HHS Public Access

Author manuscript

Psychiatry Res. Author manuscript; available in PMC 2017 May 30.

Published in final edited form as:

Psychiatry Res. 2016 May 30; 239: 12–19. doi:10.1016/j.psychres.2016.02.063.

Comorbidity and Quality of Life in Adults with Hair Pulling Disorder

David C. Houghton[a], **Joyce Maas**[b], **Michael P. Twohig**[c], **Stephen Saunders**[d], **Scott N. Compton**[e], **Angela Neal-Barnett**[f], **Martin E. Franklin**[g], and **Douglas W. Woods**[a,*]

David C. Houghton: davidhoughton@tamu.edu; Joyce Maas: j.maas@psych.ru.nl; Michael P. Twohig: michael.twohig@usu.edu; Stephen Saunders: stephen.saunders@marquette.edu; Scott N. Compton: scompton@duke.edu; Angela Neal-Barnett: aneal@kent.edu; Martin E. Franklin: marty@mail.med.upenn.edu; Douglas W. Woods: dowoods@tamu.edu

[a]Texas A&M University, Department of Psychology, 4235 TAMU, College Station, TX 77843-4235 [b]Radboud University-Nijmegen, Department of Clinical Psychology, P.O. Box 9104, NL-6500 HE Nijmegen, The Netherlands [c]Utah State University, Department of Psychology, 2810 Old Main Hill, Logan, UT 84322-2810 [d]Marquette University, Department of Psychology, 328E Cramer Hall, Milwaukee, WI 53233 [e]Duke University School of Medicine, Department of Psychiatry and Behavioral Sciences, DUMC 3527, Durham, NC 27710 [f]Kent State University, Department of Psychology, 203 Kent Hall Addition, Kent, OH 44242 [g]University of Pennsylvania School of Medicine, Department of Psychiatry, 3535 Market Street, 6th Floor, Philadelphia, PA 19104

Abstract

Hair pulling disorder (HPD; trichotillomania) is thought to be associated with significant psychiatric comorbidity and functional impairment. However, few methodologically rigorous studies of HPD have been conducted, rendering such conclusions tenuous. The following study

*Corresponding author. Tel.: (979)845 2540.

Contributors

Mr. Houghton and Dr. Compton had full access to all of the data in the study and take responsibility for the integrity of the data and the accuracy of data analysis.
Study concept and design: Woods, Franklin, Neal-Barnett, Saunders, Twohig, Compton, Maas, Houghton
Acquisition of data: Woods
Analysis and interpretation of data: Houghton, Compton, Franklin, Woods
Drafting of the manuscript: Houghton, Maas, Compton, Woods
Critical revision of the manuscript for important intellectual content: Woods, Franklin, Twohig, Saunders
Statistical analysis: Houghton, Compton
Obtaining funding: Woods, Franklin, Neal-Barnett, Saunders, Twohig, Compton
Administrative, technical, or material support: Woods, Franklin, Saunders, Twohig, Compton
Study supervision: Woods, Franklin, Twohig, Saunders, Houghton

Conflict of Interest

Drs. Twohig and Woods receive royalties from Oxford University Press for their published treatment guide for Trichotillomania. Dr. Woods has also received funding from the Trichotillomania Learning Center. Drs. Franklin, Neal-Barnett, and Saunders and Mr. Houghton and Ms. Maas report no financial conflicts of interest.

We would like to report that this study was supported by the NIMH of the National Institutes of Health under Award number grant R01MH080966 (Woods: PI). The funding organization was not involved in the design and conduct of the study. The content is solely the responsibility of the authors and does not necessarily represent the official views of the National Institutes of Health.

examined comorbidity and psychosocial functioning in a well-characterized sample of adults with HPD (*N*=85) who met DSM-IV criteria, had at least moderate hair pulling severity, and participated in a clinical trial. Results revealed that 38.8% of individuals with HPD had another current psychiatric diagnosis and 78.8% had another lifetime (present and/or past) psychiatric diagnosis. Specifically, HPD showed substantial overlap with depressive, anxiety, addictive, and other body-focused repetitive behavior disorders. The relationships between certain comorbidity patterns, hair pulling severity, current mood and anxiety symptoms, and quality of life were also examined. Results showed that current depressive symptoms were the only predictor of quality of life deficits. Implications of these findings for the conceptualization and treatment of HPD are discussed.

Keywords

Trichotillomania; Obsessive-Compulsive Disorder; Comorbidity; Depression; Quality of Life

1. Introduction

Hair Pulling Disorder (HPD) is an obsessive-compulsive spectrum condition in which individuals pull hairs from their own body, resulting in significant hair loss (American Psychiatric Association [APA], 2013). Subclinical hair pulling is relatively common (i.e., 11%) while clinical hair pulling, or diagnosable HPD, is less frequent (Woods et al., 1996). The lifetime prevalence rate of HPD as defined in DSM-IV-TR is estimated at about 0.6% (APA, 2000), but may be as high as 3.4% for women and 1.5% for men (Christenson et al, 1991b). Studies on the gender distribution of HPD suggest it is more common in females (9:1; Christenson, 1995; Duke et al., 2009; Reeve, 1999).

Research has identified two distinct styles of pulling: “automatic” and “focused” (Christenson et al., 1991a). Automatic pulling is a passive process in which pulling occurs with little conscious awareness. In contrast, focused pulling is an active and purposeful process, which some suggest, functions to regulate negative affect and/or aversive cognitions (Woods et al., 2006b). In either case, hair pulling can create a vicious cycle in which both types of pulling are present in the same individual: out of awareness (automatic) pulling leads to emotional consequences (e.g., sadness, anger, and guilt), which can lead to further (focused) pulling (Diefenbach et al., 2002).

HPD has been consistently associated with negative psychosocial consequences. Hair pulling is viewed negatively by peers (Woods et al, 1999), can lead to avoidance of social and recreational activities (Woods, Flessner et al., 2006), and can result in anxiety during intimate situations (Christenson and Mansueto, 1999; Diefenbach et al., 2005a; Duke et al., 2010). In addition, individuals with HPD experience academic, occupational, and psychological difficulties (Woods et al., 2006a). Research shows that the majority of people with HPD report feeling physical unattractiveness, depression, shame, and feelings of low self-worth (Stemberger et al., 2000).

Beyond measuring specific facets of psychosocial functioning in HPD, researchers have also investigated the relationship between HPD and global indices of quality of life, with results

being mixed. Keuthen and colleagues (2004) found no significant differences on quality of life measures between persons with HPD (N = 58) and healthy controls (from published norms). In contrast, two other studies found that persons with HPD (n = 28; 70) had poorer quality of life scores than non-psychiatric controls (n = 28; 25) (Diefenbach et al., 2005b; Odlaug et al., 2010). Three studies (Diefenbach et al., 2005b; Keuthen et al., 2004; Tung et al., 2014) with various sample sizes (n = 28, 58, 187) found that depression severity significantly predicted quality of life, even while controlling for hair pulling severity, and a fourth study (Odlaug et al., 2010) (n = 70) showed that persons with HPD who reported poor quality of life also reported higher scores on depression indices. Furthermore, in a related study examining life disability in HPD (N = 153), focused hair pulling severity and pulling-related distress and interference predicted life disability while controlling for depression, but depression also correlated with life disability (Tung et al., 2015). These results indicate that quality of life and HPD might be at least partially mediated through an association with depression.

Given the difficulties in psychosocial functioning experienced by persons with HPD, perhaps it is not surprising that HPD patients are generally believed to suffer from comorbid psychiatric disorders at a higher rate than the general population. In reviewing the HPD literature, 20 studies reported comorbidity rates in adults with HPD, but these rates varied widely from study to study. For example, rates for comorbid depressive disorders ranged from 14 to 60% (Christenson and Mansueto, 1999; Keijsers et al., 2006; van Minnen et al., 2003; Odlaug et al., 2010), anxiety disorders from 2.3 to 57% (van Minnen et al., 2003; Christenson et al., 1991a), and OCD from 5 to 27% (Christenson et al., 1991a; Schlosser et al., 1994). It is unclear what factors contributed to these inconsistencies, but many of the studies reporting comorbidity rates in HPD possess methodological limitations. First, some studies used unstructured assessment instruments (e.g., Christenson et al., 1991b) or (online) self-report measures (e.g., Woods et al., 2006a). Second, some studies reported current comorbid disorders, while others reported on lifetime comorbidity. Third, not all studies were published in peer-reviewed journals (Hand et al., 1996). Finally, some study samples did not consist entirely of persons with HPD and failed to report statistics specifically for HPD (e.g., Grant and Christenson, 2007).

After 4 studies with significant limitations were set aside, there remained 16 studies of sufficient methodological scrutiny that report comorbidity rates in HPD. These studies were all published in peer-reviewed journals, used structured or semi-structured diagnostic assessments, used samples that clearly consisted of individuals with HPD, and provided clearly delineated results for specific diagnoses (e.g., “major depression” rather than “mood disorder”). A summary of the characteristics of these studies and their data are presented in Tables 1–3. Visual analysis of these tables showed that comorbidity rates and study characteristics (i.e., sample sizes) still vary considerably across studies. This variability could have been caused by the fact that several diagnostic classification systems were used in these studies. Also, most studies did not report data on many comorbid disorders. Finally, these studies used a variety of recruitment practices, meaning that selection bias likely impacted comorbidity rates.

Due to the limitations of the literature on comorbidity rates in HPD, there is a need to characterize comorbidity patterns in persons with HPD using larger and well-characterized samples with psychometrically sound and rigorous assessment instruments. These results can then be compared to those of previous research in order to create better-established norms of HPD comorbidity. The current study reports on comorbidity data from a recently completed, federally funded clinical treatment trial of adults with HPD (R01MH080966; Woods, PI) that includes one of the top three largest samples of HPD collected to date. In addition to describing patterns of comorbidity, the relationship between psychiatric comorbidity and psychosocial functioning in persons with HPD are explored.

2. Method

2.1. Participants

Eighty-five adults with HPD participated in a randomized controlled trial comparing the relative efficacy of Acceptance-Enhanced Behavior Therapy to supportive psychotherapy. Participants were recruited via local newspaper ads, public transportation flyers, newsletters, website advertisements via the Trichotillomania Learning Center, and clinic referrals to a university-based HPD specialty clinic. The recruitment advertisements stated:

> Are you an adult between the ages of 18 and 65 who pulls their hair? If you do, you may be eligible to participate in a research study. The Psychology Department at the University of Wisconsin-Milwaukee is conducting research on the effectiveness of non-drug treatments for hair pulling in adults. The study will take up to 9 months to complete, treatment is free, and participants will be paid up to $200 for their participation in the study. For more information, please call…

Inclusion criteria included: (1) a current DSM-IV-TR diagnosis of HPD, based on a semi-structured clinical interview; (2) a Massachussetts General Hospital Hairpulling Scale score of ≥ 12; (3) a Wechsler Test of Adult Reading score of ≥ 85; (4) age 18–65; (5) ability to speak English fluently; (6) judged able to be maintained on outpatient status for the duration of treatment; (7) no initiation or change in the dosage of any psychotropic medication for up to eight weeks preceding participation in the study or during the course of the study; and (8) not currently receiving psychotherapy for HPD or another psychiatric condition.

Exclusionary criteria included: (1) a positive diagnosis of bipolar disorder, psychotic or neurocognitive disorder, substance dependence (with the exception of nicotine dependence), intellectual disability, or pervasive developmental disorder; and (2) a primary diagnosis of a mood or anxiety disorder. In addition, individuals who admitted ingesting hair after pulling were eligible for participation only after they had received a physical exam from their primary care physician to determine if there was any gastrointestinal blockage requiring more immediate care. One exception to exclusion criteria was made. A single individual who had experienced several periods of depression and a single hypomanic episode, thus meeting criteria for Bipolar II, was allowed to participate the study after the evaluators and principal investigator discussed the case.

Ninety-one participants (92.2% female; mean age = 35.39) completed the baseline assessment battery. Most were Caucasian (82.3%), 12.9% were Black or African American, 1.2% were Asian, 1.2% were Hispanic, and 3.5% identified as Other.

2.2. Measures

The study utilized a screening questionnaire to assess many self-reported aspects of participants' demographics and psychosocial functioning. Additionally, several standardized assessment measures were used.

2.2.1. Diagnosis—The *Structured Clinical Interview for DSM-IV Patient Version* (SCID-P; First et al., 2002) was used to evaluate the presence of comorbid psychiatric disorders. The interview provides the trained rater with standardized probes about symptoms of DSM-IV disorders and provides a scoring algorithm for DSM-IV diagnosis. The SCID-P examines both lifetime (present and past) and current diagnoses. Lifetime comorbidities were given if the participant met criteria for a past and/or current diagnosis. Comorbidities assessed in this study were limited to those covered in the SCID-P, as well as HPD and skin picking. This study did not assess for Attention Deficit/Hyperactivity Disorder, sexual disorders, and personality disorders.

The *Trichotillomania Diagnostic Interview* (TDI; Rothbaum and Ninan, 1994) is a six-item interview that is modeled after the Structured Clinical Interview for the DSM-III-R. Although no psychometric data are available for this instrument, it offers a structured method for assessing the presence or absence of HPD, and is commonly used to diagnose HPD (e.g., Grant et al., 2009; Tolin et al., 2007; Diefenbach et al., 2008)

2.2.2. Hair Pulling Severity—*The Massachusetts General Hospital Hairpulling Scale* (MGH-HPS; Keuthen et al., 1995; O'Sullivan et al., 1995) is a widely used self-report severity measure of HPD consisting of two factors: "Severity" and "Resistance and Control" (Keuthen et al., 2007). The MGH-HPS has 7 items that are scored on a 5-point Likert scale for a total ranging from 0–28, with higher scores reflecting greater hair pulling severity, lower resistance to pulling, and less control over pulling. It has demonstrated satisfactory psychometric properties (Diefenbach et al., 2005a; Keuthen et al., 1995; O'Sullivan et al., 1995).

The National Institutes of Mental Health Trichotillomania Severity Scale (NIMH-TSS; Swedo et al., 1989) is a semi-structured clinical interview that asks questions about time spent pulling, resistance to pulling urges, distress, and impairment. Possible scores range from 0–25. The scale has shown adequate psychometric properties for assessing HPD in both adults and children (Diefenbach et al., 2005a; Franklin et al., 2011; Stanley et al., 1999; Swedo et al., 1989).

2.2.3. General Psychological Functioning—*The Quality of Life Inventory* (QOLI; Frisch et al., 1992) is a 32-item self-report measure that assesses raters' satisfaction with 16 life areas. The reliability of the QOLI is adequate, with a temporal stability rating of .73 and coefficient alpha of .79. The measure has also demonstrated adequate convergent and

discriminant validity. QOLI t-scores were used in the present analyses and scored according to Frisch (1992).

The Beck Anxiety Inventory (BAI; Beck et al., 1988) and *The Beck Depression Inventory* (BDI; Beck, 1972) are widely used to assess anxiety and depression, respectively. Both measures demonstrate strong psychometric properties (Fydrick et al., 1992; Beck et al., 1988)

2.3. Procedure

A multi-gate assessment procedure was used to screen participants for eligibility into the study. First, patients were screened by telephone. All callers to the HPD clinic were provided information about the study and screened for possible participation. If the participant appeared to be eligible and interested, he or she was scheduled for an initial clinic screening, during which consent was obtained and inclusion/exclusion criteria checked. Participants deemed ineligible or those not wishing to participate were referred for standard clinical services. Over two hundred individuals (274) were screened via telephone. Of the 157 who were screened out at the phone stage, 30 reported having exclusionary diagnoses (24 for bipolar, 4 for schizophrenia, 1 for intellectual disability, and 1 for dementia) and were never formally assessed for HPD. Within the 117 persons who passed the phone screen and came into the clinic for the in-person screen, 21 were ineligible. Reasons included subthreshold level of hair pulling severity (n = 13), lacking an HPD diagnosis (n = 5), below minimum intelligence (n = 1), and primary diagnosis of another mental disorder (n = 2; i.e., mood disorder). Another 6 participants were lost between screening and baseline assessment due to inability to re-establish contact.

IRB approval for this project was obtained at Texas A&M University (IRB2013-3025) and the University of Wisconsin-Milwaukee (IRB09.039), and the study is publicly listed on ClinicalTrials.gov (#NCT00872742). The study was performed in compliance with the Code of Ethics of the World Medical Association (Declaration of Helsinki). Data for this manuscript were obtained from the baseline assessment of the treatment trial.

3. Results

3.1. Hair Pulling and Psychosocial Functioning

The baseline sample reported moderately severe hair pulling according to both the MGH-HPS ($M = 16.93$, $SD = 4.53$) and NIMH-TSS ($M = 14.34$, $SD = 3.64$).

The average Quality of Life t-score was near the upper bound of the low range ($M = 41.2$, $SD = 14.7$). Mean BDI and BAI scores were in the minimal to mild range at 12.92 ($SD = 10.19$) and 13.35 ($SD = 13.25$), respectively, and both had large standard deviations.

3.2. Comorbidity

According to the SCID-P (Table 4), the majority of patients (78.8%) met criteria for at least one lifetime comorbid psychiatric condition, and 38.8% were determined to be currently suffering from another Axis I disorder. The most common lifetime comorbid conditions were Major Depression, Alcohol Abuse, PTSD, and GAD. The most common current

comorbid conditions were Excoriation Disorder and Generalized Anxiety Disorder, followed by Specific Phobia and Obsessive-Compulsive Disorder.

The most notable differences between data from this study and average current comorbidity rates from previous studies (See Tables 2, 3, and 4; current study data reported first) were on Excoriation Disorder (12.9% vs. 21.6%), Major Depression (3.5% vs. 17.1%), and Obsessive-Compulsive Disorder (4.7% vs. 9.3%). Additionally, notable differences for our data and the average lifetime comorbidity rates from previous studies were on Excoriation Disorders (12.9% vs. 24.2%), OCD (7.1% vs. 15.3%), Specific Phobia (2.4% vs. 12.1%), GAD (14.1% vs. 25.6%), Alcohol Abuse Disorder (17.7% vs. 8.9%), and Substance Abuse Disorder (4.7% vs. 16.8%).

3.3. Effects of Comorbidity, Psychosocial Functioning, and Hairpulling on Quality of Life

In order to investigate associations between comorbidity, hair pulling variables, and measures of psychosocial functioning, we conducted multiple correlational analyses comparing BAI, BDI, MGH, NIMH-TSS, and the presence of current or lifetime comorbidity to QOLI scores. A full correlation matrix is shown in Table 5. Both Pearson and point-biserial correlations were used, and due to the propensity for multiple comparisons to increase Type I error rates, we used a Bonferroni correction to adjust alpha levels. Only BDI scores were significantly correlated with the QOLI. This suggests that, in persons with HPD, current depressive symptom severity is the best predictor of current ratings of quality of life.

4. Discussion

The aims of the current study were to describe psychosocial functioning and comorbid psychopathology within a well-characterized sample of adults with HPD with moderate hair pulling severity and to investigate the relationships between these variables and quality of life.

In this study, persons with HPD reported quality of life in the upper part of the low range, which was very similar to that reported by three previous studies utilizing the same measure (Raw score means on the QOLI = 41.20 vs. 43.00, 44.31, 42.77; Diefenbach et al., 2005b; Odlaug et al., 2010; E. Tung, personal communication, October 4, 2015). The findings on current levels of depressive and anxiety symptoms are not as consistent with previous findings. This study showed current depressive and anxiety symptoms to be within the minimal to mild range, along with a high degree of variance. Although these findings are consistent with that of several studies (Diefenbach et al., 2005b; Keuthen et al., 2004, 2012; Odlaug et al., 2010), they contrast with Woods et al. (2006a), who reported mean depression and anxiety scores in the severe range on the Depression Anxiety Stress Scale (DASS-21; Lovibond and Lovibond, 1995). Perhaps the Woods et al. (2006a) study, which utilized an internet sample of self-identified HPD participants, found higher rates of depressive and anxiety symptoms due to sampling differences, such that persons with HPD who participate in internet-based surveys may be more secretive and impaired than those who are willing to participate in a clinical trial.

In reviewing the literature, we found vastly differing rates of comorbidity among people diagnosed with HPD. In the current study, rates of both lifetime and current psychopathology were high, at 78.8% and 38.8%, respectively. These rates are elevated as compared to community norms, as studies have shown that, in a representative community U.S. adult sample, we should expect to find 46% lifetime and 26% twelve-month prevalence of at least one psychiatric disorder (Kessler et al., 2005a, b). Specifically, this study found high rates of comorbid ExD, Generalized Anxiety Disorder, Specific Phobia, Major Depression, PTSD, as well as other anxiety and addictive disorders. One finding that has notable implications is that comorbid OCD was shown in 7.1% of individuals over their lifetime. Proponents of the OCD-spectrum, including HPD, have proposed that shared comorbidity is evidence of this relationship, yet our findings stand in contrast to such arguments. Evidence from other studies on comorbidity rates between OCD and HPD has been mixed, as expert reviews have pointed to poor evidence for high comorbidity rates (Storch et al., 2008) while the literature review conducted in the current study points to high rates of current and lifetime comorbidity. The results from the current study and the mixed findings in the literature suggest that more research is needed on the topic.

There were several notable differences between the comorbidity rates found in the current study and those in the HPD literature. The direction of those differences was largely in the direction of lower estimates of current and lifetime comorbidity in the current study as compared to those reported in previous studies. Although the clinical trial from which these data were derived did exclude a number of individuals with comorbid diagnoses, most exclusions came because of self-reported bipolar disorder during the phone screen. Only two individuals were excluded for a primary diagnosis of severe depression. Differences in the rates of Excoriation Disorder between our study and that of Tung et al. (2015) might seem large, but a review by Snorrason et al. (2012) showed that comorbidity rates between HPD and Excoriation fall between 10 to 34% (average = 20.8%). Thus, our rate of Excoriation disorder might be below average, but not outside the range of other studies. One potential reason why lower rates of mood, anxiety, and substance use disorders were found in the current study is that individuals with HPD in addition to these diagnoses may seek treatment for HPD less frequently than persons with HPD alone. While experiencing the effects of depression, anxiety, or drug addiction, individuals might view hair pulling as a relatively minor problem and be unlikely to seek HPD-specific treatment. Thus, individuals with HPD who seek treatment for HPD might be less likely to be suffering from other conditions, whereas the more complicated group of persons with HPD exist in less specialized settings. This notion could be seen as consistent with critics of the methodology of randomized clinical trials (Westen et al., 2004), in that they tend to recruit individuals who lack treatment-complicating characteristics such as psychiatric comorbidity, making it difficult to generalize their results to real-world settings.

Although HPD is indeed associated with other psychosocial conditions, comorbid diagnoses and hair pulling symptoms do not seem to account for deficits in global functioning. Instead, it appears that current internalizing symptoms largely account for reductions in quality of life, a finding that is consistent with those of previous studies (Diefenbach et al., 2005b; Keuthen et al., 2004; Odlaug et al., 2010; Tung et al., 2014; Tung et al., 2015). It must, however, be noted that the variable correlating significantly with quality of life, depression,

was measured continuously and allowed to freely vary, whereas some other variables were constrained due to inclusion criteria (i.e., MGH ≥ 12). This practice could have attenuated the correlation between hair pulling severity as measured by the MGH. Thus, a more diverse community and clinical sample of persons with HPD and subclinical hair pulling might provide different results.

The current study has a number of implications for future research. First, future investigations should seek to understand individuals with HPD who have relatively high psychosocial functioning aside from hair pulling. Understanding factors contributing to emotional and functional resiliency in the face of moderate to severe hair pulling could have important implications for predicting outcomes and enhancing treatment. Second, results might clarify how and when selective serotonin reuptake inhibitors (SSRIs) should be prescribed for persons with HPD. Currently, SSRIs are routinely used to treat HPD (Woods et al., 2006a) despite little data supporting their effectiveness (Bloch et al., 2007; McGuire et al., 2014). Data from the current study suggest SSRIs may help improve QOL by reducing depressive symptoms, even if the medications do little to the pulling symptoms. However, even though it has been proposed that individuals with HPD who display comorbid mood and anxiety issues may be ideal candidates for combined behavioral and pharmacotherapy (Dougherty et al., 2006), combined pharmacological and behavioral treatment does not always produce enhanced results, as evidenced by treatment studies for OCD (Foa et al., 2005). Third, it is conceivable that comorbidity rates might decrease as a result of changes in HPD diagnostic criteria from DSM-IV to DSM-5. Because DSM-5 removed two criteria, this would likely result in more hair pullers receiving the HPD diagnosis. Persons with less severe hair pulling would now be diagnosed in greater numbers, and these persons would be expected to show reduced rates of comorbid anxiety and depression, which are thought to often come as a consequence of hair pulling (Diefenbach et al., 2002; Keuthen et al., 1998; 2001)

The primary limitation of this study is that potential participants were screened out for some comorbidities that might impact treatment (e.g., mania, psychosis, primary major depression), which creates selection bias that undoubtedly affects the results of this study. A related concern is that all individuals in the current study were seeking treatment for HPD, which could result in an over-estimation of the amount of comorbidities, as these persons are more likely to seek help (Alexander et al., 1986). Ultimately, in order to provide the best estimates of comorbidity, in a TTM community-based population, researchers would need to conduct a broad survey of the community that reduced selection bias, but HPD was left out of such efforts that have already been conducted (i.e., the National Comorbidity Study).

Other limitations to the current study include the lack of a psychiatric control group, which limits the ability to determine if these psychosocial patterns (i.e., QOL, depression, anxiety) are specific to those with HPD. Furthermore, some additional comorbidities were not assessed, although none, other than personality disorders (Chamberlain and Odlaug, 2014), have shown substantial comorbidity with HPD. Another potential limitation of the current study is that the QOLI may not be a highly valid measure for use in HPD. As noted by Odlaug et al. (2010), although the QOLI assesses a range of topics including self-esteem, it contains no question regarding appearance, which can be particularly relevant for persons

with HPD. Moreover, the QOLI contains no age- or gender-based norms, factors which impact quality of life (Hjermstad et al., 1998). Thus, the QOLI norms might not accurately reflect quality of life in a sample consisting primarily of middle-aged females. These caveats notwithstanding, this study contributes substantially to the existing literature regarding comorbidity patterns in HPD. Further research attention should be directed toward comorbid and internalizing symptoms in hair pulling, which might lead to more accurate conceptualizations of HPD clinical presentation and associated impairment.

Acknowledgments

Drs. Woods and Twohig receive authors' royalties from Oxford University Press. Dr. Woods receives author's royalties from Springer Press.

Research reported in this paper was supported by the NIMH of the National Institutes of Health under award number R01MH080966 (Woods; PI). The content is solely the responsibility of the authors and does not necessarily represent the official views of the National Institutes of Health.

The authors would like to thank the Trichotillomania Learning Center for assisting in recruiting as well as the participants in this study. The authors would also like to thank Steve Hayes, Thilo Deckersbach, Flint Espil, Mike Walther, Chris Bauer, Shawn Cahill, Jason Levine, Emily Ricketts, Bryan Brandt, Zach Hosale, Joe Rohde, Valerie Esser, Olivia Smith, Maddison Franklin, and Anna Gould for their assistance on this project.

References

American Psychiatric Association. Diagnostic and Statistical Manual of Mental Disorders. 4. American Psychiatric Publishing; Washington, DC: 2000. text revision

American Psychiatric Association. Diagnostic and Statistical Manual of Mental Disorders. 5. American Psychiatric Publishing; Washington, DC: 2013.

Beck, AT. Measuring Depression: The depression inventory. In: Williams, TA.; Katz, MM.; Shields, JA., editors. Recent Advances in the psychobiology of the depressive illnesses. U.S. Government Printing Office; Washington, DC: 1972. p. 299-302.

Beck AT, Epstein N, Brown G, Steer RA. An inventory for measuring anxiety: psychometric properties. Journal of Consulting and Clinical Psychology. 1988; 56:893–897.10.1037/0022-006X.56.6.893 [PubMed: 3204199]

Beck AT, Steer RA, Carbin MG. Psychometric properties of the Beck Depression Inventory: Twenty-five years of evaluation. Clinical Psychology Review. 1988; 8:77–100.10.1016/0272-7358(88)90050-5

Bloch MH, Landeros-Weisenberger A, Dombrowski P, Kelmendi B, Wegner R, Nudel J, Pittenger C, … Coric V. Systematic review: Pharmacological and behavioral treatment for trichotillomania. Biological Psychiatry. 2007; 62:839–846.10.1016/j.biopsych.2007.05.019 [PubMed: 17727824]

Chamberlain SR, Odlaug BL. Body Focused Repetitive Behaviors (BFRBs) and Personality Features. Current Behavioral Neuroscience Reports. 2014; 1:27–32.10.1007/s40473-013-0003-9

Christenson GA. Trichotillomania: from prevalence to comorbidity. Psychiatry Times. 1995; 12:44–48.

Christenson GA, Mackenzie TB, Mitchell JE. Characteristics of 60 adult chronic hair pullers. American Journal of Psychiatry. 1991a; 148:365–370. [PubMed: 1992841]

Christenson, GA.; Mansueto, CS. Trichotillomania: descriptive characteristics and phenomenology. In: Stein, DJ.; Christenson, GA.; Hollander, E., editors. Trichotillomania. American Psychiatric Publishing; Washington DC: 1999. p. 1-42.

Christienson GA, Pyle RL, Mitchell JE. Estimate lifetime prevalence of trichotillomania in college students. Journal of Clinical Psychiatry. 1991b; 52:415–417. [PubMed: 1938977]

Diefenbach GJ, Mouton-Odum S, Stanley MA. Affective correlates of trichotillomania. Behaviour Research and Therapy. 2002; 40:1305–1315.10.1016/S0005-7967(02)00006-2 [PubMed: 12384325]

Diefenbach GJ, Tolin DF, Crocetto JS, Maltby N, Hannan SE. Assessment of trichotillomania: A psychometric evaluation of hair pulling scales. Journal of Psychopathology and Behavioral Assessment. 2005a; 27:169–178.10.1007/s10862-005-0633-7

Diefenbach GJ, Tolin DF, Hannan S, Crocetto J, Worhunsky P. Trichotillomania: impact on psychosocial functioning and quality of life. Behaviour Research and Therapy. 2005b; 43:869–884.10.1016/j.brat.2004.06.010 [PubMed: 15896284]

Diefenbach GJ, Tolin DF, Meunier S, Worhunsky P. Emotion regulation and trichotillomania: a comparison of clinical and nonclinical hair pulling. Journal of Behavior Therapy and Experimental Psychiatry. 2008; 39:32–41.10.1016/j.jbtep.2006.09.002 [PubMed: 17207769]

Dougherty DD, Loh R, Jenike MA, Keuthen NJ. Single modality versus dual modality treatment for trichotillomania: sertraline, behavior therapy, or both? Journal of Clinical Psychiatry. 2006; 67:1086–1092.10.4088/JCP.v67n0711 [PubMed: 16889452]

Duke DC, Bozdin DK, Tavares P, Geffken GR, Storch EA. The phenomenology of hairpulling in a community sample. Journal of Anxiety Disorders. 2009; 23:1118–1125.10.1016/j.janxdis.2009.07.015 [PubMed: 19651487]

Duke DC, Keeley ML, Geffken GR, Storch EA. Trichotillomania: A current review. Clinical Psychology Review. 2010; 30:181–193.10.1016/j.cpr.2009.10.008 [PubMed: 19926375]

First, MB.; Spitzer, RL.; Gibbon, M.; Williams, JB. Structured clinical interview for DSM-IV-TR axis I disorders, research version, patient edition. New York State Psychiatric Institute; New York: 2002.

Foa EB, Liebowitz MR, Kozak MJ, Davies S, Campeas R, Franklin MR, … Tu X. Randomized, placebo-controlled trial of exposure and ritual prevention, clomipramine, and their combination in the treatment of Obsessive-Compulsive disorder. American Journal of Psychiatry. 2005; 162:151–161. [PubMed: 15625214]

Franklin ME, Edson AL, Ledley DA, Cahill SP. Behavior therapy for adolescent trichotillomania: a randomized controlled trial. Journal of the American Academy for Child and Adolescent Psychiatry. 2011; 50:763–771.10.1016/j.jaac.2011.05.009

Frisch, MB. Quality of Life Inventory: manual and treatment guide. PsychCorp; Bloomington: 1992.

Frisch MB, Cornell J, Villanueva M, Retzlaff PJ. Clinical validation of the Quality of Life Inventory: A measure of life satisfaction for use in treatment planning and outcome assessment. Psychological Assessment. 1992; 4:92.10.1037/1040-3590.4.1.92

Fydrich T, Dowdall D, Chambless D. Reliability and validity of the Beck Anxiety Inventory. Journal of Anxiety Disorders. 1992; 6:55–61.10.1016/0887-6185(92)90026-4

Grant JE, Christenson GA. Examination of gender in pathologic grooming behaviors. Psychiatric Quarterly. 2007; 78:259–267.10.1007/s11126-007-9045-z [PubMed: 17712636]

Grant JE, Odlaug BL, Kim SW. *N*-acetylcysteine, a glutamate modulator, in the treatment of trichotillomania. Archives of General Psychiatry. 2009; 66:756–763.10.1001/archgenpsychiatry.2009.60 [PubMed: 19581567]

Hand, IE.; Neudecker, A.; Monchau, N. New Research Program and Abstracts of the 149th Annual Meeting of the American Psychiatric Association. American Psychiatric Association; Washington DC: 1996. Trichotillomania: etiology, phenomenology, comorbidity and treatment recommendations.

Hjermstad MJ, Fayers PM, Bjordal K, Kaasa S. Using reference data on quality of life—the importance of adjusting for age and gender, exemplified by the EORTC QLQ-C30 (+ 3). European Journal of Cancer. 1998; 34(9):1381–1389. [PubMed: 9849421]

Keijsers GPJ, van Minnen A, Hoogduin CAL, Klaassen BNW, Hendriks MJ, Tanis-Jacobs J. Behavioural treatment of trichotillomania: Two-year follow-up results. Behaviour Research and Therapy. 2006; 44:359–370.10.1016/j.brat.2005.03.004 [PubMed: 15927144]

Kessler RC, Berglund P, Demler O, Jin R, Merikangas KR, Walters EE. Lifetime prevalence and age-of-onset distributions of DSM-IV disorders in the National Comorbidity Survey Replication. Archives of General Psychiatry. 2005; 62(6):593–602. [PubMed: 15939837]

Kessler RC, Chiu WT, Demler O, Walters EE. Prevalence, severity, and comorbidity of 12-month DSM-IV disorders in the National Comorbidity Survey Replication. Archives of General Psychiatry. 2005; 62(6):617–627. [PubMed: 15939839]

Keuthen NJ, Dougherty DD, Franklin ME, Bohne A, Loh R, Levy J, … Deckersbach T. Quality of life and functional impairment in individuals with trichotillomania. Journal of Applied Research. 2004; 4:186–197.

Keuthen NJ, Flessner CA, Woods DW, Franklin ME, Stein DJ, Cashin SE, et al. Factor Analysis of the Massachusetts General Hospital Hairpulling Scale. Journal of Psychosomatic Research. 2007; 62:707–709.10.1016/j.jpsychores.2006.12.003 [PubMed: 17540230]

Keuthen NJ, Fraim C, Deckersbach T, Dougherty DD, Baer L, Jenike MA. Longitudinal follow-up of naturalistic treatment outcome in patients with Trichotillomania. Journal of Clinical Psychiatry. 2001; 62(2):101–107. [PubMed: 11247093]

Keuthen NJ, O'Sullivan RL, Ricciardi JN, Shera D, Savage CR, Borgmann AS, … Baer L. The Massachusetts General Hospital (MGH) Hairpulling Scale: 1. development and factor analysis. Psychotherapy and Psychosomatics. 1995; 64:141–145.10.1159/000289003 [PubMed: 8657844]

Keuthen NJ, O'Sullivan RL, Goodchild P, Rodriguez D, Jenike MA, Baer L. Retrospective review of treatment outcome for 63 patients with Trichotillomania. American Journal of Psychiatry. 1998; 155(4):560–561. [PubMed: 9546007]

Lovibond, SH.; Lovibond, PF. Manual for the Depression Anxiety Stress Scales. 2. Psychological Foundation of Australia; Sydney: 1995.

McGuire JF, Ung D, Selles RR, Rahman O, Lewin AB, Murphy TK, Storch EA. Treating Trichotillomania: A meta-analysis of treatment effects and moderators for behavior therapy and serotonin reuptake inhibitors. Journal of Psychiatric Research. 2014; 58:76–83. [PubMed: 25108618]

Odlaug BL, Kim SW, Grant JE. Quality of life and clinical severity in pathological skin picking and trichotillomania. Journal of Anxiety Disorders. 2010; 24:823–829.10.1016/j.janxdis.2010.06.004 [PubMed: 20594805]

O'Sullivan RL, Keuthen NJ, Hayday CF, Ricciardi JN, Buttolph ML, Jenike MA, Baer L. The Massachusetts General Hospital (MGH) hairpulling scale: 2. reliability and validity. Psychotherapy and Psychosomatics. 1995; 64:146–148.10.1159/000289004 [PubMed: 8657845]

Reeve, E. Hair pulling in children and adolescents. In: Stein, DJ.; Christenson, GA.; Hollander, E., editors. Trichotillomania. American Psychiatric Press; Washington DS: 1999. p. 201-224.

Rothbaum BO, Ninan PT. The assessment of trichotillomania. Behaviour Research and Therapy. 1994; 32:651–662.10.1016/0005-7967(94)90022-1 [PubMed: 8085996]

Schlosser S, Black DW, Blum N, Goldstein RB. The demography, phenomenology, and family history of 22 persons with compulsive hair pulling. Annals of Clinical Psychiatry. 1994; 6:147–152.10.3109/10401239409148996 [PubMed: 7881494]

Snorrason I, Belleau EL, Woods DW. How related are hair pulling disorder (trichotillomania) and skin picking disorder? A review of evidence for comorbidity, similarities and shared etiology. Clinical Psychology Review. 2012; 32:618–629.10.1016/j.cpr.2012.05.008 [PubMed: 22917741]

Stanley MA, Breckenridge JK, Snyder AG, Novy DM. Clinician-rated measures of hair pulling: a preliminary psychometric evaluation. Journal of Psychopathology and Behavioral Assessment. 1999; 21:157–182.10.1023/A:1022160522908

Stemberger RMT, Thomas AM, Mansueto CS, Carter JG. Personal toll of trichotillomania: behavioral and interpersonal sequelae. Journal of Anxiety Disorders. 2000; 14:97–104.10.1016/S0887-6185(99)00028-6 [PubMed: 10770238]

Storch EA, Abramowitz J, Goodman WK. Where does obsessive-compulsive disorder belong in DSM-V. Depression and Anxiety. 2008; 25:336–347. [PubMed: 18412060]

Swedo SE, Leonard HL. Trichotillomania: an obsessive-compulsive disorder? Psychiatric Clinics of North America. 1992; 15:777–790. [PubMed: 1461795]

Swedo SE, Leonard HL, Rapoport JL, Lenane MC, Goldberger EL, Cheslow DL. A double-blind comparison of clomipramine and desipramine in in the treatment of trichotillomania (hair pulling). The New England Journal of Medicine. 1989; 321:497–501.10.1056/NEJM198908243210803 [PubMed: 2761586]

Tolin DF, Franklin ME, Diefenbach GJ, Anderson E, Meunier SA. Pediatric trichotillomania: descriptive psychopathology and an open trial of cognitive behavioral therapy. Cognitive Behaviour Therapy. 2007; 36:129–144.10.1080/16506070701223230 [PubMed: 17852170]

Tung ES, Flessner CA, Grant JE, Keuthen NJ. Predictors of life disability in Trichotillomania. Comprehensive Psychiatry. 2014; 56:239–244. [PubMed: 25281991]

Tung ES, Tung MG, Altenburger EM, Pauls DL, Keuthen NJ. The relationship between hair pulling style and quality of life. Annals of Clinical Psychiatry. 2015; 26(3):193–198. [PubMed: 25166481]

van Minnen A, Hoogduin KAL, Keijsers GPJ, Hellenbrand I, Hendriks GJ. Treatment of trichotillomania with behavioral therapy or fluoxetine: a randomized, waiting-list controlled study. Archives of General Psychiatry. 2003; 60:517–522.10.1001/archpsyc.60.5.517 [PubMed: 12742873]

Westen D, Novotny CM, Thompson-Brenner H. The empirical status of empirically supported psychotherapies: assumptions, findings, and reporting in controlled clinical trials. Psychological Bulletin. 2004; 130(4):631–663. [PubMed: 15250817]

Woods DW, Flessner CA, Franklin ME, Keuthen NJ, Goodwin RD, Stein DJ, Walther MR, et al. The Trichotillomania Impact Project (TIP): Exploring Phenomenology, Functional Impact, and Treatment Utilization. Journal of Clinical Psychiatry. 2006; 67:1877–1888.10.4088/JCP.v67n1207 [PubMed: 17194265]

Woods DW, Fuqua RW, Outman RC. Evaluating the social acceptability of persons with habit disorders: the effects of topography, frequency, and gender manipulation. Journal of Psychopathology and Behavioral Assessment. 1999; 21:1–18.10.1023/A:1022839609859

Woods DW, Miltenberger RG, Flach AD. Habits, tics, and stuttering: prevalence and relation to anxiety and somatic awareness. Behavior Modification. 1996; 20:216–225. [PubMed: 8934868]

Woods DW, Wetterneck CT, Flessner CA. A controlled evaluation of acceptance and commitment therapy plus habit reversal for trichotillomania. Behaviour Research and Therapy. 2006b; 44:639–656.10.1016/j.brat.2005.05.006 [PubMed: 16039603]

Highlights

- Hair pulling disorder is though to be associated with significant comorbidity.
- The psychosocial impact of hair pulling symptoms is also substantial.
- Data from a treatment-seeking sample of adults with hair pulling were examined.
- Results indicated that both current and lifetime comorbidity were high (38.8% & 78.8%).
- Current depressive symptoms were significantly correlated with quality of life.
- People with hair pulling might benefit from parallel treatment for depression.

Table 1

Description of former studies examining comorbidity in HPD.

Reference	Sample Size	Recruitment	Assessment
Christenson, Mackenzie, & Mitchell, 1991	60	Referrals from outpatient or respondents to newspaper ads. Study completed at a trichotillomania specialty clinic.	Semi-structured interview based on DSM-III-R for HPD and comorbid disorders
Swedo & Leonard, 1992	43	Participants who had presented for research studies at the National Institutes of Mental Health	Schedule for Affective Disorders and Schizophrenia – Lifetime Version and the Diagnostic Interview for Children and Adolescents (Based on DSM-III-R)
Schlosser, Black, Blum, & Goldstein, 1994	22	Participants recruited through a psychiatric outpatient clinic (N = 8) and newspaper advertisements (N = 14)	Semi-structured interview focused on hair pulling, Diagnostic Interview Schedule for Axis I Disorders, and Structured Interview for DSM-III-R Personality Disorders
Christenson, 1995	186	Patients presented at a Trichotillomania Clinic	Minnesota Trichotillomania Assessment Inventory based on DSM-III-R
van Minnen, Hoogduin, Keijsers, Hellenbrand, & Hendrik, 2003	43	Recruited through television ads. Self-referred to university outpatient clinic.	SCID for DSM-IV
Keijsers, van Minnen, Hoogduin, Klaassen, Hendriks, & Tanis, 2006	28	Waitlist control group from van Minnen et al., 2003	SCID for DSM-IV
Lochner et al., 2005	54	Referred to the research unit from a wide range of sources (e.g., OCD Association of South Africa, community-based primary care practitioners, and psychiatrists).	Semi-structured clinical interview and SCID-I
Diefenbach, Tolin, Hannan, Crocetto, & Worhunsky, 2005	28	Recruited for participation in treatment study	TDI and SCID
Woods, Wetterneck, & Flessner, 2006	28	Unclear	SCID
Odlaug & Grant, 2008	24	Recruited from ongoing pharmacological treatment studies and a longitudinal study on impulse control disorders	SCID-I and semi-structured interview
Grant, Odlaug, & Kim, 2009	50	Recruited through newspaper ads and referrals from medical providers	Physician-administered TDI and SCID
Lochner, Seedat, & Stein, 2010	80	Referred to the research unit from a wide range of sources (e.g., OCD Association of South Africa, community-based primary care practitioners, and psychiatrists).	SCID-I/P, SCID-II/P, SCID-OCSD, and Trichotillomania Behaviour Profile
Odlaug, Kim, & Grant, 2010	70	Participants recruited from completed clinical trials	SCID and SCID-compatible modules for impulse control disorders
Keuthen et al., 2012	38	Unclear	Semi-structured interviews for DSM-IV diagnoses. Minimum MGH-HPS score of 10, HPD symptoms for at least 1 year
Lochner, Grant, Odlaug, Woods, Keuthen, & Stein, 2012	84	Self-referred to specialty clinics	SCID-I/P for DSM-IV and proposed DSM-5 criteria
Tung, Flessner, Grant, & Keuthen, 2015	153	Participants recruited for two research studies at Massachusetts General Hospital.	SCID for DSM-IV-TR Axis I Disorders Non-Patient Edition (SCID-I/NP) and Keuthen Diagnostic Inventory for Skin Picking (K-DISP)

Table 2

Current comorbidity rates in former studies.

Disorder	Christenson et al. 1991	Schlosser et al., 1994	Diefenbach et al., 2005	Woods et al., 2006	Grant et al., 2009	Odlaug et al., 2010	Lochner et al., 2012	Odlaug et al., 2008
Excoriation Disorder	-	-	-	-	-	-	-	-
OCD	-	-	-	-	-	-	5	0
Major Depression	23	18	21.4	28.6	28	-	8	0
Dysthymia	-	-	-	-	-	-	5	-
Bipolar	-	-	-	-	-	-	0	-
Panic Disorder	-	14	3.6	3.6	-	-	2	-
Social Phobia	-	-	-	-	-	-	5	0
Specific Phobia	-	-	-	-	-	-	12	-
GAD	-	-	-	-	-	-	14	-
PTSD	-	-	3.6	-	-	-	0	-
Eating Disorder	-	5	-	-	-	-	1	-
Substance Use Disorder	-	14	-	-	-	0	-	4.2
Psychotic Disorder NOS	-	-	-	-	-	18	-	-

Table 3

Lifetime Comorbidity Rates in Former Studies.

Disorder	Christenson et al., 1991	Swedo & Leonard, 1992	Christenson, 1995	Schlosser et al., 1994	Lochner et al., 2005	Odlaug & Grant, 2008	Lochner, Seedat, & Stein, 2010	Keuthen et al., 2012	Tung et al., 2015	Average
Excoriation Disorder	-	-	-	-	-	-	-	-	24.2	24.2
OCD	5	16	13.4	27	-	8.3	7.5	-	30.1	15.3
Major Depression	32	39	51.6	41	49	41.7	-	34.2	55	42.9
Dysthymia	-	-	4.8	36	2	-	-	-	2.7	11.4
Bipolar Disorder	-	5	2.7	-	-	0	-	-	1.3	2.3
Panic Disorder	18	5	20.8	27	6.1	-	-	2.6	11.3	13
Social Phobia	-	-	11.3	-	8.2	-	-	2.6	10	7.4
Specific Phobia	-	2	18.8	-	18.4	-	-	2.6	6.6	12.1
GAD	-	32	27	32	20.4	-	-	-	16.6	25.6
PTSD	-	-	-	23	-	-	-	-	9.9	16.5
Anorexia	-	5	1.6	5	2	-	-	-	4	3.5
Bulimia	-	-	8.1	14	6.1	-	-	5.3	2	7.1
Binge Eating	-	-	-	-	10.2	-	-	-	6	8.1
Alcohol Use Disorder	-	-	19.4	5	-	-	-	2.6	-	8.9
Substance Use Disorder	22	15	16.1	18	-	8.3	-	-	21.	16.8

Table 4

Comorbidity Rates in the Present Sample.

Diagnosis	Current (%)(N = 85)	Lifetime (%)(N = 85)
Excoriation	12.9	12.9
OCD	4.7	7.1
Major Depression	3.5	51.8
Adjustment Disorder with Depressed Mood	2.4	3.5
Dysthymia	2.4	2.4
Bipolar	1.2	1.2
Panic	1.2	8.2
Social Phobia	4.7	8.2
Specific Phobia	5.9	8.2
GAD	12.9	14.1
PTSD	1.2	15.3
Anorexia	0.0	4.7
Bulimia	0.0	1.2
Binge Eating	0.0	1.2
Alcohol Abuse Disorder	2.4	17.7
Substance Abuse Disorder	0.0	4.7
Total	38.8	78.8

Table 5

Correlation Matrix.

	MGH-HPS	NIMH-TSS	BAI	BDI	Current Comorbidity	Lifetime Comorbidity
MGH-HPS	-	-	-	-	-	-
NIMH-TSS	0.62**	-	-	-	-	-
BAI	0.19	0.23*	-	-	-	-
BDI	0.25*	0.24*	0.71**	-	-	-
Current Comorbidity	0.02	0.03	0.16	0.22	-	-
Lifetime Comorbidity	0.02	0.06	0.22*	0.25*	0.41**	-
Quality of Life	−0.09	−0.09	−0.13	−0.34**	−0.17	−0.19

[a]*. denotes significance at $p < .05$

[b]**. denotes bonferroni-corrected significance at $p < 0.002$