g., to habit reversal). It is notable that treatment of covarying behaviors may reduce particular stereotypic behaviors (27). Nevertheless, additional research on the comorbidity of BFRBs in other impulse control disorders and in OCD, would be needed in order to conclude that they are associated exclusively with TTM.

There also are some preliminary data on the underlying psychobiology of stereotypic disorders. First, there may be familial relationships between different grooming disorders (26). Second, there may be involvement of striatal circuits in habit formation (27). Third, dopamine agonists may exacerbate body-focused repetitive behaviours, while dopamine antagonists may be useful in their treatment (28). Although such data suggest some overlap of stereotypic disorders with a range of other conditions, including obsessive-compulsive disorder and tic disorder, the psychobiological data are not able to determine nosological boundaries between these various conditions.

Indeed, additional work is needed to support an argument that hair-pulling is a stereotypic disorder. First, the study here provided little detail on the phenomenology of comorbid BFRBs, including their frequency and severity, and whether or not they met criteria for stereotypic movement disorder. Additional data may reveal important differences between hair-pulling and other self-injurious habits. Second, the study suggested a particularly strong association between body-focused repetitive behaviors and "focused" hair-pulling; thus there may be different subtypes of trichotillomania, only one of which is more closely related to stereotypic movement disorder. Appropriate caution is therefore warranted before approaching the diagnosis and treatment of trichotillomania solely as a stereotypic disorder (29).

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