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ORIGINAL ARTICLE

Motives for Performing Body-Focused Repetitive Behaviors (BFRBs): Similarities to and Differences from Non-Suicidal Self-Injurious and Stereotypic Movement Behaviors

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Abstract

Background In the DSM-5, body-focused repetitive behaviors (BFRBs) are now classified in the obsessive-compulsive and related disorders section. Differential diagnosis is complicated by the overlap of BFRBs with other disorders, especially non-suicidal self-injurious behavior (NSSI) and stereotypic movement behavior (SMB). The present study examined participants' motives for performing BFRBs to provide a better understanding of how BFRBs may differ from NSSI and SMB and to determine whether BFRB is best characterized as an obsessive-compulsive spectrum disorder.

Methods A total of 268 individuals with various BFRBs were assessed with respect to their motives for performing BFRBs, comorbid diagnoses, emotions accompanying their BFRBs, and whether they felt an urge to perform the behavior on others as well as themselves.

Results The main motives for performing BFRBs were release of stress (84.7%), boredom (51.5%), and gratification/pleasure (34.7%). Approximately one third of the sample were unable to provide a clear motive. The majority were ambivalent about their behavior. Participants rarely engaged in cutting; 16.4% performed a BFRB on someone else's body or wanted to do so. OCD was self-reported by only 7.5% of the participants.

Discussion Ambivalence towards symptoms is high in individuals with BFRBs; the main motive for performing the behavior was emotion regulation, particularly of stress. Limitations of the study are the self-reported assessment and the high attrition during the assessment. Further research is needed to clarify whether BFRBs, NSSI, and SMB should be kept separate or should be combined into one category, perhaps with specifiers. The current classification of BFRBs as an OCD-related disorder should be reconsidered.

Keywords Body-focused repetitive behaviors · Non-suicidal self-injury · Stereotypic movement behavior · Trichotillomania · Skin picking · Obsessive-compulsive disorder · Urge

Introduction

Body-focused repetitive behaviors (BFRBs) encompass a number of behaviors characterized by manipulation of the outer shell of the body in ways that are often harmful (i.e., involving pain or damage, as in skin picking) or, at a minimum, are not gentle (e.g., knuckle cracking). Apart from skin picking and trichotillomania, which are the only BFRBs coded in the DSM-5 (American Psychiatric Association, 2022), the following conditions are also regarded as BFRBs by most experts: nail biting, lip-cheek biting (both mentioned but not coded in the DSM-5), biting of the skin (i.e., dermatophagia), awake bruxism, knuckle cracking, thumb sucking (in adults), and excessive nose picking. The

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boundaries between these and other psychological disorders are at times blurry, hindering diagnostic classification. Notwithstanding its current status as an obsessive-compulsive and related disorder, under the classification of Unspecified Obsessive-Compulsive and Related Disorders (American Psychiatric Association, 2022), BFRBs are executed as the result of an urge that the individual eventually gives in to (when the behavior is intentional), whereas OCD is characterized by compulsive behavior aimed to neutralize an obsessive thought (Moritz et al., 2023b). In fact, research indicates that comorbidity of OCD and BFRBs is less frequent than would be expected (Moritz et al., 2023a) given that both are classified in the same section (American Psychiatric Association, 2013).

At first glance, differentiating between BFRBs and nonsuicidal self-injurious behavior (NSSI) seems straightforward. According to one paragraph on the differential diagnosis of NSSI and BFRB in the original version of the DSM-5 (American Psychiatric Association, 2013, p. 806), BFRBs, unlike NSSI such as cutting or burning, are *not* executed by a device or instrument (however, see p. 254, which acknowledges that instruments are sometimes used). However, in trichotillomania (Barber et al., 2023) and skin picking (Tucker et al., 2011) the usage of devices is common, and this criterion has been accordingly dropped in the latest revision of the DSM-5 (American Psychiatric Association, 2022). The 2022 revision, however, potentially adds new diagnostic uncertainty. For example, trichotillomania is considered a self-injurious behavior (p. 926) that may be diagnosed as NSSI if it occurs with other self-injurious behaviors. Yet, most individuals suffer from multiple BFRBs (Mathew et al., 2020; Moritz et al.,2023a, b; Snorrason et al., 2012), which blurs diagnostic categorization considerably. In addition, motives for performing BFRBs and NSSI can overlap. For example, a recent investigation (Mathew et al., 2020) found that NSSI, more than BFRBs, involves the intentional execution of the behavior to regulate acute, intense affective states, whereas in those with BFRBs, according to the study's results, the behavior primarily serves to reduce boredom or to "fix appearance." While none of these motives is pathognomonic (i.e., seen only in BFRBs or NSSI), self-hate and the feeling that one deserves punishment as motives for the behavior are deemed characteristic of NSSI (Haliczer & Dixon-Gordon, 2023; Hooley & Franklin, 2018; Sheehy et al., 2019; Sorgi-Wilson et al., 2023).

Similarities between NSSI and BFRBs include the focus on one's own body and the maintenance of the behavior through negative reinforcement, as well as similar preceding emotions and affective states (Jurska et al., 2019; Mathew et al., 2020). Further, Jurska and colleagues (2019) point out that, unlike OCD and body dysmorphic disorder, neither NSSI nor trichotillomania (as a prominent form of BFRBs) "*are preceded by pathological obsessions or concerns about potential harm*" (p. 93). Skin picking, in particular, is often seen as a form of self-harm due to potentially severe injuries to the skin (Gallinat et al., 2019). A study by Gallinat and colleagues (2019) demonstrated that "*the correlations between skin picking severity and self-harm suggest that skin picking is specifically related to certain self-harming behaviors [such as scratching oneself and preventing wounds from healing] but not self-harm in general*" (p. 6). The authors point out that "these behaviors [cutting oneself or inflicting another type of injury] might also appear in the course of skin picking. Nevertheless, intentions like this would be very different from the purpose to cause pain" (p. 6). Interestingly, types of self-harm that are not part of skin picking itself, such as burning one's skin, were not associated with skin picking. The authors conclude that while there are associations between skin picking and self-harm, the two disorders have important differences.

Another diagnostic category with some resemblance to BFRBs is stereotypic movement behavior (SMB), frequently observed in individuals with intellectual disabilities (Mackenzie, 2018; Virameteekul & Bhidayasiri, 2022). Again, some cases can be easily distinguished from BFRBs, such as rocking in a chair without direct self-harm or other SMB that do not involve manipulation of the body surface. Yet, individuals engaging in SMB sometimes harm themselves in ways typical of BFRBs (the DSM-5 mentions the biting of hands, lips, or other body parts), and this may involve instruments (e.g., for poking the eye), as in NSSI. One study even categorizes lip-cheek biting or cavitadaxia (Moritz et al., 2020), usually considered a BFRB, as a possible SMB or self-injurious behavior (Sarkhel et al., 2011). Similarities between BFRBs and SMB relate to the intended self-regulation of affective states (Fontenelle & Yücel, 2019), and both disorders respond to habit reversal training (Stein et al., 2010).

An important distinction, according to the DSM-5, is that SMB is patterned or rhythmical whereas BFRBs are not, but this requires more research as there are BFRB conditions that are described as (ritualized) "sessions" that can last for hours (DSM-5, p. 805). Apart from the rhythmic nature of SMB, another main difference between the two disorders is age of onset. SMBs mostly develop in the first three years of life (Mackenzie, 2018), which is also a diagnostic criterion in the DSM-5. In contrast, the age of onset of most BFRBs is early adolescence, except for thumb sucking and nail biting, which start in childhood (Moritz et al., 2023b).

To summarize, BFRBs, NSSI, and SMB are currently separate disorders in the DSM-5, but their behavioral manifestations often overlap, rendering definite diagnosis difficult. The underlying motives individuals have for engaging

in BFRBs have not yet been well researched (one exception is the study by Hicks et al., 2023, which elucidates different subtypes of trichotillomania). In light of the absence of clear phenomenological differences, we regard identifying the motives behind the behaviors key to making differential diagnostic decisions.

The present study was exploratory in nature. We investigated a sample of individuals with BFRBs and examined the extent to which certain characteristics possibly suggestive of NSSI, such as motives of auto-aggression/self-punishment, the usage of instruments, and the presence of borderline personality disorder, are found in BFRB. We also assessed whether the behavior is ritualized, a characteristic commonly found in SMB. By addressing these questions, we hoped to learn whether BFRBs are best characterized as obsessive-compulsive spectrum conditions. In addition, we examined the extent to which participants with BFRBs executed the behavior on their own bodies only or on others' bodies as well. The latter idea, a novel research topic, emerged from a recent case of a man who reported the urge to crack the knuckles of other persons as well as his own (Moritz et al., 2022a).

Methods

Participants

The present study is part of a larger randomized controlled online trial (preregistration: DRKS00030511, local ethics approval LPEK-0542), which has been reported elsewhere (Moritz et al., 2023c). Participants were recruited via social media and self-help sites specializing in OCD-related disorders, whether specific BFRBs or BFRB in general. As we only used the baseline data for the present study, we will not describe the entire trial. Individuals with BFRBs, aged between 18 and 80 years, and with no history of schizophrenia or acute suicidality were invited to participate.

Assessment

Individuals were assessed online at baseline and six weeks later. Apart from the experimental scales, which were developed specifically for this study and are reported in the next section, the following standard scales were administered: the Generic BFRB Scale-45 (Moritz et al., 2023c), a variant of the GBS-8 (Moritz et al., 2022a, b) that captures specific BFRB conditions (when more than one BFRB was noted, we asked the participant to identify the primary BFRB and to describe the behavior(s) in detail), the WHOQOL-BREF global quality-of-life item (QoL; (Skevington et al., 2004), and the PHQ-9 for the measurement of depression (Kroenke et al., 2001). We also asked participants whether they had received an established psychiatric diagnosis from a licensed psychologist or psychiatrist (see Table 1). Of the initial 481 participants assessed for eligibility, 213 were excluded blind to results. The final sample was thus comprised of 268 participants. Reasons for exclusion were premature cancellation of the baseline assessment ($n=202$), violation of inclusion criteria ($n=7$), and other reasons blind to results ($n=4$).

The mean age of the entire sample was 36.8 years (11.1), and the majority of the participants were female ($n=241$, 89.9%; gender was self-assigned).

Questionnaires

Motives for BFRBs, Cutting, and Comorbid Disorders

We asked individuals whether the performance of their BFRBs was like a ritual or a ceremony (e.g., skin picking in front of a certain mirror in a certain way). Participants could respond either "yes," "somewhat," or "no." If they responded yes, we asked them to name positive and/or negative aspects of the ritual or ceremony (e.g., reduction of tension or stress). In the next section, participants were asked to report emotions associated with their BFRBs on a 5-point scale (i.e., only negative, predominantly negative, both positive and negative, predominantly positive, only positive).

We then asked participants to assess each of the following causes or motives for their BFRBs on a 3-point scale (I agree, I do not know, I disagree): I don't know, to release stress, to punish myself, to feel myself, because it gives me pleasure, to free myself from a trance or semiconscious state, because I like the pain, because it signals to others that I am not well, because I am bored (see Table 1).

We continued with the statement that "Body-focused repetitive behaviors can be performed on your own body or on other people's bodies (e.g., cracking other people's joints)." Participants could endorse one of two response options: "I perform the body-related repetitive behavior(s) only on my own body" or "I perform the body-related repetitive behavior(s) on both myself and others *or* I feel the urge to do so." If the latter was endorsed, we asked the participant to elaborate on or describe this further. We then asked whether the individual had ever cut themself (no, never; in the past but not now; yes, occasionally; yes, often).[1]

[1] For a copy of the questionnaire, please email moritz@uke.de.

Table 1 Self-reported behaviors and motives related to body-focused repetitive behaviors

Variable	Frequency	Percentage	Differences among BFRB conditions, post-hoc test in brackets
ritual or ceremony (yes, somewhat, no)	34/51/183	12.7%/19.0%/68.3%	$p = .018$; S > C ($p = .042$)
emotions associated with BFRBs (only negative, mainly negative, both negative and positive, mainly positive, only positive)	37/90/132/8/1	13.8%/33.6%/49.3%/3.0%/0.4%	$p = .885$
Motives (agree, don't know, disagree)			
I do not know	86/66/116	32.1%/24.6%/43.3%	$p = .026$, C > S ($p = .028$)
to release stress	227/29/12	84.7%/10.8%/4.5%	$p = .749$
to punish myself	27/44/197	10.1%/16.4%/73.5%	$p = .298$
because it brings me pleasure	93/51/124	34.7%/19.0%/46.3%	$p = .497$
to free myself from a trance or semiconscious state	13/34/221	4.9%/12.7%/82.5%	$p = .386$
because I like the pain	52/51/165	19.4%/20.0%/61.6%	$p = .002$; T > S ($p = .007$), N ($p = .008$), C ($p = .059$)
to signal to others that I am not well	19/36/213	7.1%/13.4%/79.5%	$p = .152$
because I am bored	138/67/63	51.5%/25%/23.5%	$p = .102$
Other features			
cutting of my skin (no, never; in the past but not now; yes, occasionally; yes, often)	213/47/6/2	79.5%/17.2%/2.2%/0.7%	$p = .562$
only perform on my own body, perform on others' bodies or have the urge to do so	224/44	83.6%/16.4%	$p = .109$
Diagnoses (yes, no)			
no psychiatric diagnosis	160/108	59.7%/40.3%	$p = .337$
obsessive-compulsive disorder	20/248	7.5%/92.5%	$p = .252$
depression	109/159	40.7%/59.3%	$p = .036$, S > T ($p = .026$)
Tourette syndrome / tics	1/267	0.4%/99.6%	$p = .811$
anxiety disorder	51/217	19.0%/81.0%	$p = .626$
post-traumatic stress disorder	24/244	9.0%/91.0%	$p = .085$
schizophrenia	0/268	0%/100%	- - -
eating disorder	26/242	9.7%/90.3%	$p = .509$
alcohol dependence	8/260	3.0%/97.0%	$p = .159$
borderline personality disorder	16/252	6.0%/94.0%	$p = .390$
other personality disorder	9/259	3.4%/96.6%	$p = .757$
attention deficit disorder	19/249	7.1%/92.9%	$p = .330$
other	30/238	11.2%/88.8%	$p = .781$

Notes. C = cavitadaxia, N = nail biting, S = skin picking, T = trichotillomania; post-hoc tests were Bonferroni corrected

Results

The prevalence of various BFRB conditions was as follows (multiple conditions could be endorsed): skin picking, 68.3%; nail biting, 36.6%; trichotillomania, 28.4%; lip-cheek biting: 26.1%; other: 20.1%). Participants were asked to identify their main BFRB condition; we compared this information with results on the GBS-45 for consistency. Main conditions were as follows: skin picking ($n = 127$), trichotillomania ($n = 64$), nail biting ($n = 42$), and cavitadaxia ($n = 17$). For 18 participants, no main condition could be determined.

As can be seen in Table 1, only a minority (12.5%) of the participants characterized their BFRB as ritualized. Participants were predominantly ambivalent towards their BFRB, with "both negative and positive" endorsed most highly and

only 13.8% reporting only negative feelings when engaging in the dysfunctional behavior. The most prevalent motive for engaging in BFRBs was to relieve stress (84.7%), followed by boredom (51.5%) and gratification/pleasure (34.7%); 10% or less endorsed the following motives: to signal to others that I am not well (7.1%), and to free myself from a trance or semiconscious state (4.9%).

Almost one third of the sample were unable to provide a clear motive. Only a few participants were currently engaging in NSSI (e.g., cutting), and 16.4% performed the BFRB on others' bodies or wanted to do so. Most participants did not acknowledge having a psychiatric diagnosis. Of those who did, the following were endorsed by more than 10% of the participants: depression (40.7%) and anxiety disorder (19.0%). Of note, OCD was confirmed (by self-report) in only 7.5% of cases.

Based on the narrative descriptions of the BFRBs, the utilization of an instrument could be clearly inferred in only two cases.

About half the participants reported having only one BFRB ($n = 135$, 50.4%; conditions with at least 10 participants: skin picking: $n = 73$ (27.2%), nail biting: $n = 20$ (11.9%), trichotillomania: $n = 42$ (15.7%)). These BFRB conditions only differed on three baseline variables (please note that Table 1 refers to all participants). The motive "I like the pain" was more often endorsed by individuals with trichotillomania (yes: 33.3%) than by those with nail biting (10.0%) or skin picking (15.1%), χ^2 (4) = 9.57, $p = .048$. The urge to perform BFRBs on others' bodies was far more common in skin picking (23.3%) than nail biting (0.0%) and trichotillomania (11.9%), χ^2 (2) = 7.103, $p = .029$. The motive of boredom was rejected by only 7.1% of those with trichotillomania, fewer than those with nail biting (30.0%) or skin picking (28.8%), χ^2 (4) = 10.36, $p = .035$. Of the nine individuals with only one BFRB, five had a condition other than skin picking, nail biting, or trichotillomania (lip-cheek biting).

Lastly, we compared those with at least two BFRBs ($n = 144$) to those with one BFRB. Groups differed on three variables. First, those with at least two BFRBs more often endorsed engaging in BFRBs as a "cry for help" (10.5% vs. 4.2%; χ^2 (2) = 6.08, $p = .048$. Second, lifetime cutting was more prevalent in those with at least two BFRBs (30.6% vs. 11.8%; currently: 5.6% vs. 0.7%; χ^2 (2) = 14.50, $p < .001$). Third, anxiety disorders were also endorsed more often by those with at least two BFRBs (27.4% vs. 11.8%, χ^2 (2) = 7.10, $p = .029$).

The four BFRB conditions did not differ with respect to depression severity (PHQ-9, $M_{total} = 8.40$, $SD = 5.27$; $p = .654$, $\eta_p^2 = 0.028$) or BFRB overall severity (GBS-45, $M_{total} = 27.54$, $SD = 14.85$; $p = .834$, $\eta_p^2 = 0.018$). Few differences emerged with respect to single BFRB conditions. Skin picking was reported to be more ritualized than cavitadaxia, and those with cavitadaxia more often reported that they did not know why they engaged in the behavior than did those with skin picking. Individuals with trichotillomania more often endorsed that they liked the pain than did those with other conditions. A history of depression was more often reported by those with skin picking than with trichotillomania, but current depression severity (based on the PHQ-9) in these two groups was similar.

Discussion

The primary aim of the present study was to gain more insight into individuals' motives for engaging in BFRBs to better understand the similarities and differences between BFRB conditions and NSSI as well as SMB. The latter two conditions somewhat resemble BFRBs and were described alongside each other in prior versions of the DSM. The results of the present study show that different motives fuel the urge to engage in BFRBs. While most participants stated that BFRBs served the purpose of relieving stress or providing gratification or pleasure, a substantial minority regarded the behavior as a form of self-punishment (10.1%; 16.4% were unsure), a motive typical of NSSI (Haliczer & Dixon-Gordon, 2023; Hooley & Franklin, 2018; Sheehy et al., 2019; Sorgi-Wilson et al., 2023). Almost two out of five said they liked the pain (19.4%), and this was especially true for those with trichotillomania. Those with cavitadaxia were more often unclear about their motives.

Only two cases were found where an instrument was used (this behavior is common in NSSI). However, we extracted this from narrative reports; the number might have been higher (Barber et al., 2023) if we had asked directly. Ritualization was fully endorsed by 12.7% of the sample, and 19% identified their behavior as somewhat ritualized (with higher endorsement in those with skin picking than in those with cavitadaxia). In line with prior studies on trichotillomania and other BFRBs (Grant et al., 2020; Moritz et al., 2023a), depression and anxiety were the most prevalent comorbid conditions.

This study has several strengths, including its large sample size and its novel approach to consolidating the diagnostic criteria and boundaries of BFRBs. However, the present study also has several limitations. First, although we collected a sizable sample of treatment-seeking individuals with BFRB, attrition during assessment was high. Second, as mentioned, we should have asked explicitly whether individuals used instruments when performing BFRBs. Third, we should have asked not only about NSSI but also about SMB (e.g., rocking in a chair), and it would have been preferable to also recruit individuals with NSSI

and SMB. Fourth, assessments relied on self-report, and it is possible that some patients were not aware of comorbid diagnoses, which may have distorted the frequencies of certain self-reported diagnoses; individuals might also have had misconceptions about certain diagnostic labels (e.g., obsessive-compulsive disorder), thus affecting the results. Incorporating these suggestions into future research would allow for a deeper understanding of BFRB features that are transdiagnostic versus those that are more disorder specific.

We recommend refining the diagnostic criteria, especially the differential diagnoses for BFRBs, NSSI, and SMB. Although the behaviors often look similar across these conditions, the primary motives seem to differ greatly. If self-injury is the primary motive, behaviors that appear to be BFRBs should perhaps be classified as NSSI. Another possible modification would be to merge the three diagnostic categories and add specifiers (note that SMB already has the specifier of whether it occurs with or without self-injurious behavior), including information about motives and antecedents (e.g., autistic behavior without any conscious urge, mood states such as self-hate or pleasure), behavioral patterns (stereotypical, ritualized, random), presence of an underlying neurodevelopmental disorder (especially intellectual impairment), and whether an instrument is used. As it is difficult to draw a clear line between BFRBs and NSSI based only on symptom manifestations, future research should investigate whether individuals who engage in BFRBs that have similarities to NSSI tend to have specific comorbid disorders indicative of NSSI, such as borderline personality disorder. To distinguish among different BFRB conditions based on the degree of self-harm or physical damage might also be considered. For example, trichotillomania and skin picking are often more severe than, for example, thumb sucking, where physical damage is rare. In contrast, therapeutic response seems a less helpful criterion for classification. Some researchers (for examples, see Greenberg & Geller, 2023) have highlighted that BFRB conditions respond differently to various treatments. For example, the higher treatment response to serotonin reuptake inhibitors in skin picking but not trichotillomania has been used to argue that skin picking has a closer relationship to OCD. This, however, is not supported by the data (including that in the present study) showing that comorbidity of BFRBs with OCD is low (Moritz et al., 2023b).

Conclusion

BFRB has emerged as a relevant diagnostic category, but—at least in some of its manifestations—the differential diagnosis among BRFB, NSSI, and SMB is at times difficult to determine. We deem ritualistic behavior—suggestive of SMB according to the DSM—a weak criterion for differential diagnosis as a substantial subgroup of individuals with BFRBs display this behavior (31.7% fully or partially endorsed ritualistic aspects in the current study). Likely owing to our method of inquiry, very few participants in our sample reported using instruments to perform BFRBs, but according to previous research (Barber et al., 2023; Tucker et al., 2011) this does not adequately differentiate BFRB from NSSI. The presence of multiple BFRBs is common (Moritz et al., 2023b) and does not qualify as a criterion for differentiating BFRB from NSSI. Our results indicate that identifying the motive(s) behind the behavior is perhaps the best way to differentiate between BFRB and NSSI. Our preliminary conclusion is that a diagnosis of NSSI should be confined to cases where individuals engage in the behavior to punish or injure themselves. To verify this conclusion, we recommend that future research compare individuals diagnosed with BFRB, NSSI, and SMB by examining their motives for performing the behavior. If this does not provide clear distinctions between the three disorders, diagnostic manuals such as the DSM should consider merging the three disorders into one, preferably with specifiers.

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Declarations

Ethical Approval The trial was registered with the German Clinical Trials Register (DRKS00030511) and approved by the local ethics committee (LPEK-0542).

Animal Rights No animal studies were carried out by the authors for this article.

Consent to Participate Informed consent was obtained from all individual participants included in the study.

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