

An Exploration into the Impact of Gender on Trichotillomania: Prevalence, Severity,
and Mechanisms

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"On my honor I have neither given nor received unauthorized information regarding this work, I have followed and will continue to observe all regulations regarding it, and I am unaware of any violation of the Honor Code by others." Katherine Grace Gomulkiewicz

Trichotillomania (TTM) is a psychological disorder characterized by uncontrollable hair pulling. Often people with TTM pull hair from multiple body locations repeatedly, however the most common location to pull from is the scalp (Gawłowska-Sawosz, Wolski, Kamiński, Albrecht, & Wolańczyk, 2016). Because most people with TTM feel embarrassed about noticeable hair loss, they will often pull out their hair in private and wear wigs in public to disguise any bald patches (Woods & Houghton, 2014). The first mention of TTM by a clinician was in 1889 (Dean, Nelson, & Moss, 1992). The word itself actually describes the disorder: trich- ("hair"), tillein ("to pull or pluck"), and -mania ("to be mad") (Dean et al., 1992). Within the psychological community, the literature surrounding TTM is relatively thin.

Currently, the *Diagnostic and Statistical Manual-Five* (DSM-5) categorizes TTM as a Body Focused Repetitive Behavior (BFRB). In the past there has been controversy surrounding the most appropriate way to classify TTM. For many years TTM was classified as an Obsessive Compulsive (OC) Spectrum Disorder (Woods & Houghton, 2014). However, the most recent addition of the DSM has grouped TTM with other BFRBs such as skin picking, cheek chewing, and nail biting. Although some people would consider BFRBs as normative habits (many people bite their nails), they become problematic when they interfere with everyday functioning (Siddiqui, Naeem, Naqvi, & Ahmed, 2012). These disorders often manifest in late childhood or early adolescence and are often misdiagnosed and misunderstood (Siddiqui et al., 2012). Researchers began to focus on BFRBs when they found high comorbidity rates between these behaviors and heavily studied disorders such as anxiety and depression (Woods & Houghton, 2014). One of the main criteria for BFRBs relates to the inability of a person to resist to urge to perform a behavior (Siddiqui et al., 2012).

Diagnostically, the main feature of TTM is the recurrent pulling out of one's hair, which results in hair loss (Woods & Houghton, 2014). TTM, like all BFRBs has a component of emotional release which is characterized by feeling tension right before a hair is pulled and feeling relief right after it has been pulled out (Woods & Houghton, 2014). This hair pulling associated with TTM is distinct from medical conditions (e.g., a dermatological condition) and other mental disorders (e.g., attempts to improve a perceived defect or flaw in appearance in body dysmorphic disorder) Woods & Houghton, 2014).

One area of TTM research that is of interest relates to prevalence rates and the gender ratio of people with TTM. Many articles about TTM suggest that this is a female dominant disorder. However, there is a lack of empirical evidence to strongly back up this claim. In fact, many clinical and empirical studies complicate this idea. This literature review will examine studies on TTM to synthesize the research on gender prevalence and consequences of diagnosis. Additionally, this literature review will also explore some potential mechanisms of TTM.

Gender Differences in the Prevalence of TTM

The most accepted gender ratio in TTM literature states that women are far more likely than men to have symptoms and to be diagnosed with TTM. There is one seminal epidemiological study, which endorses a female heavy gender imbalance in prevalence rates of TTM. In 1991, an epidemiological study of TTM was conducted using 2524 first year college students at two state universities as well as one liberal arts college (Christenson, Pyle, & Mitchell, 1991). Students filled out a questionnaire, which focused on DSM-III diagnostic criteria for TTM. Within the population studied, 64 students indicated significant hair pulling but without the urge to pull or tension reduction post-pulling (Christenson et al., 1991). The gender breakdown of those 64 students indicated that 47 women and 17 men endorsed those symptoms, which is a 4:1 gender imbalance favoring women over men (Christenson et al.,

1991). Since this is the first epidemiological study, the 4:1 gender ratio is often cited in subsequent research on TTM. For years this article has been the gold standard for reinforcing the gender imbalance in TTM. However, the data from this paper does not as strongly endorse a gender imbalance in prevalence as has been reported. In fact, when strict DSM-III criteria was applied to the population, there is an even 0.6% prevalence for both men and women (Christenson et al., 1991). Since this is the main epidemiological study that shows more women with TTM, it is important that further research continues to attempt to replicate these results. However, a major weakness of this study was the use of a self-report questionnaire. The use of a self-report measure could have altered both the number of participants who endorsed TTM symptoms and the gender breakdown.

Another epidemiological exploration of TTM was conducted in 1994 and supported the gender prevalence of more women than men. Participants for this study were chosen by a mail response to a one of two national newspaper articles either on TTM or self-injurious behaviors (Cohen, Stein, Simeon, Spadaccini, Rosen, Aronowitz, & Hollander, 1994). All of the people who responded were then mailed a packet which contained a self-report survey related to medical and family history as well as questions about TTM symptoms (Cohen et al., 1994). The results of this study found that 93% of the participants who endorsed symptoms of TTM were women (Cohen et al., 1994). However, within the population of children who responded to the questionnaire, the percentage of girls is lower at 76% (Cohen et al., 1994). The lowest female to male ratio was found in children less than six years old and was 7:1 (Cohen et al., 1994). Although this research reinforces the gender prevalence rates found by Christenson and colleagues (1991), it is important to consider the methodological flaws of this study. The culling of a participant pool via newspaper article would limit the pool to people interested in seeking treatment for TTM. Furthermore, the use of a self-report questionnaire without any interaction between the researchers and the

participants did not allow researchers to validate that the responses were accurate. That said, the results from these two epidemiological studies are often cited as strong evidence for the claim that more women than men have TTM.

There have also been multiple studies exploring prevalence rates of TTM within treatment seeking populations that also show a gender imbalance in TTM. An early study by Muller in 1987 looked at prevalence of patients seeking treatment for TTM over a 20-year span. Muller found that of TTM treatment seeking patients, over 73% were women (1987). Christenson, Mackenzie, and Mitchell also conducted a study exploring prevalence of TTM within an outpatient population (1991). This study used a clinical interview instead of a self-report measure, which helps bolster the reliability of the results. Using a clinical interview allowed a trained professional to provide a more holistic diagnostic picture for each participant rather than focusing solely on results from a self-report questionnaire. For this study, patients from an outpatient population were recruited via newspaper advertisement for a treatment study (Christenson, Mackenzie, & Mitchell, 1991). 60 adult chronic hair pullers were identified and the researchers conducted a clinical interview with each person (Christenson, Mackenzie, et al., 1991). From this chronic puller population, the researchers found that 93% of the participants were women (Christenson, Mackenzie, et al., 1991). This is the same percentage of women found by Cohen and colleagues in 1994, which strengthens the validity of this high female response rate for TTM. This study, along with other research studies, indicates that within a patient population, the majority of people with TTM are women.

In 2000 another patient population study replicated a female favored gender ratio for TTM. This study used a sample of 231 patients seeking treatment for Obsessive Compulsive Disorder (OCD) or an OC Spectrum Disorder in Bangalore, India. Each participant was evaluated using the DSM-IV diagnostic criteria for a variety of different conditions under

these diagnoses (Jaisoorya, Reddy, Srinath, & Thennarasu, 2009). The goal of the study was to explore sex differences in OCD and OC Spectrum Disorder as well as to examine differential symptoms for men and women (Jaisoorya, et al., 2009). The study found a significant gender imbalance with more women having symptoms of TTM than men. With such small prevalence of TTM, the number of participants with symptomology is characteristically low. Out of the 231 participants, only one man and five women endorsed symptoms of TTM (Jaisoorya, et al., 2009). These results are important however, because they are a cross-cultural examination of TTM and find similar gender prevalence as Christenson and colleagues.

There are research study results that question the traditional gender breakdown of TTM. Instead of an increase in women with TTM, some researchers find no gender difference in participants with TTM and others even find more men than women with TTM.

In 1995 an epidemiological study of Israeli adults was conducted to look at the prevalence rates of TTM. In Israel there is a mandatory physical and psychological examination for all adults going into the military service (King et al., 1995). The study used this data to look at the psychological evaluations of 794 adults (King et al., 1995). There was a three part assessment criteria: a self-report questionnaire and two clinical interviews. A strength of this study is the use of two clinical interviews in addition to a self-report measure, which would allow people to mildly endorse TTM but then to be evaluated by a psychologist for a more comprehensive picture of the participant's symptoms and for the best diagnosis to apply. The results of this epidemiological study yielded eight chronic hair pullers who met the diagnostic criteria for TTM (King et al., 1995). Of those eight adults with TTM, five of them were men and three of them were women (King et al., 1995). These results do not support the traditionally accepted gender ratio from previous studies. The researchers further broke down the eight adults by their current and past TTM symptoms. Of the current hair

pullers who did not experience gratification symptoms, three were men and two were women (King et al., 1995). Of the past hair pullers, two were men and two were women (King et al., 1995). These results, although taken from a small sample support the idea that within this population sample more men than women experience symptoms of TTM.

Another more recent study from 2012 used a cross-sectional design to explore the prevalence of BFRB from three large medical colleges in Karachi, Pakistan (Siddiqui et al., 2012). 3000 students will fill out a habit questionnaire tailored to see if they fit any of the criteria for a BFRBs (Siddiqui et al., 2012). Because TTM is a BFRB, there was specific analysis done on prevalence of the disorder within the population. The overall prevalence of BFRBs in the sample group was 22% with the majority of people endorsing criteria for TTM (Siddiqui et al., 2012). The overall gender prevalence across all BFRBs was 14% women and 8% men, which actually falls in line with the standard gender assessment of TTM (Siddiqui et al., 2012). However, when the BFRBs are broken out by type, the gender difference disappears. To meet the full diagnostic criteria for a BFRBs, the researchers indicated that participants had to say they engaged in this behavior more than five times per day for four weeks or more (Siddiqui et al., 2012). When first looking at prevalence of TTM, which doesn't meet these strict criteria, the results show that more women endorse hair pulling than men (Siddiqui et al., 2012). However, when adhering to these full criteria for BFRB this percentage shifts to an equal gender split (Siddiqui et al., 2012). This mirrors the early Christenson and colleagues finding from 1991, which shows that when adhering to a strict DSM criteria the gender prevalence rates equalize between men and women.

Although this research is far from conclusive evidence about the gender prevalence of TTM within patient and epidemiological populations, these studies do show that the relationship is not as simple as it once may have seemed. It is important within the literature that psychologists acknowledge that there is conflicting evidence related to gender

prevalence. In addition to just acknowledging that there may not be a clear gender ratio, it is also important for researchers to cite more evidence than just Christenson and colleagues from 1991. Although this study is significant within the literature on TTM, too many subsequent articles rely solely on some of the results from this study to make their bold claims about gender ratios related to TTM. It is important to nuance this first epidemiological study by including other citations that both confirm and question these results. Additionally, it is important for researchers to continue to explore the potential mechanisms of TTM and the gender breakdown. Many researchers have suggested different possible reasons for a gender imbalance in study results. Some argue that female treatment seeking behaviors inflate the number of female patients while others suggest the normative nature of male hair loss reduces their distress related to TTM. These are important considerations for the field of research. Another important area of current research looks at how men and women respond differently to a TTM diagnosis. The following section will explore research in this area.

Gender Differences in the Consequences of TTM

Not only is there discussion in the literature about the gender prevalence of TTM but there is also research exploring the impact of gender on severity of symptoms and probability of comorbidities. The following articles explore severity of symptomology although they do not conclusively indicate if men or women respond more extremely to a diagnosis. Many of the following studies used clinical interviews or diagnostic measures to assess symptoms severity, which is a distinct strength in this section of the literature.

An early study used people with TTM identified through charts at the University of Minnesota Department of Psychiatry (Christenson, MacKenzie, & Mitchell, 1994). The hair pullers then sat down for a clinical interview to assess the severity and frequency of symptoms and to gather information on comorbidities and family history (Christenson, et al.,

1994). The results from this study indicated that men had a significantly later age of onset than the women (Christenson, et al., 1994). Additionally, men pulled from significantly more hair sites than women (Christenson, et al., 1994). This suggests that men's daily lives are more disrupted by focused, uncontrollable hair pulling. Additionally, the results for comorbid psychological conditions showed that men were significantly more likely to be diagnosed with Tourette's syndrome and twice as likely to have a history of major depression (Christenson, et al., 1994). Since TTM is a disorder with a high level of comorbidities, these results indicate that men are more likely to be affected by multiple psychological disorders in addition to TTM. These comorbid diagnoses decrease social acceptability and increase psychological stress for men. Overall, this study suggests that although men may be less likely to be diagnosed with TTM, those who are diagnosed have a higher severity of symptoms and more negative outcomes.

The results of this study are further bolstered by Grant & Christenson, who explore the role of gender in pathological grooming habits such as TTM (2007). There were 77 men and 65 women included in the study and participants were recruited from a current pharmacological study or from ongoing outpatient study on TTM (Grant & Christenson, 2007). Each participant in the study was assessed by a psychologist for symptoms and severity of symptoms using the Clinical Global Impression-Severity (CGI) scale and the Sheehan Disability Scale (SDS) via clinical interview (Grant & Christenson, 2007). The results from this study were consistent with the previous findings indicating that men have a later age of onset than women (Grant & Christenson, 2007). Although not statistically significant, men did spend over twice as much time pulling hair as women did (Grant & Christenson, 2007). This reinforces the idea that men with TTM have more daily disruptions due to large chunks of time spent pulling hair. Also, according to the SDS, men showed greater functional impairment due to symptoms than women (Grant & Christenson, 2007).

Both men and women had high comorbid psychological conditions, however women had less lifetime and current anxiety than the men in the study (Grant & Christenson, 2007). The increase in comorbid disorders for men further exacerbates the impact of one psychological condition and may lead to a greater impact on men's lives than on women's lives. This study indicates once again that men may show greater expression of symptoms and additionally greater impairment from these symptoms.

Not all of the literature supports the idea however men experience more symptoms and comorbidities if diagnosed with TTM. In fact, a recent study from a pediatric population differs from these studies in its findings of diagnostic distress and comorbidities (Panza, Pittenger, & Bloch, 2013). The sample from the study included children ages eight to 17 who were recruited for participation in a treatment trial for TTM (Panza et al., 2013). All of the children had clinically significant hair pulling and were in search of treatment for these behaviors. A clinical interview was used to establish for each child specific symptoms and the severity of the presented symptoms as well (Panza et al., 2013). The researchers predicted that more girls would experience more distress, anxiety, and depression than boys (Panza et al. 2013). Interestingly, the researchers found that between the genders, there was an equal age of onset, severity, frequency and urges, number of sites, and time spent pulling out hair (Panza et al. 2013). This shows no significant difference between the severity of TTM for boys and girls. However, Panza and colleagues did find significant gender differences in level of distress with boys showing lower distress than girls (Panza et al., 2013). This result indicates that in patients with TTM who exhibit the same severity of symptoms, girls are more likely to be distressed by them. Additionally, girls had higher comorbid symptoms for anxiety and depression with girls higher than boys (Panza et al., 2013). This result is different than the previous few studies, which suggest men have a higher comorbid anxiety and depression. Although these results are from a pediatric

population, this study does indicate that the hypothesis that males always indicate increased symptom severity and distress is not the case.

Another experiment that indicates a more complicated gender dynamic looks at the social acceptability of people with habit disordering including TTM (Woods, 1999). This comprehensive experiment ran multiple pilot tests to create baselines for social desirability and habit disorders (Woods, 1999). The most significant results for this paper come from the final experiment. 103 undergraduate students were recruited as participants for the experiment and they were asked to view multiple tapes of an actor, either female or male, and either engaging in a habit behavior or not (Woods, 1999). In the neutral condition, the actor in the tape did not engage in any abnormal behaviors. The habit conditions were broken up by disorder (tic, TTM, etc.) in which the actor would simulate general physical symptoms specific for each disorder (Woods, 1999). For example, in the TTM condition the actor would twist and pull at his or her hair and eventually simulate pulling out multiple strands of hair while being observed by a participant. Participants viewed multiple tapes, which always included the neutral condition and then the habit conditions. Participants were asked to rate the actor in each individual tape on his or her overall social desirability, acceptability, and likability (Woods, 1999). Participants rated the habit group as significantly less socially desirable than the non-habit group (Woods, 1999). However, when giving a gender breakdown of the female or male actor exhibiting TTM symptoms, the participants rated the female as having a higher social acceptability than the male actor. Additionally, participants were more likely to want to engage with the female actor even in a habit condition over the male actor (Woods, 1999). There was also an interaction between gender of the participant and gender of the actor such that female participants rated the female actor as even more socially desirable compared to the male actor than the male participants did (Woods, 1999). These results suggest that men with TTM are seen as less socially desirable than women with

TTM. Although some psychologists have suggested that more women seek treatment because of higher social stigma surrounding hair loss, these results indicate that actually men are more likely to face social consequences of habit disorders.

The epidemiological study conducted via newspaper response mentioned earlier by Cohen and colleagues also explored the relationship between gender and severity of TTM symptoms (1994). A series of statistical tests were used to assess the severity of pulling specific symptoms and sites between men and women (Cohen et al., 1994). This study found there to be no difference in symptom severity between women and men (Cohen et al., 1994). Two important limitations of this study however are the way it defined severity and the small sample size. The study defined severity as amount of hair pull from each common site (Cohen et al., 1994). This definition ignores the DSM criteria related to emotional arousal pre and post pulling which is an important part of symptom severity. Additionally, of the final participant pool of 123 people, there were only eight men which makes the significance of the findings less statistically stable.

Overall, like with gender prevalence of TTM within the community, there are no conclusive results about the impact of gender on severity of symptoms. The literature has shown times when men are more greatly effected and times when more women are greatly effected by a TTM diagnosis. This is an important area for further research because the impact of TTM on a person is distinctly negative and characterized by emotional distress. Understanding how to best treat and support a person with TTM regardless of gender impact, should be a critical within the psychological community.

Potential Mechanisms Underlying Gender Differences in TTM

Many psychologists have posited social mechanisms for differences in the gender prevalence and consequences of TTM. Some researchers have suggested that the number of women within the clinical population is due to female treatment seeking behaviors. Others

have suggested that the gender imbalance within the clinical population is due to men not seeking treatment because they do not view hair loss as being as socially undesirable as women. However, there is incredibly limited empirical research on either of these theories specifically related to TTM. These would be important future areas of research.

There are other psychologists who argue that the gender difference in prevalence of TTM is biological. Animal models for TTM have been used to enhance the biological argument. Abnormal hair pulling behaviors have been observed in six different primate species, rabbits, mice, and a variety of other animals as well (Reinhardt, 2005). Within a ethological observation of a breeding troop of 22 thesus macaques there were 388 recorded incidences of hair pulling in a span 162 hours (Reinhardt, Reinhardt, & Houser, 1986). Monkeys, like humans with TTM use their fingers to pull out hair in chunk from themselves or from other monkeys (Reinhardt, et al., 1986). Although monkey hair pulling may vary in certain ways from humans with TTM, this can serve as a relatively reliable animal model. The researchers observed that the hair pulling behavior seemed to be related to exposure to social stress (Reinhardt, et al., 1986). Although not significant, there were major trends within the money population to indicate that overall more female monkeys pulled out hair than male monkeys (Reinhardt, et al., 1986). Some unpublished research from Tufts University of Veterinary Medicine on abnormal grooming habits in cats bolsters these results. The data from this research indicates that female cats are far more likely to engage in abnormal grooming habits than male cats (Sawyer, Moon-Fanelli, Dodman). Out of the 18 cats with abnormal grooming habits studied in the lab, 72% were female cats (Sawyer, Moon-Fanelli, Dodman).

A mouse study from 2004 also used an animal model to explore inherent gender differences in the presence of TTM (Garner, Weisker, Dufour, & Mench, 2004). The study explored extreme grooming behaviors within a population of lab mice with the goal of using

this to mirror the obsessive focus on hair pulling which is characteristic of TTM (Garner et al., 2004). The mice were examined for grooming sites, patterns of grooming, frequency of grooming, as well as an overall look at prevalence and gender ratio of this extreme behavior within the mice population (Garner et al., 2004). Female mice were 1.5 times more likely to exhibit these extreme grooming behaviors than the male mice (Garner et al., 2004). As the researchers point out, this increased prevalence in the female mice population cannot be due to many of the frequently reported societal gender biases (Garner et al., 2004). Specifically, mice cannot have bias in reporting frequency, do not experience social or cultural differences, or other sex-biases. These results therefore suggest that further research is needed into the reliability of animal models for TTM and additionally that there may be a biological underpinning to some of the gender prevalence rates that are seen in humans with TTM.

Conclusion

Like most psychological research, the results related to gender prevalence and consequences for TTM are not conclusive. It appears that generally within a patient population more women than men are being treated for TTM. However, within an epidemiological sample, it seems that there may be no gender difference or a reduced gender difference specifically when full diagnostic criteria is applied. These differences in prevalence ratios may be due to social factors that increase the likelihood of women in treatment populations.

It is important to note however that there are discrepancies in the literature about how gender impacts the severity of TTM. Some studies in this review indicate that men experience greater distress and high disruption of everyday life than women with TTM. However, these results are not conclusive because other studies indicate the opposite finding. Animal models for TTM suggest a potential biological underpinning for the gender

difference in prevalence for people with TTM. Overall, more research is needed in all of these areas to produce stronger trends in results.

TTM is not a heavily researched topic and very little population research has been done exploring prevalence and gender. It is important for psychologists to conduct more studies on TTM. There needs to be more research in both patient population and epidemiological samples. This is critical not just to explore the gender prevalence within these populations but also to begin to dissect gender differences between TTM prevalence within these two different samples. Since there is not extensive research on different age groups, it is also important to focus specifically on gender rates in the following populations: pediatric, young adult, adult, and geriatric. This may show a shift in gender ratios and prevalence over time, although without research it is impossible to hypothesize this.

One interesting finding from this literature review is the impact of the DSM in prevalence rates of TTM. Since two studies find that with adherence to strict DSM criteria prevalence drops and the gender ratio diminishes, it may be important to reassess the criteria for TTM. Overall, more women than men endorsed abnormal hair pulling habits but an equal amount of men and women endorsed these habits with the inclusion of the emotional tension before and the emotional release after pulling a hair. As a result, it seems important to examine the DSM-5 criteria for TTM to see if these are the appropriate and total criteria to use.

There are many significant issues surrounding the research of TTM. The small amount of studies is exacerbated by small samples sizes and limited clinical measures. There is conflicting evidence related to the gender rates of TTM and needs to be more research in this area. There are many people who are negatively effected by TTM and it is important to gain a better psychological understanding of this disorder. Many people with TTM live in shame and work hard to hide their hair loss. It is important for psychologists to continue to

study TTM to have a better understanding of this disorder so that there can be a greater understanding about the mechanisms underlying TTM. With a stronger understanding of mechanisms, psychologists could work to improve treatment options and reduce stigma surrounding TTM. Hopefully with more research in the field TTM can be understood to a greater depth and with more clarity.

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