

# Emotional Disclosure Through Journal Writing: Telehealth Intervention for Maternal Stress and Mother–Child Relationships

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**Abstract** This study examines emotional disclosure through the activity of journaling as a means of coping with maternal stress associated with parenting a child with disruptive behaviors. Through a randomized control and pre-test post-test study design of an online journal writing intervention, change to maternal stress and quality of mother–child relationship for children with ASD, ADHD and SPD was addressed. Behavioral symptoms were found to be the primary source of parenting stress for mothers and a significant relationship between child characteristics and maternal stress was identified. Emotional disclosure through the online journal writing program (especially in the presence of high disclosure of negative emotions) was shown to reduce maternal stress and improve the quality of mother–child relationship. These findings suggest cost-effective telehealth interventions may support maternal health. Important clinical implications are discussed.

**Keywords** Autism spectrum disorders · ADHD · Maternal stress · Sensory processing · Quality of mother–child relationship · Family quality of life · Telehealth

## Introduction

Over the last two decades the number of children with disruptive behaviors, social relatedness disorders, and other

pediatric psychopathologies has risen significantly [Centers for Disease Control and Prevention (CDC) 2014b]. Taken together, ASD and ADHD are reported to account for the largest body of pediatric psychopathologies, estimated to occur between 1 and 5 % of the population, respectively. Some states report the prevalence of ADHD to reach upwards of 19 % of the population (CDC, 2014a). Each diagnosis presents with high levels disruptive behavior (Lee et al. 2009). Mothers of these children experience social isolation, burnout, self-doubt, high levels of stress, depression, and the loss of competence within their role of mother (Cronin 2004; Lawlor 2006; Lee et al. 2009; Little 2002; Vitanza and Guarnaccia 1999).

Motherhood is a major life role for more than 82 % of adult American women (The U.S. Bureau of the Census, 2010). Few other occupations profoundly affect so many women across all sociocultural and economic boundaries in the United States and women typically assume the primary burden of care for their children (National Alliance for Caregivers Executive Report 2009). The mother–child system is considered to be of pivotal import to child development and is correlated with the child’s sociability, emotional regulation, and peer relationships (Fivush and Sales 2006; Vando et al. 2008). Mothers are both uniquely vulnerable to parental stress due to their role as primary caregivers and uniquely able to navigate a child to optimal wellbeing. The mother is typically the one who cultivates family cohesion and assumes the primary burden of care within families, and as a result, is at risk for the greatest levels of distress (Griffith et al. 2010).

Socially disruptive behavior, operationalized as externalizing and internalizing child behaviors, is the primary predictor of parental stress with the most common disorders displaying these characteristics being ASD and ADHD (Lee et al. 2009; Liu 2004). Significant and substantiated

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co-morbidity has been shown to be associated with ASD, ADHD and sensory processing (Schaaf et al. 2011; Tomchek and Dunn 2007). Both correlational and causal mechanisms between SPD and disruptive behavior have been documented (Ben-Sasson et al. 2013; Yochman et al. 2004). The Difficult Child (PSI-DC) subscale on the PSI, a measure of defiance, non-compliance, and demandingness, was used operationally to measure level of socially disruptive behaviors in this study.

Parents who raise children with an autism spectrum disorder (ASD), attention deficit/hyperactivity disorder (ADHD), disruptive behavioral disorder (DBD), sensory processing disorder (SPD) or other childhood disorders associated with challenging behaviors are especially vulnerable to stress (Schaaf et al. 2011). Daily hassles, life stress, and depression are all reported at higher incidences for mothers raising these children than for mothers raising a child without challenging behaviors (Lee et al. 2009; Osborne and Reed 2009; Quintron and McIntyre 2010). Additionally, mothers who attend to the needs of children with socially disruptive conduct, spend 3.6 more waking hours of their day caring for their child compared with mothers of typical children (Tunali and Power 2002). As the incidence of childhood psychosocial disorders climbs, more mothers attempt to orchestrate families with disruptive, non-engaging and socially challenged children (Kuhlthau et al. 2010), contributing to greater stress within the family unit.

Maternal stress affects a mother's ability to cope with daily occupations, her feelings of competence, the mother-child relationship, and the overall family quality of life (Lee et al. 2009). Maternal stress is influenced by the parent's parenting style, the child's resiliency and the quality of relationships within the family (Antshel and Joseph 2006; Haskett et al. 2006; Hoffman et al. 2009). More, parental stress has been shown to negatively impact many child outcomes (Lee et al. 2009). Even a child's ability to respond to early interventions aimed at symptom reduction is compromised by parental stress, (Osborne et al. 2008) perhaps in part due to the way parents appraise and attempt to manage, find meaning and comprehend their stress (Antonovsky 1996; Lazarus and Folkman 1984). Specifically, maternal *distress* (stress at clinically significant levels), is associated both with higher incidences of child behavioral problems and lower parental mental health, including higher rates of anxiety and depression (Boyd 2002).

Various theories have examined the various ways that human beings attempt to manage stress. Individuals with a secure sense of resiliency have a greater capacity to cope when confronted with a stressor in life. Antonovsky proposed the paradigm of salutogenesis which advances a theoretical framework to guide health-promoting activities

aimed at facilitating coping methods for stressors inherent to human existence (1996). This theory encourages researchers to seek out practices that help people make sense of their life and see the world as comprehensible, manageable, and meaningful. Similarly, Lazarus and Folkman's (1984) cognitive theory of stress and coping explained that individuals use coping strategies to either reduce the actual distress (emotion-focused coping) or to manage the trigger causing the distress (problem-focused coping). Folkman (1997) suggests three pathways for resolving stress including; (a) positive psychological states created from construction of meaning-based processes or activities targeting the stressor or emotion-based problem focused methods, (b) coping as a primary response to the experience of distress rather than to the causes of the distress and (c) the generation of positive psychological states. These positive psychological states help sustain and renew emotion and problem-focused coping strategies, which in turn help the individual, re-engage with efforts to cope with an on-going stressor. The seminal works of both Antonovsky and Folkman suggest similar constructs. The theory of salutogenesis endorses facilitating a sense of coherence and therefore wellbeing in spite of life's inevitable stressors while Folkman's theory suggests pathways to reduce stress that are focused on helping the individual attain a positive psychological state during chronically stressful situations.

Unmet needs reported by mothers who are raising children with disabilities include having the ability to do the things they enjoy (91 %), having someone to talk to (85 %) and meeting with other parents in socially satisfying situations (69 %) (Bromley et al. 2004). Mothers with high social isolation scores experience greater stress and have fewer satisfying mother-child interactions than mothers who are raising children without disabilities (Lee et al. 2008; Heiman and Berger 2008). Emotional disclosure is often used by women as a stress buffer and takes the form of seeking emotional support, gaining informal counseling and advice from friends, and using their relationships to discharge feeling overwhelmed by role responsibilities (Al-Yagon and Cinamon 2008; Cacioppo and Patrick 2009). Folkman (1997) suggests negative psychological states associated with significant and ongoing stress may consciously or unconsciously motivate an individual to search for and create positive psychological states to gain relief from the distress.

Expressive writing can enhance emotional adaptation when a person is faced with stressful life events and can produce significant improvement in psychological wellbeing (Lepore and Smyth 2002; Pennebaker 2007; Smyth 1998). People who express their feelings outwardly cope better with stressors, live a healthier lifestyle and are better able to understand themselves and life events. Writing

about emotional stresses produces significant health improvements including decreased blood pressure, a restored sense of well-being and higher levels of self-reported life satisfaction. Externalizing these emotions into a journal has been reported to reduce stress and promote wellbeing (Adams 1999). Creating a story that explains the mother's day-to-day stress can create a coherent narrative and appears to help mothers realize greater levels of self-competency, cope more effectively with stressful life events, and engage with daily occupations that are meaningful and satisfying (Fivush and Sales 2006).

## The Study

The purpose of this study was to explore whether a journal writing intervention would lessen measured levels of maternal stress for mothers parenting a child with socially disruptive behaviors. The study set out to understand the effect of emotional disclosure (IV) through participation in an online journal writing intervention as well as the impact of the level of a child's disruptive behavior on maternal stress (DV1) and on the quality of mother–child relationship (DV2). Helping mothers share their emotions when isolated from friends and other social outlets may reduce the impact of stress on the parent and child outcomes. Coping in this way may support mothers to better meet the demands of parenting challenging children (Fivush and Sales 2006; Fleischmann 2005).

## Methods

To recruit participants, a letter of invitation was posted on various online support group bulletin boards of parents of children known to have socially disruptive conduct as a result of a primary diagnosis [children and adults with attention deficit disorder (CHADD), interactive autism network (IAN), and sensory street]. The invitation invited mothers in the online-community (i.e. a support group), who had a child between the ages of 3–18, and self-identified as having a “difficult” or “hard-to-parent” child due to multiple diagnoses, including Autism, Asperger's, non-verbal learning disorder, sensory processing disorder, to participate. IRB approval was attained for each site, and the recruitment letter was then posted on the respective website by the online site administrator. Prospective research participants were fully informed about the procedures and risks involved in this research project, as well as their right to withdraw from the study at any point in time. Participants were recruited over a 6 months period. Recruitment was closed after 150 subjects completed the online consent document. To protect confidentiality, protected health

information was de-identified by a research assistant (RA) prior to analysis.

## Measures

The parenting stress index (PSI) is a self-report instrument with high internal consistency (Cronbach's  $\alpha \geq .90$ ) commonly used to measure the relationship between child characteristics and mother characteristics, two related but qualitatively distinct domains of parenting stress (Abidin 1995). Responses to the 36 questions fall across a 5-point Likert scale where higher reported scores indicate greater levels of stress. Raw scores are converted to a percentile for each subtest as well as the combined scores, creating an overall total stress index. A high total raw score of ( $M = 97.8$ ) and above is considered significant (85th–99th percentile).

The PSI measures four domains with the overall composite of the three sub-domains of parental scores comprising a total stress score. As the sample in this study consisted only of mothers, total stress and maternal stress were operationalized as the same variable (TS). This combined total stress score measures the mother's personal experience of stress associated with a child's behavioral characteristics as well as the stress associated with the role of parent. The three sub-domains included in total stress are parental distress (PSI/SF-PD), parent–child dysfunctional interaction [a measure of the mother–child system] (PSI/SF-P-CDI), and difficult child (PSI/SF-DC). Questions from the PSI-SF were converted to an online platform after attaining appropriate permission and license from the publisher. The PSI was used to measure parental stress because it provides a quantified representation of the difficult child (PSI-DC) domain scores, which was an important area of interest for this study. The PSI is also advantageous to use as an instrument to measure parental stress in that it accounts for specific child demographics which can contribute to the overall non-engaging behavioral composite.

Parental distress (PD) was operationalized as the mother's adaptation to the occupational role of parent. Higher scores suggest the parent's distress is related more to poor adjustment to the role of parent rather than to the mother–child relationship. Example: “*I feel trapped in my responsibilities as a parent*” and “*I feel alone and without friends*”. Parent–child dysfunctional interaction (PSI/SF; P-CDI) was operationalized as the mother's perception that the expectations and the interactions between the mother–child do not positively reinforce maternal–child attachment. Example: “*My child rarely does things for me that make me feel good*”. Difficult child (PSI-DC) was defined as the behavioral characteristics of the child that makes them hard-to-parent such as defiance, non-compliance, and

demandingness. Example: “My child does things that bother me a great deal” and “My child turned out to be more of a problem than I had expected. The final subscale operationalized overall maternal stress.

The second outcome measure, the Linguistic Inventory Word Count (LIWC) (Pennebaker et al. 2007) provided a quantitative measure of emotional disclosure that took place through the journal entries of participants. The LIWC reads a body of text and analyzes text for target words and provides output data regarding the level of emotionality of the written text (Pennebaker et al. 2007). Internal reliability is high (.92). The LIWC calculates the word count per text and provides averages for use of negative emotional words (2.6), positive emotional words (2.7) and self-reference words (11.4) for comparison. Higher individual scores on the LIWC indicate journalers are using more emotionally laden language in their journal entries than the researchers found in sample averages (Pennebaker et al. 2007).

### Procedures

An experimental design with control group was employed in which subjects were randomized to either an experimental group (group A) or a control group (group B). Prior to the pretest, participants were asked to read and sign the Informed Letter of Consent and register for the online intervention following sign-in protocols. All questionnaires were distributed as surveys through Survey Monkey. After consents were obtained, both groups were asked to complete a survey (T1 of the PSI/SF and a brief attribute survey to obtain relevant demographic data). Subjects who completed this phase of the study were then randomly assigned to either the control group (and placed on a waiting list) or the experimental group following the *a priori* established ABAB randomization scheme.

For those mothers in the experimental condition (group A), measurements of maternal stress and self-reported quality of the mother–child relationship were taken before (PSI-SF T1) and after (PSI-SF T2) the 8 weeks journaling period. Mothers in the wait list control group were then invited to participate in the intervention phase of the study and asked to complete the PSI-SF (T2) again. Following the experimental procedure, the control condition (group B), were asked to complete the PSI-SF (T3) one final time after the 8 weeks journaling period.

### Response Rate

Of the mothers who consented to be in the study ( $N = 156$ ), 77 % ( $n = 120$ ) completed the demographic questionnaire and were randomized to either the experimental group ( $n = 56$ ) or control group ( $n = 64$ ). Both

groups of mothers were asked to complete the electronic form of the PSI-SF. In all, 63 mothers completed at least one journal writing session, with 15 % completing 1–4 sessions ( $n = 18$ ) and 37.5 % ( $n = 45$ ) completing all 8 sessions. Once the wait period ended, 66 % of the control wait group ( $n = 39$ ) participated in the 8 weeks journal writing intervention and completed the posttest PSI-SF.

### Participant Characteristics

The mean age of the mothers in this study fell between the ages of ( $M = 41$ ; range 31–50). The mothers had an annual household income level of over \$60,000 and approximately half were parenting 1 or 2 preschool–middle school aged children. Most of the mothers in the sample were Caucasian (91 %), lived in the United States and worked at least part time. The children with disruptive behaviors in this sample were primarily male (72 %), with 75 % of the children falling between the ages of 3 and 18 years. The primary diagnosis given to these children by a professional included: autism 47.9 % ( $n = 56$ ), sensory processing disorder (SPD) 15.4 % ( $n = 18$ ), Asperger’s syndrome (AS) 4.3 % ( $n = 5$ ), ADHD/ADD 3.4 % ( $n = 4$ ), and other 28.2 % ( $n = 33$ ) with the option to specify. Secondary diagnoses included: AS (23.5 %), SPD (17.6 %), and Oppositionality/ODD (5.9 %). Of those mothers who reported ‘other’ and specified, 12.4 % identified “Oppositionality/ODD”, as the most frequently reported ‘other’ diagnosis (see Fig. 1). It is important to note that the term ‘mental retardation’ rather than the term ‘intellectual disability’ was reported by mothers in the sample.

### Procedure

During the 8 weeks period, participants in the experimental group responded to eight prompts in eight writing sessions and were instructed to take no more than 15 min to journal (Fig. 2). There were no restrictions on the number of sessions mothers could complete per week or on the time allocated for each writing session. This protocol follows previous research suggesting short bursts of writing (15 min) are sufficient to allow for emotional disclosure (Adams 1996, 1999; Lange et al. 2003; Pennebaker 2007). Prompts were selected to follow a structured writing protocol, allowing the mothers to use cathartic writing and express strong emotions that are highly affective and often internalized. Journal entries were submitted via a secure online drop-box. To control for researcher interference, there was no contact between the researcher and the participants during the 8 weeks intervention. Procedural questions were intercepted and responded to by the research assistant (Fig. 2).

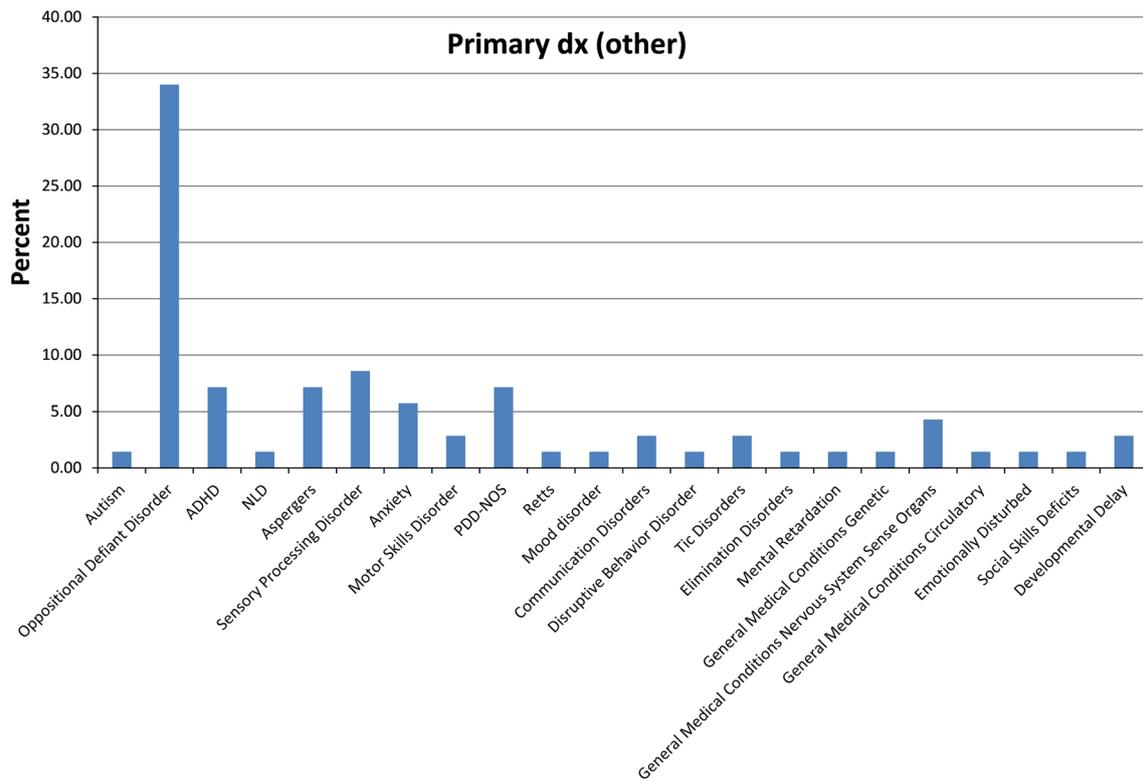
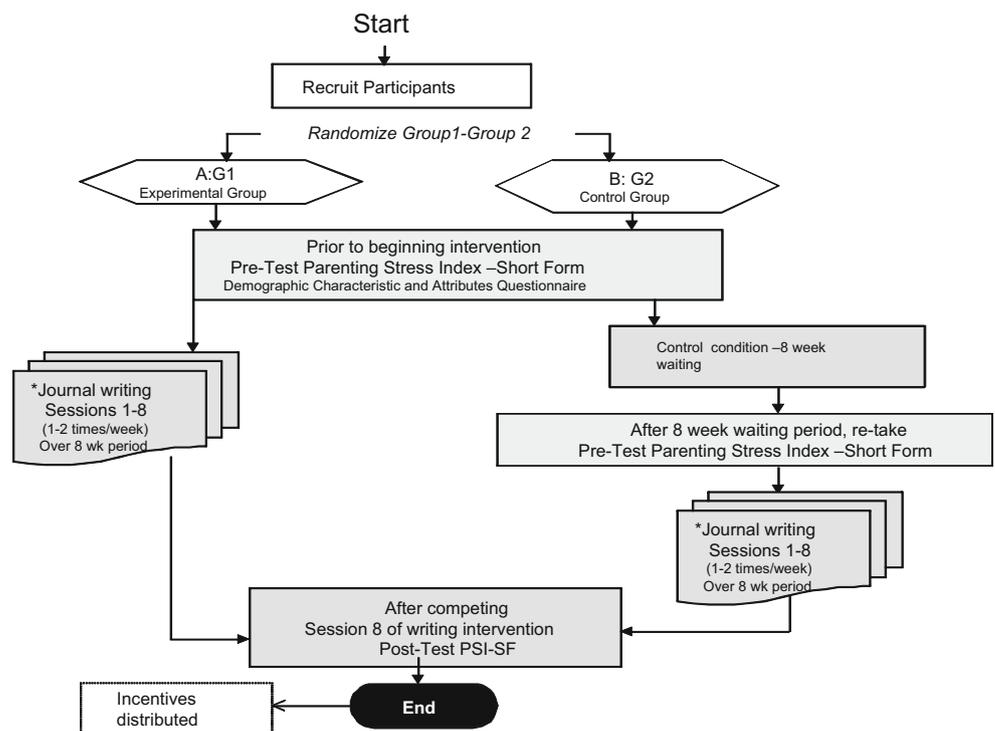


Fig. 1 Diagnosis “Other”

Fig. 2 Flow chart of data collection procedure

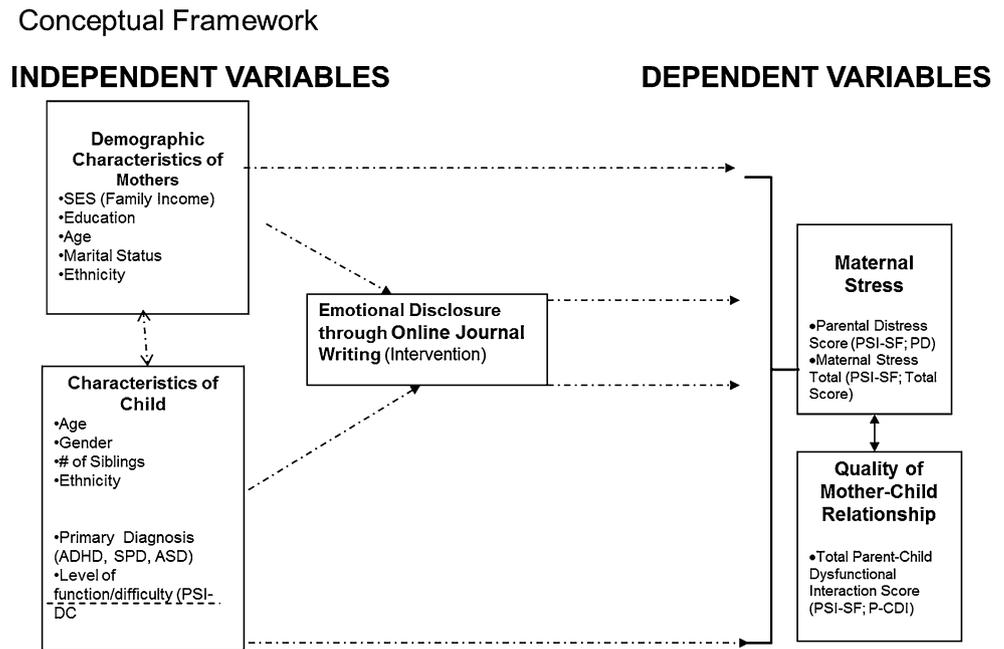


Statistical Analysis

An independent samples *t* test was performed to detect significant differences in maternal stress levels between

participants assigned to the experimental group and those in the control group. Stepwise linear regression analysis was performed in order to determine causal relationship between variables of interest (see Fig. 3: conceptual

**Fig. 3** Conceptual framework and operationalization of variables



framework and operationalization of variables). To understand the characteristics of the children in this sample, correlation coefficients were computed on child age range, level of difficult behaviors, ethnicity, gender and primary and secondary diagnoses. The design allowed for both a typical randomized controlled study as well as and a time series pre-test post-test study.

After another 8-week period, 41 % ( $n = 16$ ) of the control group completed the PSI-SFI a third and final time (T3). Of those, 28 % ( $n = 18$ ) finished 1–4 sessions and 71 % ( $n = 45$ ) completed at least five sessions. Of the sample of mothers across both analyses ( $N = 113$ ), half ( $n = 36$ ) were available for post-intervention analysis.

## Results

Total maternal stress (PD) for this population at T1 was in the clinically significant range ( $N = 113$ ,  $M = 33.59$ ,  $SD = 8.212$ ) and the quality of mother–child interaction for this participant population was low ( $N = 113$ ,  $M = 37.38$ ,  $SD = 8.66$ ). Interestingly, the mean scores on the PSI-DC sub-domain fell within in the “normal” range ( $N = 113$ ,  $M = 26.53$ ,  $SD = 8.48$ ).

Level of participation between the groups showed no significant difference ( $p = .290$ ). On average, mothers in both the experimental and control groups used higher level of emotional laden disclosure during journal writing than seen in the general population (see Table 1).

Multiple ANOVAs suggest demographic maternal characteristics played little role in maternal stress or quality of

**Table 1** Emotionality of journal entries compared to population

Group	N	Mean	Norm	SD	SE
<i>Negative emotional vocabulary</i>					
Control	30	1.77	2.6	.67	.12
Experimental	33	1.83		.55	.09
<i>Positive emotional vocabulary</i>					
Control	30	3.11	2.7	1.65	.30
Experimental	33	2.86		.87	.15
<i>Self-referential language</i>					
Control	30	8.06	11.4	2.16	.39
Experimental	33	7.86		2.33	.40
<i># Total emotional vocabulary</i>					
Control	30	4.89	4.2	1.60	.29
Experimental	33	4.59		.93	.16

mother–child relationships (see Table 2). There were no significant differences between the experimental and control groups in total stress  $F(3, 110) = .888$ ,  $p = .450$  or parental distress  $F(3, 110) = .429$ ,  $p = .733$ . Difficult child behaviors were comparable between groups (PSI-DC)  $F(3, 110) = .888$ ,  $p = .450$ .

Level of difficulty of child behaviors was strongly related to total maternal stress (TS) before ( $r = .810$ ;  $p = .001$ ) and after the intervention ( $r = .891$ ;  $p = .001$ ). Average scores for difficult-child behaviors predicted maternal stress ( $r = .821$ ;  $p = .001$ ).

Difficult child behaviors predicted lower quality in the mother–child interaction (P-CDI) ( $r = .557$ ,  $p = .001$ ); taken together, socially disruptive behaviors (PSI-DC) and

**Table 2** Maternal stress T1

	N	Mean	Std. Deviation	Std. Error	% tile
<i>Parental distress (PD)</i>					
Control	61	32.67	7.55	.96	85 <sup>a</sup>
Experimental	52	34.13	9.15	1.27	87 <sup>a</sup>
Total	113	33.34	8.32	.78	85 <sup>a</sup>
<i>Parent–child dysfunctional interaction (P-CDI)</i>					
Control	61	38.36	7.95	1.01	99+ <sup>a</sup>
Experimental	52	36.25	9.38	1.30	99+ <sup>a</sup>
Total	113	37.38	8.66	.81	99+ <sup>a</sup>
<i>Difficult child (DC)</i>					
Control	61	26.77	8.93	1.14	60
Experimental	52	26.25	8.00	1.11	55
Total	113	26.53	8.48	.79	55
<i>Total stress (TS)</i>					
Control	61	97.73	18.89	2.41	93 <sup>a</sup>
Experimental	52	96.53	21.73	3.01	92 <sup>a</sup>
Total	113	97.18	20.16	1.89	93 <sup>a</sup>

<sup>a</sup> Clinical significant range

quality of mother–child (P-CDI) accounted for 31 % of the variance of total maternal stress (TS).

**Study Variables**

An independent samples *t* test was conducted to evaluate whether participation in a journal writing intervention lessened maternal stress and increased the quality of mother–child relationship. While participation in the online journal writing intervention did affect total stress scores, the results were counterintuitive. Mothers who participated in the online writing intervention reported *higher* total stress after participating in journal writing ( $M = 36.97$ ,  $SD = 1.12$ ) compared to mothers in the control group ( $M = 35.44$ ,  $SD = .79$ ),  $t(1) = -4.13$ ,  $p = .017$ . This was a concern which initially suggested that the intervention exacerbated stress. However, when controlling for the level of stress prior to the intervention, no significant differences in total stress were reported between participants in the experimental group and participants in the control group ( $p = .045$ ). To better analyze the effect participation in the intervention had on the outcome variables, participation was converted to a dichotomous variable (Y/N) and an ANCOVA was performed to isolate the effect that the number of sessions had on the outcomes of interest. Total stress (TS) reported by the mothers before entering the study was high and accounted for almost 76.6 % of the variance in total stress at post-intervention.

The study population appears to contain a subgroup of mothers who experienced greater stress during the time of

the journal writing experience, while the control group remained constant in total maternal stress, even after completing the 8 weeks intervention phase of the study, suggesting the change may have occurred independent of the intervention. When controlling for pre-study stress, linear regressions also showed that no linear effects were seen when mothers participated in more writing sessions, either for total maternal stress, ( $B = .088$ ,  $p = .948$ ) or parental distress ( $B = 1.001$ ,  $p = .483$ ). Additionally, when controlling for pre-intervention levels of stress, there was no effect  $B = .047$ ,  $p = .780$ .

The number of sessions the mother participated in had no effect on quality of mother–child relationship,  $B = .047$ ,  $p = .780$ . Conversion to a dichotomous variable (0 = sessions 1–4; 1 = sessions 5–8) was necessary to control for those participants who participated in zero writing sessions. The level of socially disruptive child behaviors (PSI-DC) showed a moderate but highly significant correlation to the quality of mother–child relationship before intervention and in fact accounted for 30 % of variance ( $r = .546$ ,  $p = .0001$ ). Therefore, 45 % of the variance post intervention: ( $r = .673$ ,  $p = .0001$ ) can be attributed to level of difficult child behaviors.

Mothers in the experimental group experienced no change in quality of mother–child relationship ( $M = 36.81$ ,  $SD = 7.58$ ) when compared to mothers in the control group ( $M = 36.81$ ,  $SD = 7.17$ ). Regression analyses revealed that the number of writing sessions were not predictive of parental distress or total stress ( $p = .651$ ), for PD ( $p = .483$ ). No significant differences in the quality of mother–child relationship between groups was found,  $t(19) = -1.636$ ,  $p = .118$ , even when controlling for pre-PCDI scores ( $p = .780$ ). The experimental group ( $n = 30$ ) showed no difference in quality of mother–child relationship (P-CDI) post intervention  $F(1, 39) = 1.23$ ,  $p = .275$ .

Regression analyses show a greater number of emotion laden vocabulary words, as measured by the LIWC, appears to predict lower maternal distress, accounting for 22.8 % of the variance of total stress ( $B = 2.282$ ,  $p = .339$ ) and parental distress ( $B = 1.888$ ,  $p = .064$ ) at posttest. The emotionality in journal writing had a negative linear relationship ( $B = .369$ ,  $p = .897$ ) with maternal stress, especially the discharge of negative, emotionally laden vocabulary. Positive emotion laden words in mothers’ journal entries was shown to account for 22.8 % of the variance in parental distress ( $p = .003$ ). Higher frequency use of emotionally laden words was associated with lower maternal distress ( $p = .032$ ) especially when the emotions were of a negative nature. Negative emotion laden words accounted for 17.6 % of the total variance in total stress ( $B = -14.894$ ,  $p = .011$ ) and 22.8 % of the variance in maternal distress ( $p = .003$ ). Positive emotional words were a significant predictor for maternal distress ( $r = .312$ ,

one tailed  $t$  test  $p = .032$ ) but not total stress ( $r = .254$ , 2-tailed  $p = .134$ ). See Table 1.

Online journal writing intervention was found to be associated with lower self-reported levels of maternal stress, ( $M = -4.139$ ,  $SD = 9.870$   $t(35) = -2.516$ , one-tailed  $p = .992$ ), yet the direction of the difference is opposite of what was expected and was significant. Both one-tailed and two-tailed analysis was conducted to explore direction of association. When controlling for mean total stress prior to the intervention, analysis shows participation in the online journal writing intervention was actually associated with higher levels of maternal stress (two-tailed  $p = .017$ ) in Group A while Group B experienced a lowering of stress.. Notably, group A (experimental group) concurrently reported an increase in difficult child behaviors between T1 and T2 ( $M = -2.2$ ,  $SD = 4.15$ ,  $t(19) = -2.371$ , two tailed  $t = p = .028$ ) as well as an increase in stress.

## Discussion

There were several surprising findings in this study. The study sample was randomized into two groups, half participating in the intervention immediately after completing the pre-questionnaire and the other half being moved into an 8-week waiting control. While the experimental group experienced an elevation of stress between T1 and T2 and no change in the quality of mother–child relationship, the control group *benefitted* from the intervention after the wait period, realizing a significant reduction in stress and increase in the mother–child relationship. This finding remained consistent even when controlling in the model for covariance of level of stress at entry into the study.

Results of this study suggest that maternal stress and the quality of mother–child relationship may be malleable with online intervention and emotional disclosure through journal writing for those who use emotionally laden language. The number of sessions the mothers participated in had no effect on the outcome variables, suggesting journal writing itself was not the active ingredient in producing stress reduction but it does appear to be a promising modality with which to elicit *emotional disclosure*, the active ingredient in this intervention. This finding is consistent with Pennebaker's (2007) body of work. Potency of emotional disclosure appears to be the most influential component of the intervention. Not surprisingly, total scores for maternal stress are consistent with previous studies that looked the relationship between maternal stress and children with socially disruptive behaviors (Estes et al. 2009; Lee et al. 2009). In this population, as previous research suggested (Davis and Carter 2008), the reported overall maternal stress related to the occupational role of parent was above the threshold of clinically significant levels.

Interestingly, total parental stress for this population was in the clinically significant range suggesting conflicts with the child's other parent, perceived social isolation and symptoms of depression. The quality of mother–child relationship for this participant population was found to be consistent with indicators that perhaps the mother–child bond has either not been established or has been weakened in some elemental way.

The finding that higher emotionality in journal writing predicts a lowering of stress follows previous research. Emotionally laden vocabulary, whether positive or negative, has reliably been shown to be associated with stress reduction. This study added a novel finding by showing that the greater the number of negative emotionally laden words used in emotional disclosure by mothers raising a child with a disability had greater power to lower stress maternal stress, especially when mothers expressed negative emotional feelings. This is a central finding—mothers may be reluctant to verbalize negative feelings about their child or their situation under the mistaken belief it will make things worse, when the research suggests emotional disclosure of such ruminations can actually improve feelings of wellbeing.

Predictably, the level of difficult child behaviors was highly correlated with both maternal stress and quality of mother–child interaction both before and after the intervention; as one unit of difficult child behaviors increased, maternal stress increased stress by a factor of 2 ( $p \leq .001$ ). A significant shift in stress attributed to the difficult child was observed, suggesting emotional disclosure can be one tool for enhancing adaptation within the occupational role of mother. Cook and Doyle (2002) found working reliance, the ability to create a therapeutic relationship, is achievable in online therapy; perhaps journal writing might open a door for facilitated emotional disclosure. Future telehealth interventions may wish to expand upon this finding and combine psychoeducation and journal writing to address mothers' sense of personal resilience and family coherence. More, the change of stress identified to fall within the role of parent was shown to be malleable, suggesting mothers can, through emotional disclosure, change what they attribute their stress to, e.g., reducing the attribution of their stress to their interactions with their child and the child's unique behaviors. Perhaps the mothers who completed the study had stress less related to their child's behaviors than the ones who dropped out or perhaps the intervention somehow changed their attribution of stress. Journaling, when using emotionally laden language, may offer the potential to provide both emotion-focused and problem-focused coping strategies for mothers of children with disruptive behaviors, consistent with both Folkman's model of coping (1997) and Antonovsky's theory of salutogenesis (1996).

While journal writing as an activity was not seen to show change, perhaps because of the small sample completing the full intervention, emotionally laden vocabulary, specifically negative emotional vocabulary, did show a significant and important reduction of maternal stress even in small doses of journaling.

A second aim of the study was explore the usability of an online platform designed to promote emotional disclosure through journal writing. The initial analysis suggests that online intervention is a promising opportunity for researchers and interventionists, and mothers can be a practical target population. Recruitment was strong and level of participation was encouraging perhaps because mothers are actively seeking ways to improve their own stress and see the connection of their stress with their child's behaviors and they primarily rely on the internet when seeking information. The activity of journal writing is perhaps a reliable emotion-based process consistent with Folkman's coping theory (1997) in that it allows the expression of negative emotions in a possibly self-perceived acceptable way.

The mean scores on the PSI-DC mothers fell within in the "normal" range ( $n = 113$ ,  $M = 26.53$ ,  $SD = 8.48$ ). This was a perplexing finding in context with the other data reported by the mothers who self-identified as being the mother of a difficult child. One possible explanation that appears to be supported by the data in this study is the halo effect; the tendency to judge the character of another in such a way as to bias the overall impression (Koenig and Jaswal 2011; Thorndike 1920). In this study, the mothers seemed unwilling to initially portray their child as difficult, but were able to express frustrations via journaling that ultimately served as a key ingredient to their own health outcome (lower stress) and improved perception of quality in their relationship with their child. Perhaps the mothers felt they were their child's champion, and having the opportunity to discharge feelings about disruptive behavior and not be judged or have their child be judged, provided an important therapeutic benefit.

### Strengths and Limitations

This study was the first to quantitatively examine the impact of an online intervention on maternal stress and self-reported quality of the mother-child relationship and provides a manualized protocol for future investigators wishing to explore online journaling as a therapeutic modality. This study was supported by the large sample size, strong recruitment across multiple sites, and range of diagnoses represented in the participant population.

Several limitations in this study must be noted. The writing prompts were novel to the outcomes of interest and as such, their validity was not determined prior to the study. The PSI may not have been sensitive to the change

in stress experienced as a result of the intervention, and outcome variables were limited to self-report. Adding biomarkers to gather outcome data can provide real world insight into the states and traits of health for mothers in addition to their self-report. Additionally, using prompts that align strategically to the constructs measured by the PSI may allow greater specificity of mothers' emotional disclosure. Further, there was no restriction on the number of sessions mothers could complete per week or on the time allocated for each writing session, which may have had an influence on outcomes and no mechanism was put in place to evaluate why a drop-off of participants occurred. Future research wishing to explore the usability of an online journal writing program would want to strengthen retention. Some mothers were highly active in the intervention and others less so; thus an understanding of what would support compliance for a greater percentage of the study group would be a critical element for future project.

### Clinical Significance

Online intervention for therapeutic purposes is in its infancy and solid evidence is needed to monitor efficacy. Using online journaling as a therapeutic occupation is novel—most research related to therapeutic journal writing has been conducted in a face to face environment. Journal writing for mothers, while intuitively important, has limited empirical study. The finding that having a child with autism prior to intervention predicts maternal stress (an 8.40 point increase in total maternal stress) is a very important finding to this population of mothers. Recognizing that a diagnosis of autism may be a strong predictor of debilitating maternal stress might imply including stress reducing treatment interventions for mothers as part of each initial autism diagnosis. Growing bodies of research demonstrate that children's social-emotional health and families' quality of life are tied intimately to the physical and mental well-being of their primary caregiver (Kuhlthau et al. 2010; Park et al. 2003), yet current interventions do not yet adequately address the centrality of these relationships.

This study suggests online interventions can be feasibly created and made available through existing online groups. Understanding factors that predict maternal stress and impact the quality of the mother-child relationship associated with parenting children with socially disruptive behavioral disorders can add to the sparse but growing family quality of life literature. Journal writing can be used as an adjunct or primary component of therapy, providing the opportunity for better communication of a mother's distress, in emotionally rich and provocative linguistic style.

Ultimately, this study extends the substantial body of empirical data related to journal writing as a mechanism to

relieve stress to online journal writing as a form of emotional disclosure, and examines the effectiveness of emotional disclosure through journal writing specifically for mothers raising challenging children. This research contributes to an understanding of the effectiveness of an online e-therapy intervention as both a research method for health scientists and an intervention tool for clinicians.

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