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Testing the efficacy of pure versus guided mirror exposure in women with bulimia nervosa: A combination of neuroendocrine and psychological indices

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ABSTRACT

Background and Objectives: Body exposure improves body image problems in women with eating disorders. However it has almost always been combined with other interventions. Thus, the efficacy of body exposure alone (i.e., pure exposure) remains largely unclear. We aimed to compare the efficacy of two body exposure techniques through psychological and neuroendocrine indices recorded within and between successive sessions.
Method: Twenty-nine women with high body dissatisfaction and diagnosis of bulimia nervosa were randomly assigned to one of two treatment groups: Pure Exposure ($n = 14$) or Guided Exposure ($n = 15$). Participants received 6 exposure sessions. After each session, changes in thoughts (positive/negative) and body satisfaction were assessed. Also, we assessed the body discomfort experienced by participants within and between sessions. Finally, the changes in salivary cortisol levels within and between the initial and final treatment sessions were measured.
Results: Both groups showed a reduction in negative thoughts and a progressive increase in positive thoughts throughout the treatment. However, the increase in body satisfaction and the reduction in subjective discomfort within the sessions were greater in the pure exposure group. The cortisol levels during the initial and final treatment sessions decreased in both groups.
Limitations: Methodological limitations are reported.
Conclusions: These results suggest that pure and guided exposures are effective interventions for improving thoughts and neuroendocrine responses, although pure exposure increased more body satisfaction feelings in bulimic women. Subjective discomfort also showed different patterns of change within and along sessions for each treatment. Reasons for these results are discussed.

1. Introduction

Body exposure has been demonstrated to be an effective technique for reducing body dissatisfaction and negative thoughts and emotions associated with body image in individuals with eating behavior disorders (EBDs) (Trentowska, Bender, & Tuschen-Caffier, 2013; Tuschen-Caffier, Vögele, Bracht, & Hilbert, 2003). In this context, several authors have observed that when body exposure exercises are included in cognitive behavior therapy programs or linked to other therapeutic techniques (e.g., *mindfulness*), they contribute significantly to reducing body dissatisfaction and/or improving other indicators associated with body image disturbances, such as *body checking* or *avoidance* behaviors (Delinsky & Wilson, 2006, 2010; Key et al., 2002).

Tuschen-Caffier, Pook, and Frank (2001) developed a body exposure technique in which patients were guided to describe their physical appearance in detail as accurately and as neutrally as

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possible while watching themselves in a full-length mirror. With this guided neutral description, individuals focused their attention on areas of the body that are normally ignored, including those considered particularly unpleasant. Hilbert, Tuschen-Caffier, and Vögele (2002), using this exposure technique in women with binge-eating disorders, observed that after two treatment sessions, patients' self-esteem increased, and the levels of discomfort, the negative moods and the frequency of the negative thoughts declined. Similar positive findings concerning increased body satisfaction after this type of body exposure were reported by Jansen et al. (2008) in obese adolescents and Trentowska et al. (2013) in women with bulimic symptoms.

A different method of mirror exposure for the treatment of body dissatisfaction was recently proposed by Moreno-Domínguez, Rodríguez-Ruiz, Fernández-Santaella, Jansen, and Tuschen-Caffier (2012). These authors examined, in a group of women with high body dissatisfaction, but without EBDs, whether *pure exposure* to one's own body would be effective in reducing body dissatisfaction compared with the *guided exposure* developed by Tuschen-Caffier and Florin (2002). It was observed that body dissatisfaction, negative thoughts and feelings of ugliness were reduced in both groups, but subjective discomfort caused by the body was significantly reduced only in the pure exposure group. This type of exposure involves a stronger initial negative emotional reaction followed by a reduction within and between sessions probably reflecting the activation and subsequent habituation/extinction of the dysfunctional emotional responses elicited by viewing one's own body (Craske et al., 2008; Foa & Kozak, 1986; Foa & McNally, 1996; Rauch & Foa, 2006).

Following Lang's bio-informational model (Lang, 1979), Foa and Kozak (1986) were the first to propose that the therapeutic effects of exposure techniques in the treatment of anxiety disorders are the result of the activation and subsequent modification of the patient's "pathological fear structure" by integration, within the therapeutic context, of information that is inconsistent with that pathological structure. The end result is the reprocessing and modification of the original structure by another non-pathological one. Changes produced in subjective fear and its associated physiological responses within and between sessions are assumed to be indicators that such emotional reprocessing is occurring (Foa & Kozak, 1986; Lang, 1971; Rachman, 1980). Thus, the success of body exposure therapy might be explained because the discomfort decreases after successive exposure sessions ending the connection between the body and the associated negative emotional responses.

However, few studies have evaluated physiological changes that occur within and between successive sessions over the course of treatment based on body exposure. Vocks, Legenbauer, Wächter, Wucherer, and Kosfelder (2007) incorporated such measures in a single mirror exposure session. These authors observed that negative emotions and thoughts increased at the beginning of the session in women with EBDs, in comparison with women without EBDs, decreasing significantly over the session. They also observed significant differences between the groups at baseline cortisol levels, with EBD patients showing higher salivary cortisol concentrations (Vocks et al., 2007). Although they did not examine changes in cortisol after body exposure, the relevance in the area of eating disorders of the role of the stress response, mediated by activation of the hypothalamic-pituitary-adrenal axis through cortisol release, is well documented (Koo-Loeb, Pedersen, & Girdler, 1998; Lo Sauro, Ravaldi, Cabras, Faravelli, & Ricca, 2008; Neudeck, Jacoby, & Florin, 2001). Koo-Loeb et al. (1998) reported elevated cortisol levels, together with more perceived stress, worse mood, and greater anxiety, in women with bulimia nervosa (BN), compared to control women. Additionally, Neudeck et al. (2001) observed that the abnormal levels of cortisol in women with BN disappeared after weight normalization and the stabilization of symptoms after treatment.

The present investigation aims to replicate and extend the pilot study by Moreno-Domínguez et al. (2012) comparing the efficacy of *pure exposure* and *guided exposure* procedures in healthy women with high body dissatisfaction focusing on the cognitive and emotional components. Participants were a group of women with bulimia nervosa and body dissatisfaction. We included neuroendocrine (cortisol) assessment before and during the initial and final treatment session, together with cognitive and affective measures within and between sessions. We also extended the number of treatment sessions from five to six. First, we predicted that pure exposure, based on Foa and Kozak's paradigm of anxiety response extinction (Foa & Kozak, 1986), would be as effective as guided exposure in decreasing body dissatisfaction levels and negative thoughts, simultaneously increasing positive thoughts. Second, according to the results of the study by Moreno-Domínguez et al. (2012), we expected that the reduction in subjective discomfort within each treatment session would be larger and quicker in the pure exposure than in the guided exposure method. Finally, regarding cortisol, we assumed that repeated mirror exposure would reduce the stress response caused by viewing one's own body within and between the initial and final treatment sessions in both exposure methods.

2. Method

2.1. Participants

Twenty-nine college women with body dissatisfaction and bulimia nervosa (BN) symptoms participated voluntarily in the study. The participants were screened from a sample of 1154 women according to their scores on the *Bulimic Investigatory Test Edinburgh* (BITE; Henderson & Freeman, 1987) (BITE scores $\geq$ 20) and the *Body Shape Questionnaire* (BSQ; Cooper, Taylor, Cooper, & Fairburn, 1987) (BSQ scores $\geq$ 105), which were completed in different departments at the University of Granada (Spain). From this group, 85 women remained eligible and were provided an individual appointment by telephone to participate in an assessment and diagnostic interview conducted by a trained clinical psychologist. Nineteen women declined to participate in the assessment and diagnostic session. Diagnoses were confirmed through a structured clinical interview based on the DSM-IV-TR (APA, 2000), which allowed to examine the defining characteristics of BN. The inclusion criteria for BN were as follows: a) the presence of recurrent binge eating accompanied by loss of control over eating and inappropriate compensatory behaviors; b) duration of binge eating and compensatory behaviors (at least twice per week for three months); and c) a self-evaluation overly influenced by body weight and shape. Exclusion criteria were as follows: a) the presence of substance abuse or addiction; b) current psychological and/or psychiatric treatment for eating disorders or other mental disorders; c) BMI <18 or >29; d) age <18 or >30; and e) currently following a weight loss program. From 66 women who arrived for the assessment and diagnostic session, twenty-four did not meet the inclusion criteria, three met the exclusion criteria, and nine declined to take part in the study (see Fig. 1). In this session, the participants were informed of the purpose of the study and were measured and weighed to obtain body mass index (BMI). Finally, they were randomly assigned to one of the two treatment groups (pure exposure, $n = 14$ and guided exposure, $n = 16$). One participant abandoned the guided treatment, leaving a sample of 29 individuals seeking treatment. Nine participants (31, 04%) received past psychological support during adolescence: two (6, 89%) for BN, five (17, 24%) for anxiety