

A cycle of stress: a study of increased COVID-19 exposure through body-focused repetitive behaviors

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Abstract

Body-focused repetitive behaviors (BFRBs), impacting up to 5% of the population, are behaviors in which a person uncontrollably fidgets with his or her own body in ways that leave physical harm. They can often be dismissed as bad habits; however, BFRBs are actual disorders and much harder to treat due to changes in brain anatomy and external stressors. These disorders leave the individual more susceptible to infection through his or her increased contact with the facial region and orifices. In a literature review and synthesis, a potential link between body-focused repetitive behaviors and COVID-19 exposure is discussed; the added stress and anxiety of contracting the virus results in an increase of severity and frequency for these disorders, which, in turn, further increases the risk of COVID-19 infection for this population. The end result is a complex cycle in which an individual is trapped between the stress of his or her conditions. Methods of prevention are also discussed in order to promote individual safety during the pandemic. *Keywords: Body-focused repetitive behavior, BFRBs, Onychophagia, COVID-19, Stress*

Introduction

Estimated to impact up to 5% of the population, body-focused repetitive behaviors (BFRBs) are behaviors in which an individual repeatedly fidgets with his or her own body in ways that leave physical harm (Roberts et al., 2013). BFRBs—including trichotillomania (hair-pulling), dermatillomania (skin-picking), and onychophagia (nail-biting)—can be subclinical and relatively common, but they can also be more severe, albeit rarer (Houghton et al., 2017); pathological manifestations of BFRBs can be conceptualized as disorders (Houghton et al., 2018).

The current COVID-19 pandemic revolves around the transmission of the COVID-19 virus, which is catalyzed by contact of viral particles with the facial region. Humans are intrinsically prone to touching their faces 10-20 times an hour, but individuals with BFRBs are at an even greater risk because of their compulsions (Sudharsan et al., 2020). These compulsions tend to increase in severity and frequency when an individual is under stress (Grant et al., 2015). Therefore, the stress of the COVID-19 pandemic should theoretically exacerbate these behaviors, and, in turn, increase COVID-19 exposure for the BFRB

population, creating a cycle of strain on each individual's health.

Body-focused repetitive behaviors are stigmatized due to their novelty and lack of discussion in the research world; consequently, struggling individuals are already prone to feeling isolated and misunderstood due to these behaviors. During a time when there is a global struggle, it is even more critical to reach out to these individuals and make sure that their problems are acknowledged and understood, through both its causes and aggravators, before discussing possible solutions to ensure we all persevere through the COVID-19 crisis.

Methodology

With the COVID-19 pandemic being relatively recent, there has been an influx of literature surrounding various protective measures and adherence guidelines. Based on a Pubmed and Google Scholar search, to our knowledge there have not been any studies focused on body-focused repetitive behaviors in the coronavirus pandemic. A literature review was conducted to identify BFRBs that may impede adherence to established protective measures against infectious disease spread. This analysis was conducted by surveying articles in Pubmed and Google Scholar that matched a predetermined set of search terms. Disorders were limited to mainly independent individuals, excluding those left reliant on caregivers for basic needs (ex. excluding disorders such as chorea, cataplexy, etc. that could potentially increase risk). Reviewed articles covering general disorders such as autism and Tourette syndrome were also excluded as they did not primarily focus on physical compulsions and impulsivity. The search strategy combined keywords of various iterations of SARS-CoV-2, Coronavirus, or COVID-19 with the broad category of BFRB and numerous examples such as trichotillomania, dermatillomania, and onychophagia to broaden sensitivity while maintaining specificity. General articles on body-focused repetitive behaviors were excluded unless they also covered mental triggers in order to better build a pandemic-

conscious framework with proposed risk reduction strategies for individuals with a BFRB.

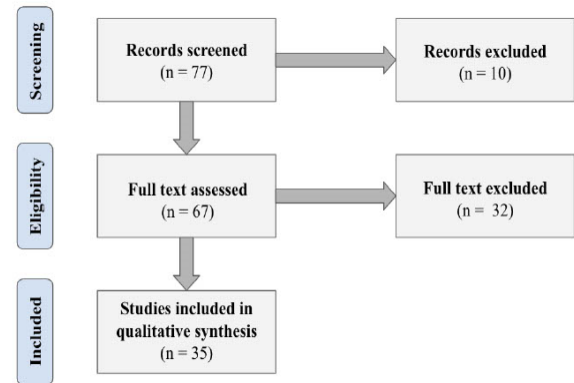


FIGURE 1. PRISMA Flow Diagram depicting the systematic review of 77 articles evaluated in this study.

Results

Neurobiology behind BFRBs

BFRBs are still a relatively novel topic in the research world, but some studies have suggested a predisposition to the disorders through genetics or experienced stress (Duke et al., 2009; Novak et al., 2009). Modern imaging studies have also been conducted to research the anatomical differences in the brains of BFRB groups and control groups. One such study provided evidence for cortico-basal ganglia circuit dysfunction in obsessive-compulsive-spectrum disorders (Graybiel et al., 2000). As corticostriatal circuits and the basal ganglia are both responsible for regulating impulsive motor behavior, damage or lesions to any part of these circuits could lead to their hyperactivity and abnormal repetition of behavior (Graybiel et al., 2000; Lanciego et al., 2012; Langen et al., 2010; Laplane et al., 1989). This dysfunctional impulsivity can lead to a dysregulation in the brain's dopamine reward system, increasing feelings of pleasure, gratification, or emotional release in BFRB patients when engaging in their behaviors (Flessner et al., 2012; Griffin et al., 2018).

Another studied characteristic of these behaviors is their ability to seemingly increase pain tolerance in their patients. A fairly recent study conducted by Professor Jon Grant compiled evidence that individuals with a BFRB

(specifically dermatillomania) were able to withstand higher levels of pain as compared to those in control groups; while still reporting similar levels of pain intensity, individuals with dermatillomania experienced dampened autonomic responses (Grant et al., 2017). These results can be extrapolated to other BFRBs and can help explain why these individuals actively and subconsciously continue to engage in these painful behaviors. According to the 5th edition of Diagnostic and Statistical Manual of Mental Disorders, the diagnostic criteria for body-focused repetitive behaviors also involves identifying a patient's impairment in function from engaging in his or her behaviors as well as repeated attempts to reduce or stop them.

These studies give a brief background on BFRBs and how difficult it may be for any patient to stop engagement; however, as stress is hypothesized to exacerbate these behaviors, the added anxiety of the COVID-19 pandemic could greatly increase this difficulty (Grant et al., 2015). Furthermore, since the spread of the COVID-19 virus is expedited through contact with one's face and orifices, individuals with BFRBs could be at a greater risk for contracting the virus. The conjunction of these two phenomena could potentially lead to a complex cycle in which BFRB patients stress over their chances of being infected with COVID-19, leading to more engagement in their behaviors in order to relieve that stress but increasing their chances even more.

Implications during the COVID-19 Pandemic

Body-focused repetitive behaviors are already associated with increased sensory sensitivity, indicating potential abnormalities in the sensory process (Houghton et al., 2017). This sensory sensitivity could potentially indicate that individuals with BFRBs are already more prone to feelings of anxiety and stress after consuming media covering COVID-19. BFRBs were also found to be maladaptive emotional regulation mechanisms, with higher feelings of perceived stress leading to greater disease severity; trichotillomania specifically was shown to increase in severity in patients that have

experienced past traumatic events (Grant et al., 2015; Houghton et al., 2016; Miller et al., 2017; Roberts et al., 2013). Individuals with BFRBs demonstrated an increased reaction time in which to control these feelings of stress (Murphy et al., 2016). The synthesis of these studies offer an explanation as to how body-focused repetitive behaviors are exacerbated by feelings of stress and anxiety.

Simultaneously, body-focused repetitive behaviors, specifically onychophagia, were shown to increase risk of infection of enterobacteriaceae (Kamal et al., 2015; Reddy et al., 2013). Onychophagia is characterized by the practice of keeping one's hands close to his or her mouth from a few seconds to half a minute (Sachan et al., 2012). In this time, the fingers act as carriers of microorganisms from the external oral environment into the oral cavity, whose warm and moist environment can support the growth of these microorganisms (Kamal et al., 2015; Reddy et al., 2013). This data can be extrapolated to the transmission of the COVID-19 virus, which is highly contagious and can last on surfaces from a few hours to days. In fact, a 2020 study has provided evidence for an increased chance of being diagnosed for a general psychiatric disorder three months after an infection with COVID-19; correspondingly, a diagnosis of a general psychiatric disorder the previous year was found to be associated with a 65% higher chance for contracting COVID-19, regardless of known physical health risk factors (Taquet et al. 2020).

In summary, individuals with body-focused repetitive behaviors are already more impacted stress-wise by media concerning the current pandemic, but the increased engagement in these behaviors further increases their risk for contracting COVID-19. As a result, during this pandemic, these individuals are experiencing a cycle in which their own behaviors aggravate their conditions mentally, emotionally, and physically.

Discussion

These results show that individuals with body-focused repetitive behaviors are at risk of worsening their mental and physical healths by

themselves. Consequently, potential prevention methods must be discussed in order to protect this population from the stress of COVID-19 infections. For the best possible result, patients should consult their primary care physician to identify what treatment is best for them. One possibility for general prevention and treatment for BFRBs is therapy, including pharmacotherapy, psychotherapy, and cognitive-behavioral therapy. Pharmacotherapy can include treatment with drugs such as *n*-acetylcysteine and clomipramine, although data researching these substances is limited (Grant, 2019; Phillips et al., 2021). Cognitive-behavioral therapy, most commonly habit reversal therapy, is also proven to be efficacious in affected individuals (Gunter et al., 2009). This primarily behavioral therapy involves awareness training, stimulus control, and competing response training; essentially, work must be done by each individual to identify and suppress his or her personal triggers, as well as find behavioral substitutes, such as sitting on their hands to prevent engagement in the BFRB (Phillips et al., 2021).

Loved ones also play a critical role in an affected individual's treatment. By establishing a supportive and positive environment, loved ones can offer vital encouragement to boost the individual's self-confidence (Baghchechi et al., 2020).

For onychophagia specifically, aversive therapy can include using olive oil or bitter-tasting polish in order to deter individuals from biting or chewing on his or her fingers (Baghchechi et al., 2020); however, especially during the COVID-19 pandemic, this solution can be harmful as it would still potentially involve contact with the oral cavity. One specific solution is the wearing of a smart device that would alert the user when his or her hands are unintentionally brought up to the face; humans are naturally prone to touching their faces 10-20 times an hour, increasing their risk of viral infection, and so these devices could be a harmless, effective way to avoid that contact (Sudharsan et al., 2020).

For general COVID-19 prevention, all individuals should continue with handwashing, cleaning high-touch surfaces, and wearing masks

to avoid the spreading of particles. Not only would this ultimately help the individual with a BFRB by reducing possibility of exposure, but it would also protect family and friends from transmission as well.

Some limitations of this study could include lack of data or research previously done on this subject. For example, BFRBs tend to be more common in adolescents (Hull et al., 2020); simultaneously, teenagers tend to be the population avoiding social distancing (Miller, 2020). Perhaps this connection is evidence that BFRBs are not a partial cause to COVID-19 infection, but only a concurrent statistic. Even so, people that have BFRBs, specifically onychophagia, and participate in social distancing are still statistically more probable to be exposed to pathogens (Kamal et al., 2015); as a result, it is still necessary to delve deeper into this subject in order to protect these individuals and those around them. More steps can be taken in terms of research, such as mirroring Taquet's 2020 study on the connection of COVID-19 infection rates with psychiatric disorders but increasing the level of specificity. The hope is to find irrefutable results that protect this population so they no longer expose themselves or others to an already-devastating virus.

To conclude, individuals with body-focused repetitive behaviors are more inclined to touch their faces and facial orifices than the average person, increasing their risk of contracting COVID-19. This added anxiety and pressure further contributes to behavior engagement, resulting in a cycle of immense stress for the individual's health in a time when the world is already suffering under the stress of a global pandemic.

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