

Relationship of Body-Focused Repetitive Behavior Disorders to OCD

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Opinion statement

Obsessive-compulsive disorder (OCD) and body-focused repetitive behaviors (BFRBs) have demonstrated considerable presence and impact among clinical populations. As consistent with any treatment approach, necessary intervention among these disorders begins with a comprehensive evaluation of client's symptoms, with particular attention placed on potential comorbidities. Common practice among clinicians identifies exposure and response prevention (ERP) as a first line treatment of OCD. However, among client's demonstrating BFRBs, habit reversal therapy (HRT) or novel emotion-based treatments (e.g., acceptance-enhanced behavior therapy [AEBT], dialectical behavioral therapy [DBT]) are used. Such therapies have demonstrated significant efficacy among their respective disorders. Notably, depending upon disorder severity, medications may also be suggested. Given frequent comorbidity between OCD and BFRBs, it is recommended that clinicians adequately modify interventions when presented with clients demonstrating such comorbid behaviors, perhaps combining effective facets of multiple approaches (see discussion below). From a pharmacological perspective, burgeoning research identifies two potential interventions applicable to both OCD and BFRBs (e.g., silymarin and *n*-acetyl-cysteine); however, given the novelty of this research, we recommend caution with use of such therapies. While current studies suggest potential efficacy, further research examining such pharmacological interventions is necessary.

Introduction

Obsessive-compulsive disorder (OCD) substantially affects both adult and pediatric populations [1, 2]. OCD has been linked to significant psychosocial impairment including both poorer quality of life and, in pediatric samples, difficulties within academic, home, and social settings [3, 4]. Interestingly, research identifies a considerable comorbidity between OCD and body-focused repetitive behaviors (BFRBs) [5–7] such as trichotillomania (hair pulling disorder; HPD), excoriation (skin picking disorder; SPD), nail biting, cheek biting, and teeth grinding. Collectively, literature examining BFRBs demonstrates significant impact among these behaviors as well, including psychosocial and physical impairment [8–10]. Though OCD may be studied to a greater extent within the broader research community, these more recent findings suggest significant (though clearly not complete) overlap among OCD and BFRBs and highlight the similar psychosocial impact attributed to both clusters of behavior.

Notably, recent changes to the Diagnostic and Statistical Manual 5th Edition [11] have identified two BFRBs (i.e., hair pulling and skin picking disorders [HPD and SPD, respectively]) as distinct psychological disorders, both clustered within the category of obsessive-compulsive and related disorders (OCDs). Such clustering signifies hypothesized similarities between OCD and BFRBs; however, the degree to which these similarities exist remains a point of some contention with notable criticisms by some. Specifically, while some

research postulates similarities and inherent relationships among these behaviors/disorders, other research highlights critical differences and a potential lack of such relationships [12, 13]. Understandably, clarification within this domain (i.e., confirming either presence or lack of relationships between OCD and BFRBs) may have critical implications for several areas including the conceptualization and—perhaps most notably—treatment of OCD and BFRBs. For example, considering the high rates of comorbidity among these behaviors, understanding such relationships may naturally lend itself towards development of more transdiagnostic interventions or, alternatively, point to the need for discrete interventions.

Given the importance of understanding the relationship (or lack thereof) between OCD and BFRBs, this paper seeks to present an overview and critical analysis of recent research (i.e., research from the past 3 years) examining shared and unique facets to OCD and BFRBs, with considerable focus on potential treatment implications. As scant research has sought to examine several BFRBs (e.g., teeth grinding, cheek biting, nail biting), discussion herein is necessarily weighted towards the OCD, HPD, and SPD literature. What is more, our brief review endeavors to partition this information by way of specific domains (i.e., phenomenology, symptomology, neurocognitive, genetic, and treatment) of inquiry, rather than by discrete diagnoses.

Phenomenology and symptomology

Recent research has identified some consistent similarities with respect to the phenomenology of OCD and BFRBs. In particular, BFRBs and OCD are both characterized by repetitive behaviors conceptualized to provide a form of relief or pleasurable sensation (e.g., anxiety relief, emotional regulation, etc.) [14, 15]. Though several BFRBs (e.g., teeth grinding and nail biting) have yet to be acknowledged within the DSM, similarities in phenomenology have provided partial justification for the grouping of HPD and SPD within the broader OCD cluster. Somewhat relatedly, recent literature has also identified relationships among OCD and BFRBs in regards to symptomology (e.g., aggression symptoms within OCD related to skin picking) [16]. For example, Weingarden and Renshaw [17•] reviewed 100 studies assessing the role of shame within OCDs. Within this context, general shame was referred to as self-conscious emotions, by which individuals judge themselves negatively. Such emotions have been shown to be related to negative outcomes, including social withdrawal and

depression. Weingarden and Renshaw's review demonstrated general shame among all OCRDs, with particular symptom-based shame specific to OCD (i.e., shame regarding content of obsessions and/or compulsions) and BFRBs (i.e., body shame and shame related to pulling and picking). These authors posited that such results suggest the need for further research examining shame within the context of OCRDs and highlight the potentially important clinical implications for work of this nature (e.g., interventions highlighting the necessity for providing psychoeducation and nonjudgment, addressing shame as a treatment goal, etc.). To be sure, however, not all research or researchers agree that OCD and BFRBs are inextricably linked.

Interestingly, despite some of the similarities noted above, some researchers hypothesize that OCD and BFRBs—though related on a trivial level—have little to no relation in regards to symptom function or motivation. In particular, Abramowitz and Jacoby [18•] posit that while compulsive behaviors are cued by irrational and anxiety provoking thoughts, skin picking and hair pulling are cued by negative emotions (e.g., tension, depression, anger, boredom, etc.) with considerable implications for BFRBs as emotion regulatory behaviors [10]. Beyond such arguments, further examination of OCD and BFRBs also demonstrates critical distinctions between these two categories. For example, Rozenman [19•] utilized cross sectional methodology to examine clinical characteristics of 89 children demonstrating HPD, OCD, and tic disorders. Findings demonstrated HPD as most similar to tic disorders compared to OCD. In fact, children within the OCD group demonstrated increased levels of anxiety and depression compared to those within HPD group. What is more, while findings demonstrated that children with OCD showed characteristics of cognitive (i.e., attention and thought problems) and externalizing problems, such characteristics were not associated with either HPD or tic disorders.

In summation, findings in relation to unique and shared phenomenological- and symptom-level characteristics of OCD and BFRBs are mixed. As such, it is perhaps most appropriate to view these behaviors as demonstrating both unique and shared qualities at the phenomenological- and symptom-level with noted difference found within recent and prior research based largely upon the distinct subdomain of measurement the research team has chosen to undertake. In our opinion, this is a good thing and clearly points to the need for further researcher. For example, the identification or reliably determined dissimilarities and similarities are critical within a clinical context. Such a line of research may hold considerable benefit, particularly when viewing the world from a transdiagnostic perspective, via the development of intervention strategies that may be disseminated and equally beneficial across OCRDs yet still others that are best employed in a more idiosyncratic fashion. (e.g., interventions targeting shame/guilt for persons with OCD, HPD, or SPD, interventions targeting irrational thoughts and resultant compulsive behaviors for OCD only).

Neurocognition and genetics

Research among OCD and BFRBs also suggests some similarities in relation to neurocognitive functioning. For example, Francazio and Flessner [20] examined

cognitive flexibility among young adults exhibiting obsessive-compulsive and related behaviors (OCBs; i.e., obsessive-compulsive behaviors, hair pulling, and skin picking) compared to controls. Cognitive flexibility within this study was assessed through participant performance on the Intradimensional/Extradimensional Shift (IDED) Test, in which participants were required to mentally “shift” between rules based upon computerized feedback. Results indicated that individuals demonstrating OCBs performed worse on the IDED compared to controls; however, performance was not related to OCB severity. Findings corroborate prior research demonstrating decreased cognitive flexibility among individuals exhibiting BFRBS or OCD [21–24] and further support cognitive inflexibility as an overarching characteristic of these disorders. What is more, a prior review of the pediatric literature—an often unexamined population—further highlights additional deficits among individuals demonstrating OCRDs (e.g., executive functioning, memory, and attention), with notable differences between children and adults [25•]. Interestingly, findings within this review demonstrate cognitive deficits (i.e., deficits remaining despite successful treatment of symptoms), most often seen among adults rather than youths. The authors hypothesize that such differences may highlight the importance and benefits of early intervention among the OCRDs. Somewhat similarly, additional research utilizing youths with HPD has also indicated critical differences between pediatric and adult samples. Specifically, Brennan and colleagues [26] examined inhibitory control among youths with HPD and healthy controls, with findings suggesting increased inhibitory control among those with HPD. Though not viable within this paper as a comparison to OCD, such findings do further indicate stark disparities between youth and adult characteristics of HPD and highlight necessity of further research, particularly among youth samples.

Beyond the neurocognitive literature, familial studies similarly highlight potential relationships between OCD and BFRBs. For example, results of Keuthen and colleagues’ [27] study demonstrate rates of OCD significantly higher among HPD probands with and without OCD, suggesting an etiological relationship between the two disorders. What is more, based upon their findings, the authors hypothesize a familial subtype of HPD specifically related to OCD. Interestingly, corroborating findings discussed previously (See *Phenomenology and Symptomology* section), when compared to hair pullers without OCD, hair pullers with OCD demonstrated greater self-reports of anxiety and depressive symptomology. With this latter finding notwithstanding, further support for a familial relationship among OCD and BFRBs has noted increased risk for BFRBS (i.e., HPD [4 %], skin picking [17 %], and nail biting [15 %]) among relatives of individuals with OCD [28]. While the research briefly reviewed above appear to suggest some degree of familial and neurocognitive overlap among these disorders, findings are not always consistent.

Recently, researchers have noted important caveats to the prior literature examining, in particular, the neurobiological similarities between OCD, HPD, and SPD. For example, Abramowitz & Jacoby [18•] disregard a neurocognitive basis for grouping OCD and OCRDs (i.e., HPD and SPD), highlighting considerable methodological limitations within the literature (e.g., small sample sizes, lack of direct comparisons, etc.), thus limiting causal inferences based on prior study findings. What is more, empirical research has also indicated critical differences between OCD and BFRBs. For example, McKay [29] reviewed

literature examining behavioral inhibition among individuals demonstrating OCRDs and subsequently concluded that such domains were dissimilar among the behaviors. Specifically, individuals with OCD demonstrated higher levels of inhibition, while those with other OCRDs demonstrated lower levels. Interestingly, research utilizing electroencephalogram (EEG) cordance (i.e., a computed measure of regional brain activity) has also suggested distinct neurological differences among OCD and HPD (i.e., theta cordance in frontal brain regions) [30]. Lastly, in relation to familial studies, Abramowitz and Jacoby [18•] discuss prior research indicating low levels of family patterns between OCD and HPD (1%), both highlighting discrepancies among the familial literature and suggesting little shared genetics between OCD and HPD.

In summary, recent and prior research indicates potential neurocognitive and familial relationships between OCD and BFRBs. However, such studies contain important methodological limitations (e.g., small samples, differing measurement techniques, few direct comparisons, etc.) with some more recent research highlighting important distinctions between OCD and BFRBs as well. Considering the apparent disparities within the literature and some of the noted methodological limitations, a clear picture of shared and unique neurobiological and genetic underpinnings of these disorders is unavailable. However, it is plausible to presume—based upon what work has been completed—that these disorders do share some neurobiological overlap (i.e., cognitive flexibility, basal ganglia circuitry, etc.) yet those area(s) of uniqueness (to each disorder) are most likely to shape science's understanding as to the pathophysiological of OCD and BFRBs. That is, perhaps problems with basal ganglia circuitry are key to and shared by OCD, HPD, and SPD (and other related disorders). It is, however, the identifications of those brain regions and corresponding performance on neurocognitive tasks that differentiate these disorders which may both advance transdiagnostic research (i.e., narrowed focus on those regions common to multiple disorders characterized by obsessive-compulsive behaviors) and, in turn, more efficacious pharmacological and behavioral interventions. Finally, it should also be noted that a dearth of literature—compared to the adult population—has sought to examine neurobiological/neurocognitive functioning in direct comparisons within pediatric populations. In fact, to our knowledge, only two studies have sought to examine cognitive functioning in children with any BFRBs. Clearly, further research is necessary as this may shed important light on the pathogenesis of these disorders across the developmental spectrum.

Treatment

Clinicians must consider how some of the relationships (or lack thereof) described previously may impact the treatment of OCD and BFRBs. From a therapeutic perspective, the degree of comorbidity that exists among these disorders likely warrants further attention. For example, Grant and Odlaug [31] discussed three case studies in which individuals demonstrating OCD, HPD, and nail biting were successfully treated using a pharmacological intervention—silymarin. The authors' choice of silymarin was based upon their conceptualization of OCD and BFRBs as issues of both striatum and frontal lobe peculiarity—a finding supported by prior research. The authors posit that

these findings may indicate that silymarin is a promising treatment of these disorders yet, considering the novelty of this examination, further replication is warranted. What is more, based upon studies suggesting glutamatergic deficits among OCRDs, recent research has similarly assessed the use of *n*-acetyl-cysteine (NAC) as a potential cross cutting intervention [32]. Review of four randomized control trials demonstrated inconclusive evidence yet also suggested that future research seeking to address some of these study's limitations (e.g., small sample size) may help clarify discrepancies and provide a better depiction as to potential benefits of NAC for OCD and BFRBs alike.

Notably, while research has identified similarities among OCD and BFRBs, one must also consider important differences between these problems and how such differences impact treatment approach. From the perspective of psychosocial interventions, differences in symptom function and motivation heavily dictate differences in treatment planning. For example, given the underlying conceptualization of obsessive and compulsive behaviors (i.e., reactions to irrational and intrusive thoughts), clinicians often opt for exposure and response prevention (ERP), during which individuals are prohibited from carrying out anxiety relieving compulsions. Perhaps unsurprisingly, while ERP demonstrates considerable efficacy among individuals with OCD [33, 34], no such research—that we are aware of—has ever examined the efficacy of ERP for patients with BFRBs. In contrast, given habitual and/or emotional components underlying BFRBs, clinicians treating patients with HPD or SPD often opt for behavior (e.g., HRT) and/or emotion-based treatments (e.g., ACT, DBT) [35]. In the case of HRT, patients are taught to recognize behavioral triggers and enact appropriate competing responses and/or coping skills. More recently, at least among adults, acceptance-enhanced behavior therapy (AEBT; i.e., ACT + HRT) has demonstrated efficacy [36]. While ACT alone has been examined as a treatment for adults with OCD [37], we are unaware of any study to employ HRT for the amelioration of OCD-related symptoms. Understandably, within the context of the considerable comorbidity that exists among these problems, clinicians must remain cognizant of various treatment options and utilize clinical judgment to effectively adapt appropriate interventions.

As noted above, the utility of ERP for BFRBs or AEBT for OCD has not been investigated. We bring this caveat to the reader's attention because there may be facets to these interventions, at least in relation to the broad-based approach utilized, that are similar. For example, could we conceptualize the response prevention facet to ERP as instructing a client to engage in a competing behavior/response (i.e., doing anything that keeps the patients in contact with the anxiety-evoking stimuli yet does not alleviate the anxiety produced by the intrusive/obsessive thought)? Similarly, could we conceptualize equipping a client—as done in AEBT—with the skills necessary to practice willingness and acceptance of unpleasant urges/triggers to pull their hair (i.e., while getting ready for work in the morning/bed at night), through the use of a competing behavior (i.e., clenching fists, hands in pockets), as similar to ERP. Tolin [38] highlighted this potentiality, although in a manner specific to a comparison of ACT to ERP for OCD. Further, several years ago, Verdellen and colleagues [39] examined the use of ERP for chronic tics disorders, a neuropsychiatric condition in which HRT has been used quite extensively, with notable success. To our knowledge, there has been little follow-up research to the Verdellen et al. [39] study yet the intrigue associated with these findings points to the potential

fruitfulness of further work in this domain.

There are important differences with respect to how ERP, HRT, and AEBT are implemented. First and foremost, the proposed mechanism of change for each of these approaches to interventions is different. From a topographical perspective, ERP is administered in a graded fashion progressing towards the pinnacle of a client's symptom hierarchy. The homework tasks and assignments utilized as part of AEBT/HRT and ERP also differ considerably. The point here is not to suggest that ERP, HRT, and AEBT are the same. Our intent is to demonstrate that similarities can be seen in these therapeutic approaches, if we modify our conceptualization of the intervention(s) employed. Future research may wish to leverage potential similarities between these therapeutic approaches, as Verdellen et al. [39] did, to further the development of transdiagnostic interventions and potentially improve the dissemination of evidence-based treatments. For example, a transdiagnostic intervention may wish to focus upon obsessive-compulsive behaviors (OCBs) characteristic of OCD, BFRBs, and related disorders (e.g., repetitive question asking in youths with generalized anxiety disorders, irrational thoughts/compulsive skin picking frequently associated with body dysmorphic disorder, etc.). In conjunction with continued phenomenological and laboratory-based work, such interventions may seek to incorporate additional components to treatment commonly associated with OCBs. For example, as discussed previously, guilt/shame is a concern seemingly present across both OCD and BFRBs [17•]. It is plausible that shame may hinder client's motivation for therapy, as well as disclosure within sessions. In line with these authors' suggestions, it may be appropriate for transdiagnostic interventions—targeting OCRDs—to explicitly address shame within the therapeutic context (e.g., discussing common prevalence of such behaviors, addressing stigmas associated with specific BFRBs and OCD, strategies for decreasing shame/guilt or boosting self-esteem, etc.). The inclusion of optional treatment modules that may be more tailored to the specific function and presentation of a client's problematic behavior may help to “round out” an intervention of this nature and reach the most patients with the most efficacious intervention possible. While certainly labor-intensive, such an approach, as the National Institutes of Mental Health has highlighted, may facilitate an important and dramatic advance in our understanding and treatment of OCD, BFRBs, and related clinical phenomena.

Conclusion

Review of recent literature examining relationships between OCD and BFRBs indicates both similarities and differences between the two categories. Ultimately, one must consider both perspectives as they each hold critical information for the conceptualization and treatment of such behaviors.

Of note, while this paper sought to highlight novel research within the field, examination of such studies indicated several limitations. First, research explicitly examining relationships between OCD and BFRBs is scarce, with little to no research examining BFRBs unclassified within DSM-5 (e.g., teeth grinding, cheek biting). Though such limitations are disconcerting, future research may wish to address these areas by expanding participant BFRB criteria and utilizing direct comparisons between individuals demonstrating OCD and BFRBs. Such

research may help clarify discrepant findings demonstrated among studies examining discrete diagnoses. What is more, while research in this domain is generally scarce, research comparing OCD and BFRBs among pediatric populations is nearly nonexistent. As discussed prior, it is plausible that further examination of pediatric populations may highlight additional distinctions between youths and adults critical to further our understanding of and interventions for these sometimes debilitating conditions.

Compliance with Ethical Standards

Conflict of Interest

Yolanda E. Murphy, Christopher A. Flessner, and Alexandra C. Smith declare that they have no conflict of interest. Christopher A. Flessner has received a grant from the TLC Foundation for BFRBs.

Human and Animal Rights and Informed Consent

This article does not contain any studies with human or animal subjects performed by any of the authors.

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