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ORIGINAL ARTICLE

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Dysfunctional beliefs associated with hair pulling disorder: an examination in clinical versus non-clinical groups

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ABSTRACT

Objective: Until recently, empirical studies had been limited with respect to investigating factors that influence the onset and maintenance of hair pulling disorder (HPD), particularly regarding the role of dysfunctional cognitions and beliefs. The primary aim of this study was to examine the relationships between symptom severity and belief domains in a sample with hair pulling disorder compared with non-clinical participants, using the Beliefs in Trichotillomania Scale (BiTS); a recently developed measure of relevant negative self-beliefs, coping efficacy beliefs, and perfectionist cognitions.

Method: Twenty adults with HPD and 43 age- and gender-matched control participants completed the BiTS and several measures of related constructs.

Results: HPD severity was significantly and positively correlated with negative self-beliefs and low coping efficacy, but not perfectionism, even after controlling for anxiety and depressive symptoms. Focussed hair pulling, but not automatic hair pulling, was correlated with each BiTS domain; however, once anxiety and depressive symptoms were controlled for, the significant relationship between focussed hair pulling and perfectionism was no longer apparent. The BiTS psychometric properties demonstrated good internal consistency and differentiated clinical from non-clinical participants, with clinical participants endorsing greater negative self-beliefs, lower coping efficacy, and greater perfectionism compared with control participants.

Conclusions: Negative self beliefs, low coping efficacy, and perfectionism have differential relationships with HPD severity and hair pulling styles, variable on the presence of co-occurring anxiety and depressive symptoms. While further support for the BiTS internal consistency was obtained, future examination of divergent validity with a more diverse range of constructs is required.

KEY POINTS

What is already known about this topic:

(1) Current cognitive-behavioural interventions for hair pulling disorder are designed to facilitate behaviour change by targeting the habit-formation and emotion-regulation mechanisms that maintain hair pulling behaviours.
(2) The Beliefs in Trichotillomania Scale (BiTS) measures three belief domains found to be relevant to hair pulling disorder: negative self beliefs, low coping efficacy, and perfectionism.
(3) Some cognitive-behavioural interventions additionally target cognitions and beliefs, however, few studies have investigated the relationships between relevant belief domains and hair pulling disorder severity and styles.

What this topic adds:

(1) Independent of co-occurring anxiety and depressive symptoms, negative self beliefs and low coping efficacy, but not perfectionism, were associated with hair pulling severity.
(2) Negative self beliefs, doubts about one's coping efficacy, and perfectionism were all associated with focussed hair pulling behaviours, but not automatic hair pulling behaviours. However, perfectionism was no longer correlated with focussed hair pulling upon controlling for anxiety and depressive symptoms.
(3) Assessment for these domains of dysfunctional beliefs, as part of formulation-driven cognitive-behavioural interventions for hair pulling disorder, is appropriate.

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Introduction

Despite its formal recognition as a psychological disorder over 30 years ago (American Psychiatric Association, 1987), the aetiology of hair pulling disorder (HPD) remains poorly understood. It is, however, generally accepted that a range of aversive internal states elicit and maintain hair pulling behaviours. Similar explanations have been proposed in the conceptualisation of putatively related body-focussed repetitive behaviours (BFRBs), such as skin picking and nail biting (Roberts et al., 2013). One of the earliest maintenance models of HPD proposed that conducting a functional analysis of the internal and external antecedents, facilitators, and inhibitors of hair pulling behaviour is critical to developing effective, individually tailored psychological treatments (Falkenstein et al., 2016; Mansueto et al., 1997, 1999). Research into the affective cues and correlates of hair pulling behaviours (e.g., Diefenbach et al., 2002; Shusterman et al., 2009) influenced the development of habit reversal therapy (HRT) protocols, since "enhanced" through the incorporation of acceptance and commitment therapy (ACT; e.g., Twohig & Woods, 2004; Woods et al., 2006) or dialectical behaviour therapy (DBT; e.g., Keuthen et al., 2010, 2012). Both augmented treatments have shown efficacy in treating HPD, and have facilitated new knowledge regarding the importance of targeting experiential avoidance and emotion dysregulation as two proposed mechanisms of behaviour change (Brennan et al., 2017; Roberts et al., 2013).

Cognitive therapy has long been incorporated into HRT protocols or used as a standalone intervention for HPD (Diefenbach et al., 2006; Keijsers et al., 2016; Lerner et al., 1998; Ninan et al., 2000; Ottens, 1981; Pélissier & O'Connor, 2004; Toledo et al., 2014). However, research into the cognitive cues and correlates of compulsive hair pulling has rarely preceded nor informed treatment developments in the same way that research regarding affective correlates has done. For instance, some studies of cognitive-behavioural therapy (CBT) for HPD (e.g., Lerner et al., 1998; Ninan et al., 2000) incorporated cognitive restructuring and thought-stopping techniques, but did not specify the content or function of the cognitions purported to precipitate and maintain hair pulling behaviours. In other studies of CBT for HPD, self-control beliefs (Keijsers et al., 2016), perfectionism (Pélissier & O'Connor, 2004; Toledo et al., 2014), and a range of specific facilitative thoughts have been targeted (e.g., "If you pull one, you might as well pull all of them", Ottens, 1981; and "Pulling is the only way to feel good", Diefenbach et al., 2006, p. 356).

The rationales for modifying these specific dysfunctional cognitions and beliefs in HPD can be understood from a range of theoretical perspectives. The comprehensive behavioural model of HPD (CoMB; Mansueto et al., 1997, 1999) positioned specific facilitative thoughts as cues that strengthen their associations with hair pulling stimuli over time, through classical and operant conditioning processes. In this, and other early perspectives on HPD (Franklin & Tolin, 2007), co-occurring depression and obsessionality were believed to increase vulnerability to negative self-evaluations and perfectionism as cognitive processes that may indirectly lead to hair pulling through increased negative affect; hence, adjunctive cognitive therapies were recommended when these comorbidities were present.

Based on their clinical experience, Keijsers et al. (2016) observed that, like patients with a range of unwanted habits (e.g., other BFRBs, smoking, over-eating), their patients with HPD often endorsed strong automatic cognitions that (a) hair pulling is rewarding (i.e., it produces pleasure, comfort, or relief) and (b) the urges cannot be resisted or controlled. Rather than simply weakening stimulus-response associations, they hypothesised that revising the meaning ascribed to both hair pulling urges and the consequences of pulling (i.e., that urges can be resisted and the behaviour produces nothing of value) may produce more robust treatment effects (Keijsers et al., 2016).

The frustrated action model proposes that people who engage in BFRBs, including hair pulling, have a maladaptive style of activity planning characterised by perfectionistic standards for personal organisation and productivity (Pélissier & O'Connor, 2004; Roberts et al., 2015). When these self-imposed standards are not met, feelings of tension, frustration or boredom develop. In line with operant conditioning principles, these negative feelings are then reduced by performing BFRBs, which are themselves positively appraised as a form of "taking action" (Roberts et al., 2015, p. 190). As support for the role of emotion dysregulation in the aetiology of HPD has strengthened (Crowe et al., 2024), researchers are increasingly suggesting that – beyond addressing cognitions as conditioned cues – it could be beneficial to target the cognitive appraisals that contribute to the emotional experiences individuals with HPD find most aversive (e.g., self-critical beliefs in relation to shame [Houazene, Leclerc, et al., 2021] and perfectionist cognitions in relation to frustration [Roberts et al., 2015]).

It has been argued that modifying dysfunctional beliefs could be most critical for individuals who engage in high levels of "focussed" hair pulling, which is intentionally performed to regulate negative cognitions, emotions, and sensations (Houghton et al., 2014; Mansueto et al., 1997). By contrast, the

"automatic" style of pulling occurs largely outside of conscious awareness, so high levels of this pulling style have been suggested as being more effectively managed with HRT (Flessner et al., 2008). Like HRT augmented with ACT or DBT, the above-mentioned trials of CBT have also demonstrated efficacy in reducing HPD severity (e.g., Diefenbach et al., 2006; Keijsers et al., 2016; Lerner et al., 1998; Ninan et al., 2000; Ottens, 1981; Toledo et al., 2014). However, it is difficult to conclude that participants' behaviour change was a consequence of the cognitive therapy strategies applied; excepting Keijsers et al. (2016), none of the mentioned studies included pre-to-post measures of the specific cognitions or belief domains targeted for modification.

Carrying out such measurement appears to have been hampered by the paucity of research into cognitions and beliefs relevant to HPD, and consequent lack of dedicated psychometric scales. Using their measure of self-control cognitions validated for a range of non-pathological habits (see Maas et al., 2017), Keisjers et al. (2016) found that cognitive therapy alone produced more favourable outcomes for HPD compared with behavioural therapy alone, but they did not find that outcomes for either condition were uniquely predicted by modification of self-control cognitions, which were found to significantly reduce over the course of both intervention types. The authors suggested that behavioural therapy may be similarly effective for modifying beliefs as cognitive therapy, as participants likely gained first-hand experience that urges can be successfully resisted, and that immediate rewards from hair pulling were ultimately outweighed by the longer-term rewards experienced by using behavioural strategies to abstain.

To allow future research to test the hypotheses that cognitive restructuring is an important mechanism of change in HPD, it is necessary to: (i) identify the cognitions and beliefs of most relevance to hair pulling onset and maintenance; and (ii) develop valid and reliable measures of those pertinent cognitions and beliefs that can be used in studies. Building upon the limited studies published at the time that explicitly examined the relationships between HPD and dysfunctional beliefs (e.g., Norberg et al., 2007; Rehm et al., 2015), Rehm et al. (2019) developed the *Beliefs in Trichotillomania Scale* (BiTS). Initially, the BiTS was expected to feature six belief domains as derived from thematic analysis of in-depth interviews with people diagnosed with HPD who described the influence of cognitive processes on their difficulties with hair pulling urges and behaviour: (1) negative self beliefs, (2) control beliefs, (3) beliefs about coping, (4) beliefs about negative emotions, (5) permission-giving beliefs, and (6) perfectionism (Rehm et al., 2015). As such, the BiTS items do not reference HPD-specific cognitions, but global dysfunctional beliefs identified as relevant to the onset and maintenance of symptoms according to participants with lived experience.

Using factor analyses with a large, internet-surveyed sample of participants with and without self-reported HPD symptoms, Rehm et al. (2019) found support for an abbreviated, parsimonious set of three subscales: (1) negative self beliefs, such as low self-worth and perceptions of being "abnormal"; (2) low coping efficacy, including perceptions about reduced self-control; and (3) perfectionism, including a desire for things to feel "right". Each of these belief domains have previously featured in proposed cognitive-behavioural models of HPD (Franklin & Tolin, 2007; Gluhoski, 1995; Keijsers et al., 2016; Norberg et al., 2007; Pélissier & O'Connor, 2004) and recently in emerging research into the role of cognitions in a range of BFRBs (Houazene, Aardema, et al., 2021; Noble et al., 2017).

Rehm et al. (2019) found that belief domain scores significantly and positively correlated with HPD severity, even after controlling for co-occurring depressive and anxiety symptoms, and were also correlated with focussed hair pulling. Controlling for depression and anxiety symptoms was deemed appropriate given these are the two most frequently co-occurring conditions in HPD (43% and 55%, respectively, in Grant et al., 2020). Furthermore, regression analyses found that only negative self-beliefs significantly predicted HPD symptom severity over-and-above depressive and anxiety symptoms (Rehm et al., 2019), corresponding with recent findings that self-critical cognitions and shame may increase BFRB urges and severity by activating a desire to modulate those aversive experiences (Houazene, Leclerc, et al., 2021, 2021b). Despite these findings, further examination of the BiTS is required to determine if the relationships identified between hair pulling behaviours and belief domains generalise to participants with a clinician-confirmed diagnosis of HPD according to *DSM-5* criteria.

The primary aim of the current study was to investigate the relationships between belief domains and HPD symptoms experienced by a clinical sample when compared with an age- and gender-matched non-clinical control group. A secondary aim was to examine the internal consistency and construct validity of the BiTS in this clinical sample. Three hypotheses were proposed:

(i) We expected that, even after controlling for symptoms of anxiety and depression, the BiTS subscale scores would significantly correlate with measures of HPD severity (*Massachusetts Hospital Hair Pulling Scales*) and focussed hair pulling (*Milwaukee Inventory for Subtypes of Trichotillomania-Adult* focussed subscale).

(ii) We anticipated that, even after controlling for symptoms of anxiety and depression (*Depression Anxiety Stress Scales-21*), the BiTS subscale scores would differentiate between clinical and control group participants.

(iii) We expected to replicate the internal consistency, convergent validity, and divergent validity of the BiTS subscales per Rehm et al. (2019), including significant positive correlations between:

a. Negative self-beliefs (BiTS-NSB) and *Rosenberg Self-Esteem Scale* scores.
b. Low coping efficacy (BiTS-LCE) and emotion-relevant scales including the *Acceptance and Action Questionnaire-II*, *Anxiety Control Questionnaire-Revised*, and *Difficulties in Emotion Regulation Scale* scores.
c. Perfectionism (BiTS-P) and perfectionism/certainty subscale scores from the *Obsessive Beliefs Questionnaire-44*.

Materials and methods

Participants

Participants included 20 participants with HPD symptoms (M_{age} = 28.65, SD = 6.43, 90% female) (referred to herein as clinical participants) and 43 non-clinical control participants (M_{age} = 27.30, SD = 8.45, 83.7% female). Sixteen clinical participants received a diagnosis of HPD and four participants' symptoms were classified as subthreshold, defined as meeting *DSM-5* criterion A (i.e., repetitive hair pulling causing hair loss) and at least two of the four remaining criteria (APA, 2013).

All participants were Australian residents except one who resided in the United Kingdom. Demographic and clinical characteristics of the samples are summarised in Tables 1 and 2. Groups were matched for age ($t(61) = .63$, $p > .05$), gender (Fisher's exact test $p = .711$), education level (Fisher's exact test $p = .545$), relationship status (Fisher's exact test $p = .065$), and nationality (Fisher's exact test $p = 1.00$). Compared with control participants, a significantly greater proportion of participants with HPD symptoms were employed (Fisher's exact test $p = .002$) and diagnosed with any other psychiatric disorder (Fishers exact test $p < .001$).[1]

Table 1. Summary demographic and clinical characteristics among clinical ($n = 20$) and non-clinical ($n = 43$) participants.

Variable	HPD *n* (%)	Non-clinical *n* (%)
Gender		
Female	18 (90)	36 (83.7)
Male	2 (10)	7 (16.3)
Employment status[a]		
Employed	14 (70)	12 (28)
Unemployed	4 (20)	0 (0)
Studying full-time	2 (10)	31 (72)
Education		
Secondary college	4 (2)	13 (30.2)
Vocational or higher degree	16 (80)	30 (69.8)
Relationship status		
Single	14 (70)	19 (44.2)
In a relationship	6 (30)	24 (55.8)
Nationality[b]		
Australia	13 (65)	28 (65.1)
United Kingdom and Europe	4 (20)	5 (11.6)
Other	3 (15)	10 (23.3)
MINI diagnosis		
No diagnosis (excludes TTM)	3 (15)	31 (72.1)
Any mood disorder (depression, bipolar)	14 (70)	11 (25.6)
Any anxiety disorder	9 (45)	1 (2.3)
Alcohol abuse disorder	0 (0)	1 (2.3)

MINI diagnoses do not add to 100% as comorbidities were counted.
[a]Categories for Fisher's exact test were 1 = employed (full-time or part-time/casual) and 0 = unemployed or full-time student.
[b]Categories for Fisher's exact test were 1 = Australia and 0 = all other nationalities (United Kingdom, Europe, South America, South East Asia, India, South Africa).

Table 2. Details of HPD symptoms, severity, and impact during the preceding 6 months ($n = 20$).

Variable	Median (range)	*n* (%)
Symptom characteristics		
Age at symptom onset	12 (5–20)	
Number of hair pulling sites	2 (0–5)	
Longest number of days without hair pulling	4.5 (0–181)	
Typical duration (mins) of hair pulling episodes	40 (0–350)	
Typical duration (mins) thinking about hair pulling	62.5 (1–610)	
Level of distress		
None-to-mild		5 (25)
Moderate-to-severe		10 (50)
Severe-to-extreme		5 (25)
Functional impairment		
None-to-mild		12 (60)
Moderate-to-severe		6 (30)
Severe-to-extreme		2 (10)

Information gathered via the *Diagnostic Interview for HPD* (Rehm & Nedeljkovic), unpublished.

Measures

The *Massachusetts General Hospital Hair Pulling Scale* (MGHHPS; Keuthen et al., 1995; O'Sullivan et al., 1995) is a commonly used 7-item self-report measure that assesses the severity of HPD symptoms over the past

week, including the frequency and intensity of urges and distress associated with hair pulling. Each item was rated on a 5-point Likert scale, where higher total scores reflect higher symptom severity. The MGHHPS has good internal consistency (α = .80; Diefenbach et al., 2005).

The *Milwaukee Inventory for Subtypes of Trichotillomania-Adult* version (MIST-A; Flessner et al., 2008) is a 15-item self-report measure of two styles of hair pulling; automatic (i.e., occurring with little-to-no awareness) and focussed (i.e., intentional). Each item was rated on a 10-point Likert scale ranging from 0 ("not true for any of my hair pulling") to 9 ("true of for all of my hair pulling"). Higher total subscale scores indicate greater reliance on focussed or automatic hair pulling. The scales show adequate internal consistency (range of α = 0.73–0.77), and good construct and discriminant validity in participants with HPD symptoms (Flessner et al., 2008). In the current study, participants who did not endorse HPD symptoms did not complete the MIST-A.

The *Beliefs in Trichotillomania Scale* (BiTS; Rehm et al., 2019) is a 14-item self-report measure of three belief domains found to be relevant to the onset and maintenance of distressing and repetitive hair pulling behaviours: negative self beliefs (BiTS-NSB), low coping efficacy (BiTS-LCE), and perfectionism (BiTS-P). Items were rated on a Likert scale ranging from 1 ("disagree very much") to 7 ("agree very much"), where higher mean subscale scores indicated higher endorsement of TTM-relevant beliefs. The BiTS subscales show good internal consistency (range of α = 0.76–0.88), and divergent and convergent validity in an internet-surveyed sample of participants with HPD symptoms (Rehm et al., 2019).

The *Depression Anxiety Stress Scales-21* (DASS-21; Lovibond & Lovibond, 1995) is a 21-item self-report scale that measures symptoms of depression, anxiety, and stress during the past week. Each subscale (depression, anxiety, stress) is comprised of seven items and rated 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"). Higher total subscale scores indicate higher symptom severity. Only the depression (DASS-21-D) and anxiety (DASS-21-A) subscales were used in the current study. The subscales show good internal consistency (range of α = 0.82–0.94), divergent validity, and convergent validity in clinical and non-clinical samples (Antony et al., 1998; Henry & Crawford, 2005).

The *Obsessive Beliefs Questionnaire-44* (OBQ-44; Compulsive Cognitions Working Group & Obsessive Compulsive Cognitions Working Group, 2005; Obsessive Compulsive Cognitions Working Group, 2001) is a self-report scale that measures beliefs associated with obsessive-compulsive disorder (OCD) across three subscales: responsibility/threat, perfectionism/certainty, and importance/control of thoughts. To minimise participation burden, only the 16-item perfectionism/certainty subscale (OBQ-PC) was used in the current study. Items were rated with a Likert scale ranging from 1 ("disagree very much") to 7 ("agree very much"), where a higher total score indicates a higher desire for perfection/certainty. The perfectionism/certainty subscale shows high internal consistency (α = 0.89) in OCD samples (Compulsive Cognitions Working Group & Obsessive Compulsive Cognitions Working Group, 2005).

The *Urgency, Premeditation, Perseverance, Sensation-Seeking Impulsive Behaviour Scale* (UPPS; Whiteside & Lynam, 2001) is a self-report measure of four dimensions of impulsivity: negative urgency, lack of premeditation, lack of perseverance, and sensation seeking. Only the first three subscales (UPPS-URG, UPPS-PREM, UPPS-PERS), comprising 33 items, were used in the current study. Items were measured on a Likert scale ranging from 1 ("strongly agree") to 4 ("strongly disagree"). Several items were reverse-scored to ensure that higher mean subscale scores indicate greater difficulties with impulse control. The UPPS subscales show high internal consistency (range of α = .82–.91) and good construct validity in non-clinical and clinical samples, respectively (Whiteside & Lynam, 2001; Whiteside et al., 2005).

The *Acceptance and Action Questionnaire-II* (AAQ-II; Bond et al., 2011) is a 10-item self-report questionnaire designed to measure experiential avoidance (i.e., a coping repertoire characterised by avoiding unpleasant internal states). Items were rated on a Likert scale ranging from 1 ("never true") to 7 ("always true"). Several items were reverse-scored to ensure that a higher total score indicates higher experientially avoidant tendencies. The AAQ-II shows sound internal consistency (range of α = 0.78–0.88) in clinical and non-clinical samples (Bond et al., 2011).

The *Rosenberg Self-Esteem Scale* (RSE; Rosenberg, 1965) is a 10-item self-report measure of self-esteem. Several items were reverse-scored to ensure that a higher total score indicates higher self-esteem. The RSE shows strong internal consistency (range of α = 0.88–0.90) in community and student samples (Robins et al., 2001).

The *Anxiety Control Questionnaire-Revised* (ACQ-R; Brown et al., 2004; Rappee et al., 1996) is a 15-item self-report measure comprising three subscales: control of emotions, control of threat, and control of

responses to stress. Several items were reverse-scored such that a higher total score indicates higher perceived anxiety control. The ACQ-R shows good internal consistency, test–retest reliability, and convergent and divergent validity in clinical samples (Brown et al., 2004).

The *Difficulties with Emotion Regulation Scale* (DERS; Gratz & Roemer, 2004) is a 36-item self-report measure of six facets of emotional dysregulation being non-acceptance of emotional responses, difficulties engaging in goal-directed behaviour, impulse control difficulties, lack of emotional awareness, limited access to emotion regulation strategies, and lack of emotional clarity. Items were rated on a Likert scale ranging from 1 ("almost never") to 5 ("almost always"). Several items were reverse scored to ensure that a higher total score indicates more emotional dysregulation. The DERS shows high internal consistency ($\alpha = 0.93$) and adequate construct validity in non-clinical and clinical samples (Gratz & Roemer, 2004; Hallion et al., 2018).

The *Distress Tolerance Scale* (DTS; Simons & Gaher, 2005) is a 15-item self-report measure of distress tolerance comprising four subscales: perceived ability to tolerate emotional distress, subjective appraisals of distress, the level of attention being absorbed by their experience of distress, and regulation efforts employed to alleviate distress. Participants rated their beliefs about distress on a Likert scale ranging from 1 ("strongly agree") to 5 ("strongly disagree"). One item was reverse-scored and higher mean subscale scores indicate higher distress tolerance. The DTS shows good convergent, discriminant, and criterion-related validity (Simons & Gaher, 2005).

Procedure

Clinical participants were recruited through mental health organisations and support groups specific to HPD, and control participants were recruited through university- and community-distributed advertisements. All participants attended an in-person or telehealth diagnostic interview using the *Mini International Neuropsychiatric Interview* (MINI; Sheehan et al., 1997, 1998) to establish the presence of common psychological disorders. Participants who self-identified as having HPD also completed the *Diagnostic Interview for HPD*, developed by IR and MN, to establish the presence of HPD according to *DSM-5* criteria (APA, 2013). Clinical participants completed their diagnostic interview with a (then) provisional psychologist (IR) while non-clinical participants completed their diagnostic interview with the same assessor and/or a suitably trained research assistant. Both assessors received training and supervision from an experienced clinical psychologist (MN), who verified all diagnostic decisions.

Following the diagnostic interview, all participants completed a battery of online surveys hosted on the *PsychSurveys* platform at a place and time of their choosing. Estimated completion time was between 30 to 40 minutes. All participants provided consent in accordance with the study protocol approved by the Human Research Ethics Committee of the host institution.

Statistical analyses

Statistical analyses were performed using SPSS version 27. For participants with HPD symptoms, all variables were normally distributed besides the BiTS-P, which featured one outlying case with a very low score. Rather than deleting the case, the raw score was re-coded to one unit less than the case with the next lowest score (Tabachnick & Fidell, 2019). This successfully normalised the BiTS-P distribution. For the non-clinical group, most variables required square-root (BiTS-NSB, BiTS-LCE, DASS-21-D, RSE, UPPS-PREM) or logarithmic (AAQ-II, DERS) transformation to return normal distributions. All affected variables were transformed except for the DASS-21-A, which remained positively skewed (3.23) and was thus excluded from analyses as appropriate.

Partial correlations tested the hypothesis that BiTS subscale scores would be significantly associated with HPD severity (MGHHPS) and focussed hair pulling (MIST-A-F) for clinical participants, even after controlling for depression and anxiety (DASS-21). Comparisons between the strength of correlations between HPD symptoms (MGHHPS, MIST-A), BiTS subscale scores, and the measures of construct validity that demonstrated the most conceptual overlap with the BiTS subscales were examined with Fishers *r*-to-*Z* score transformations. Due to the strong inter-correlation between BiTS-NSB and BiTS-LCE scores for clinical participants, assumptions for running a multivariate analysis of covariance (MANCOVA) were considered violated. Instead, a series of ANCOVA tests determined whether the BiTS subscale scores could differentiate between clinical and control participants, even after controlling for DASS-21-D scores. Due to the positive skew in DASS-21-A scores among non-clinical participants, our planned analysis to investigate group differences while controlling for both depression and anxiety symptoms could not be completed, hence only DASS-21-D was entered as a covariate. To mitigate against the risk of

Type I errors associated with performing multiple tests, Bonferroni adjustments were made to increase the threshold for interpreting statistical significance to $p < .017$.

To examine the reliability of the BiTS subscales, internal consistency coefficients (Cronbach's α) and Pearson's zero-order inter-correlations were calculated separately for clinical and control participants. To investigate convergent and discriminant validity with other constructs, Pearson's zero-order correlations between each of the BiTS subscales and a range of conceptually related psychological measures were conducted. Correlations were performed separately for clinical and control groups. Fisher's *r*-to-*Z* score transformations (Lenhard & Lenhard, 2014) tested construct validation hypotheses for significant differences between correlation magnitudes, as relevant to participants with HPD symptoms. To further investigate convergent validity, Pearson's zero-order correlations between each of the BiTS subscales and various symptom measures (MGHHPS, MIST-A, DASS-21) were calculated for clinical participants.

Results

Relationships with HPD and other symptoms

HPD symptom severity in the clinical sample was significantly and positively correlated with BiTS-NSB and BiTS-LCE scores to a moderate degree, but not with BiTS-P scores (Table 3). This indicates that, as negative self-beliefs and low coping efficacy increase, so too did HPD severity. Relatedly, RSE scores were significantly and negatively correlated with MGHHPS scores to a moderate degree, indicating that lower self-esteem was associated with increased HPD severity. However, the strength of this relationship was not significantly greater than the strength of the correlation between the BiTS-NSB and MGHHPS according to Fisher's *r*-to-*Z* score transformations ($p > .05$). Despite the apparent conceptual overlap between the BiTS-LCE and BiTS-P subscales with most measures of construct validity (per correlations in Table 6), MGHHPS scores were not significantly correlated with OBQ-PC, UPPS-URG nor AAQ-II scores.

Focussed hair pulling demonstrated significant, positive, and moderate correlations with all three BiTS subscales as anticipated, but also with measures used to examine construct validity (Table 3). MIST-A-F scores had especially strong relationships with AAQ-II, BiTS-NSB and BiTS-LCE scores, suggesting that focussed hair pulling behaviours increase alongside experiential avoidance, negative self-beliefs, and low coping efficacy. Fisher's *r*-to-*Z* score transformations indicated that the strength of the correlation between MIST-A-F and AAQ-II scores were no greater than the magnitude of correlations shared with the BiTS-NSB or BiTS-LCE (all *p*'s > .05). Consistent with expectations, the MIST-A-A subscale did not share significant correlations with any measures.

Finally, significant and positive correlations were found between BiTS-NSB and DASS-21-D and DASS-21-A scores, with medium-to-large effect sizes, suggesting a relationship between greater negative self-beliefs and increased depression and anxiety. There was also a significant, positive, and moderate-strength correlation between BiTS-P and DASS-21-D scores. The BiTS-LCE subscale did not share significant correlations with either of the DASS-21 subscales. While there were no significant correlations between the MGHHPS and DASS-21-A ($r = .01$, $p > .05$) and DASS-21-D ($r = .09$, $p > .05$), MIST-A-F scores demonstrated significant, positive, and moderate correlations with DASS-21-A ($r = .52$, $p < .05$) and DASS-21-D scores ($r = .53$, $p < .05$). As such, focussed hair pulling behaviours, specifically – but not HPD symptom severity, generally – increased alongside greater depression and anxiety symptoms.

Table 3. Correlations (partial correlations) between the BiTS, MGHHPS, MIST-A, and DASS-21 scores in the clinical sample ($n = 20$).

	MGHHPS	MIST-A-F	MIST-A-A	DASS-21-D	DASS-21-A
BiTS-NSB	.48* (.58*)	.71** (.48*)	.01 (.24)	.56**	.49*
BiTS-LCE	.48* (.51*)	.68** (.53*)	−.01 (.14)	.43	.38-
BiTS-P	.41 (.45)	.60** (.35)	.14 (.36)	.48*	.44
RSE	−.46* (−.54*)	−.52* (−.19)	.09 (−.07)	−.61**	−.41
OBQ-PC	.23 (.24)	.63** (.41)	.11 (.33)	.43	.48*
UPPS-URG	.24 (.25)	.60** (.33)	−.11 (.03)	.63**	.37
AAQ-II	.42 (.53*)	.73** (.53*)	−.14 (.05)	.49*	.57**
M (*SD*)	15.10 (5.94)	50.65 (14.22)	26.35 (7.86)	5.75 (4.12)	5.90 (5.79)

BiTS = Beliefs in Trichotillomania Scale; NSB = Negative Self Beliefs subscale; LCE = Low Coping Efficacy subscale; *p* = Perfectionism subscale; RSE = Rosenberg Self-Esteem Scale; OBQ-PC = Obsessive Beliefs Questionnaire – Perfectionism/Certainty subscale; AAQ-II = Acceptance and Action Questionnaire-II; UPPS-URG = Negative Urgency subscale; DASS-21-D = Depression, Anxiety, Stress Scale Depression subscale; DASS-21-A = Anxiety subscale.
Partial correlations (featured in parentheses) are controlling for DASS-21-D and DASS-21-A scores.
*$p < .05$; **$p < .01$.

When correlations between all variables were repeated – this time controlling for depression and anxiety – the same patterns of significant correlations between the MGHHPS and BiTS-NSB, BiTS-LCE, and RSE scores were replicated, and the magnitude of effect sizes increased. Of note, only after controlling for DASS-21 scores did the MGHHPS demonstrate a significant relationship with AAQ-II scores. For MIST-A-F scores, most correlations that were previously significant became non-significant after controlling for DASS-21 scores. Only the BiTS-NSB, BiTS-LCE, and AAQ-II maintained significant relationships with focussed hair pulling behaviours over and above depression and anxiety.

Group comparisons

A series of ANCOVAs demonstrated that all BiTS subscales differentiated participants with HPD symptoms from non-clinical participants, even after controlling for DASS-21-D scores. Compared with non-clinical participants, participants with HPD symptoms reported significantly greater negative self beliefs, as measured by the BiTS-NSB ($F(1, 60) = 23.73$, $p < .001$, partial $\eta^2 = .28$); and significantly lower coping efficacy, as measured by the BiTS-LCE ($F(1, 60) = 16.09$, $p < .001$, partial $\eta^2 = 21$). Both effect sizes were large. Participants with HPD symptoms also reported significantly greater perfectionism, as measured by the BiTS-P, even after controlling for DASS-21-D scores ($F(1, 60) = 6.19$, $p = .016$, partial $\eta^2 = .09$), with a medium effect size. For each analysis, the covariate contributed statistically significant variance (range of p's .003 to < .001), indicating that DASS-21-D scores accounted for between 14% and 31% of the variance in BiTS subscale scores.

Reliability

All of the BiTS subscales and the total scale demonstrated at least adequate reliability in both groups, and were particularly strong for participants with HPD symptoms (Table 4). The BiTS subscales for both groups also demonstrated moderate-to-large strength inter-correlations (Table 5), suggesting the scale constructs are related, but nonetheless distinct. The exception to this was the relationship between BiTS-NSB and BiTS-LCE scores among participants with HPD, which shared a particularly strong correlation.

Table 4. Means, (standard deviations) and Cronbach's alpha coefficients for BiTS subscales and total scales in the clinical and control groups.

	HPD ($n = 20$)		Non-clinical ($n = 43$)	
	M (SD)	α	*M (SD)*	α
BiTS-NSB	4.74 (1.64)	0.92	2.12 (0.98)	0.72
BiTS-LCE	4.16 (1.34)	0.87	2.30 (0.95)	0.76
BiTS-P	4.87 (1.30)	0.88	3.09 (1.41)	0.77
BiTS total	4.51 (1.29)	0.94	2.40 (0.89)	0.86

BiTS = Beliefs in Trichotillomania Scale; NSB = Negative Self Beliefs; LCE = Low Coping Efficacy; p = Perfectionism. All subscales scored as a mean on a 1–7 Likert scale.

Table 5. Inter-correlations between BiTS subscales for clinical (below the diagonal) and non-clinical (above the diagonal) groups.

	1.	2.	3.	4.
1. BiTS-NSB	–	.61**	.57**	.85**
2. BiTS-LCE	.80**	–	.53**	.87**
3. BiTS-P	.62**	.49*	–	.80**
4. BiTS total	.95**	.92**	.73**	–

BiTS = Beliefs in Trichotillomania Scale; NSB = Negative Self Beliefs subscale; LCE = Low Coping Efficacy subscale; p = Perfectionism subscale.
BiTS-NSB, BiTS-LCE and BiTS total scores for non-clinical participants are square root transformed.
**$p < .001$; *$p < .05$.

Construct validity

For clinical participants, the BiTS-NSB subscale was most strongly correlated with the RSE, as expected (Table 6). However, this large, negative correlation was not significantly higher when compared with the next highest correlations between the BiTS-NSB and the DERS, AAQ-II, DTS, and UPPS-URG (p's > .05). Among control participants, correlations were attenuated to moderate-to-large in effect size and generally suggested similar conceptual overlap as identified among the clinical group. However, the BiTS-NSB shared its highest correlations with the AAQ-II and DERS among non-clinical participants, rather than with the RSE, which was unexpected. For clinical participants, the BiTS-LCE subscale was most strongly correlated with the UPPS-URG and AAQ-II, both with large effect sizes. However, these correlations were again not significantly higher when compared with the next highest correlations between the BiTS-LCE and the ACQ-R, DERS, UPPS-PERS, and DTS (p's > .05). By contrast, the BiTS-LCE was most strongly correlated with RSE and OBQ-PC scores among non-clinical participants. Furthermore, this correlation was larger among the non-clinical group ($r = .58$, $p < .001$) than it was for the clinical group ($r = .48$, $p < .05$). Besides this exception, a similar pattern of associations emerged for non-clinical participants in comparison with the clinical group, but with mostly attenuated effect sizes. Finally, the BiTS-P scores among participants with HPD symptoms were most strongly correlated with OBQ-PC scores, but this correlation was not significantly higher compared with the next highest

Table 6. Correlations between the BiTS subscales and other constructs for clinical and non-clinical groups.

	HPD ($n = 20$)					Non-clinical ($n = 43$)				
	BiTS-NSB	BiTS-LCE	BiTS-P	*M*	*SD*	BiTS-NSB	BiTS-LCE	BiTS-P	*M*	*SD*
RSE	**−.89****	−.65**	−.65**	16.20	6.48	.60**	**.63****	.24	23.65	4.65
OBQ-PC	.59**	.48*	**.82****	70.60	21.04	.65**	.58**	**.75****	47.28	18.76
AAQ-II	.80**	**.82****	.75**	46.70	11.01	**.73****	.51**	.40**	25.12	8.39
DTS	−.78**	−.75**	−.74**	2.52	0.94	−.52**	−.55**	−.62**	3.78	0.77
ACQ-R	−.75**	−.79**	−.64**	29.90	15.05	−.53**	−.49**	−.42**	51.14	9.77
DERS	.86**	.79**	.78**	105.55	30.59	.71**	.45**	.44**	67.51	17.04
UPPS-URG	.75**	**.83****	.54**	2.78	0.66	.39*	.33*	.21	2.21	0.51
UPPS-PREM	.16	.38	−.20	1.93	0.36	−.16	−.00	−.47**	2.14	0.45
UPPS-PERS	.71**	.77**	.32	2.38	0.41	.19	.32*	−.12	2.14	0.39

BiTS-NSB = Beliefs in Trichotillomania Scale Negative Self Beliefs subscale; BiTS-LCE = Low Coping Efficacy subscale; BiTS-P = Perfectionism subscale; RSE = Rosenberg Self-Esteem Scale; OBQ-PC = Obsessive Beliefs Questionnaire – Perfectionism/Certainty subscale; AAQ-II = Acceptance and Action Questionnaire-II; DTS = Distress Tolerance Scale; ACQ-R = Anxiety Control Questionnaire – Revised; DERS = Difficulties in Emotion Regulation Scale; UPPS-URG = Negative Urgency subscale; UPPS-PREM = Premeditation (lack of) subscale; UPPS-PERS = Perseverance (lack of) subscale.

For non-clinical participants, square root transformation were applied to BiTS-NSB, BiTS-LCE, RSE, and UPPS-PREM data; and logarithmic transformations were applied to AAQ-II and DERS data.

The largest correlations between the BiTS subscales and measures of construct validity are emboldened.

**$p < .001$; *$p < .05$.

correlations between the BiTS-P and the DERS, AAQ-II, DTS, RSE, and ACQ-R scores (p's > .05). Effect sizes were all large. A similar pattern of associations emerged for non-clinical participants, but with mostly attenuated effect sizes. The exception to this was the significant and moderate correlation between the BiTS-P and UPPS-PREM, which was larger among the non-clinical group ($r = -.47$, $p < .001$) than for the clinical group ($r = -.20$, *ns*).

Discussion

This study examined relationships between dysfunctional beliefs relevant to HPD and symptom measures, and further examined the psychometric properties of the BiTS in a clinical sample of adults with HPD compared with a matched non-clinical control group. A series of hypotheses were proposed with the expectation that findings from the earlier validation of the BiTS (Rehm et al., 2019), which used an internet-surveyed sample of participants with and without self-reported HPD symptoms, would be replicated in the current sample of participants whose hair pulling behaviours largely met *DSM-5* diagnostic criteria for HPD.

The findings were in support of the first two hypotheses. Each of the three BiTS subscales successfully differentiated participants with HPD symptoms from the control participants, even after controlling for depression symptoms (due to positive skew in control participants' data, anxiety symptoms could not be controlled for this analysis). All three BiTS subscale scores were significantly correlated with focussed hair pulling, but only negative self beliefs and low coping efficacy significantly correlated with HPD severity. None of the BiTS subscales correlated with automatic hair pulling behaviours, supporting suggestions that automatic hair pulling behaviours are sustained by non-cognitive, habit-forming learning processes (Flessner et al., 2008; Houghton et al., 2014).

After controlling for depression and anxiety symptoms, the correlations between HPD severity and the BiTS subscales increased in strength, while those relating to focussed hair pulling became attenuated. Such findings could challenge past assumptions that negative self-evaluations and perfectionism may contribute more to HPD symptoms among individuals with co-occurring affective disorders (Franklin & Tolin, 2007; Mansueto et al., 1997) – while cognitions associated with co-occurring depression and anxiety may be more influential in leading to the individual adopting focussed hair pulling behaviours to facilitate experiential avoidance as an emotion regulation strategy – negative self beliefs and low coping efficacy appear strongly associated with the frequency and intensity of hair pulling urges and behaviours (i.e., disorder severity), independent of depression and anxiety symptoms. Further research is required to elucidate the differential contributions of negative self beliefs, low coping efficacy, and perfectionism to hair pulling styles specifically, and disorder severity generally, with and without a range of co-occurring psychological disorders, as this may have implications for tailoring interventions for symptom profiles.

Regarding the unanticipated non-significant relationship between HPD severity and perfectionism, it is likely that the small number of participants comprising the clinical sample limited statistical power to detect small-to-moderate relationships. However, in a larger sample of 125 clinical participants, Noble et al. (2017) similarly did not find a relationship between HPD severity and maladaptive perfectionism,

but did report significant correlations between symptom severity, and behavioural and body shame. Although there was no direct relationship between HPD severity and perfectionism, perfectionism was correlated with multidimensional shame (i.e., behavioural, body, characterological) in Noble et al'.s sample. Only behavioural shame mediated the relationship between maladaptive perfectionism and symptom severity. Houazene, Aardema, et al. (2021) recently reported a similar model whereby multidimensional shame mediated the relationship between perfectionism and BFRB severity. Shame about behaviours associated with HPD (e.g., about a perceived inability to control one's actions and secretive behaviours that keep one's difficulties hidden from loved ones) may elicit perfectionistic cognitions that directly or indirectly culminate in further hair pulling (Rehm et al., 2015).

Alternatively, individuals with higher levels of maladaptive perfectionism may be predisposed to experiencing shame about their hair pulling behaviours, leading to a decreased sense of control and coping efficacy, increased distress, and increased hair pulling (Noble et al., 2017). Indeed, the relationship between perfectionism and HPD severity may depend on a range of factors, with recent mixture modelling analyses by Grant et al. (2021) identifying only one of three HPD subtypes characterised by high levels of perfectionism; termed the "impulsive/perfectionist pullers", these participants also experienced high levels of impulsivity, depressive symptoms and functional impairment, and were less able to resist urges, tolerate distress, and typically pulled their hair to control unpleasant feelings. If only a subgroup of individuals with HPD experience high levels of perfectionism, and this group was not adequately represented in the current small sample, then this might also help to explain the lack of a relationship between perfectionism and HPD severity found herein.

In support of the third set of hypotheses, the BiTS demonstrated good reliability in both the clinical and non-clinical groups, and reliability was particularly strong for participants with HPD symptoms. Subscale inter-correlations were of moderate effect size or higher in both groups, and for the most part, measures that were expected to correlate the strongest with each of the BiTS subscales did so, at least among clinical participants. The negative self beliefs and perfectionism subscales were respectively most highly correlated with measures of self-esteem and a perceived need for certainty and perfection. Effect sizes were large, as also reported by Rehm et al. (2019). The low coping efficacy subscale was most highly correlated with experiential avoidance, but also unexpectedly, with negative urgency, which relates to acting impulsively upon experiencing negative affect (Whiteside et al., 2005). At least one item comprising the low coping efficacy subscale reflects a perceived inability to modulate the experience of impulsivity (e.g., "I do not have any choice but to act upon my urges or impulses when they occur"). There were also large correlations between low coping efficacy, emotional dysregulation, and lower perceived control over anxiety, as originally identified in the preliminary validation (Rehm et al., 2019).

Among non-clinical participants, the expected pattern of correlations between the BiTS subscales and measures used to examine construct validity were largely unsupported. For both the clinical and non-clinical groups, none of the strongest correlations between BiTS subscales and construct validity measures were significantly larger than the next-highest correlations, although this may reflect a lack of power. Overall, the support for hypothesis two and partial support for the third set of hypotheses indicate that the BiTS is most suitable for use within the population for which it was intended (i.e., individuals with compulsive hair pulling).

The BiTS subscales appear to all broadly relate to constructs representing rigid, inflexible perceptions that negative emotions are unacceptable, and that one is incapable of tolerating distress and other unpleasant internal states. While factor analyses in Rehm et al. (2019) supported retention of three distinct subscales, the current construct validity findings could suggest that the BiTS appears to measure an overarching construct akin to experiential avoidance. In their seminal study of cognitions and beliefs associated with HPD, Norberg et al. (2007) found that experiential avoidance, as measured by the AAQ-II, accounted for most or all of the relationships between symptom severity and shame cognitions, dysfunctional beliefs about appearance, and fear of negative evaluation. Wetterneck et al. (2020) identified a range of internal antecedents to hair pulling behaviours in an internet-surveyed sample of 285 adults with HPD, including general uncomfortableness; bodily sensations; physical symptoms; mental anxiety; and thoughts, ideas, and images. In contrast with Norberg et al'.s findings, experiential avoidance, as measured by the AAQ, did not mediate the relationships between any of the antecedent types and HPD severity (Wetterneck et al., 2020).

Following a meta-analysis that indicated the relationship between experiential avoidance and HPD severity is of moderate effect size, Angelakis and Pseftogianni (2021) cautioned the AAQ/AAQ-II may

primarily measure psychological distress and negative affectivity rather than experiential avoidance (Wolgast, 2014). Similarly, other research has shown the AAQ-II to have a stronger correlation with self-as-content (i.e., making negative judgements that narrow one's self perceptions) rather than with experiential avoidance (Rolffs et al., 2018). Such associations could help to explain the unexpected high correlation between negative self beliefs and experiential avoidance in the control group of the current study. An adaptation of the AAQ-II that specifically references hair pulling urges has been developed – the AAQ-TTM (Houghton et al., 2014) – and could be a worthwhile measure to include in future evaluations of the BiTS construct validity. However, it is important to point out that the BiTS was developed first and foremost from a thematic analysis of individuals' cognitions, and as such, may retain more direct relevance to HPD than scales developed elsewhere and undergoing adaptation, such as the AAQ-TTM.

Another interpretation for the limited divergent validity of the BiTS may be that the subscales all broadly reflect maladaptive cognitive emotion regulation strategies. Although less than half of Wetterneck et al. (2020) sample endorsed thoughts, ideas, or images as antecedents to their hair pulling behaviours, 86% of participants who did endorse such antecedents reported that cognitions precipitated their hair pulling episodes "most of the time" or "always". Specific cognitions reported in that study related primarily to negative emotions. Using the *Cognitive Emotion Regulation Questionnaire* (CERQ), Houazene, Aardema, et al. (2021) recently found that maladaptive strategies (i.e., self-blame, blaming others, rumination, and catastrophising) significantly predicted the severity of BFRBs overall, but not of hair pulling, specifically. This finding may reflect the Houzane et al'.s use of a non-clinical sample with few participants endorsing hair pulling, but could also suggest that the BiTS subscales might offer incremental validity over existing measures of overlapping constructs like the RSE, AAQ-II, and DERS. To determine this, however, the CERQ ought to be used to clarify the BiTS construct validity in clinical and control participants, as it appears to be the case that cognitions and beliefs do play a critical role in HPD for at least a subgroup of individuals (Wetterneck et al., 2020).

The current study has several limitations. The small sample of clinical participants means that the findings may not be generalisable, although symptom severity of the clinical group was comparable with that reported in other studies investigating cognitions and beliefs in HPD (e.g., Noble et al., 2017; Norberg et al., 2007). Contrasting with an epidemiological study of HPD (Grant et al., 2020), our clinical participants were majority female, more highly educated, and had somewhat higher rates of co-occurring mood disorders (70% in the current sample versus 62% in Grant et al.). It is also important to note that the non-clinical control group was not necessarily a "healthy" control group, as 28% of these participants were diagnosed with a psychological disorder, comparable with the 21.5% 12-month prevalence rate reported in an Australian population survey (Australian Bureau of Statistics, 2020–2022). However, given the BiTS subscale scores were still significantly greater among participants with HPD compared with non-clinical participants, employing a control group with high rates of psychopathology may actually lend support to the proposition that dysfunctional beliefs do uniquely influence HPD symptoms irrespective of the influence of co-occurring conditions. Finally, the directionality of relationships identified between dysfunctional beliefs and HPD cannot be inferred from the cross-sectional design of the study.

Limitations notwithstanding, there are also strengths, future directions, and implications, worth addressing. Consistent with best practices in measure development (Terwee et al., 2018), the BiTS items were developed on the basis of in-depth interviews with people with HPD. Following factor analyses using data pooled from hair pulling and control participants (Rehm et al., 2019), the current study has again included people with diagnosed HPD to further examine its psychometric properties. Nonetheless, the divergent validity of the BiTS may be improved through future review of item content by expert clinicians, researchers, and people with lived experience of HPD to strengthen the meaning of items and clarity of constructs underlying each subscale, as necessary (Terwee et al., 2018). Should any revisions to item content be made, confirmatory factor analysis and additional psychometric testing will be necessary.

Future research should also focus on recruiting a larger sample of HPD participants, with and without commonly co-occurring disorders, to parse out the contributions that comorbidities like depression, anxiety, and obsessive-compulsive disorder may have upon the relationships between dysfunctional beliefs and HPD symptomology. Such research will go towards investigating largely untested hypotheses that dysfunctional cognitions and beliefs are more likely to play a stronger role in hair pulling urges and behaviour among those with depression and obsessive-compulsive features, in particular (e.g., Mansueto et al., 1997). As Grant et al. (2021) identified, there could exist several unique HPD

subtypes characterised by specific interacting comorbidities and clinical features, which may require different treatment approaches to target underlying mechanisms that maintain hair pulling urges and behaviour. We recommend that clinicians engage in a comprehensive assessment of co-occurring psychological disorders and carefully formulate the functions served by an individual's hair pulling to guide treatment planning, with particular attention given to the cognitive-affective processes referenced in the BiTS; namely, negative self-construals, perceived coping efficacy/self-control, and perfectionist cognitions. Finally, we anticipate that, with any further revisions, the BiTS may offer a useful tool for future studies to examine the efficacy of cognitive therapies versus behavioural therapies in terms of impact to key dysfunctional beliefs.

The findings of the current study suggest that negative self beliefs, low coping efficacy, and perfectionism have differential relationships with HPD severity and hair pulling styles, which may be a reflection of underlying predispositions towards experiential avoidance (Norberg et al., 2007). As others have concluded (Gluhoski, 1995; Houazene, Aardema, et al., 2021; Keijsers et al., 2016; Novak, 2014; Pélissier & O'Connor, 2004), individuals with HPD experience difficulties with cognitive emotion regulation in the context of negative experiences, and these difficulties could directly contribute to hair pulling behaviours. In combination with the current findings, and emerging research into the role of cognitions and beliefs in HPD (Noble et al., 2017; Wetterneck et al., 2020), the importance of explicitly targeting relevant dysfunctional beliefs in treating this disorder is highlighted. Further research is required to examine the BiTS factor structure and construct validity in larger clinical samples and with a more diverse range of measures to establish its convergent and divergent validity. In doing so, we anticipate that the BiTS might be used to elucidate the contributions of dysfunctional beliefs to the onset and maintenance of HPD, and ultimately guide case formulation, treatment planning, and outcomes monitoring.

Note

1. Research regarding the role of emotion dysregulation in HPD by Arabatzoudis et al. (2017) was also conducted with this sample.

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Data availability statement

The data that support the findings of this study are available on request from the corresponding author. The data are not publicly available due to ethical reasons.

Ethics statement

This study was granted ethical approval by Swinburne University Human Research Ethics Committee and was conducted in accordance with the Declaration of Helsinki.

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