

Lowering Parental Stress Levels Through Use of Mindfulness Smartphone Application

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# Abstract

Providing parents with a healthy stress relieving method can be an effective way of providing family-centered care. At the initial neurodevelopmental pediatrician appointment, children are being assessed and evaluated for a developmental delay. This initial interaction would be a beneficial time to introduce a coping mechanism for parents. Parents were asked to practice mindfulness using a smartphone application to alleviate self-reported stress levels. The parents responded to a stress survey before and after the intervention. This quality improvement project focused on evaluating the effectiveness of mindfulness practices in order to lower self-reported stress levels.

*Keywords:* mindfulness, mindfulness-based smartphone application, Headspace, developmental-behavioral, parent

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## Lowering Parental Stress Levels Through Use of Mindfulness Smartphone Application

Mindfulness is the practice of being aware of one's thoughts and feelings. The practice of mindfulness has been found to be an effective method of reducing stress symptoms. Parents of children with developmental concerns have been found to have elevated levels of stress. Introducing these parents to the practice of mindfulness during a Developmental-Behavioral pediatrician appointment can be an effective method to reduce the stress levels of the parents. Parents with lowered stress levels have a positive effect on the children.

### **Background/Purpose of Project**

One of the subspecialties available within pediatric medicine is Developmental-Behavioral pediatrics. Developmental-Behavioral pediatrics was recognized as a subspecialty by the American Academy of Pediatrics in 1999 (Soares, Baum, & Patel, 2017). This subspecialty focuses on the vast array of developmental and behavioral conditions and diagnoses. These diagnoses include, but are not limited to, Autism Spectrum Disorder (ASD), Attention Deficit Hyperactivity Disorder, Cerebral Palsy, and Fetal Alcohol Spectrum Disorders. As of 2015, the American Board of Pediatrics (2016) recognized 775 board certified Developmental-Behavioral pediatricians in the nation.

In the United States (U.S.), it was estimated about 15% of children between the ages of 3 and 17 have one or more developmental disabilities (Centers for Disease Control and Prevention [CDC], 2015). With a large and growing number of children affected by developmental disabilities, the demand for Developmental-Behavioral pediatricians continues to grow. The American Academy of Pediatrics (2013) released a statement indicating there was a shortage of Developmental-Behavioral pediatricians.

Pediatric nurse practitioners have begun to specialize in Developmental-Behavioral pediatrics as well. There is only one post-graduate fellowship available to nurse practitioners looking to specialize in Developmental-Behavioral pediatrics in the U.S. (“Fellowships”, n.d.). This program trains one nurse practitioner per year in New Jersey (Aghjayan, 2019).

The shortage of specialized care providers has been cited as one of the reasons for the significant waiting periods for appointments. A study examined the average waiting period for an initial developmental-behavioral appointment within the programs available in the U.S. The study found the average waiting period was 5.4 months among 75 developmental-behavioral programs across the nation (Jimenez, Alcaraz, Williams & Strom, 2017). This is a significant waiting period that families must endure in order to have their child evaluated by a Developmental-Behavioral pediatrician. This significant waiting period can lead to stress as parents wait hoping for answers to be given during the developmental-behavioral appointment.

Parental stress levels are important for a pediatrician to be mindful of as it can have a profound effect on the child. Evidence has shown high stress levels in parents can lead to children internalizing the stressful problems and having trouble with self-regulation (Neece, Green, & Baker, 2012). The relationship between parental stress and child development was often viewed as a transactional model of development with the ongoing interactions between the child and the parent. One study found elevated parental stress to be the antecedent of behavior problems in a child in both the typically developing and developmentally delayed populations (Neece et al., 2012). This relationship is important to consider when providing care to the pediatric population.

Caring for a child with a developmental disability or concern can be a burdensome responsibility for parents. Many studies have focused on the stress levels of the parents caring for the developmental disability population. One study sought to examine the parents of children with undiagnosed conditions. The evidence showed parents of children with undiagnosed conditions had higher rates of anxiety and depression (Mcconkie-Rosell et al., 2018). However, the parents did exhibit positive coping behaviors. This evidence supports the importance of discussing stress with parents due to the elevated anxiety and depression levels in spite of positive coping mechanisms.

Many studies have focused on the stress levels of parents caring for children with developmental disabilities especially ASD. Researchers found elevated parental stress levels were significantly related to the irritability of the child (Valicenti-McDermott et al., 2015). The parents cited the children's sleeping problems and maladaptive behaviors as a great source of stress (Valicenti-McDermott et al., 2015). Evidence has shown the early introduction of coping strategies and self-efficacy improves parental levels of life satisfaction including stress (Salas, Rodriguez, Urbieta, & Cuadrado, 2017). Introducing a coping strategy during the long awaited initial Developmental-Behavioral pediatrician appointment may help to alleviate the stress of the responsibility of caring for a child with developmental concerns.

One coping strategy available is the practice of mindfulness. Mindfulness is a practice based on Buddhist meditation involving an individual focusing on his thoughts or feelings without judgment (Greater Good Science Center, n.d.). Mindfulness has been found to be an effective method to reducing stress. In 1979, a Mindfulness-Based Stress Reduction program was introduced at the University of Massachusetts Medical School.

Since this introduction, evidence has shown the benefits of mindfulness to decrease stress within numerous populations (Greater Good Science Center, n.d.). Mindfulness has evolved as technology has advanced. Mindfulness smartphone applications are readily available to guide individuals during the practice of mindfulness. Introducing parents of children with developmental concerns to the practice of mindfulness may decrease the elevated levels of stress experienced by this population.

### **Needs Assessment**

Addressing parental mental health while providing care for a child is imperative in order to assess the child's daily environment. Parents caring for children with developmental concerns are at an increased risk for high stress levels, anxiety and depression. This can have a significant impact on the child. Evidence has shown there is a transactional relationship between a parent's level of stress and the child's behavior. Children being cared for by highly stressed parents are more likely to exhibit problems with behavior and self-regulation (Neece et al., 2012). Understanding this relationship is important when providing care for a child with developmental or behavioral concerns.

Promoting coping methods for the parents caring for children with developmental disabilities helps to cultivate a healthy course of growth within a family. It is estimated about 15% of children between the ages of 3 and 17 have at least one developmental disability in the U.S. (CDC, 2015). The State of New Jersey monitors the number of children with developmental disabilities through the number of children served under the Individuals with Disabilities Education Act (IDEA). In New Jersey, 16.5% of students between the ages of 6 and 21 have been identified with at least one disability (United States Department of Education, n.d.).

When examining certain specific developmental disability diagnoses, New Jersey has increased prevalence as compared to the rest of the U.S. The national prevalence rate of children diagnosed with ASD is every 1 in 59 children (Autism New Jersey, 2018). However in New Jersey, the rate of prevalence is 1 in 34 children are diagnosed with ASD (Autism New Jersey, 2018). Due to the increased prevalence of ASD in New Jersey, there is a great need to examine possible support options for parents in order to improve quality of life for the family.

Parents should be offered guidance and methods to cope with stress when caring for a child with a developmental disability. Helping parents to decrease stress levels will provide the child with a calm environment to grow and learn. Currently, there is no standardized practice to offering parents coping mechanisms or programs. It is up to the individual provider to be aware of available programs and inform parents of the programs. Any parent programs that are available in New Jersey, such as the non-profit SPAN Parent Advisory Network, would require the individual parent to search on his own for support (“About SPAN”, n.d.). Decreasing parental stress will alleviate the transactional relationship between a parent’s level of stress and the child’s behavior. Encouraging parents to incorporate the practice of mindfulness will help to alleviate increased stress levels.

### **Purpose/Problem Statement**

Parents caring for children with developmental disabilities have been shown to experience increased levels of stress. The prolonged average waiting period to have a child evaluated by a Developmental-Behavioral pediatrician can be an added source of a stress for parents. Parents should be offered guidance and support during this initial

developmental-behavioral appointment. Evaluating parental stress levels during this point of interaction is important to offer as part of the family-centered care these families should receive.

### **Clinical Question**

This quality improvement project aims to relieve parental stress with an easily accessible tool. When assessing the stress levels of parents of children with undiagnosed developmental concerns, does one month of using a mindfulness smartphone application decrease stress levels?

### **Aims & Objectives**

The aim of this quality improvement project was to provide parents of children with developmental concerns an easily accessible method of relieving stress.

The objectives of this quality improvement project were to:

- include up to 30 parents in participation and responding to the Perceived Stress Scale form while in the waiting room of the developmental-behavioral outpatient practice.
- have participants complete ten mindfulness sessions within the given four-week period.
- evaluate participants' response to the post-intervention Perceived Stress Scale email.

### **Review of Literature**

#### **Search Strategy**

PubMed, the U.S. National Library of Medicine database, was utilized to identify evidence for mindfulness decreasing stress levels. A total of six searches were completed

within the database in order to find relevant evidence. The six sets of search terms included *mindfulness stress parents*, *mindfulness mobile*, *guideline integrative therapy*, *mindfulness compassion*, *web-based mindfulness*, and *mindfulness perceived stress*. A total of 1,514 articles were identified through these searches. Duplicates and articles older than 10 years were eliminated. A total of 1,102 articles remained. Articles were screened and eliminated based on study design and relevance. Eleven articles were identified as relevant to the topic of mindfulness as a form of stress reduction. Refer to Table of Evidence in Appendix A.

### **Literature Review**

**Benefits of mindfulness-based interventions.** The benefits of mindfulness have been examined with years of research. The mindfulness practice of meditation has been recommended to reduce anxiety and stress in breast cancer patients within clinical practice guidelines (Greenlee et al., 2017). Mindfulness-based stress reduction programs are an effective coping method that results in decreased stress levels. These programs have been found to decrease stress, anxiety, and depressive symptoms (Brown, Ryan, & Creswell, 2007). Mindfulness-based smartphone applications are an effective method of alleviating stress in a convenient manner.

**Mindfulness to decrease parental stress.** Mindfulness-based interventions have demonstrated a significant impact on decreasing stress levels of the parents of children with developmental concerns and chronic conditions. Parents and caregivers of children with developmental conditions and chronic diseases are a population found to significantly benefit from a mindfulness intervention (Minor, Carlson, Mackenzie, Zernicke, & Jones, 2006). Mindfulness-based interventions range from six to eight week



programs for parents (Neece, 2013). The parents who completed the mindfulness based programs self-reported their stress levels. The results reported showed that parents experienced a decrease in the symptoms of stress following the intervention of a mindfulness program (Minor et al., 2006).

Various measurement tools are utilized in order to assess parental stress. All of the tools were self-reported measures that were validated with prior research. In addition to stress, parents reported decreased anxiety, depression, and insomnia through the self-reported tools (Dyken, Fisher, Taylor, Lambert, & Miodrag, 2014). The improvement in depression, anxiety and life satisfaction levels continued up to six months following the mindfulness intervention (Dyken et al., 2014). Mindfulness based programs improved the behavioral symptoms in children by reducing the children's hyperactivity and inattention symptoms (Lo et al., 2017).

**Technology-based mindfulness interventions.** Mindfulness-based interventions have evolved from in-person programs to online platforms and smartphone applications. Online mindfulness programs have been shown to be effective in decreasing individual's stress levels (Cavanagh et al., 2013; Krusche, Cyhlarova, King, & Williams, 2012). Mobile smartphone applications have been developed to readily deliver mindfulness techniques to individuals. Ensuring the mobile smartphone application was evidence-based was important in order to teach mindfulness techniques. A review found 32 evidence-based mobile mindfulness smartphone applications available on Apple and Android platforms (Coulon, Monroe, & West, 2016). Headspace is a mobile smartphone application that delivers mindfulness techniques in an evidence-based manner. Headspace has lowered the stress scores of various populations including medical students and

nurses (Yang, Schamber, Meyer, & Gold, 2018). Following the use of Headspace, nurses reported significantly higher mindfulness scores and decreased burnout (Wylde, Mahrer, Meyer, & Gold, 2017). Decreased burnout was a benefit a mobile smartphone mindfulness-based intervention offers to caregivers.

**Limitations.** Since stress levels were assessed using self-reported measurement tools, the findings of the research were reliant on individuals accurately reporting their feelings and concerns (Neece, 2013). Small samples sizes were frequently used in the intervention groups. Findings were significant, but it was difficult to identify other factors that may have decreased stress levels with such smaller sample sizes. Another common limitation was the lack of a true control group. Not every piece of literature reviewed used an identified control group (Krusche et al., 2012). Some used a waitlist as a control group. The intervention groups received the mindfulness-based intervention immediately while the control groups were placed on waitlists and received the intervention a few weeks later (Dykens et al., 2014).

### **Theoretical Framework**

The theoretical framework of this quality improvement project was the Plan-Do-Study-Act Cycle (PDSA). This quality improvement project was focused on the quality improvement process in order to further develop family-centered care. Family-centered care is the approach of supporting the social, emotional and developmental domains of the patient and family in order to establish a healthcare partnership that recognizes the importance of the family (“Patient- and Family-Centered Care and the Pediatrician’s Role”, 2012). The PDSA Cycle allows for continuous cycles of improvements as

modifications are needed. The framework consists of four steps, which include plan, do, study, and act (Institute for Healthcare Improvement, 2017) (See Appendix B).

The initial step of the cycle was the “plan.” During the “plan” phase, evidence has found that parents of children with autism and other neurodevelopmental disabilities have increased levels of stress. An evidence-based mindfulness smartphone application was identified. The plan was to encourage the parents to use the smartphone application in order to potentially lower stress levels.

The next phase of the cycle was “do.” At the initial Developmental-Behavioral pediatrician appointment, the Perceived Stress Scale (PSS) was administered to participating parents in order to assess baseline stress levels. The parents were given written instructions and offered in-person help to download the mindfulness smartphone application. The last part of the “do” phase was the follow-up with the parents. The follow-up was one month after introducing the smartphone application. Participating parents would self-report using the PSS if stress levels decreased with the use of the mindfulness smartphone application.

The next phase in the cycle was “study.” During the “study” phase, the pre and post intervention surveys would be reviewed. The effectiveness of the mindfulness smartphone application would be evaluated based on the self-reported stress levels of the participating parents. The self-reported stress levels would indicate if the mindfulness smartphone application lowered the parental stress levels via the PSS.

The final phase of the cycle was “act.” If the results of the intervention indicated lowered stress levels, Developmental-Behavioral healthcare providers would be encouraged to offer this mindfulness stress reducing option to the parents during an

appointment. If the intervention did not yield lowered stress levels, recommendations for modifications of the project would be identified. The “act” phase of the cycle allowed for any modifications that may be necessary prior to the start of another PDSA cycle. The PDSA cycle was ideal for this quality improvement project in order to allow for any modifications that may be necessary in order to experience the most significant outcome for the intervention.

## **Methodology**

### **Design of Project**

The methodology for this project was a quality improvement project. The project was designed according to the Plan-Do-Study-Act Cycle framework. The project focused on parental stress levels. Parents of children being evaluated by a Developmental-Behavioral healthcare provider were the focus of the project. The parents were given information explaining a mindfulness smartphone application. The parents were given four weeks to complete a 10-session mindfulness program. Following the four-week period, the parents’ stress levels were reassessed. This quality improvement project was designed to assess if this mindfulness smartphone application intervention helped to alleviate stress levels.

### **Setting**

The project was undertaken in a Developmental-Behavioral pediatric practice in Mountainside, New Jersey. The Developmental-Behavioral pediatric practice is one program within a larger health system. The health system serviced over 34,000 pediatric patients across 13 sites in a wide variety of programs and specialties (Children’s Specialized Hospital Foundation, 2018).

### **Study Population**

The population of the project was a convenience sample. Parents of children being evaluated by a Developmental-Behavioral provider were recruited for the project during the child's initial appointment. Nine English-speaking parents were recruited over a three week span in January. Any parents presenting for a follow-up appointment were excluded from the project. Any parent without daily access to a smartphone was also excluded. Parents were excluded if they were unwilling to download the application.

### **Subject Recruitment**

Individuals were recruited to participate in the quality improvement project while in the waiting room of the Developmental-Behavioral pediatric practice. The recruitment occurred up to the first three weeks of the quality improvement project. The office practice staff provided the information in regards to which parents were present for their child's initial appointment. The project investigator (PI) in the waiting room approached the parents to discuss the project. The PI explained the purpose and intervention of the quality improvement project. The participants needed to have access to a smartphone, be English-speaking, willing to download the application and be present for their child's initial appointment. The parent was asked at this point of the interaction if he would consent to participate. The PI gave the parent the PSS and explained the post-intervention email (see Appendix C). The parent was given a flyer explaining how to download the Headspace smartphone application (see Appendix D). The parents recruited for the project signed consent to participate following explanation of the intervention.

### **Consent Procedure**

Consent was obtained from each participating parent. The consent form was distributed to the parent following explanation of the quality improvement project (see Appendix E). The parent was able to read over the consent form at this time and ask any questions regarding the project and consent. All questions presented by the subjects were answered at this time. The consent was signed in the waiting room prior to the parent completing the PSS and downloading the smartphone application.

### **Risks/Harms/Ethics**

The risks of participating in this project were minimal. The possible risk was the potential loss of confidentiality in the data that was collected for this quality improvement project. The participants' confidentiality was protected by only using assigned numbers as their identities. The data with the participants' emails was stored on a password protected hard drive that was stored in a locked cabinet within a locked room with key access only. The connection between the assigned number identity and email address was destroyed as soon as the post-intervention incentives were sent. The PI was the only person with a key to this locked room and cabinet. This ensured the confidentiality of participants was protected. The participants may not have experienced a change in stress levels following the mindfulness intervention.

### **Subject Cost and Compensation**

There was no cost to the participants in the project. The Headspace smartphone application was free to download. The 10 sessions of mindfulness recordings were free content in the application. The participants did not incur any costs. The participants did receive a \$10 gift card after completing the follow-up PSS. The electronic gift cards were

sent to the email address provided by the participant. Accounting for this, the cost of providing this incentive was \$300 for the 30 possible participants. This cost was incurred by the PI.

### **Study Interventions**

The project's intervention was introducing the practice of mindfulness in order to alleviate stress levels. The nine parents completed the 10-question PSS (see Appendix C). The self-reported stress levels were used as the individual's baseline stress score. The PSS scores were used to measure the effectiveness of the intervention. The baseline score was compared to the post-intervention score.

The next part of the intervention was the use of the Headspace mindfulness-based smartphone application. Headspace is a free evidence-based mindfulness smartphone application. This required participants to have access to a smartphone. The application worked on both Android and Apple smartphone platforms. The participant was asked to make an account within the application. The participant had to provide his name, email, and a chosen password in order to create an account. The application then proceeded to ask the parent three questions in regards to any past experience of using mindfulness practices. There were various mindfulness sessions offered within the application. The parent was directed to use the "Basics" mindfulness guided recordings over the course of four weeks. The "Basics" recordings are ten mindfulness sessions. The individual was able to choose the length of time for each session ranging from three to ten minutes. The sessions could be replayed as many times as the individual desires. This allowed the parent to replay a session that may be interrupted or found to be beneficial. The parent

was given written instructions and one-on-one guidance on how to download the Headspace application and access the “Basics” recordings.

Following the 4-week period, the participating parents received a follow-up email from the PI using the email address provided on the PSS handout. The follow-up email asked the participants to again answer the 10-question PSS. The follow-up self-reported stress level was used as the post-intervention stress score. Attaining the follow-up scores was the final part of the intervention.

### **Outcome Measures**

The PSS was used to measure the outcome of the intervention. The PSS is composed of 10-questions answered by using a 5-point Likert rating scale (Cohen, Kamarck, & Mermelstein, 1983; Cohen & Williamson, 1988) (see Appendix C). The responses by the individual participant were added together to achieve the stress score. The higher the score translates to the more perceived stress the individual was experiencing. A score ranging from 0 to 13 is considered low stress. A score ranging from 14 to 26 is considered moderate stress. A score of 27 to 40 is considered high stress. The pre-intervention scores and post-intervention scores were compared in order to evaluate the effectiveness of the mindfulness smartphone application intervention. There was no requirement for permission in order to use the PSS.

### **Project Timeline**

The Gantt chart illustrated in Appendix F outlines the timeline for this quality improvement project.



### **Resources Needed/Economic Considerations (Project Budget)**

This quality improvement project was a low-cost project. The cost was to print the consent forms, the PSS forms, and the step-by-step guide to downloading Headspace flyer. There was the additional cost of purchasing a hard drive to secure the data collected. The final cost of the project was gift cards for participants who complete the intervention. The overall budget for the quality improvement project was \$160 (see Appendix G).

### **Evaluation Plan**

#### **Data Maintenance/Security**

The data collected from the quality improvement project was stored on a password protected external hard drive. The data collected on paper was transcribed onto the hard drive by the PI. The PI and project chair had access to the hard drive. The participants' email addresses were only be saved on the hard drive until the gift cards were emailed. The data was saved under the individual's assigned number. This hard drive was kept in a key-locked cabinet in a key-locked room. The PI kept the keys to this cabinet and room. Written informed consents, aggregate data and study records were stored and maintained at the Rutgers University School of Nursing, 65 Bergen Street; Newark, New Jersey 07107 within the office of Dr. Sallie Porter and held in accordance of the Rutgers University Office of Information Technology guidelines.

### **Results**

Data was collected in the pre-intervention and post-intervention periods. Nine parents ( $n=9$ ) enrolled in the quality improvement project and completed the pre-intervention stress scale. Of the nine parents, only one parent completed the post-

intervention survey. The mean pre-intervention stress score for the total population was 19.56 (See Table 1). The mode pre-intervention stress score for the total population was 24 (See Table 1). This mean and mode stress scores are considered moderate stress scores on the PSS. The range of reported pre-intervention stress scores was 8 to 26.

The pre-intervention stress scores did not differ by gender. The average stress score for men was 19 and for females it was 19.7 (See Table 2). Both of these averages are in the moderate stress level. There were differences among the stress scores according to the age groups of the participants (See Table 3). The participants between ages 31-35 and 41-45 had lower stress scores than those in the 36-40 and 45-50 age groups.

When looking at the one participant who completed the pre-intervention and post-intervention PSS, there was a difference in the stress scores (See Table 4). The participant had an initial stress score of 23. Following the intervention, the participant reported a stress score of 15.

### **Discussion**

This quality improvement project aimed to better understand and help alleviate the stress levels of parents caring for children with developmental concerns.

#### **Barriers to Recruitment**

Recruitment was hampered by the limited number of appointments each day. There are a limited amount of new patients scheduled each day. Each new patient in the practice was scheduled for either a 45-minute or 90-minute appointment. These extended appointment times limited the amount of parents present to possibly enroll in the quality improvement project. The potential participants were further restricted due to the inclusion criteria of being fluent in English and having daily access to a smartphone.

Another limitation observed was the support present with the participating parents. Of the nine participants, eight of the parents had a second caregiver present who watched their child in the waiting room as they enrolled in the quality improvement project. Not having someone to watch their child while they completed the survey may have been a reason parents declined from participating in the quality improvement project.

### **Limitations**

Unfortunately, a number of limitations occurred while implementing the project. One limitation of the study was the small population that was eligible to participate in the quality improvement project which lead to a small sample size of participants. The limited sample size impacts the ability to draw broader conclusions about parental stress levels. A significant limitation is that only one participant responded to the post-intervention PSS. The effectiveness of the mindfulness application could not be evaluated as there was only one participant who completed the task. Another limitation is the Headspace software does not allow for the PI to track the progress of the participants using the application. It is unknown if any of the eight participants who did not complete the post-intervention PSS completed any of the mindfulness sessions on Headspace. The quality improvement project did not have a control group and relied on self-reported stress scores.

Another aspect of the developmental practice that may have had an effect on the participants was the structure of the initial appointments at this practice shifted from a diagnostic focus to an intake focus during the development of this quality improvement project. The initial 45-minute appointments were now focused on the history-taking of the patient instead of diagnosing a child's developmental disabilities. This may have been

a limitation of the study as parents may not have been receiving the answers they were hoping for during this initial developmental appointment. This may have further affected stress levels and why parents did not complete the study.

Despite these limitations, the results gathered from the initial PSS scores are meaningful. Eight of the nine participants reported moderate stress levels. These findings support parents caring for children with developmental concerns experience elevated stress levels. The elevated stress levels experienced by these parents can have an effect on everyone in the family (Neece, et al., 2012). Although it is unknown if the practice of mindfulness did lower stress levels. The one participant who completed the post-intervention PSS did report a lower stress score. With only one post-intervention stress score, it cannot be determined if the mindfulness smartphone application had a impact on parental stress levels.

### **Implications for Practice**

#### **Implications for Clinical Research and Practice**

This quality improvement project has implications for clinical research and practice. The majority of parents reported moderate stress scores with a few being on the edge of being high stress scores. This is an important finding for healthcare providers to keep in mind when evaluating patients and parents. Healthcare providers need to be better understand the stress parents are experiencing caring for children with developmental concerns. Increased stress levels in parents have been found to lead to mental health difficulties in their children who are at high-risk for ASD diagnosis (Crea, Dissanayake & Hudry, 2016). Identifying the parents who are experiencing increased stress would be beneficial for the healthcare provider to intervene to lessen the effects the parental stress

may have on the child. The average pre-intervention stress score of the participants was within the moderate stress range. This finding highlights the need to continue to research parental stress. The moderate levels of stress parents are reporting could be negatively affecting the patients.

Further research focusing on parental stress would help providers to help families overcome this difficulty. The providers at the recruitment site agree with the need to address parental stress at the evaluations. Currently, the individual provider is responsible for knowing and recommending available resources and coping mechanisms to parents. The providers stated more and different resources are necessary to provide parents with better suggestions for coping with their stress levels. Further research would help to identify additional, effective coping mechanisms for parents and for providers to recommend.

### **Implications for Education**

The project findings reflect the need for an educational focus on parental stress. Mindfulness stress reduction programs have been found to alleviate stress levels in parents caring for children with chronic conditions (Minor et al., 2006). Mindfulness programs have found to be effective in different forms whether it be a live course or online program (Cavanagh et al., 2013; Lo, Wong, Wong, Yeung, Snel, & Wong, 2017). Providers should be aware of the various options of providing mindfulness stress reductions practices. The stress reduction technique needs to be individualized for each parent. One parent may prefer the online course while another parent prefers the live course. Further research is needed in order to evaluate the effectiveness of a variety of stress reduction techniques. With further research, a healthcare provider would be able to

offer a variety of stress reduction techniques and parents would be able to choose the technique they prefer.

### **Implications for Healthcare Policy**

Healthcare policies should be developed in order to encourage and promote assessing parental stress levels during pediatric healthcare encounters. The American Academy of Pediatrics only has a recommendation for evaluating parental stress levels during the postpartum period and currently does not have any recommendation regarding assessing parental stress levels outside of the newborn period (2019). The National Association of Pediatric Nurse Practitioners (2013) recommends children's mental health should be evaluated at every encounter. The organization does not have any recommendation regarding the assessment of parental mental health. These two organizations should emphasize the importance of assessing parental stress during every pediatric encounter. A change in policy would ensure providers acknowledge and follow through with addressing parental stress levels.

### **Plans for Future Scholarship**

The quality improvement project's findings support the need to further study parental stress levels of parents caring for children with developmental concerns. Further research is needed to find readily available and effective methods of coping for these parents. This quality improvement project was designed with the ability to make suggestions for further research. Expanding the population to any parent caring for a child with developmental concerns and being able to track the participants' progress in a mindfulness application would be ideal. This would create a larger population, help better

understand how often parents have the time to practice mindfulness, and help to show if there is a relationship between the practice of mindfulness and lowering stress scores.

The results of this quality improvement project will be disseminated in a variety of platforms. In May 2018, the project's proposal was presented at the New Jersey Leadership Education in Neurodevelopmental and Related Disabilities graduation. The quality improvement project was presented at Rutgers University to the project committee and others who attend. The project and results were presented at the Rutgers University School of Nursing DNP Poster Day.

### **Conclusion**

This quality improvement project focused on examining whether a mindfulness-based smartphone application would alleviate stress levels of parents caring for children with developmental concerns. Nine parents agreed to participate in the study and provided pre-intervention stress scores. The study population reported a moderate level of stress on average. Due to the lack of post-intervention stress scores, a relationship between the practice of mindfulness and stress levels was not established. There were limitations experienced throughout this quality improvement project which could be controlled better in further research. Further research is needed to find effective coping methods for parents caring for children with developmental concerns. Screening for parental stress enhances family centered care by promoting the mental health of the family as a whole. Providing stress relieving resources ensures the parents learn healthy coping mechanisms for periods of increased stress. As the demand for developmental healthcare providers grows, so does the need for adequate support services for parents caring for this special population of children every day.

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Table 1				
<i>Pre-Intervention Stress Scores of Total Population</i>				
<u>Total Number of Participants</u>	<u>Mean Stress Score</u>	<u>Mode</u>	<u>Median</u>	<u>Range</u>
9	19.56	24	23	8-26

Table 2

*Pre-Intervention Stress Scores By Sex*

<u>Gender</u>	<u>Number of Participants</u>	<u>Mean Stress Score</u>	<u>Median</u>	<u>Mode</u>	<u>Range</u>
Male	2	19	19	none	12-26
Female	7	19.7	23	24	8-25

Table 3				
<i>Pre-Intervention Stress Scores By Age</i>				
<u>Age Range</u>	<u>Number of Participants</u>	<u>Mean Stress Score</u>	<u>Median</u>	<u>Range</u>
31-35	3	15.33	15	12-19
36-40	3	24	24	23-25
41-45	2	16	16	8-24
46-50	1	26	26	26

Table 4		
<i>Pre-Intervention and Post-Intervention Stress Score</i>		
<u>Number of Participants</u>	<u>Pre-Intervention</u>	<u>Post-Intervention</u>
1	23	15



Appendix A  
Table of Evidence

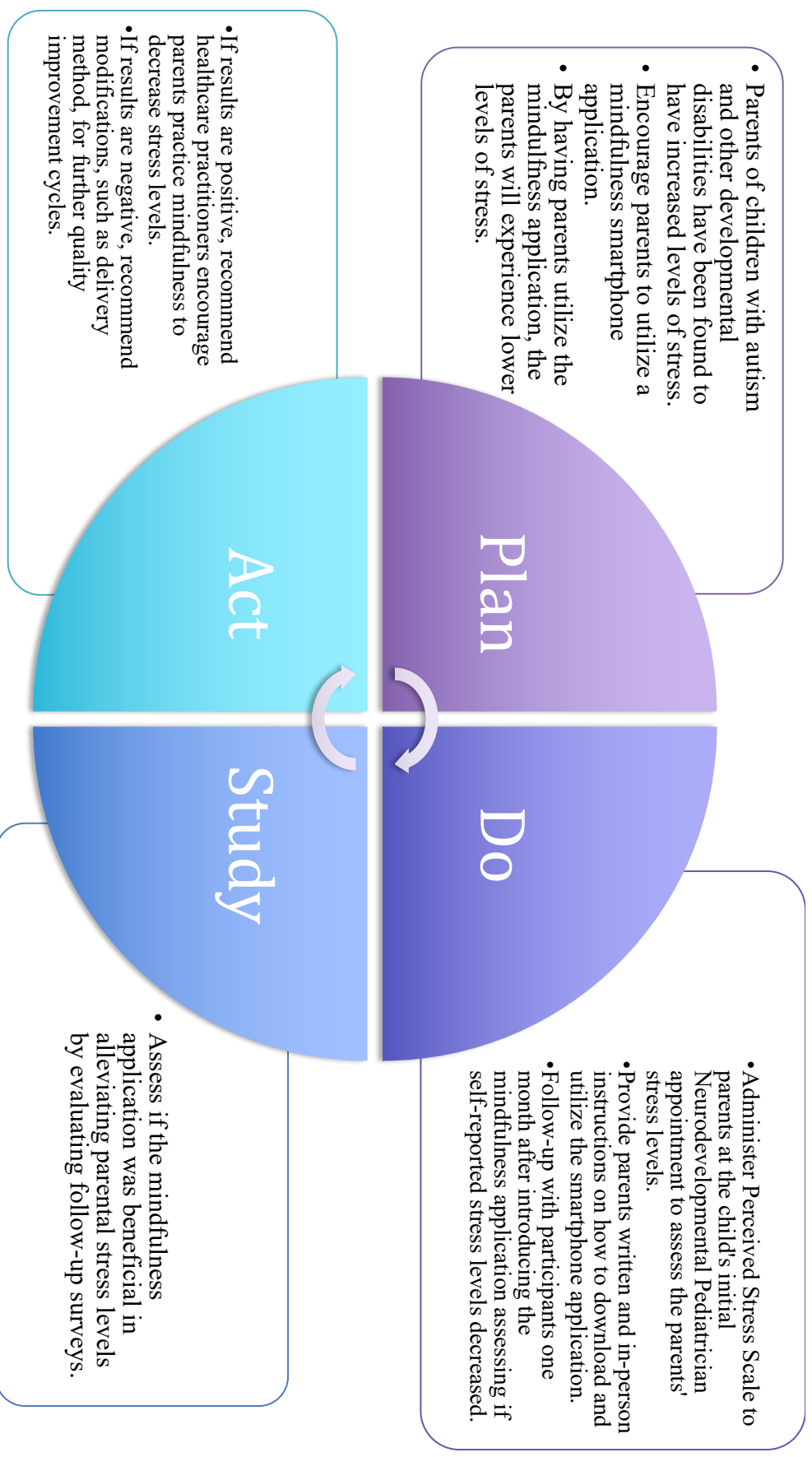
Article #	Author & Date	Evidence Type	Sample, Sample Size, Setting	Study findings that help answer the EBP Question	Limitations	Evidence Level & Quality
1	Minor, H.G., Carlson, L.E., Mackenzie, M.J., Zernicke, K., & Jones, L. (2006).	Observational analytic-cohort study	Convenience sample 44 caregivers Alberta Children's Hospital- tertiary care setting	SOSI Total Stress scores had a statistically significant decrease in the 8-week period following a Mindfulness-Based Stress Reduction (MBSR) program Reduction of stress symptoms reported by participants	-Lack of randomized control group to compare results. -Systematic data was not collected in regards to practice at home. -MBSR program was a significant time commitment for caregivers.	Non-experimental – Level III High quality
2	Neece, C.L., (2013).	Randomized Control Trial	Randomized 46 parents participating in the Mindful Awareness for Parenting Stress Project at Loma Linda University	-Treatment group has lower stress scores on Parenting Stress Index (PSI). -Mindful-based Stress Reduction intervention successfully lowered parental stress.	-Small sample size limited the ability to find smaller effects that are possibly present. -The study did not have an active treatment control group. Findings suggest MBSR is better than no treatment at all. -Data relied on parents self-reporting.	Level I High quality
3	Dykens, E. M., Fisher, M. H.,	Randomized Control Trial	Randomized 243 mothers of children with autism or	-Mothers in MBSR intervention group has significant decrease in stress, anxiety, depression	-There was no untreated control group. -The effects of maternal improvements on the	Level I High quality

	Taylor, J. L., Lambert, W., & Miodrag, N., (2014).		developmental disabilities	and insomnia. -Depression, anxiety, and life satisfaction continued to improve during follow-ups up to 6 months after treatment for both MBSR and Positive Adult Development intervention groups.	children were not tested. -Data relied on the mothers self-reporting. -Subjects dropping from the study due to life circumstances.	
4	Lo, H. H., Wong, S. W., Wong, J. Y., Yeung, J. W., Snel, E., & Wong, S. Y., (2017).	Randomized Control Trial	Randomized 100 children diagnosed with ADHD and their parents	-The intervention group saw a statistically significant improvement in Parenting Stress Index (PSI) scores. -The children in the treatment group experienced a reduction in inattention and hyperactivity symptoms.	-Parents were self-reporting data regarding themselves and their child's behavior. -Short project period did not allow to test the sustainability of the intervention. -Small proportion of female children involved in the study.	Level I High quality
5	Yang, E., Schamber, E., Meyer, R. M., & Gold, J. I. (2018).	Randomized Control Trial	88 medical school students	-The smartphone application intervention group exhibited significantly decreased stress levels as compared to the control group using the Perceived Stress Scale.	-Medical students had to self-report the questionnaires. -Intervention period was short.	Level I High quality
6	Cavanagh, K., Strauss, C., Cicconi, F., Griffiths, N., Wyper,	Randomized Control Trial	104 students in the South of England	-Students in the mindfulness intervention group experienced a significant decrease in Perceived Stress Scores. -A short online meditation	-Intervention was brief and no follow-up was collected. -There was a high attrition rate for those who began the study and those who completed the study.	Level I High quality

	A., & Jones, F. (2013).			intervention increased mindfulness and decreased perceived stress.		
7	Krusche, A., Cyhlarova, E., King, S., & Williams, J. M. (2012).	Observational analytic-cohort study	100 participants recruited to participate on online mindfulness training platform	-There was a significant decrease in the Perceived Stress scores following completing the online mindfulness intervention and 1 month after.	-There was no control group. -Unaware of any other factors that may have lead to the reduction of the PSS scores -The data was self-reported by the participants. -No data in regards to the clinical status of the participants was collected.	Non-experimental Level III High quality
8	Wylde, C. M., Mahrer, N. E., Meyer, R. M., & Gold, J. I. (2017).	Randomized Control Trial	95 pediatric nurses	-Nurses who used the smartphone mindfulness application reported significantly higher mindfulness scores and less burnout as compared to the traditional mindfulness program group.	-Small sample size. -Brief version of traditional mindfulness program was utilized for this study. -Data was not collected if nurses were using mindfulness on their own time.	Level I High quality
9	Coulon, S. M., Monroe, C. M., & West, D. S. (2016)	Systematic Review	60 smartphone applications	-32 smartphone applications were found to be evidence-based for stress management. -Headspace smartphone application is an evidence-based mindfulness/meditation application for stress management.	-Only the Apple App store was searched for smartphone applications.	Level III Good quality

10	Brown, K. W., Ryan, R. M., & Creswell, J. D. (2007)	Literature review	N/A	<p>-Mindfulness-Based Stress Reduction programs have shown to decrease depressive symptoms, anxiety, and stress.</p> <p>-Being in a mindful state is related to a higher well-being.</p>	<p>-Some of the Randomized Control Trials reviewed had small sample sizes.</p> <p>-Different measurement instruments were used throughout the RCTs reviewed.</p>	Level V High quality
11	Greenlee, H., DuPont-Reyes, M. J., Balneaves, L. G., Carlson, L. E., Cohen, M. R., Deng, G., Johnson, J.A., Mumber, M., Seely, D., Zick, S.M., Boyce, L.M., & Tripathy, D. (2017).	Clinical Practice Guideline	N/A	<p>-Meditation is recommended to reduce anxiety and stress in patients.</p> <p>-Meditation therapies have little risk to patients.</p>	<p>-Guidelines focused on women diagnosed with breast cancer.</p>	Level IV High quality

Appendix B  
**PDSA Concept Map: Utilizing a Mindfulness Application to Lower the Stress Levels of Parents with Children Diagnosed with Autism and Other Developmental Disabilities**



Reference: Institute for Healthcare Improvement. (2017). Plan-Do-Study-Act (PDSA) worksheet. Retrieved from <http://www.ihi.org/resources/Pages/Tools/PlanDoStudyActWorksheet.aspx>



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### Appendix C Perceived Stress Scale

Please answer the following questions by indicating how often you thought or felt a certain way in the last month.

Date: \_\_\_\_\_ Age Range: \_\_\_\_ 18-25 \_\_\_\_ 26-30 \_\_\_\_ 31-35 \_\_\_\_ 36-40 \_\_\_\_ 41-45 \_\_\_\_ 46-50  
Gender: Male Female Other

**0=Never 1=Almost Never 2=Sometimes 3=Fairly Often 4=Very Often**

	0	1	2	3	4
1. In the last month, how often have you been upset because of something that happened unexpectedly?					
2. In the last month, how often have you felt that you were unable to control the important things in your life?					
3. In the last month, how often have you felt nervous and "stressed"?					
4. In the last month, how often have you felt confident about your ability to handle your personal problems?					
5. In the last month, how often have you felt that things were going your way?					
6. In the last month, how often have you found that you could not cope with all the things that you had to do?					
7. In the last month, how often have you been able to control irritations in your life?					
8. In the last month, how often have you felt that you were on top of things?					
9. In the last month, how often have you been angered because of things that were outside of your control?					
10. In the last month, how often have you felt difficulties were piling up so high that you could not overcome them?					

#### References:

- Cohen, S., Kamarck, T., & Mermelstein, R. (1983). A global measure of perceived stress. *Journal of Health and Social Behavior*, 24(4), 385-396. Retrieved from <http://www.psy.cmu.edu/~scohen/globalmeas83.pdf>
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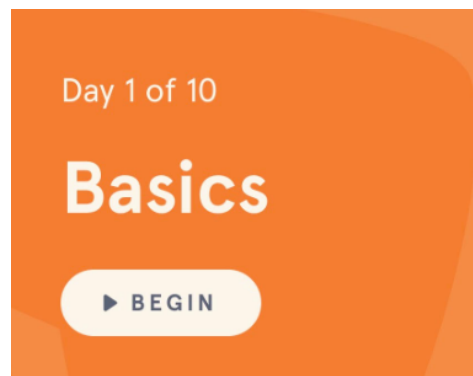
Fax: (973) 972-3225

## Appendix D How to Download Headspace? The Mindfulness Based Smartphone Application

1. Open Google's Play Store on your Android device or the App Store on your Apple device.
2. Search for "Headspace".
3. Select the "Headspace: Meditation" application. The name will appear as this picture below.



4. When you open the application, you will be prompted to create an account.
5. The Headspace application will ask you a few simple questions to understand your past experience with mindfulness better. You can enable or disable a daily notification reminding you to meditate.
6. When you are on the home screen of the application, the "Basics" recordings will appear. The screen will appear in this manner.



7. These 10 sessions can be done over the 4-week period.



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## Appendix E CONSENT TO TAKE PART IN A RESEARCH STUDY

**TITLE OF STUDY:** Lowering Parental Stress Levels Through Use of Mindfulness-Based Smartphone Application

**Principal Investigator:** Gabriela Fernandes

This informed consent form provides information about a research study and what will be asked of you if you choose to take part in it. If you have any questions now or during the study, if you choose to take part in it, you should feel free to ask them and should expect to be given answers you completely understand. It is your choice whether to take part in the research. Your alternative to taking part is not to take part in the research.

After all of your questions have been answered and you wish to take part in the research study, you will be asked to sign this informed consent form. You are not giving up any of your legal rights by agreeing to take part in this research or by signing this consent form.

### **Who is conducting this research study?**

Gabriela Fernandes is the Principal Investigator of this research study. A Principal Investigator has the overall responsibility for the conduct of the research. However, there are often other individuals who are part of the research team.

Gabriela Fernandes may be reached at [REDACTED] NJ.

Gabriela Fernandes or another member of the study team will also be asked to sign this informed consent. You will be given a copy of the signed consent form to keep.

### **Why is this study being done?**

This study is being done in order to evaluate if smartphone-based mindfulness lowers stress self-reported stress levels.

### **Who may take part in this study and who may not?**

English-speaking parents present for initial developmental-behavioral appointment who have daily access to a smartphone and willing to download the Headspace mobile app. Parents who are non-English speaking or unable to download the Headspace mobile application may not take part of the study.



**Why have I been asked to take part in this study?**

To understand if smartphone-based mindfulness lowers your stress levels over the period of four weeks. You have been approached to participate in this study as a parent of a child being evaluated by a developmental-behavioral healthcare provider for the first time.

**How long will the study take and how many subjects will take part?**

Up to 30 parents will participate. As a participant, the study will be four weeks from the initial appointment.

**What will I be asked to do if I take part in this study?**

You will be asked to download the smartphone application and respond to the Perceived Stress Scale handout. The Perceived Stress Scale consists of 10 questions regarding your feelings over the past month. The responses are on scale ranging from never to very often. You will use the “Basics” recordings over a period of four weeks. You will be asked to listen to a 3-10 minute mindfulness recording 2-3 times per week over a four-week period. In order to setup a Headspace account, parents will need to provide their name, email address, and chosen password. The Headspace sessions are recordings in which you will be guided in clearing your thoughts and focusing on your presence and breathing. Following the four-week period, you will receive an email in order to respond to the Perceived Stress Scale handout again.

**What are the risks and/or discomforts I might experience if I take part in this study?**

The risks of participating in this study are not experiencing lower stress scales after using the mindfulness application and the possible breach of confidentiality.

**Are there any benefits to me if I choose to take part in this study?**

The benefits of taking part in this study may be:

Experiencing lower stress levels

However, it is possible that you may not receive any direct benefit from taking part in this study.

**What are my alternatives if I do not want to take part in this study?**

There are no alternative treatments available. Your alternative is not to take part in this study.

**How will I know if new information is learned that may affect whether I am willing to stay in the study?**

During the course of the study, you will be updated about any new information that may affect whether you are willing to continue taking part in the study. If new information is learned that may affect you after the study or your follow-up is completed, you will be contacted.

**Will there be any cost to me to take part in this study?**

There is no cost to you to participate in this study.

**Will I be paid to take part in this study?**

You will receive a \$10 electronic gift card after completing the final email of the study.

**Who might benefit financially from this research?**

No one benefits financially from this research.

**How will information about me be kept private or confidential?**

All efforts will be made to keep your personal information in your research record confidential, but total confidentiality cannot be guaranteed. Your email will be the only identifiable information kept during the study. Your information will be stored in a password-encrypted hard drive in a locked cabinet in a locked room.

**What will happen if I do not wish to take part in the study or if I later decide not to stay in the study?**

It is your choice whether to take part in the research. You may choose to take part, not to take part or you may change your mind and withdraw from the study at any time.

If you do not want to enter the study or decide to stop taking part, your relationship with [REDACTED] not change, and you may do so without penalty and without loss of benefits to which you are otherwise entitled.

You may also withdraw your consent for the use of data already collected about you, but you must do this in writing to Gabriela Fernandes 65 Bergen Street Newark NJ.

If you decide to withdraw from the study for any reason, you may be asked to return for at least one additional visit for safety reasons.

**Who can I call if I have questions?**

If you have questions about taking part in this study or if you feel you may have suffered a research related injury, you can call the study [REDACTED]

If you have questions about your rights as a research subject, you can call the IRB Director at:

Newark Health Sciences (973)-972-3608 or the Rutgers Human Subjects Protection Program at (973)972-1149 in Newark.

## AGREEMENT TO PARTICIPATE

### 1. Subject consent:

I have read this entire consent form, or it has been read to me, and I believe that I understand what has been discussed. All of my questions about this form and this study have been answered. I agree to take part in this study.

Subject Name: \_\_\_\_\_  
\_\_\_\_\_

Subject Signature: \_\_\_\_\_ Date: \_\_\_\_\_  
\_\_\_\_\_

### 2. Signature of Investigator/Individual Obtaining Consent:

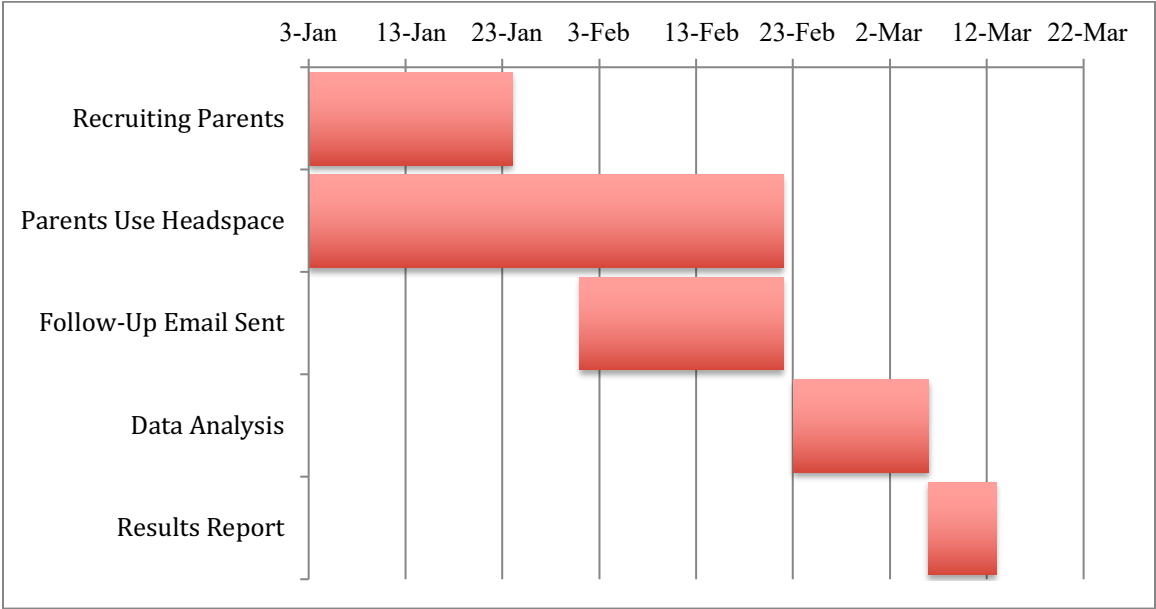
To the best of my ability, I have explained and discussed all the important details about the study including all of the information contained in this consent form.

Investigator/Person Obtaining Consent (printed name):  
\_\_\_\_\_

Signature: \_\_\_\_\_  
Date: \_\_\_\_\_

Appendix F

Gantt Chart



Appendix G

Table 5	
<i>Quality Improvement Project Budget</i>	
<u>Item</u>	<u>Cost (\$)</u>
Printed Handouts	100
Password-protected Hard Drive	50
Online Gift Cards	10
Total	160



Robert Wood Johnson  
Medical School

## Appendix H Poster Presentation for LEND Graduation

**THE BOGGS CENTER ON DEVELOPMENTAL DISABILITIES**  
*New Jersey's University Center for Excellence in Developmental Disabilities Education, Research, and Service*  
*New Jersey's Leadership Education in Neurodevelopmental and Related Disabilities Program*

# Lowering Parental Stress Levels By Use of Mindfulness Smartphone Application

Gabriela Fernandes, RN, BSN, Doctor of Nursing Practice Pediatric Primary Care student  
Sallie Porter, DNP PhD APN RN-BC CPNP FNP, Nursing Discipline Coordinator, Rutgers School of Nursing

## Background & Significance

- Approximately 15% of children ages 3 - 17 years have at least one developmental disability.
- Evidence shows parents of children with undiagnosed conditions have increased rates of anxiety and depression (Mcconkie-Rosell, Hooper, Pena, Schoch, Spillmann, Jlang, et al, 2018).
- Often even waiting for initial evaluation appointment can be stressful. One study found the average waiting period for a developmental-behavioral pediatric appointment across the country was 5.4 months (Jimenez, Alcaraz, Williams & Strom, 2017).
- Developmental-behavioral healthcare providers should be aware of the increased stress levels parents are experiencing during these visits.

## Needs Assessment

- New Jersey has an increased prevalence with certain diagnoses of developmental disabilities.
- The prevalence of children diagnosed with Autism Spectrum Disorder is 1 in 41 children in New Jersey (Autism New Jersey, 2016).
- Parents caring for children with developmental disabilities should be offered methods to cope with the increased stress of caregiving.
- The practice of mindfulness could help parents to alleviate stress in a healthy manner.
- Parents should be offered guidance and support strategies during the initial developmental-behavioral pediatric appointment.
- Evaluating parental stress levels during this appointment is important in order to achieve family-centered care.

## Purpose Statement

## Clinical Question

- When assessing the stress levels of parents of children with undiagnosed developmental concerns, does one month of using a mindfulness smartphone application decrease stress levels?

## Aims & Objectives

- Aim: To provide parents of children with developmental concerns an easily accessible method of reducing stress.
- Objective: After one month of using the mindfulness-based smartphone application, parents of children with developmental concerns will self-report lowered stress scores.

## Review of Literature

- Mindfulness-based interventions make a significant impact in decreasing stress levels of parents of children with developmental concerns and chronic conditions.
- Web-based and mobile-based mindfulness programs are effective in decreasing individual's stress levels.
- Mindfulness-based smartphone applications are a convenient, accessible, and effective method of alleviating stress.

## Framework

- The theoretical framework of this quality improvement project is the Plan-Do-Study-Act Cycle.

## Methodology

- Setting will be an outpatient developmental-behavioral pediatric practice.
- A convenience sample of parents, present for the initial developmental-behavioral appointment, will be recruited. Parents will respond to the 10-question Perceived Stress Scale for baseline stress score.
- Parents will be given written instructions and one-on-one instruction on how to download the Headspace mindfulness-based smartphone application.
- Parents will be given 4 weeks to complete a 10-session mindfulness based program on Headspace.
- Following the 4-week period, parents will be asked to repeat a response to the Perceived Stress Scale. This will be the post-intervention stress score.

## Anticipated Findings

- It is expected parents will report lower stress scores as compared to the baseline scores following the 10-session mindfulness-based smartphone application.

## References

- Autism New Jersey. (2016). Prevalence rate in New Jersey rises to 1 in 41. Retrieved from <https://www.autismnj.org/prevalence-rates>
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Appendix I  
Poster Presentation for Rutgers Poster Day



**RUTGERS**  
School of Nursing

**Lowering Parental Stress Levels By Use of Mindfulness Smartphone Application**

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**Background & Significance**

- Approximately 15% of children ages 3-17 years have at least one developmental disability.
- Evidence shows parents of children with undiagnosed conditions have increased rates of anxiety and depression (Mcconkie-Rosell, Hooper, Perna, Spillman, Jiang, et al, 2018).
- The prevalence of children diagnosed with Autism Spectrum Disorder is 1 in 34 children in New Jersey (Autism New Jersey, 2018).
- Often even waiting for initial evaluation appointment can be stressful. One study found the average waiting period for a developmental-behavioral pediatric appointment across the country was 5.4 months (Jimenez, Alcaraz, Williams & Strom, 2017).
- Developmental-behavioral healthcare providers should be aware of the increased stress levels parents may experience.
- The practice of mindfulness may help parents to alleviate stress in a healthy manner.

**Purpose Statement**

- Parents should be offered guidance and support strategies during the initial developmental-behavior pediatric evaluation appointment.

**Clinical Question**

For parents of children with undiagnosed developmental concerns, does one month of using a mindfulness smartphone application decrease stress levels?

**Methods**

- Setting was an outpatient developmental-behavioral pediatric practice.
- A convenience sample of parents, present for the initial developmental-behavioral appointment, were recruited.
- 9 parents (n=9) were recruited over a 3 week period.
- Parents responded to the 10-question Perceived Stress Scale for baseline stress score.
- Parents were given written instructions and one-on-one instruction on how to download the Headspace mindfulness-based smartphone application.
- Parents were given 4 weeks to complete a 10-session mindfulness based program on Headspace.
- Following the 4-week period, parents were asked to repeat a response to the Perceived Stress Scale. This was the post-intervention stress score.

**Results**

Table 1

Pre-Intervention Stress Scores of Total Population				
Total Number of Participants	Mean Stress Score	Mode	Median	Range
9	19.56	24	23	8-26

Table 2

Pre-Intervention Stress Scores By Sex				
Gender	Number of Participants	Mean Stress Score	Median	Range
Male	2	19	19	12-26
Female	7	19.7	23	8-25

Table 3

Pre-Intervention Stress Scores By Age				
Age Range	Number of Participants	Mean Stress Score	Median	Range
31-35	3	15.33	15	12-19
36-40	3	24	24	23-25
41-45	2	16	16	8-24
46-50	1	26	26	26

Table 4

Pre-Intervention and Post-Intervention Stress Score		
Number of Participants	Pre-Intervention	Post-Intervention
23	23	15

**Discussion**

- Limitations:**
  - Small sample size (n=9)
  - Only one participant completed the intervention
  - Unable to determine whether other participants used Headspace at all
  - Limited number of new patient appointments each day
  - Each new patient appointment is either 45 or 90 minutes.
- The parents reporting moderate stress scores on average shows the importance of continuing to examine parental stress.
- The elevated stress levels can have an effect on the child and family unit.
- The one parent who completed both the pre-intervention and post-intervention Perceived Stress Scales did report a decrease in stress.



**References**

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