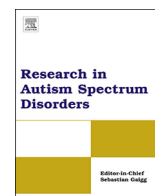




Contents lists available at ScienceDirect

Research in Autism Spectrum Disorders

journal homepage: www.elsevier.com/locate/rasd

Effects of written disclosure on psychophysiological stress among parents of children with autism: A randomized controlled pilot study

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ARTICLE INFO

Keywords:

Autism spectrum disorders
Parent intervention
Caregiver stress
Written disclosure

ABSTRACT

Background: In comparison to parents of typically functioning children or parents of children with other developmental disabilities (i.e. Down's syndrome or cerebral palsy), parents or caregivers of children with an autism spectrum disorder (ASD) sustain a greater incidence of depression, anxiety, and emotional distress. It is imperative to identify effective methods that target improvement to caregiver mental health.

Method: A randomized controlled pilot study was conducted to investigate the effect of a written disclosure intervention (expressive writing about traumatic events versus neutral events) on the psychophysiological stress of 71 parents (age 23–62) caring for a child with ASD. Self-reported measures of stress (parenting stress, caregiver burden, and global stress) and a stress biomarker (cortisol awakening response) were evaluated at baseline and 6-month follow-up. Adjusting for baseline values, we performed a univariate analysis of covariance to test directional hypotheses that parents in the treatment group would show a reduction in subjective stress and improvement in physiological stress over time.

Results: As expected, treatment group parents displayed healthier cortisol activity and reported less global stress compared to controls. Whereas within group analyses indicated all parents experienced improvement in parenting stress and caregiver burden over time, there was no significant treatment effect for these caregiving-specific stress measures.

Conclusions: Within this pilot study, written disclosure appeared beneficial to caregiver psychophysiological stress. However, due to the provision of substantial participant adherence support, we refrain from suggesting feasibility. Nonetheless, improvement of mental health pathology in parents of children with ASD is both significant and timely.

Some research has indicated positive results associated with parenting a child with autism spectrum disorders (ASD), such as increased spirituality (Ekas, Whitman, & Shivers, 2009), acceptance of differences, and heightened compassion (Pakenham, Sofronoff, & Samios, 2004). However, accumulating evidence maintains that a large majority of parents caring for a child with ASD experiences deleterious mental and physical health consequences. Studies have reported unfavorable parent outcomes such as elevated anxiety (Lecavalier, 2004), poor health-related quality of life (Allik, Larsson, & Smedje, 2006; Khanna et al., 2011), irregularities in cortisol production and immune system dysfunction (De Andrés-García, Moya-Albiol, & González-Bono, 2012; Lovell, Moss, & Wetherell, 2012), and heightened parental stress (Barroso et al., 2017; Dunn et al., 2001). Moreover, parents or caregivers of

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children with ASD sustain a greater incidence of parenting stress, depression, and psychological distress compared to parents of children with other developmental disabilities such as Down's syndrome, cerebral palsy, or fragile X syndrome (Abbeduto et al., 2004; Estes et al., 2009; Hayes & Watson, 2013; Mugno et al., 2007; Smith et al., 2008; Weiss, 2002).

With the high prevalence of children diagnosed with ASD (Wingate et al., 2014) and the many challenges that parents may face, it is imperative to identify effective methods that target improvement to caregiver mental health. Previous research offering "treatment" for caregivers of children with ASD focused on improving the child's behavior or providing parent education to increase parental understanding of autism (Da Paz & Wallander, 2017). Rather than targeting parent health, researchers evaluated the effectiveness of these programs on outcomes specific to *children with ASD*, such as behavior management or improvement in language and social skills (Mcconachie & Diggle, 2007). While these approaches are commendable, subsequent investigations have recognized the need to target parent mental health and evaluate treatments that improve well-being (Dababnah & Parish, 2016). Interventions such as mindfulness-based stress reduction (Dykens et al., 2014; Ferraioli & Harris, 2013; Neece, 2014), relaxation therapy (Gika et al., 2012), and cognitive behavioral therapy (Feinberg et al., 2014; Lunsky et al., 2017) have shown promise in the attenuation of psychological pathology for parents of children with ASD. However, work stills remains to expand intervention variety and improve methodological limitations such as, few randomized controlled trials, small sample size, and inconsistent measurement of parent outcomes (Dababnah & Parish, 2016). Moreover, poor parent mental health not only affects the parent, it has also been linked to unfavorable outcomes for the child, such as, reduced effectiveness of child gains acquired through early intervention (Osborne et al., 2008) and increased child behavioral problems (Barroso et al., 2017; Tomanik, Harris, & Hawkins, 2004).

In addition, a parent's ability to access to their own treatment might be hindered due to time constraints caused by their child's behavior intervention sessions which typically occur three to five days per week at an average of two to six hours per day (Granpeesheh et al., 2009). The prohibitive costs typically associated with many psychological interventions might also serve as a deterrent or barrier to treatment for most parents (Wallander, Madan-Swain, Klapow, & Saeed, 2011). To address these barriers and expand evidence-based interventions targeting parent mental health, this study evaluated written disclosure (WD), a treatment that is efficient with both, cost and time.

Developed by Pennebaker and colleagues, WD provides an outlet for the private expression of traumatic events yielding health benefits over time. Pennebaker and Beall (1986) operationally define trauma as a "personally upsetting experience." Henceforth, references to *trauma* within this manuscript will be synonymous to Pennebaker's definition. Standard writing protocol proposes three consecutive days of writing about the same topic or different topics across writing sessions. Several "doses" of writing have been examined (ranging from one to five days) and found to be unrelated to treatment effect size (Frattaroli, 2006; Sloan & Marx, 2004; Smyth, 1998). Health improvements are usually observed 3–6 months later and typically not immediately post-treatment, despite only requiring three 20-min sessions of uninterrupted writing, making it extremely economical and convenient.

Participants are randomly assigned to one of two conditions, the WD condition (treatment) where they are instructed to write about the most traumatic experience of their lives, preferably not shared with anyone, or control condition where they write about a neutral topic, one that does not elicit distressing emotions. Although this study focuses on parents of children with ASD, we purposely chose not to instruct them to write specifically about traumatic parenting experiences concerning autism. Research has shown that intervention effects are less successful when participants are given more constrained or focused writing topics (Sloan & Marx, 2004; Smyth & Pennebaker, 2008). Rather, they need to be able to bring forth the area of most concern for themselves. Thus, this study maintained standard protocol and encouraged treatment participants to choose their own experience of trauma as their writing topic.

For over three decades of written disclosure research, scientists (including founder Pennebaker) have been unable to pinpoint one single mechanism that can account for effects experienced by all participants (Pennebaker & Chung, 2007; Sloan & Marx, 2004). In their seminal study, Pennebaker and Beall (1986) posited that the expression of undisclosed trauma maintained by inhibition might be associated with health benefits over time. For example, healthy college students reported improved mood and reductions in blood pressure, six months after completing four consecutive days of writing about a traumatic event (Pennebaker & Beall, 1986). In a similar study, after three consecutive days of writing about their trauma, adolescents experiencing chronic abdominal pain reported fewer pain experiences and fewer health care visits compared to controls who wrote about a neutral topic describing activities in their daily life (Wallander et al., 2011). Subsequent studies have compared written disclosure to exposure therapy, due to the similarities of repeated exposure or repetitive confrontation of painful memories at each writing session (Sloan, Marx, & Epstein, 2005). However, findings have been inconsistent, with some studies indicating improvement in self-reported psychological distress (Stanton et al., 2002) and some finding no physiological benefit due to the effects of repeated exposure (Kloss & Lisman, 2002).

Hence, converging evidence suggests no single mechanism or all-encompassing theory that explains the treatment effect of the writing paradigm. Overlapping explanations with multi-leveled factors interact to evoke healthy adaptation, with each level governed by the focus of analysis, whether physiological (e.g., optimal functioning of the HPA axis or other autonomic health indices) or psychological (e.g., reductions in mental pathology or improved well-being). Pennebaker posits that the actual mechanisms influencing health outcomes are multi-leveled with numerous interacting components (Pennebaker & Chung, 2007). Regardless of lacking a definitive process catalyst, WD has resulted in significant psychophysiological improvements across numerous populations (Lepore & Smyth, 2002; Smyth & Pennebaker, 2008).

We conduct here a pilot study, using a randomized controlled design, to evaluate the effects of WD on caregiver psychophysiological stress. We hypothesize that parents who write about traumatic events in the treatment condition would display at 6-month follow-up: (1) improved physiological stress as indicated by salivary cortisol reactivity; and (2) reduced subjective stress as measured by global stress and caregiver-specific stress (parenting stress and caregiver strain), compared to parent controls who write about a neutral topic.

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