

THESIS

EXAMINING BARRIERS THAT PREDICT MINDFULNESS UPTAKE
IN PARENTS OF CHILDREN WITH AUTISM SPECTRUM DISORDER

Submitted by

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In partial fulfillment of the requirements

For the Degree of Master of Science

Colorado State University

Fort Collins, Colorado

Summer 2020

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ABSTRACT

EXAMINING BARRIERS THAT PREDICT MINDFULNESS UPTAKE IN PARENTS OF CHILDREN WITH AUTISM SPECTRUM DISORDER

This study aimed to investigate barriers to mindfulness practice in parents of children with Autism Spectrum Disorder (ASD). I hypothesized that I could reliably measure three barriers to mindfulness that parents could rate themselves on statements reflecting these barriers. I also hypothesized that the barriers to mindfulness vary as a function of parent characteristics (e.g., overall experience with mindfulness, trait mindfulness, level of mindfulness experience) and child characteristics (e.g., severity of ASD symptoms) and that parents in this population are less likely to use mindfulness to reduce parent stress due to the perceived barriers, (1) misconceptions about mindfulness, (2) beliefs that parenting stress is not relevant to child outcomes, and (3) lack of time parents allocate to focus on their own well-being. The study surveyed 91 parents of children with ASD using a demographics questionnaire, the Mindfulness Barriers Scale (MBS), created by the research team, and the Mindful Attention and Awareness Scale. Preliminary analysis of the measure was conducted, followed by a series of independent sample t-tests, an ANOVA, and regression analysis to test the hypotheses. Examination of the MBS showed that each subscale was distinct in what they measured and showed acceptable reliability. Results showed that misconceptions, time, and disinterest in mindfulness, a single-item variable found as conceptually interesting in the preliminary analysis, were predictors of mindfulness uptake. Significant differences were found between the levels of mindfulness experience and misconceptions about mindfulness, parents with neutral or negative overall experience with mindfulness reported time

as a greater barrier and higher misconceptions than parents with positive overall experience, and parents with low trait mindfulness reported time as a greater barrier than parents with high trait mindfulness. The significance of the findings, limitations, and future directions are discussed.

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INTRODUCTION

One of the most significant factors for promoting positive child developmental outcomes is the quality of care provided by caregivers (Ainsworth et al., 1978; Bowlby, 1969). While feeling stress as a parent may be inevitable, studies have shown that parental stress may be associated with less positive parenting behaviors (Deater-Deckard, 2004). Positive parenting behaviors include acceptance, warmth, sensitivity, responsiveness, involvement, and empathy (Dyches et al., 2012). Although all parents experience stress related to raising children, parents of children with Autism Spectrum Disorder experience significantly more stress than parents of typical children and parents of children with other developmental disabilities (Beer, Ward, & Moar, 2013). Addressing parental stress is necessary to increase parent and child well-being. *Family Stress Theory* (Hill, 1949) suggests that stressors can lead to either adaptive or maladaptive responses, depending on the coping strategies utilized by those experiencing the stressor (Hill, 1949).

Mindfulness is a type of awareness in which individuals maintain a present, open, accepting, and nonjudgmental stance towards their thoughts, emotions, and bodily sensations (Kabat-Zinn, 1990). Although mindfulness research is relatively new, mindfulness practice is centuries old but is currently used in interventions that focus on stress reduction, pain, anxiety, depression, and parenting, among others (Baer, 2006; Cullen, 2011). Mindfulness has been called an “antidote to the disease of the twenty-first century life and its attendant and ever-increasing pull towards multi-tasking and 24/7 connectivity” (Cullen, 2011, p. 187) due to its ability to slow the mind down and focus on the present moment.

While mindfulness research increasingly focuses on the rewards for both parents of typically developing children and children with disabilities, there has been little research in investigating potential barriers to mindfulness uptake, meaning interest in practicing mindfulness and the degree to which participants feel confident that they can practice mindfulness. The current study will focus on potential barriers to mindfulness practice in parents of children with Autism Spectrum Disorder (ASD).

Parental Stress in Autism Spectrum Disorder

Parents of children with Autism Spectrum Disorder (ASD) experience significantly higher levels of stress than parents of typically developing children and parents of children with other developmental disabilities (Beer et al., 2013; Ferraioli & Harris, 2012; Hsiao, 2018; Lindo, Kliemann, Combes, & Frank, 2016; Trute, Hiebert-Murphy, & Levine, 2007). In parents of children with disabilities the increased stress has been theorized to be attributed to greater physical burdens, increased maladaptive behaviors in children, greater financial responsibilities, more frequent feelings of social isolation, and chronic concerns about lifelong care of the child (Lindo et al., 2016). In addition to these stressors, higher levels of stress specific to parents of children with ASD is theorized to be due to child behavior difficulties. Externalizing behavior is often more severe in children with ASD and provides parents with additional stress, adding to the difficulties they already experience from the core symptoms of ASD (see *Table 1*) (Beer et al., 2013).

Table 1
Core Characteristics of Autism Spectrum Disorder

A. Persistent deficits in social interaction across multiple contexts, as manifested by the following, currently or by history:

1. Deficits in social emotional reciprocity

2. Deficits in nonverbal communicative behaviors used for social interaction, ranging, for example, from poorly integrated verbal and nonverbal communication; to abnormalities in eye contact and body language or deficits in understanding and use of gestures

B. Restricted, repetitive patterns of behavior, interests, or activities, as manifested by at least two of the following, currently or by history:

1. Stereotyped or repetitive motor movements, use of objects, or speech (e.g., simple motor stereotypies, lining up toys or flipping objects, echolalia, idiosyncratic phrases).

2. Insistence on sameness, inflexible adherence to routines, or ritualized patterns of verbal or nonverbal behavior (e.g., extreme distress at small changes, difficulties with transitions, rigid thinking patterns)

3. Highly restricted, fixated interests that are abnormal in intensity or focus (e.g., strong attachment to or preoccupation with unusual objects, excessively circumscribed or perseverative interests).

4. Hyper- or hyporeactivity to sensory input or unusual interest in sensory aspects of the environment

(American Psychiatric Association, 2013)

Family Stress Theory (Hill, 1949) emphasizes both normative and nonnormative changes or transitions that families experience, referred to as stressors. Families must constantly adapt to these stressors. The processes of the adaptation are rooted in the family's available resources and their perceptions of the stressor (Weber, 2011). The outcomes of the stressor, however, lie in the family's ability to cope using their existing resources and perceptions of the event. Hill's (1949) description of stress applies to any normative or non-normative change or transition within the

family or externally affecting the family. This sequence of events is described using the ABCX model, that reflects the event or stressor (A), family resources (B), perception of stressor (C), and crisis (X). This is further elaborated upon in cases of chronic stress shown as the Double ABCX model (see *Figure 1* from McCubbin & Patterson, 1983) in which a pile up of stress becomes the new stressor and the family must assess its coping strategies to avoid maladaptive responses to the stress (Weber, 2011). The stress pile up referenced in the Double ABCX model is typical in families of children with disabilities, due to the chronic nature of the disability.

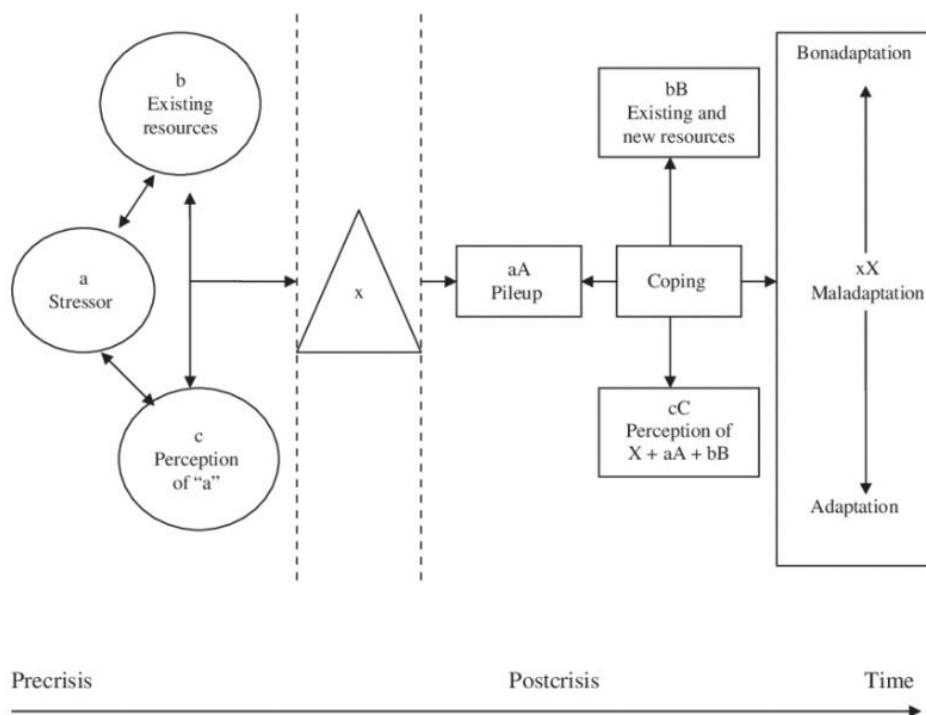


Figure 1. Double ABCX model of adjustment and adaptation (McCubbin & Patterson, 1983)

Parental stress has been conceptualized as parental perceptions of disparities between available resources and the demands of parenting (Hsiao, 2017). This is one of the factors that can contribute to effective parenting. Higher stress in parents can lead to higher risk of emotional and psychological distress, leading parents to apply less effective coping strategies and reach out less for the necessary supports for their child. As shown in the ABCX model, ineffective use of

coping strategies (B and C) can lead the family to crisis, which can lead to more pile up that depends again on the family's ability to cope to avoid maladaptation (Hsiao, 2017). Helping parents manage stress is important for increasing child well-being, parent well-being, and overall family functioning (Lindo et al., 2016).

Family Stress Theory suggests that perceptions and resources can mediate the relationship between stressor and crisis either positively or negatively depending on how effectively they are used (Hill, 1949; Weber, 2011). Parent perceptions and resources are also mentioned in Hsiao's (2017) definition of parental stress, highlighting the importance of the use of coping strategies in parents of children with developmental disabilities. Research on factors contributing to resiliency in this population has shown that coping strategies, optimism, and social supports were strong predictors of resilience for parents of children with developmental disabilities (Peer & Hillman, 2014). According to *Family Stress Theory*, perceptions and resources determine the direction of adaptation in individuals. Since parents of children with disabilities experience significantly more stress, understanding effective coping strategies that target perceptions and resources is necessary to try to reduce levels of stress in this population.

In recent literature, several coping strategies were shown to reduce stress in parents of children with developmental disabilities (Hassall, Rose, & McDonald, 2005; Peer & Hillman, 2014; Hsiao, 2017). Hassall and colleagues (2005) found that in mothers, parent self-esteem was inversely related to parenting stress. Mothers that reported higher levels of parenting self-esteem experienced lower levels of parenting stress (Hassall et al., 2005). It was also shown that overall social support reduced stress (Hassall et al., 2005). Also, perception of helpfulness of social support seems to be the critical variable in stress reduction for mothers, rather than the range of social supports available (Hassall et al., 2005).

Perceptions and optimism have also been studied in relation to parenting stress. In a study exploring the predictors of parent-perceived positive gain and parent distress in this population parent empowerment and reframing were found to be the only significant predictors of parent perceived positive gain (Minnes, Perry, & Weiss, 2015). Inversely, lower parent empowerment was found to be a predictor of parent distress (Minnes et al., 2015). Parent empowerment and reframing were found to be stronger predictors of parental stress than child characteristics and financial hardship (Minnes et al., 2015). In another study focusing on parent perceptions, when controlling for child problem behavior and parental stress, parent optimism was shown to moderate the relationship between parenting stress and positive feelings towards their child (Kurtz-Nelson & McIntyre, 2017). These studies highlight the importance of studying parent perceptions. Increasing positive parent perceptions of their self-efficacy and experiences may result in families experiencing better quality of life and family functioning.

Coping Strategies

According to a meta-analytic review of interventions targeted at managing stress in parents of children with developmental disabilities (Lindo et al., 2016), the two dominant effective interventions in stress reduction in parents of children with developmental disabilities were behavior parent training and coping strategies interventions. The studies on behavior parent training focused on providing parents with specific strategies to address the behavioral needs of their children to improve child outcomes (Lindo et al., 2016). The activities included addressing the precursors to unwanted behaviors, teaching replacement skills, differential reinforcement, redirection of behaviors (Feldman & Werner, 2002) and creating goals for their children (Baker-Ericzén et al., 2005). The studies on coping strategies focused on directly addressing parent stress through addressing parent perceptions. The studies reviewed examined interventions that

taught techniques such as self-monitoring, progressive muscle relaxation, and/or cognitive reframing (Singer, Irving, & Hawkins, 1988). It also examined interventions that focused on group counseling sessions addressing problem solving strategies, conflict resolution and decision-making techniques (Kirkham & Shilling, 1990). Lastly, it examined interventions focusing on mindfulness techniques (Kowalkowski, 2012; Neece, 2014). The mindfulness studies focused on behavioral changes and cognitive structures to address how to reduce stress (Kowalkowski, 2012; Neece, 2014). Parents were encouraged to learn and apply the concepts of mindfulness, exercise mindfulness, and share in a discussion group setting (Neece, 2014). Although results of the meta analytic review of interventions found that both behavior parent trainings and parent coping interventions showed a moderate to large effect, this paper will focus specifically on parent coping interventions, specifically mindfulness.

Mindfulness

Mindfulness is described as nonjudgmental, present-centered, intentional awareness and attention to one's thoughts, feelings, and sensations (Baer, 2006; Bishop et al., 2004; Kabat-Zinn, 1990; Kabat-Zinn, 2003; Shapiro et al., 2006). This sense of intentional awareness and attention is typically cultivated and practiced through meditation. Paying attention on purpose to one's internal thoughts, emotions, and sensations are core teachings of Buddha (Kabat-Zinn, 2003). This awareness is traditionally described as *dharma* which conveys the meaning of *lawfulness*, or the way things are. Dharma is thought of as "an innate set of empirically testable rules that govern and describe the inward, first-person experience of suffering and happiness in human beings." (Kabat-Zinn, 2003). So, the principles of dharma are universal. Mindfulness is compassionate attention to our mind that is openhearted, friendly, and free of judgment (Baer, 2006; Kabat-Zinn, 2003; Kabat-Zinn, 1990). While Buddhist traditions have emphasized

mindfulness, attention is universal and can be used outside of Buddhist practice. Its aims align with the Hippocratic tradition of Western medicine of “do no harm” in that it describes how unexamined behaviors can contribute to human suffering (Kabat-Zinn, 2003).

Mindfulness in Western Medicine and Psychology

In Western culture, mindfulness carries much of the same meaning as it does for Eastern cultures. It is an intentional awareness and attention to one’s thoughts, feelings, and sensations from a nonjudgmental stance (Baer, 2006; Bishop et al., 2004; Kabat-Zinn, 1990; Kabat-Zinn, 2003; Shapiro et al., 2006). Its principles are the same, however it is often taught in mental health programs independently of the cultural and religious traditions associated with it. The principles of mindfulness are becoming increasingly focused to specific populations in the behavioral sciences. Mindfulness interventions are currently used to help with anxiety (Baer, 2003), parenting (Duncan et al., 2015; Gouveia, Carona, Cannavarro, & Moreira, 2016; Van der Oord, Bögels, & Pijnenburg, 2012) eating habits, depression (Jain et al., 2007; Segal et al., 2002) stress reduction and chronic pain (Kabat-Zinn, 1990), among others.

Since the implementation of mindfulness in Western culture, several therapeutic approaches have been created that incorporate or are founded in mindfulness. Many were created by the need to focus intervention on specific populations. Mindfulness-based Cognitive Behavioral Therapy (MBCBT) is used with clients experiencing anxiety and depression and stems from traditional Cognitive Behavioral Therapy. Dialectal Behavioral Therapy (DBT) is a cognitive-behavioral treatment for complex mental disorders and has been an effective form of treatment for Borderline Personality Disorder (Dimeff & Linehan, 2001). It combines the balance of acceptance and change strategies with explicit teaching of how to regulate emotions (Dimeff & Linehan, 2001). Acceptance and Commitment Therapy (ACT) uses acceptance and

mindfulness strategies in combination with commitment and behavior change strategies to increase one's ability to be psychologically flexible, or the ability to be present in the moment (Hayes, Strosahl, & Wilson, 2012). Finally, Mindfulness-Based Stress Reduction (MBSR), founded by Jon Kabat-Zinn (1979) is a form of treatment that uses mindfulness strategies to decrease stress and has been efficacious in treating a wide variety of psychological and physical health problems (Chiesa & Serretti, 2011; Reiner, Tibi, & Lipsitz, 2012; Kearney, McDermott, Malte, Martinez, & Simpson, 2012; Hoge, et. al., 2013). Since parental stress and mindfulness are being examined, strategies within MBSR will be the primary focus of this study.

MBSR was developed in the Stress Reduction Clinic at the University of Massachusetts Medical Center. The program has been utilized in other medical centers, and non-medical settings such as schools, professional programs, prisons, and the workplace (UMass Medical School, 2016). It is adaptable to different locations and populations due to the emphasis that there are many different ways to structure MBSR, but in all forms, relies on the same key principles. MBSR is empirically validated and over the past thirty-five years has shown reductions in medical and psychological symptoms across a range of diagnoses, including generalized anxiety disorder (Hoge et al., 2013), major depression (Chiesa & Serretti, 2011), chronic pain (Reiner, Tibi, & Lipsitz, 2012) as well as other diagnoses with a secondary diagnosis of anxiety and depression.

Mindfulness in Parenting

In recent years, researchers have begun to incorporate mindfulness strategies into parenting interventions to teach parents the importance of paying attention to their child and their parenting in an intentional and nonjudgmental way (Kabat-Zinn, 1990). Through this lens, parents learn the benefit of incorporating mindfulness practice into their daily routine in order to

take care of themselves, bring calm into their family, pay attention to their child nonjudgmentally, increase awareness of the present moment spent with their child, and reduce automatic negative reactions to their child (Van der Oord, Bögels, & Pijnenburg, 2012). In mindful parenting programs, parents are taught mindfulness practices; including breathing, breath and body awareness, meditation, and centering (Bögels, Lehtonen, & Restifo, 2010; Van der Oord et al., 2012).

In a study that taught mindful parenting strategies to parents of children with ADHD (Van der Oord et al., 2012), parent stress from pre- to post-test showed a significant reduction and many families asked for further mindfulness training at the conclusion of the study. A study examining the relationship between self-compassion and dispositional mindfulness with parenting stress (Gouveia, Carona, Cannavarro, & Moreira, 2016) found that, in a sample of over 300 parents, higher levels of self-compassion and dispositional mindfulness were associated with higher levels of mindful parenting. Mindful parenting was found to be associated with lower levels of parenting stress and higher levels of authoritative parenting styles (Gouveia et al., 2016). In a study evaluating the acceptability and possible effects of a Mindful Parenting course (Bögels, Hellemens, van Deursen, Römer, & van der Meulen, 2013) findings suggest that parents showed significant reductions in parents' internalizing and externalizing problems and parents reported significantly reduced parental stress. Parents in this study also reported significant reductions in their children's internalizing problems (e.g., anxiety and depression) and externalizing behavior (e.g., aggression and behavior problems) (Bögels et al., 2013). Findings from this study suggest that the Mindful Parenting course was shown to be effective in a range of measures including, parenting stress, parental and child psychopathology, and parenting styles (Bögels et al., 2013). As demonstrated in the aforementioned studies practicing mindfulness has

the potential to impact parental stress and parent child relationships in positive ways. Research on mindfulness in parenting is broadening its scope of parent populations, including research conducted in parents of children diagnosed with ASD.

Studies of Mindfulness Interventions in Autism Spectrum Disorder

Mindfulness has also been a subject of interest in the field of developmental disabilities research. The significantly higher stress levels of parents in this population combined with increased frequency of externalizing behaviors reported in children with Autism Spectrum Disorder, creates a clear necessity for mindfulness parenting strategies. Parent perceptions have been a target of intervention in this population through mindfulness-based interventions. Parental stress in parents of children with ASD has been shown to have a direct impact on a child's psychological well-being (Cachia, Anderson, & Moore, 2016; Neff & Faso, 2015). It has also been shown to reduce the effectiveness of behavioral therapies aimed at helping parents manage their child's behavior (Cachia et al., 2016). When parents do not attend to their own perceptions and stressors, they are not as equipped to handle their child's behaviors, despite learning skills in parent coaching programs.

Conversely, parents of children with ASD who incorporate mindfulness into their parenting and daily lives report lower levels of stress and better quality of life (Beer et al, 2013; Cachia et al., 2016; Rayan & Ahmad, 2016; Singh et al., 2014) Preliminary evidence suggests that parents of children with ASD who report higher trait mindfulness report lower levels of stress, anxiety, and depression and report decreased problem behavior in their children (Beer et al., 2013). In a mindfulness intervention focused on mothers of a child with ASD, as mothers' mindfulness skills increased over the course of the intervention, parent's stress and child's disruptive and aggressive behaviors decreased (Singh et al., 2014). In a study in which parents

were randomized into either a mindfulness intervention or a parenting skills intervention, parents' stress in the mindfulness intervention decreased to a greater extent than those in the parenting skills intervention (Ferraioli & Harris, 2012). Central to mindfulness practice is the ability to show an accepting and nonjudgmental stance towards one's thoughts, feelings, and sensations. Self-judgment and shame in relation to parent self-efficacy are often experienced in this population. It was found that parents who had higher levels of self-compassion were less likely to describe their child's behaviors as difficult (Neff & Faso, 2015). In a similar study, mindfulness was found to have a mediating effect on well-being outcomes including anxiety, depression, personal growth, emotion regulation, forgiveness, self-compassion, stress, and parent-child interaction (Benn, Akiva, Arel, & Roeser, 2012). These findings support the theory that stress is the product of one's perception of life stressors (Hill, 1949).

Although mindfulness practices appear to benefit parents of children with ASD, it appears that relatively few parents take up the practice of mindfulness. This could be due to several possible reasons, such as the lack of available time allocated to parent self-care, misconceptions or misinformation about mindfulness, and parental beliefs around stress and how it might impact their children. These perceived barriers are likely to vary as a function of parent and child characteristics and are likely to influence the extent of parents' "mindfulness uptake", meaning their interest in practicing mindfulness and the degree to which they feel confident that they can practice mindfulness.

Evidence of Barriers to Mindfulness Uptake

A review of the literature revealed that only a handful of studies have examined barriers to mindfulness. Evidence of perceived barriers to mindfulness have been found in college student populations. Evidence that barriers exist, even in a different population, gives this study a

benchmark for potential barriers that may be present in parents of children with ASD. In an investigation into reported doubts about meditation in a sample of college students, time and motivation was found to be an issue reported by participants as well as questions about the efficacy of mindfulness meditation (Sears, Kraus, Carlough, & Treat, 2011). In a recent study on college students and their beliefs towards mindfulness meditation, almost half of the participants reported that time was a major barrier. In addition, around 20% of the participants reported a lack of knowledge or misperceptions regarding meditation and made statements that signified that lack of knowledge and confidence were a barrier to trying meditation (Gryffin, Chen, & Erenguc, 2014). Survey responses also indicated ignorance of the benefits of meditative practices, suggesting this also as a major barrier to uptake (Gryffin et al., 2014). In a report on stress in the US from the American Psychological Association (2010), many adults reported understanding the importance of managing stress (69 percent reported this as important); however, one third of adults reported doing an excellent or very good job at managing stress. According to the survey, the majority of parents did not think their children were strongly affected by their stress while their children reported otherwise (Norman et al., 2010). Almost three-quarters of parents reported their stress having only a slight or no impact on their children, yet 91 percent of children reported knowing when their parent was stressed (Norman et al., 2010). This study aims to examine if the barriers identified as relevant in other populations are also present in parents of children with Autism Spectrum Disorder.

THE CURRENT STUDY

The current study will investigate barriers to mindfulness practice in parents of children with Autism Spectrum Disorder. Current research identifying barriers to mindfulness has found that barriers to uptake exist (Gryffin et al. 2014; Sears et al., 2011); however, research has not focused on examining if barriers identified in other populations are also present in parents of children with ASD. If barriers to this practice in this population are not examined, future studies incorporating mindfulness interventions may not be as effective as they could be. If our hypotheses are proven correct, by not examining these barriers, mindfulness-based intervention programs focusing on parental stress in this population may run the risk of creating programs that do not include information about parental stress and its impact on child outcomes, do not include common misconceptions to mindfulness and evidence of its benefits, and do not create an intervention that can be adapted to fit the short time that parents allocate to their well-being, parents in this population may not use this practice despite its benefits.

The study is guided by three research questions. First, I investigated whether parents of children diagnosed with Autism Spectrum Disorder would identify, and we could assess, three barriers to mindfulness uptake: misconceptions, time, and beliefs about stress. I hypothesized that I could reliably measure these three barriers and parents could rate themselves on indicators representing these three barriers. Second, I examined how these barriers vary based on child characteristics (e.g., severity of ASD symptoms) and parent characteristics (e.g., previous experience with mindfulness, trait mindfulness, level of mindfulness experience). I hypothesized that that perceived barriers vary as a function of child characteristics (e.g., severity of ASD symptoms) and parent characteristics (e.g., overall experience with mindfulness, trait

mindfulness, level of mindfulness experience), with ASD symptoms positively associated with barriers, individuals expressing negative previous experience with mindfulness showing higher barriers, trait mindfulness being negatively associated with perceived barriers, and levels of mindfulness experience being negatively associated with perceived barriers. Third, I tested the strength of the associations between the three barriers and parents' mindfulness uptake. I hypothesized that parents in this population are less likely to practice or try mindfulness (mindfulness uptake) due to the perceived barriers, (1) misconceptions about mindfulness, (2) beliefs that parenting stress is not relevant to child outcomes, and (3) lack of time parents allocate to focus on their own well-being.

RESEARCH QUESTIONS AND HYPOTHESES

Research Questions

1. Will parents of children diagnosed with Autism Spectrum Disorder identify three barriers to mindfulness uptake: misconceptions, time, and beliefs about stress, thus allowing assessment of the existence of these barriers?

2. Do the perceived barriers to mindfulness uptake vary based on child characteristics (e.g., severity of ASD symptoms) and parent characteristics (e.g., previous experience with mindfulness, trait mindfulness, level of mindfulness experience)?

3. Do the barriers to mindfulness evidenced in other populations exist in parents of children diagnosed with Autism Spectrum Disorder?

Hypotheses

1. I hypothesize that I could reliably measure these three barriers and parents could rate themselves on indicators representing these three barriers.

2. It is hypothesized that perceived barriers vary as a function of child characteristics (e.g., severity of ASD symptoms) and parent characteristics (e.g., overall experience with mindfulness, trait mindfulness, level of mindfulness experience), with ASD symptoms positively associated with barriers, individuals expressing negative previous experience with mindfulness showing higher barriers, trait mindfulness being negatively associated with perceived barriers, and levels of mindfulness experience being negatively associated with perceived barriers.

3. It is also hypothesized that parents in this population are less likely to use mindfulness (DV) to reduce parenting stress due to the perceived barriers, (1) misconceptions about mindfulness (IV), (2) beliefs that parenting stress is not relevant to child outcomes (IV), and (3) lack of time parents allocate to focus on their own well-being (IV).

METHODS

Participants

Participants were recruited to this cross-sectional study through an existing research database of parents of children with ASD who have participated in previous research studies conducted by the Autism Research Group in the Department of Human Development and Family Studies at Colorado State University and through JFK partners from the University Center for Excellence in Developmental Disabilities (UCEDD) for Colorado. Participants were surveyed in two waves of recruiting, first through an aggregate email list from the Autism Research Group then a week later through an anonymous link sent via email to parents through JFK partners from UCEDD. The sample included one hundred and fifteen parents of one or more children with ASD however; we had an attrition rate of 21% ($n = 24$) resulting in 91 participants [mothers ($n = 80$) and fathers ($n = 11$)] used in analysis. The majority of participants were white (93.4%), between thirty-six and forty-five (36.3%), had a bachelor's degree (45.1%). See Table 2 for more demographic information.

Table 2
Participant demographic information

Characteristic	<i>n</i>	percent
Parent		
Mother	80	87.9%
Father	11	12.1%
Age		
26-35	6	6.6%
36-45	33	36.3%
46-55	32	35.2%
56-65	17	18.7%

66-75	3	3.3%
Race/Ethnicity		
American Indian or Alaska native	2	2.2%
White	85	93.4%
Asian	1	1.1%
Middle Eastern or North African	0	0%
Black or African American	1	1.1%
Native Hawaiian or other Pacific Islander	0	0%
Biracial	2	2.2%
Hispanic or Non-Hispanic		
Hispanic	2	2.2%
Non-Hispanic	89	97.8%
Education		
Less than a high school diploma/ High school		
Diploma/GED	0	0%
Some college or associate/trade degree	10	11%
Bachelor's degree	41	45.1%
Master's degree or higher	36	39.6%
Children		
1	15	16.5%
2	48	52.7%
3	22	24.2%
4	2	2.2%
5	2	2.2%
6 or more	2	2.2%
Child diagnosed with ASD		
1	83	91.2%
2	7	7.7%
3 or more	1	1.1%
Age of child diagnosed with ASD		
0 – 3	14	15.4%
4 - 7	13	14.3%

8 - 12	13	14.3%
13 - 17	22	24.2%
18+	29	31.9%
Communication style of child with ASD		
My child is still learning how to communicate	2	2.2%
Pictures or augmentative communication	2	2.2%
Sign language and gestures	1	1.1%
Single words/simple sentences	12	13.2%
My child speaks in full sentences	74	81.3%

Procedure

Study procedures were approved by the Institutional Review Board (IRB) at CSU. A recruitment email was sent to parents in the database by the Principal Investigator of the Autism Research Group requesting participation in the study. Once the participants received the email request describing the study, they were directed to an online site where they could provide consent to participate and then complete an anonymous survey via Qualtrics. The survey ends with a statement of completion and expresses appreciation for participation.

Measures

Measures embedded within the online survey include: (1) demographics questionnaire, (2) the Mindfulness Attention and Awareness Scale (MAAS) that measures trait mindfulness, and (3) the Mindfulness Barriers Scale (MBS; Castells & Hepburn, 2019) which include Likert-scale ratings of perceived barriers and mindfulness uptake. Each of these measures is provided in Appendix A.

Demographics Information was gathered through a demographics questionnaire and asked participants to identify their age, race/ethnicity, education, and role in the family (e.g., father, mother). It also includes the age of the child with autism and communication status of

their child. Communication is used in the study as a proxy for ASD severity, consistent with the recommendations of Kasari et al. (2014). The severity of symptoms of the child was used to define one of our covariates, examining the difference between higher and lower severity of the child's symptoms and the association between parent perceived barriers and mindfulness uptake.

Trait Mindfulness was assessed using the *Mindfulness Attention Awareness Scale* (MAAS). The MAAS is a measure of dispositional mindfulness and mindful awareness and has been shown to be negatively related to the frequency and intensity of negative affect (Brown & Ryan, 2003). Trait mindfulness refers to an individual's baseline or average mindfulness (Sieglin & Petrides, 2014). The measure is focused on the presence or absence of awareness of and attention to what is happening in the present moment and is a 15-item questionnaire that assesses this core characteristic of mindfulness (Brown & Ryan, 2003). The statements are comprised of experiences including, "I find it difficult to stay focused on what's happening in the present", "I find myself preoccupied with the future or the past", and "I rush through activities without being really attentive to them". The experiences are rated 1 "*almost always*" to 6 "*almost never*" and are averaged. Higher scores indicate high awareness and attention.

This measure was examined in previous studies to have strong psychometric properties, including divergent and convergent validity with other measures of psychological well-being (Baer et al., 2006; MacKillop & Anderson, 2007). The MAAS was found to have good internal consistency ($\alpha \geq .82$) and test-retest reliability (interclass $r = .81$), and scores were significantly higher among meditation practitioners than nonpractitioners (Cohen's $d = .50$) which supports high scores reflecting high trait mindfulness and low scores reflecting low trait mindfulness (Brown & Ryan, 2003). Higher average scores are an indication of high trait mindfulness, so the

participant's MAAS score was used to define another covariate, that low trait mindfulness is associated with higher perceived barriers.

Barriers to Mindfulness Uptake was assessed using the *Mindfulness Barriers Scale* (MBS; Castells & Hepburn, 2019). The MBS assesses the three hypothesized barriers to uptake by asking participants to rate 18 statements with respect to how well it describes them on a scale of 1 “*strongly disagree*” to 5 “*strongly agree*”. This measure was created by the research team after reviewing the literature and being unable to find a quantitative measure that examined perceived barriers to mindfulness. Studies that provided evidence of our hypothesized barriers used qualitative research designs including participant interviews of barriers to mindfulness uptake after completing a mindfulness intervention (Gryffin et al., 2014; Sears et al., 2011). In order to measure the relationship of perceived barriers and mindfulness uptake quantitatively, measure development was necessary. The MBS is comprised of statements including, “I can find the time to prioritize these exercises”, “I tend to put my child's needs before my own”, and “I am currently able to dedicate fifteen minutes to myself every day.” The MBS includes a six-item subscale that addresses each of the three hypothesized barriers; misconceptions about mindfulness, beliefs that parenting stress is not relevant to child outcomes, and lack of time parents allocate to focus on their own well-being. Subscales are computed by summing the 6 items, creating a range of values from six to thirty. Higher scores reflect higher perceived barriers.

Based on the conceptual foundation describing the parental stress unique to parents of children with ASD supported by *Family Stress Theory* (Hill, 1949), the role of mindfulness in reducing stress, and existence of barriers to uptake in other populations, statements were created to address the three hypothesized barriers to mindfulness: (1) misconceptions about mindfulness,

(2) beliefs that parenting stress is not relevant to child outcomes, and (3) lack of time parents allocate to focus on their own well-being. The measure has strong face validity and preliminary analysis of the intercorrelations and alpha coefficients were conducted prior to the analysis of the relationship between the perceived barriers and mindfulness uptake.

Mindfulness uptake was assessed using the *Mindfulness Barriers Scale*. The fourth subscale of the MBS assessed mindfulness uptake and was operationalized through a brief explanation of mindfulness followed by three statements, “I am confident that I could practice mindfulness meditation every day”, “I doubt that I could practice mindfulness meditation on a regular basis”, and “I am not interested in learning more about mindfulness meditation”. Participants will respond to the first three subscales addressing perceived barriers and the MAAS questionnaire prior to responding to the fourth subscale of the MBS to avoid biased responses. So, the fourth subscale of the MBS will be placed at the end of the survey. This subscale will also have a range score of six to thirty. The MBS includes the statement “Overall my experience with mindfulness has been:” with options including positive, neutral, or negative. This statement will be used to define our last covariate, that the relationship between perceived barriers and mindfulness uptake will vary based on previous experience with mindfulness. More specifically, negative previous experience with mindfulness will result in higher perceived barriers to uptake.

Analysis Plan

Preliminary analyses examined the distributions of all variables. For the first research question and hypothesis, I examined the psychometric properties of the three hypothesized barrier scales (e.g., alpha reliability) and intercorrelations of variables. Data analyses for the two hypotheses of the second and third research questions were tested using independent samples t-tests, a one-way ANOVA analysis, and a multiple regression analysis. The second hypothesis,

that perceived barriers vary as a function of child characteristics (e.g., severity of ASD symptoms) and parent characteristics (e.g., previous experience with mindfulness, trait mindfulness, level of mindfulness experience), was tested in two ways. First, a series of independent samples t-tests was conducted comparing mean scores of parent characteristics (e.g., overall experience with mindfulness, parent trait mindfulness) and child characteristics (e.g., severity of symptoms) in relation to the perceived barriers. Second, a one-way ANOVA compared mean scores on the three barriers (DVs) as a function of parent level of experience with mindfulness.

The third hypothesis, that each of the barriers that parents in this population are less likely to use mindfulness to reduce parenting stress due to the perceived barriers, (1) misconceptions about mindfulness, (2) beliefs that parenting stress is not relevant to child outcomes, and (3) lack of time parents allocate to focus on their own well-being, was tested using a multiple regression. In this analysis, age, education, family role (e.g., mother, father), race/ethnicity, and total number of children were entered as control variables in step one and two. All three barrier variables were entered in step three to examine how strongly all three barriers predict mindfulness uptake together. A series of three additional regression equations examined the unique prediction of each barrier. In each analysis, two barriers were entered as the second step and the third barrier was entered in the third.

RESULTS

Preliminary analyses indicated that most variables were within limits for normal skew, so did not require transformation. Distribution of the variable “symptoms severity”, however, was highly skewed with 81.3% of participants responding “my child speaks in full sentences”, describing low severity of symptom, 13.2% responding “my child speaks in single words or simple sentences”, and 5.5% responding as “sign language and gestures”, “pictures or augmentative communication”, and “my child is still learning to communicate”. Given this distribution, responses “my child speaks in single words or simple sentences”, “sign language and gestures”, “pictures or augmentative communication”, and “my child is still learning to communicate” were collapsed to create a bivariate variable, representing “High Severity”. “My child speaks in full sentences” responses represent “Low Severity”.

To examine the first research question, I explored the internal consistency of each subscale of the MBS (Castells & Hepburn, 2019): (1) misconceptions about mindfulness (misconceptions), (2) lack of time parents allocate to focus on their own well-being (time), (3) beliefs that parenting stress is not relevant to child outcomes (parental stress beliefs), and (4) mindfulness uptake. Initial analyses of the alpha reliabilities of the subscales, showed adequate reliability for Time ($\alpha=.70$). However, misconceptions ($\alpha=.38$), parental stress beliefs ($\alpha=.26$), and mindfulness uptake ($\alpha=.63$) all showed poor alpha reliabilities. For Misconceptions, removal of one item “I feel confident that I know what mindfulness is” improved the scale reliability to $\alpha=.63$. Removal of items “My child will be okay despite my level of stress” and “My stress is mine and mine alone to deal with” from parental stress beliefs improved reliability to $\alpha=.63$. After removing “I am not interested in practicing mindfulness strategies” from the

mindfulness uptake scale, the reliability improved to $\alpha = .78$. This single item, Disinterest, was conceptually interesting as a potential barrier so we included it in the subsequent analyses as a predictor of uptake.

Intercorrelations of the scales as demonstrated in Table 2 showed moderate associations. The predictor variables showed intercorrelations ranging from weak non-significant ($r = -.02$) to statistically significant moderate associations ($r = .43$). This pattern suggests that these variables are relatively independent, sharing between 0 and 18% of variance. All of the predictor variables except Parental Stress were significantly associated with Mindfulness Uptake, with Time showing the strongest correlation ($r = -.57$).

Table 3
Correlations

		Misconceptions	Parental Stress	Time	Disinterest in Mindfulness	Mindfulness Uptake
Misconceptions	Pearson Correlation	1				
Parental Stress	Pearson Correlation	-.02	1			
Time	Pearson Correlation	.21*	-.22*	1		
Disinterest in Mindfulness	Pearson Correlation	.43**	-.12	.12	1	
Mindfulness Uptake	Pearson Correlation	-.26*	.12	-.57**	-.31**	1

*. Correlation is significant at the 0.05 level (2-tailed).

**. Correlation is significant at the 0.01 level (2-tailed).

Hypothesis Two: Barriers to mindfulness vary by parent and child characteristics

Results from the three t-tests examining differences on severity of symptoms indicated non-significant differences on Time ($t(89) = .27, p = -.22$) for Low ($M = 17.11$; $SD = 4.12$) and High ($M = 17.39$; $SD = 4.81$) groups; on Parental Stress ($t(89) = -.07, p = .94$) for Low ($M = 8.94$; $SD = 3.13$) and High ($M = 9.00$; $SD = 3.06$) groups; and on Misconceptions ($t(89) = .15, p = .88$) on Low ($M = 9.06$; $SD = 2.51$) and High ($M = 8.95$; $SD = 2.88$) groups. In contrast, parent's experience with mindfulness (positive versus neutral/negative) differed by Time and Misconceptions. For Time ($t(89) = 2.29, p = .024$), those who reported a neutral or negative experience ($M = 18.52$; $SD = 4.25$) saw time as a greater barrier (e.g., spent less time on themselves) than those who reported positive experiences with mindfulness ($M = 16.33$; $SD = 4.82$). For Misconceptions ($t(68.98) = 5.65, p < .001$) those with neutral or negative experiences with mindfulness ($M = 10.55$; $SD = 2.87$) reported higher misconceptions about mindfulness than those who indicated an overall positive experience with mindfulness ($M = 7.61$; $SD = 1.89$). Non-significant differences were evident on Parental Stress ($t(89) = .52, p = .61$) for those who reported negative or neutral experience with mindfulness ($M = 8.81$; $SD = 2.98$) and those who reported positive experience with mindfulness ($M = 9.14$; $SD = 3.14$). To test differences in Trait Mindfulness, we created high and low groups after performing a median split (e.g., lowest through 3.59 = Low, 3.6 through highest = High). Results testing differences between high and low Trait Mindfulness groups revealed significant differences on Time and Parental Stress. For Time ($t(89) = 4.79, p < .001$), parents with low trait mindfulness ($M = 19.47$; $SD = 4.45$) reported significantly less time allocated on themselves (higher reported time barrier), than parents with

high trait mindfulness ($M = 15.26$; $SD = 3.91$). For parental stress ($t(89) = 3.38$, $p = .001$), high trait mindfulness ($M = 10.00$; $SD = 3.17$) was significantly related to beliefs that their stress impacts their child (higher reported parental stress barrier) than parents with low trait mindfulness ($M = 7.96$; $SD = 2.58$).

The one-way ANOVA, shown in Table 4, confirmed that there are significant differences between the levels of mindfulness experience and misconceptions about mindfulness ($F(2, 88) = 7.85$, $p = .001$), but not for Time or Parental Stress. A Bonferroni post-hoc test revealed that individuals with high levels of mindfulness experience are significantly related to fewer misconceptions about mindfulness than individuals with either moderate levels of mindfulness experience ($p = .024$), or low levels of mindfulness experience ($p = .001$). Those with low and moderate levels of experience were not different from each other.

Table 4
Means, Standard Deviations, and One-Way Analyses of Variance in Previous Mindfulness

Measure	Low Experience		Moderate Experience		High Experience		F(2)	η^2
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>		
Time	16.61	3.71	17.97	5.28	17.21	4.63	.50	.01
Parental Stress	9.50	3.40	9.27	3.23	8.58	2.80	.753	.02
Misconceptions	10.56	2.59	9.57	2.78	7.88	2.49	7.85***	.15

Experience and Perceived Barriers to Mindfulness

* $p < .05$ *** $p < .001$

Hypothesis Three: The perceived barriers to mindfulness will be negatively associated with mindfulness uptake

As indicated in the preliminary analysis, beliefs about parental stress showed no association with mindfulness uptake ($r = .09$, $p = .41$) so it was so it was not included in any of the

regression model. We tested each of the predictors independently in independent regression analyses. Time ($\beta = -.59, p < .001$), Misconceptions ($\beta = -.29, p = .01$), and Disinterest ($\beta = -.40, p < .001$) were all significant predictors of mindfulness uptake. Following the independent regression analyses, we entered all three variables into a final regression equation to identify how they predicted uptake together. Table 5 shows that Misconceptions is not a significant predictor when accounting for Time and Disinterest in Mindfulness.

As shown in Table 5, holding demographic variables constant and accounting for Misconceptions and Disinterest in Mindfulness, Time was significantly and negatively related to Mindfulness Uptake. Less time spent on self (higher reported Time barrier) was related to lower reported Mindfulness Uptake. Holding demographic variables constant and accounting for Misconceptions and Time, Disinterest in Mindfulness was negatively related to Mindfulness Uptake. Higher scores of Disinterest was significantly related to lower reported Mindfulness Uptake. The association between Disinterest in Mindfulness and Mindfulness Uptake after accounting for Time and Misconceptions was not as strong as it was when independently analyzed, but still had a p -value of less than .05 ($\beta = .24, p = .03$). The results of the final regression analysis suggest that there is a significant negative association between Misconceptions and Mindfulness Uptake even when accounting for demographic variables, and there are significant negative associations between Time and Mindfulness Uptake and Disinterest and Mindfulness Uptake when accounting for the demographic variables and the perceived barriers to uptake.

Table 5
Regression Analysis Summary for Perceived Barriers to Mindfulness Predicting Mindfulness Uptake

Model	Variable	B	95% CI	β	t	p
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1	(Constant)	4.68	[1.03, 8.32]		2.55	.013
	Parent Age	.20	[-.30, .70]	.085	.793	.43
	Education	.157	[-.57, .88]	.046	.431	.68
	Mother/Father	.95	[-.49, 2.40]	.14	1.31	.19
2	(Constant)	4.78	[.36, 9.20]		2.15	.03
	Parent Age	.21	[-.30, .72]	.10	.81	.42
	Education	.13	[-.62, .87]	.04	.34	.74
	Mother/Father	1.07	[-.42, 2.57]	.16	1.43	.16
	Race	-.25	[-.90, .41]	-.09	-.74	.46
	Hispanic/Not Hispanic	.06	[-3.54, 3.67]	.004	.03	.97
	Total # of Children	.17	[-.32, .66]	.08	.70	.49
3	(Constant)	6.87	[2.20, 11.54]		2.92	.004
	Parent Age	.36	[-.29, 1.00]	.15	1.11	.27
	Education	.07	[-.65, .80]	.02	.20	.84
	Mother/Father	1.00	[-.46, 2.46]	.15	1.36	.18
	Race	-.11	[-.75, .53]	-.04	-.34	.73
	Hispanic/Not Hispanic	-.51	[-4.11, 3.08]	-.03	-.28	.78
	Total # of Children	.33	[-.17, .83]	.15	1.32	.19
	# of Children with ASD	-.74	[-2.15, .67]	-.11	-1.05	.30
	Age of Child with ASD	-.03	[-.45, .39]	-.02	-.15	.88
	Misconceptions	-.23	[-.41, -.06]	-.29	-2.66	.01

4	(Constant)	9.22	[4.12, 14.31]		3.60	.001
	Parent Age	-.03	[-.59, .52]	-.01	-.11	.91
	Education	.06	[-.55, .67]	.02	.19	.85
	Mother/Father	.98	[-.25, 2.22]	.14	.158	.12
	Race	-.05	[-.61, .50]	-.02	-.19	.85
	Hispanic/Not Hispanic	-.61	[-3.63, 2.41]	-.04	-.40	.69
	Total # of Children	.20	[-.23, .63]	.09	.94	.35
	# of Children with ASD	-.47	[-1.65, .71]	-.07	-.79	.43
	Age of Child with ASD	-.02	[-.40, .35]	-.02	-.12	.91
	Misconceptions	-.04	[-.21, .13]	-.05	-.44	.66
	Time	-.24	[-.34, -.15]	-.51	-5.15	.000
	Disinterest in Mindfulness	-.41	[-.04, -.78]	-.24	-2.21	.03

a. Dependent Variable: Mindfulness Uptake

DISCUSSION

This study examined whether parents of children diagnosed with ASD could reliably identify three perceived barriers to mindfulness uptake (1) misconceptions about mindfulness, (2) beliefs that parenting stress is not relevant to child outcomes, and (3) lack of time parents allocate to focus on their own well-being. The study also examined how barriers vary as a function of child characteristics (e.g., severity of ASD symptoms) and parent characteristics (e.g., previous experience with mindfulness, trait mindfulness, level of mindfulness experience) and the relationship between the perceived barriers and mindfulness uptake. Previous research on barriers to mindfulness is limited and lacking a quantitative form of measurement, relying on qualitative interviewing techniques. This study created a quantitative measure (MBS; Castells & Hepburn, 2019) that was used to measure the existence of barriers and mindfulness uptake in the sample of parents.

Several interesting findings emerged from this study. The measure created for the study was generally supported and allowed for parents to report on their experiences. Parents with overall neutral or negative experience reported significantly less time allocated on themselves and significantly higher misconceptions. Additionally, parents with low trait mindfulness reported less time allocated on themselves and parents with low and moderate experiences with mindfulness reported higher misconceptions than those with high levels of mindfulness experience. Finally, time, misconceptions, and disinterest in mindfulness independently predicted mindfulness uptake holding our demographics constant.

Barriers to Mindfulness

The short measure of barriers to mindfulness and mindfulness uptake in which I proposed three dimensions was generally supported. A few items on select subscales did not fit well with the proposed subscales so were dropped from final analyses. The modest interrelationships among items indicate that they are distinct and might have different associations and influences on mindfulness practices. In addition, one item, “I am not interested in learning more about mindfulness meditation”, that did not load on the measure of uptake was also retained because it was conceptually interesting. Although some items were not retained, parents could readily report their experiences on these items, and it indicates that it is possible to create a quantitative measure of barriers to mindfulness. Additional work can be done to expand the number of items used for the proposed scales and to test additional scales that might assess other barriers that parents experience.

Barriers to Mindfulness and Child and Parent Characteristics

It was predicted that perceived barriers vary as a function of child characteristics (e.g., severity of ASD symptoms) and parent characteristics (e.g., overall experience with mindfulness, trait mindfulness, level of mindfulness experience). It was hypothesized that higher severity of ASD symptoms would be positively associated with barriers, negative previous experience with mindfulness would result in higher barriers, trait mindfulness would be negatively associated with perceived barriers, and levels of mindfulness experience would be negatively associated with perceived barriers. After analysis of severity of symptom differences in the perceived barriers, we found no significant differences between low and high severity groups on any of the three perceived barriers.

Analysis of participant overall experience with mindfulness (e.g., positive, neutral/negative) showed that parents who reported overall neutral or negative experience with mindfulness were associated with significantly less time allocated on themselves than those who had an overall positive experience with mindfulness. This finding is consistent with our hypothesis and could be a topic for future research. This could suggest that parents who had positive overall experiences with mindfulness perceive their time or prioritize their time on themselves differently than parents who have had neutral or negative experiences with mindfulness. In addition, neutral/negative experience with mindfulness was related to significantly higher misconceptions about mindfulness than parents who reported positive overall experience with mindfulness. This is an interesting finding because it suggests that the accuracy of understanding one has of mindfulness could impact the overall experience the participant has with mindfulness as in intervention. It is possible that by limiting misconceptions through more clarification and psychoeducation in mindfulness interventions, participants could report a more positive experience and thus see the value of incorporating mindfulness into their daily lives.

In the analysis of low versus high trait mindfulness on perceived barriers, two significant findings emerged. Parents with low trait mindfulness scores indicated that they allocated significantly less time to themselves than parents with high trait mindfulness. This could suggest that baseline or trait mindfulness in parents could impact perceived or prioritized time spent on themselves. This association indicates a possible population that could benefit from more targeted or informed mindfulness intervention. This study's findings can further inform future interventions by focusing on time and misconceptions. While interventions cannot give parents more time in the day, giving them accurate information about the subjectivity of mindfulness practice can dispel misconceptions. It can also change the perspective or misconception that

mindfulness must be a lengthy and formal practice by describing brief mindfulness exercises and focus on the habit building of mindful awareness and its benefits rather than just the formal meditation process.

Knowing that parents with low trait mindfulness may not perceive or prioritize necessary time to themselves could help future research on this population increase the knowledge of the importance of time spent on themselves and create more informed interventions. In addition to this finding, I found that high trait mindfulness was associated with less beliefs that their stress impacts their child than low trait mindfulness. This finding was surprising and disproved our hypothesis that high trait mindfulness would be negatively associated with parental stress beliefs. This could possibly be due to the subscale of the measurement itself, which could need further research on its validity and reliability. This relationship might also mean that parents with high trait mindfulness are more aware and open to their stress levels, but also have confidence in their ability to control their reactivity to stress and are able to buffer their children from the effects of their stress.

In the analysis of perceived barriers varying by level of mindfulness experience, we found that significant differences existed between the levels of mindfulness experience and misconceptions about mindfulness, but differences did not exist in parental stress beliefs or time. Low and moderate experience with mindfulness was associated with significantly higher misconceptions about mindfulness than those who had high level of experience. This finding could suggest that experience with mindfulness could have an impact on how much accurate knowledge an individual has about mindfulness. Our findings suggest that those with less experience with mindfulness may have less accurate information or more misconceptions than those with more experience. These findings suggest an interesting relationship between parent

characteristics and barriers to mindfulness and warrants further targeted analysis in future studies.

Barriers to Mindfulness and Mindfulness Uptake

It was predicted that the perceived barriers to mindfulness, (1) misconceptions about mindfulness, (2) beliefs that parenting stress is not relevant to child outcomes, and (3) lack of time parents allocate to focus on their own well-being, would be significantly negatively related to mindfulness uptake. In addition to the three barriers we included the single item variable, Disinterest in Mindfulness, as a predictor of mindfulness uptake. After preliminary analysis, parental stress was not found as a predictor of mindfulness uptake, so it was removed from the regression analyses.

Independently, Misconceptions, Time, and Disinterest were found to be statistically significant predictors of mindfulness uptake after holding the demographics constant. For misconceptions this could suggest that the clarity of information about mindfulness can have an impact on whether or not an individual practices mindfulness. There is empirical evidence that mindfulness approaches reduce stress and can be useful in this population (Beer et al, 2013; Cachia et al., 2016; Rayan & Ahmad, 2016; Singh et al., 2014), but misconceptions about mindfulness may be inhibiting parents from practicing mindfulness. An approach to reduce misconceptions about mindfulness could be to provide more education around what mindfulness truly is and dispel myths about mindfulness to allow mindfulness practice to be tailored to each individual based on their lifestyle. The fact that Misconceptions was not a significant predictor of uptake when also accounting for Time and Disinterest suggests some overlap of how these barriers are associated with uptake. This may indicate a need for greater precision in measurement to more fully distinguish misconceptions from the other two barriers. This could

also suggest that in order to effectively address misconceptions, elements of disinterest and time have to be taken into account.

Time parents reported allocating to themselves was found to be a significant predictor of mindfulness uptake, even after accounting for the effects of Misconceptions and Disinterest and holding our demographics constant. This finding is important in validating previous literature suggesting that time is a barrier to mindfulness (Sears, Kraus, Carlough, & Treat, 2011), but extends this by supporting the existence of this barrier in parents of children diagnosed with ASD. Previous studies that parents in this population are highly stressed and this could impact the time they spend on themselves (Beer et al., 2013; Ferraioli & Harris, 2012; Hsiao, 2018; Lindo, Kliemann, Combes, & Frank, 2016; Trute, Hiebert-Murphy, & Levine, 2007). Knowing that parents who report less time available to spend on themselves was associated with lower mindfulness uptake could help in future mindfulness interventions in this population. Parents may not know that mindfulness can be tailored to the time that they have available and does not have to be a formal, lengthy process. This relationship may also indicate misconceptions or misinformation about mindfulness practice. Parents may believe that they have very little time for themselves and because of this reason, believe that mindfulness will be too difficult to learn or incorporate into their daily routines. Time spent on mindfulness practice could be a myth/misconception that is discussed in future interventions, educating parents on brief mindfulness strategies and meditations that can be as beneficial as more formal meditative practices. Shifting the perspective of time being a barrier to this practice is important in believing this practice could be helpful even in a short time. Addressing this perspective that due to the high needs of their child, parents do not have time for themselves is necessary in showing parents the importance of self-care. While we may not be able to provide parents with more time

in their day, more targeted interventions dispelling myths and misconceptions to mindfulness may reduce time as a barrier to mindfulness uptake through brief mindfulness interventions.

Disinterest in mindfulness was a variable that ended up being conceptually interesting to include in analysis despite it not being a consideration in the initial hypotheses. Disinterest in mindfulness was a predictor of mindfulness uptake, given the effect of time and misconceptions, holding the demographics constant. Disinterest in mindfulness is an interesting variable to focus on in future studies. It speaks to underlying motivation which may be more difficult to change through information or intervention. It could further be examined in its relationship with misconceptions about mindfulness and time for self-care. It is possible that disinterest in mindfulness could be due to not understanding it, maybe the participant believes it is a formal religious practice that goes against their beliefs, or that it is a long process, or other common myths about mindfulness. It is possible that parents may not know the benefits of self-care or time to themselves and thus show disinterest in a form of self-care. Understanding the motivation behind the disinterest in mindfulness, maybe through examining these other barriers, could be the key in changing this belief.

Limitations

While the results of this study provide interesting correlations, there were several limitations. First, caution should be taken in generalizing the findings to other populations due to the cross-sectional study design, smaller sample size ($n=91$), higher participation of mothers over fathers, and a primarily Caucasian sample. In addition, measure development was based on a conceptual foundation, so further psychometric research is necessary on the Mindfulness Barriers Scale to determine its validity and reliability. Significant associations were found despite potential limitations of the measure which is promising, however further measure development

analysis is necessary. This could include a mixed methods approach that incorporates qualitative and quantitative measures of barriers to mindfulness uptake, also testing this measure against other measures of mindfulness, and eventually testing this measure on other populations to see if these barriers still exist. Parental stress was not found to be related to mindfulness uptake which could be an indication that beliefs about parental stress impacting child outcomes is simply not a barrier to mindfulness uptake, or this could suggest a measurement issue. Again, further analysis of this measure may allow this hypothesis to be verified.

Additionally, severity of symptoms (described in the survey as communication with child), was highly skewed and possibly not representative of parents of children with ASD. Our sample was highly skewed in the direction of low severity of symptoms, so unsurprisingly, there were no differences between low and high severity groups in our perceived barriers. This skewed sample could have impacted the analysis on variation in perceived barriers which possibly limited our ability to accurately describe differences in low and high severity of symptoms that may exist in barriers to mindfulness. Another limitation of the study was the collapsing of the variable “overall experience with mindfulness”. The participant data only reported one negative experience, so it was collapsed into neutral experience. Having a more evenly distributed sample of positive, neutral, and negative experience with mindfulness responses, may impact future findings differently than our sample data. Despite the limitations that exist in this study, the associations found are exciting nonetheless and warrant further examination of these relationships.

Future Directions

This study’s findings provide the field of research on mindfulness and parents of children with ASD a possible quantitative form of measurement to examine barriers to mindfulness in this

population. Additionally, the relationships found provide interesting areas for further examination in future studies. The current study was the first to examine quantitatively perceived barriers to mindfulness and through it, shows important topics for future studies. For example, the MBS (Castells & Hepburn, 2019) is based on a conceptual foundation of literature and could benefit from further testing. Future studies could focus on psychometric testing and validity testing of the measure. The relationships found in this study warrant additional examination as well. Once the measure has gone through proper testing, future studies could focus on one of these relationships and further examine the strength of the relationship or even, through more sophisticated study design, determine if causality exists in any of these associations. An interesting variable that was found during analysis that warrants further examination is disinterest in mindfulness. Understanding how interest in mindfulness may be impacting barriers to uptake could help inform future interventions/programs on how to best inform people about the practice of mindfulness, limiting barriers to uptake. Finally, the findings suggest that time and misconceptions independently predict mindfulness uptake and could be the quantitative evidence that informs mindfulness interventions and informs future quantitative studies on barriers to mindfulness.

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APPENDIX

Demographics:

1. Which category below includes your age?
 - a. 18-25
 - b. 26-35
 - c. 36-45
 - d. 46-55
 - e. 56-65
 - f. 66-75
 - g. 75 or more
2. With which racial and ethnic group(s) do you identify? (*Mark all that apply*)
 - a. American Indian or Alaska native
 - b. Hispanic, Latino, or Spanish origin
 - c. White
 - d. Asian
 - e. Middle eastern or North African
 - f. Black or African American
 - g. Native Hawaiian or other Pacific Islander
 - h. Another race or ethnicity not listed above _____
3. What is your highest level of education?
 - a. Less than a high school diploma
 - b. High school diploma/GED
 - c. Some college or associate/trade degree
 - d. Bachelor's degree
 - e. Master's degree or higher
4. I am a:
 - a. Mother of a child with ASD
 - b. Father of a child with ASD

About your Son/Daughter:

1. How many children do you have? _____
2. How many children are diagnosed with Autism? _____
3. Check all that apply:
 - a. I have a son with autism
 - b. I have a daughter with autism
4. How do you and your child communicate?
 - a. My child is still learning how to communicate
 - b. Pictures or augmentative communication
 - c. Sign language and gestures
 - d. My child speaks in single words or simple sentences
 - e. My child speaks in full sentences
5. How old is your child with autism?
 - a. 0 – 3

- b. 3 – 7
- c. 7 – 12
- d. 13 – 17
- e. 18+

Mindfulness Barriers Scale (MBS):

Below is a collection of statements about your everyday experiences. Using the scale below as a reference, please indicate how strongly you agree or disagree with each statement. Please answer according to what really reflects your experience rather than what you think your experience should be. Please treat each item separately from every other item.

1	2	3	4	5
Strongly disagree	Disagree	Neutral	Agree	Strongly agree

1. I always put my child's needs before my own

1	2	3	4	5
---	---	---	---	---

2. I feel confident that I know what mindfulness is

1	2	3	4	5
---	---	---	---	---

3. My child's behavior does not change despite the level of my stress

1	2	3	4	5
---	---	---	---	---

4. I can find the time to prioritize mindfulness exercises

1	2	3	4	5
---	---	---	---	---

5. I have a positive perception of mindfulness

1	2	3	4	5
---	---	---	---	---

6. My child's behavior impacts my stress level

1	2	3	4	5
---	---	---	---	---

7. I am currently dedicating fifteen minutes or more to myself every day

1	2	3	4	5
---	---	---	---	---

8. Mindfulness is only used in religious practices

1 2 3 4 5

9. My stress is mine and mine alone to deal with

1 2 3 4 5

10. If I had an extra hour in my day, I would spend it on taking care of myself

1 2 3 4 5

11. My child will be okay despite my level of stress

1 2 3 4 5

12. I have a negative perception of mindfulness

1 2 3 4 5

13. I never have time to think about myself

1 2 3 4 5

14. I get so overwhelmed that I sometimes take it out on those around me

1 2 3 4 5

15. Mindfulness can be beneficial for your health and well-being

1 2 3 4 5

16. It is easy to deal with my stress without it affecting my family

1 2 3 4 5

17. I rarely have 15 minutes or more spent to myself every day

1 2 3 4 5

18. Mindfulness is basically just a relaxation strategy

1 2 3 4 5

19. I can find the time to prioritize mindfulness exercises

1 2 3 4 5

20. I have a negative perception of mindfulness

1 2 3 4 5

21. My child will be okay despite my level of stress

1 2 3 4 5

22. I have heard of mindfulness:

- a. Yes
- b. No

23. I have participated in mindfulness activities with a facilitator (therapist/instructor):

- a. Yes
- b. No

24. I have participated in mindfulness activities on self-care apps or self-help books:

- a. Yes
- b. No

25. I have attended a mindfulness retreat:

- a. Yes
- b. No

26. Overall my experience with mindfulness has been

- a. Positive
- b. Negative
- c. Neutral

27. Mindfulness is a type of awareness in which individuals maintain a present, open, accepting, and nonjudgmental stance towards their thoughts, emotions, and bodily sensations.

Mindfulness interventions are currently used to help with stress reduction, parenting, chronic pain, anxiety and depression.

Mindfulness can be an informal or formal daily practice and it cultivated through contemplative practices including journaling, reflection, walking, yoga, dance, music and singing, and meditation.

I am confident that I could practice mindfulness strategies every day

1 2 3 4 5

I doubt that I could practice mindfulness strategies on a regular basis

1 2 3 4 5

I am not interested in practicing mindfulness strategies

1 2 3 4 5

Mindfulness Attention and Awareness Scale (MAAS)

Instructions: Below is a collection of statements about your everyday experience. Using the 1-6 scale below, please indicate how frequently or infrequently you currently have each experience. Please answer according to what really reflects your experience rather than what you think your experience should be. Please treat each item separately from every other item.

1	2	3	4	5	6
almost always	very frequently	somewhat frequently	somewhat infrequently	very infrequently	almost never

- _____ 1. I could be experiencing some emotion and not be conscious of it until some time later.
- _____ 2. I break or spill things because of carelessness, not paying attention, or thinking of something else.
- _____ 3. I find it difficult to stay focused on what's happening in the present.
- _____ 4. I tend to walk quickly to get where I'm going without paying attention to what I experience along the way.
- _____ 5. I tend not to notice feelings of physical tension or discomfort until they really grab my attention.
- _____ 6. I forget a person's name almost as soon as I've been told it for the first time.
- _____ 7. It seems I am "running on automatic," without much awareness of what I'm doing.
- _____ 8. I rush through activities without being really attentive to them.
- _____ 9. I get so focused on the goal I want to achieve that I lose touch with what I'm doing right now to get there.
- _____ 10. I do jobs or tasks automatically, without being aware of what I'm doing.
- _____ 11. I find myself listening to someone with one ear, doing something else at the same time.
- _____ 12. I drive places on 'automatic pilot' and then wonder why I went there.
- _____ 13. I find myself preoccupied with the future or the past.
- _____ 14. I find myself doing things without paying attention.
- _____ 15. I snack without being aware that I'm eating.