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Brief research report

Stress exposure and generation: A conjoint longitudinal model of body dysmorphic symptoms, peer acceptance, popularity, and victimization

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ABSTRACT

This study examined the bidirectional (conjoint) longitudinal pathways linking adolescents' body dysmorphic disorder (BDD) symptoms with self- and peer-reported social functioning. Participants were 367 Australian students (45.5% boys, mean age = 12.01 years) who participated in two waves of a longitudinal study with a 12-month lag between assessments. Participants self-reported their symptoms characteristic of BDD, and perception of peer acceptance. Classmates reported who was popular and victimized in their grade, and rated their liking (acceptance) of their classmates. In support of both stress exposure and stress generation models, T1 victimization was significantly associated with more symptoms characteristic of BDD at T2 relative to T1, and higher symptom level at T1 was associated with lower perceptions of peer acceptance at T2 relative to T1. These results support the hypothesized bidirectional model, whereby adverse social experiences negatively impact symptoms characteristic of BDD over time, and symptoms also exacerbate low perceptions of peer-acceptance.

Introduction

Individuals with body dysmorphic disorder (BDD) exhibit significant distress, preoccupation, and compulsive behaviors (e.g., excessive grooming) related to imagined or slight appearance defects. BDD has been associated with significant impairment, including school dropout, poor social engagement, and suicidal ideation and attempts (Albertini & Phillips, 1999). BDD typically onsets during adolescence (Phillips, Menard, Fay, & Weisberg, 2005), and the cognitive behavioral model (CBM) of BDD (Veale, 2004) has proposed that childhood stress exposure is a key risk factor for onset. Yet, there has been little prospective research on this stress exposure hypothesis (Cole, Nolen-Hoeksema, Girgus, & Paul, 2006), whereby stress exposure is a precursor of adolescents' BDD symptoms. It is known that BDD sufferers recall a great deal of interpersonal stress, including appearance teasing, and they recall victimization experiences as more vivid and traumatic than healthy controls (Buhlmann et al., 2011). Adults with BDD retrospectively report higher rates of abuse compared to individuals with obsessive-compulsive disorder (Neziroglu, Khemlani-Patel, & Yaryura-Tobias, 2006) and healthy controls (Buhlmann, Marques, & Wilhelm, 2012). Notably, these studies included, but were not limited to adolescents, as little research (except for case reports) has focused on adolescent BDD (Dyl, Kittler, Phillips, & Hunt, 2006).

Inspired by the stress generation model of depression (Hammen, 1992), here we considered whether there might be evidence that BDD could result in stress generation. In stress generation models, individuals contribute to their environmental stress by inadvertently perpetuating social adversity through their beliefs or behavior. Stress generation has been supported in research on depression and social anxiety (Cole et al., 2006; Conway, Hammen, & Brennan, 2012; Zimmer-Gembeck & Skinner, 2015), whereby individuals with depression or social anxiety report higher rates of stressful events that are considered dependent on the individual or more controllable (e.g., interpersonal stressors), but do not report higher rates of uncontrollable events (Rudolph et al., 2000). Those with more depressive symptomology seem to exhibit impairments that undermine effective engagement in the social environment (Rudolph et al., 2000; Zimmer-Gembeck, 2015). Similarly, in an attempt to avoid or obtain relief from the distress about appearance defects (which leads to compulsive engagement in checking, grooming, and concealment), individuals with BDD report withdrawing from social situations and people (Fang & Wilhelm, 2015).

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There is extensive evidence of the social and occupational impairment associated with BDD, including one prospective study which showed that among adolescents and adults diagnosed with BDD, functional impairment remained steadily low over three years (Phillips, Quinn, & Stout, 2008). Accordingly, the present study examined whether adolescents' symptomology of BDD predicted declines in social functioning, suggestive of increasing social stress, over 12 months. Given the adolescent onset of BDD, and that potential sufferers may show elevated symptoms prior to full onset of BDD (Veale, 2004), our aim was to assess a community sample of early adolescents in order to evaluate social risk factors for symptoms associated with BDD during a developmental period when symptoms typically emerge, as well as to assess social functioning over 12 months.

We utilized both self- and peer-reported indicators of social stress exposure in this study, because BDD sufferers have been found to demonstrate biased processing of social information, which might affect their reports of stress exposure. For example, adults with BDD misinterpret ambiguous situations as threatening (Buhlmann et al., 2002) and misidentify others' neutral expressions as contemptuous or angry in self-referent scenarios (Buhlmann, Etcoff, & Wilhelm, 2006). Also, in one cross-sectional study, adolescents who reported higher levels of BDD symptoms also reported more frequent peer appearance teasing, but BDD symptom level was not associated with peer-reported victimization (Webb et al., 2015).

Participant Sex

The prevalence of BDD has been described in a review as being 'roughly similar' in adult men and women, yet some studies show higher rates among women (Fang & Wilhelm, 2015). Notably, our previous study of early adolescents found no significant differences between boys and girls in concurrent associations between BDD symptoms and self- or peer-reported victimization (Webb et al., 2015). Similarly, in a study of 200 adults with BDD, no significant difference was found in social and functional impairment across many domains (e.g., social and occupational, quality of life). However, men with BDD showed significantly greater impairment in a few areas, including being more likely to be out of work due to psychopathology and receiving a disability pension, and being rated lower on global functioning (Phillips, Menard, & Fay, 2006). More generally, in a community sample, adolescent boys, relative to girls, showed stronger associations between elevated symptoms of anxiety and depression and declines in social and emotional functioning over time (Derdikman-Eiron et al., 2011). Accordingly, sex differences in the stress exposure and stress generation hypotheses were examined, and stronger associations between BDD symptoms and later social impairment were anticipated for boys than girls.

Current Study

We focused on a community sample of early adolescents to enable assessment of social risk factors for symptoms characteristic of BDD during the developmental period when symptoms typically emerge. We tested a conjoint longitudinal model of stress exposure and stress generation linking symptoms characteristic of BDD and social functioning (self-reported peer acceptance, and peer-reported social acceptance, popularity, and general victimization), which permitted simultaneous assessment of whether (1) indicators of stress exposure (e.g., low acceptance, high victimization) predicted an increase in BDD-like symptoms 12 months later; and (2) BDD-like symptoms predicted an increase in social stress over time. Sex differences were also assessed.

Method

Participants

Participants were 367 (55.5% girls) Australian students in grades 5 (27%), 6 (31%), or 7 (42%) who participated in two waves of a longitudinal study with a 12-month lag between assessments. All students attended one of three participating schools. Participants were 9–14 years (M_{age} = 12.01, SD = 0.91), and were predominantly White/Caucasian (79%) or Asian (15%).

Measures

BDD symptoms. Examining a community sample of adolescents was vital in order to assess potential sufferers prior to or during the onset of BDD symptoms. It was not, therefore, anticipated that a significant proportion of participants would be experiencing clinical symptom levels. Given this and the large sample assessed, the 10-item Appearance Anxiety Inventory (AAI; Veale et al., 2014) was utilized to measure symptoms associated with BDD. Items were reflective of BDD symptoms as described in the Diagnostic and Statistical Manual of Mental Disorders (*DSM-5*), including obsessional thoughts and repeated behaviors. An example item is: "I check my appearance (e.g., in mirrors, with photos)". Participants indicated the frequency of symptoms (0 = *Never*, 4 = *Always or almost always*). The total score was computed by summing all items (Cronbach's α at T1 was .92 for girls, .83 for boys). Veale et al. (2014) calculated a median score of 27 (IQR = 12) for a sample of adult BDD sufferers and a median score of 13 (IQR = 13.5) for an adult community sample. In the present study the median score was 6.25 (IQR = 10) at T1 and 6.00 (IQR = 10) at T2. At T1, 33 adolescents (14% of girls, 2% of boys) showed elevated symptomology (≥20; midway between the median of the BDD and community samples). At T2, 35 adolescents (15% of girls, 3% of boys) showed elevated symptomology. The AAI has previously been used with an adolescent community sample (Cronbach's α was .94 for girls, .83 for boys; Webb et al., 2015).

Self-reported peer acceptance. Peer acceptance was assessed with one item: "How much do you feel that other kids in your school like you?" (1 = *Not at all*, 5 = *Very much*).

Peer-reported acceptance, popularity, and victimization. To measure peer-reported acceptance, each participant rated how much s/he liked each of their classmates (1 = *Not at all*, 5 = *Very much*). Classmates' responses were averaged to form a peer-reported acceptance score for each participant.

A widely-used peer-nomination procedure was used to assess popularity and victimization. From a list of all students in the same grade, each participant nominated up to 10 grademates that were "the most popular". Students nominated up to three grademates who best fit five behavioral descriptors of victimization (e.g., "Who is made fun of by others"; Crick & Grotpeter, 1995). For each participant, nominations received for popularity and for victimization were summed and standardized within grades to adjust for unequal grade sizes.

Procedure

The present study was drawn from Waves 1 and 3 of a larger longitudinal study on appearance concerns. Study approval from the university Human Research Ethics Committee was obtained and local schools were contacted. The first three consenting schools were permitted to participate, and parental consent was obtained. A party was awarded to the class within each grade, at each school, that returned the most forms (regardless of parental consent to