

A SYSTEMATIC REVIEW OF POTENTIAL MINDFULNESS ASSESSMENT TOOLS FOR PARENTING CHILDREN WITH AUTISM

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ABSTRACT

Autism Spectrum Disorder (ASD) presents lifelong challenges to children's cognitive, social, and communication skills, often resulting in substantial parental stress. Mindfulness-based interventions have emerged as promising approaches to alleviate stress and improve the well-being of parents raising children with ASD. This paper conducts a comprehensive systematic review and critical evaluation of existing mindfulness assessment tools specifically tailored to this demographic. We assess these tools against a set of established criteria, offering a nuanced understanding of their applicability and effectiveness in the unique context of parenting children with ASD. By conducting this in-depth analysis, we aim to provide valuable insights that can inform and enhance support systems and interventions for families navigating the distinct challenges of ASD parenting. More than an academic pursuit, this study aspires to empower parents in their journey of self-discovery and acceptance. We believe that equipping them with the knowledge of effective tools to enhance their well-being is a vital step toward offering practical and meaningful assistance. This research, therefore, underscores the profound theme of empowerment, arming parents with the resources they need to navigate the complex landscape of raising children with ASD with resilience and confidence.

Introduction

According to recent statistics, the prevalence of Autism Spectrum Disorder (ASD) diagnoses has been steadily increasing, impacting an ever-growing number of families. Behind these statistics lie countless personal stories of parents facing unique challenges and triumphs in their journey.

Importance of Assessing Mindfulness

Mindfulness, the practice of being fully present and aware now, has gained recognition for its potential benefits in managing stress, improving emotional well-being, and enhancing parenting skills. Assessing mindfulness in parents of children with autism becomes crucial because it can help identify whether incorporating mindfulness practices can be a valuable addition to their parenting toolkit.

Neurological Effects of Mindfulness

Research reported in a Scientific American article highlights the intriguing impact of mindfulness on the brain. MRI scans revealed that participation in an eight-week mindfulness practice leads to a notable change in the amygdala, a brain region responsible for triggering the 'fight or flight' response, primarily associated with fear and emotional reactions. The study suggests that this region appears to shrink after sustained mindfulness practice. Furthermore, this neuroscientific observation is significant as it underscores the connection between mindfulness and reductions in negative emotional states, such as fear, stress, and anxiety. In essence, mindfulness seems to play a role in reshaping our brain's response to stress and enhancing emotional well-being. Research on mindfulness meditation reveals fascinating insights into its impact on the brain. According to studies (Akirav & Richter-Levin, 2002; Kim, Lee, Han, & Packard, 2001), ongoing stress can alter brain areas associated with the amygdala, the region responsible for triggering the 'fight or flight' response, closely linked to fear and emotional reactions. Additionally, even single intense events can impact the limbic system (Gesing et al., 2001), while positive social interactions are shown to modify the brain in a nurturing manner. This neurological aspect underscores the critical role of mindfulness in reshaping the brain's response to stress and improving emotional well-being. Such findings set the stage for assessing the potential impact of mindfulness-based interventions on parents of children with autism. (Ryback, 2006)

Aim of This Review

The primary purpose of this review is to identify and evaluate existing assessment tools designed to measure mindfulness in parents who have children with autism. Research focuses, on clarifying and assessing the effectiveness of mindfulness-based interventions as a potential support system for these parents. Despite the growing interest in mindfulness-based interventions for parents of children with ASD, there exists a notable research gap. Specifically, there is a lack of comprehensive assessment tools tailored to the unique needs and experiences of this particular group of parents. This review aims to bridge that gap by systematically examining existing tools and shedding light on their applicability and effectiveness.

Research Questions

The foundation of this research lies in addressing specific questions that guide the systematic investigation of mindfulness assessment tools for parents of children with autism. These research questions have been carefully crafted to provide clarity and direction to the study:

- i. Research Question 1: How do I systematically search for mindfulness assessment tools designed for parents of children with autism?
- ii. Research Question 2: What are the key characteristics and psychometric properties of identified mindfulness assessment tools for parents of children with autism?
- iii. Research Question 3: What strengths and limitations are associated with each mindfulness assessment tool for parents of children with autism?

Methodology

Search Strategy

To systematically identify and evaluate mindfulness assessment tools designed for parents of children with autism, a rigorous search strategy was developed. This strategy aimed to locate pertinent studies and assessment tools within the field. The following steps outline the systematic search process:

Keyword Selection

A comprehensive set of keywords and phrases related to mindfulness, parenting, autism, and assessment tools was meticulously curated. These keywords were chosen to ensure the inclusiveness of the search, covering all relevant literature. Example Keywords:

- i. mindfulness
- ii. parenting
- iii. children with autism
- iv. assessment tools
- v. scales
- vi. questionnaires

Selection of Databases

Several well-regarded academic databases were selected to conduct the search, including PubMed, PsycINFO, and Google Scholar. These databases were chosen due to their extensive coverage of research literature in the domains of psychology, child development, and autism studies.

Inclusion Criteria

To refine the search results and focus on the most relevant studies, specific inclusion criteria were established. Studies meeting these criteria included those that provided detailed information on the psychometric properties, development, and validation of mindfulness assessment tools tailored for parents of children with autism.

Exclusion Criteria

Studies that did not meet the inclusion criteria were excluded from consideration. This included studies that primarily focused on general mindfulness interventions without specific tools designed for parents of children with autism.

Search Execution

The search was meticulously executed in the chosen databases using the defined keywords and criteria. This approach enabled the identification and retrieval of relevant studies and assessment tools for subsequent evaluation.

Research Instruments

The research instruments used in this study were selected based on a review of available mindfulness assessment tools and their suitability for evaluating parental mindfulness in the context of raising children with autism.

Tool 1: MAAS (Mindful Attention Awareness Scale)

The MAAS is a widely recognized self-report scale that measures an individual's general capacity for mindfulness. While not tailored specifically to parents of children with autism, it provides valuable insights into an individual's overall mindfulness awareness. It comprises 15 items designed to assess an individual's present-moment attention and awareness.

Tool 2: Interpersonal Mindfulness in Parenting Scale (IMP)

The Interpersonal Mindfulness in Parenting scale (IMP) is a specialized tool designed to evaluate mindfulness specifically in the context of parenting. It assesses the parent's ability to bring mindful attention to their interactions and relationships with their children. The IMP typically includes items related to listening, responding, and connecting mindfully with one's child.

Tool 3: Mindfulness In Parenting Questionnaire (MIPQ)

The Mindfulness in Parenting Questionnaire (MIPQ) is another mindfulness assessment tool tailored for parents. It focuses on assessing mindfulness skills and practices within the parenting role. The MIPQ typically includes items related to mindful parenting behaviours, such as patience, emotional regulation, and compassionate responses to the child's needs.

Tool 4: FFMQ (Five Facet Mindfulness Questionnaire)

The FFMQ is a comprehensive questionnaire designed to measure multiple facets or aspects of mindfulness. While it is not specific to parenting, it can still provide valuable insights into various dimensions of mindfulness that may be relevant to parents of children with autism. The FFMQ assesses five facets: observing, describing, acting with awareness, non-judging, and non-reactivity to inner experience.

Literature Review

Mental Health

In a seminal study by Kirk Warren Brown and Richard M. Ryan, researchers aimed to investigate the role of mindfulness, assessed both inter- and intra-individually, in psychological well-being. This study contributed to the growing interest in understanding the foundations of well-being, a trend that has gained momentum in recent years (Ryan & Deci, 2001; Seligman & Csikszentmihalyi, 2000).

The findings of this research underscore the significance of mindfulness as a reliably and validly measured characteristic with a substantial impact on various aspects of mental health. The study suggests that mindfulness has the potential to enhance well-being, shedding light on new pathways for improving mental health.

This pivotal research highlights the relevance of mindfulness assessment tools, such as the Mindful Attention Awareness Scale (MAAS), for understanding and promoting well-being, particularly in the context of parenting children with autism. Building upon this foundation, the present study aims to identify and evaluate existing mindfulness assessment tools tailored to parents of children with autism. ("Mindful Attention Awareness Scale (MAAS)," 2014).

Psychometric Measurement

Psychometric Measurement Psychometrics is a specialized field dedicated to the quantification and assessment of various psychological aspects within individuals. It offers valuable insights into attitudes and behaviours, making it an essential tool for understanding and evaluating individuals' mental states.

Application to Health and Well-Being Psychometric

These tools find extensive applications in health-related research, particularly in addressing the multifaceted challenges faced by individuals dealing with health conditions. In a recent study involving Iranian women with breast cancer, the importance of psychometric instruments became evident. This demographic often confronts complex health, psychological, social, and functional issues during their journey. Consequently, the need for precise assessment tools that can effectively gauge cognitive, behavioural, and physical symptoms in these patients becomes imperative (Nooripour et al., 2022).

Cognitive and Behavioural Assessment

Within the realm of psychometrics, specialized instruments have been developed to assess, diagnose, and mitigate cognitive and behavioural problems. These instruments provide a structured framework for comprehensively evaluating the cognitive and behavioural aspects of individuals dealing with health challenges. The study conducted by Nooripour et al. in 2022 underscores the importance of these instruments in understanding and addressing the unique needs of Iranian women with breast cancer.

Mealtime Behaviour

The assessment of mealtime behaviour in children, especially those with autism, is of paramount importance. The Brief Autism Mealtime Behaviour Inventory, or BAMBIC, represents a significant advancement in this area. Developed using factor analysis, BAMBIC exhibits stronger psychometrics compared to the original scale. It comprises three distinct subscales, each addressing specific feeding problems: Limited Variety, Food Refusal, and Disruptive Behaviour.

Notably, BAMBIC's utility extends to identifying and categorizing various feeding challenges that children may encounter. In particular, it effectively distinguishes between Limited Variety, Food Refusal, and Disruptive Behaviour. This nuanced approach allows for a more comprehensive understanding of a child's mealtime behaviour.

Research findings have shed light on factors associated with BAMBIC-assessed problems. It was observed that child gender, age, and diagnosis significantly influenced the nature of these issues. Boys tended to exhibit more Limited Variety, while younger children and those with special needs, including conditions other than autism spectrum disorder (ASD), displayed higher levels of Food Refusal. This variability underscores the importance of tailoring interventions to the specific needs of children based on these factors.

Moreover, parents' responses to BAMBIC-assessed feeding problems were found to vary based on their child's diagnosis. Parents of children with special needs, particularly those beyond ASD, tended to employ more permissive actions in response to Limited Variety and Food Refusal. This flexibility in their approach aligns with the unique requirements of children with special needs and reflects the caregivers' adaptability to address their specific challenges.

In cases where special needs children exhibited Disruptive Behaviour during meals, such as self-injury or aggression, parents adopted a different strategy. They increased their use of Positive Persuasion, emphasizing the positive aspects of the meal and its appeal to peers and family members. This tailored response highlights the dynamic nature of mealtime behaviour interventions and the importance of considering both the child's diagnosis and specific feeding challenges.

This research, conducted by Hendy et al. in 2013, underscores the nuanced relationship between mealtime behaviour, diagnosis, and parental responses. Understanding these dynamics is essential for providing effective support and interventions for children with autism and related disorders, particularly in the context of mealtime challenges. (Hendy et al., 2013).

Psychological Properties

In an Indonesian study, researchers explored the applicability of mindful parenting scales to various populations of parents. One such scale they investigated is the Interpersonal Mindfulness in Parenting (IMP) scale, developed by Duncan (2007) for parents of children aged 10-14. The IMP scale comprises four key dimensions: present-centered attention, present-centered emotional awareness, low reactivity, and non-judgmental acceptance

Recognizing the need for a mindful parenting scale that could be effectively utilized across diverse parental populations, McCaffrey (2015), in collaboration with McCaffrey, Reitman, and Black (2017), developed the Mindfulness in Parenting Questionnaire (MIPQ). This questionnaire was constructed using

the Item Response Theory (IRT) approach and aimed to provide a more versatile tool for assessing mindfulness in parenting practices (Febriani et al., 2021).

Psychometric Properties of the Dutch Version of MAAS-A

The factor structure and psychometric properties of the Dutch version of the Mindful Attention Awareness Scale for Adolescents (MAAS-A) were studied in a sample of adolescents. Mindfulness as measured by the MAAS-A correlated positively with quality of life, but an expected positive relationship with acceptance was not found. Mindfulness questionnaires with good psychometric properties are needed to determine whether mindfulness skills do indeed increase after participation in a mindfulness-based intervention in clinical and non-clinical populations and to assess whether this increase mediates the subsequent decrease in psychological or psychiatric symptoms (e.g., Baer et al. 2006; Bishop et al. 2004).

The Dutch version of the MAAS-A shows favourable psychometric properties which confirm the findings of the original USA-based MAAS-A. The Dutch version of the MAAS-A is reliable and consists of one factor in a sample of adolescents from the general community. In addition to the original MAAS-A, we found this one-factor structure and high internal consistency to be met in the younger adolescents since our sample consisted of 11–17-year-olds. Negative correlations were found with constructs such as rumination, catastrophizing, and stress, and positive correlations, as expected, were found with happiness, healthy self-regulation, quality of life, and another measure for mindfulness assessment in children and adolescents. (de Bruin et al., 2011).

Mindfulness Training

Alleviating Stress and Enhancing Well-being in Parents and Educators

The roles of parents and special educators involve substantial stressors that can impact their health, well-being, and the quality of care and education they provide. Surprisingly, there has been a lack of rigorous studies examining the effectiveness of mindfulness training (MT) as a strategy to mitigate stress, foster well-being, and enhance caregiving in these individuals. One plausible mechanism through which MT achieves stress reduction and promotes well-being is by nurturing positive self-directed attitudes. As participants become more attuned to their mental processes, including their typical emotional, behavioural, and cognitive patterns, they can release negative self-judgments and disengage from ruminative tendencies (Jain et al., 2007; Segal, Williams, & Teasdale, 2002).

This study presents initial evidence supporting the advantages of MT in reducing stress and anxiety while fostering psychological growth among parents and educators who work with children having unique emotional, cognitive, and behavioural needs. Remarkably, this research represents the first randomized control study that establishes the feasibility and effectiveness of group-based MT for this specific population over an extended period. These findings lay a strong foundation for future research, encouraging the replication and expansion of these results using a broader range of observational, biological, behavioural, and self-report measures (Benn et al., 2012).

Combined training between parents and child

Mindfulness training is anticipated to have a substantial impact on attention, anxiety, and depression. While related variables like rumination and worry have been incorporated into studies, future research should encompass assessments of internalizing and externalizing symptoms. For instance, a study by Spek et al. (2012) revealed significant reductions in feelings of anxiety and depression among adults with Autism Spectrum Disorder (ASD) following mindfulness training.

The integration of MYmind training for adolescents with ASD alongside Mindful Parenting has proven to be both feasible and promising. The results demonstrate positive effects on symptoms associated with ASD (though not on core ASD symptoms) such as improved social responsiveness and reductions in comorbid issues like rumination. Additionally, this combined approach has shown a broader impact on

parenting styles, general and parental mindful awareness (while not significantly affecting adolescent mindful awareness), and overall quality of life. (De Bruin et al., 2015).

Mindfulness in Parenting Questionnaire (MIPQ)

Mindful discipline, as explained by McCaffrey, Reitman, and Black (2017), encompasses a parent's ability to apply non-reactive parenting techniques. This approach emphasizes parenting with awareness and engaging in activities with a clear focus on parenting objectives. It allows parents to remain composed and purposeful in their parenting endeavours. When considering the impact of parenting stress, Bögels et al. (2013) suggest that, during stressful situations, parental knowledge and skills may temporarily falter but can be recalled when parents learn to recognize their emotions and effectively manage them, even in challenging circumstances. It's noteworthy that parenting stress is intricately connected to processes within the brain.

Parenting stress, often described as a stress response triggered by the demands of parenting roles (Deater & Deckard, in Cronin, Becher, Christians, Maher, & Dibb, 2015), reflects the level of stress experienced while fulfilling parental responsibilities (Hoekstra-Webers et al., in Zarina et al., 2012). According to Berry and Jones (1995), parenting stress comprises two distinct components: the pleasure component and the strain component. The pleasure component is associated with the sense of accomplishment and joy derived from fulfilling parental duties, such as experiencing happiness and affection (Zelman & Ferro, 2018) (Kumalasari & Fourianalistyawati, 2020).

Mindfulness-Based Interventions (MBIs)

To examine effects of family MBI on parental self-control as assessed with ecologically valid self-ratings (BRIEF-A) and objective computerised tasks and on psychological symptoms, well-being and mindful parenting of the parents (secondary outcome measures for parents). my tertiary aim is to look at the effects of family MBI on some exploratory measures such as mind-wandering

In the sessions (playful) mindfulness exercises are done and education is given around the following themes, one per session: 1) Beginners' mind, 2) Home in our body, 3) The breath, 4) Distractors! 5) Stress, 6) High way, walking way, 7) Acceptance & autonomy, and 8) The future. Both children and parents receive daily homework during the eight weeks of training (15 min for child and 30–45 min for parent, 6 days/week). Theory and exercises are described in a workbook that both children and parents receive together with audio-files to guide the mindfulness exercises. (Siebelink et al., 2018)

Five Facet Mindfulness Questionnaire (FFMQ)

The study found strong correlations between the short form and the full-length version of the FFMQ, indicating significant overlap between the two questionnaires. Furthermore, the internal consistency of the facets in the short form, as measured by Cronbach's alpha coefficient, was comparable to that of the original questionnaire. The short form also demonstrated similar levels of convergent and divergent validity and sensitivity to change when compared to the original scale. These collective findings suggest that the short form maintained adequate content validity and psychometric properties.

The study's newly developed short form was further validated in an independent sample comprising 146 fibromyalgia patients, providing additional support for the robustness of the study's results. Construct validity was assessed through confirmatory factor analyses and by examining the relationships between the FFMQ and measures of psychological symptoms, well-being, experiential avoidance, and personality traits such as neuroticism and openness to experience (Bohlmeijer et al., 2011).

FFMQ-15 for Stress Levels

The utilization of the FFMQ-15 aimed to assess changes in the incorporation of mindfulness practices into the daily routines of parents. Results revealed a noteworthy 4% increase in the application of mindfulness practices among participants when comparing pre-and post-intervention scores. Furthermore,

insights gained from an author-generated measure indicated that a significant majority, 82% of parents, perceived an enhanced ability to navigate challenging situations following the intervention. Additionally, a unanimous agreement among all parents (100%) affirmed that the course heightened their awareness of their thought processes. Parents who are caring for children with autism spectrum disorder (ASD) often face elevated levels of stress, clinical depression, and anxiety disorders (2,3). This phenomenon extends to parents of children with other neurodevelopmental disabilities, including attention deficit hyperactivity disorder (ADHD), who also contend with heightened stress levels.

The study participants comprised American citizens residing in various regions, including North America (5), South America (2), Europe (1), and Africa (3). Stress levels and the integration of mindfulness practices into daily routines were assessed using the stress sub-scale of the Depression Anxiety and Stress Scales (DASS-SS), the Perceived Stress Scale (PSS), and the Five Facet Mindfulness Questionnaire-15 item (FFMQ-15). This study underscored the importance of self-care and empowered parents to explore mindfulness practices as effective tools for stress reduction and the management of emotional reactions (Shaffer et al., 2020).

Strengths and Difficulties Questionnaire

Assessing children's behavioural and emotional adjustment, the Strengths, and Difficulties Questionnaire (SDQ; Goodman, 1997) was employed. Both mothers and fathers independently completed this measure. The SDQ encompasses 25 items that evaluate five domains: a prosocial-behaviour domain and four problem-behaviour domains (emotional symptoms, conduct problems, hyperactivity, and peer problems). Respondents rate statements about their child as "not true," "somewhat true," or "certainly true." Sample items include "Often downhearted and tearful" (assessing emotional symptoms), "Often has temper tantrums or a hot temper" (evaluating conduct problems), "Easily distracted, concentration wanders" (measuring hyperactivity), "Has at least one good friend" (reverse-scored for peer problems), and "Considerate of other people's feelings" (assessing prosocial behaviour). In this study, a total difficulties score was generated by summing the scores of the four problem domains, resulting in a scale with scores ranging from 0 to 40. The total difficulties score was employed in the present study, with maternal ratings utilized for maternal analyses and paternal ratings applied in paternal models (Jones et al., 2014).

Findings

Comparison of the assessment tools MAAS, MIPQ, MBI, FFMQ, and Strengths and Difficulties Questionnaire (SDQ)

Parenting children with Autism Spectrum Disorder (ASD) presents unique challenges, and assessing various aspects of mindfulness and well-being among parents is crucial. In this context, five assessment tools—Mindful Attention Awareness Scale (MAAS), Mindfulness In Parenting Questionnaire (MIPQ), Mindfulness-Based Interventions (MBI), Five Facet Mindfulness Questionnaire (FFMQ), and Strengths and Difficulties Questionnaire (SDQ)—play distinct roles.

MAAS, known for assessing present-centered attention and awareness, offers valuable insights into parents' mindfulness levels in the context of ASD parenting. It helps gauge parents' ability to stay focused on the present moment and be aware of their thoughts and emotions, which is particularly beneficial in managing the stress associated with caring for children with ASD.

MIPQ, specifically designed for parents, assesses mindfulness in the context of parenting. It provides a comprehensive understanding of how mindfulness practices are integrated into daily parenting routines. This tool is vital for exploring how parents use mindfulness to cope with the challenges of raising children with ASD, enhancing their ability to handle challenging situations, and promoting self-awareness.

MBI encompasses mindfulness-based interventions that can be tailored to meet the needs of parents of children with ASD. These interventions target stress reduction, enhancing emotional well-being, and

improving mindful parenting. MBI serves as a practical approach to empower parents with mindfulness practices that can positively impact their caregiving experiences.

FFMQ delves deeper into the facets of mindfulness, including observing, describing, acting with awareness, non-judging, and non-reacting. It offers a comprehensive view of parents' mindfulness skills, shedding light on specific areas where they may excel or need improvement. This assessment tool is valuable for understanding how mindfulness facets relate to parenting children with ASD.

SDQ, while primarily focused on assessing children's behavioural and emotional adjustment, indirectly impacts parenting by providing insights into the well-being and mental health of both parents and children. It helps identify areas where parents may face challenges due to their child's ASD-related behaviours and emotions.

In summary, these assessment tools play distinct but interconnected roles in evaluating mindfulness, well-being, and parenting experiences among parents of children with ASD. MAAS and MIPQ specifically target mindfulness in the parenting context, while MBI offers practical interventions. FFMQ explores facets of mindfulness, and SDQ provides insights into children's well-being, indirectly influencing parenting dynamics. Together, they contribute to a holistic understanding of the challenges and strengths of parents in this context.

Discussion

Introduction of the tools

These assessment tools collectively offer a nuanced perspective on the multifaceted dynamics of mindfulness, parenting, and autism. By delving into their purposes, applications, and psychometric properties, we aim to provide valuable insights that can inform support systems and interventions for parents navigating the challenges of raising children with ASD. The following are the tools that provide valuable insights into the intricate relationship between mindfulness, parenting, and the unique challenges faced by families raising children with autism spectrum disorder (ASD).

- a. *Mindful Attention Awareness Scale (MAAS)*: The MAAS is a well-established mindfulness assessment tool designed to measure one's ability to maintain present-centered attention and awareness. Its application to parents of children with autism allows us to explore how mindfulness practices can enhance parental focus and presence in the face of the complex demands of autism caregiving.
- b. *Mindfulness in Parenting Questionnaire (MIPQ)*: The MIPQ specifically targets parents and their mindfulness experiences within the parenting context. By examining the MIPQ, we gain insights into how mindfulness practices can be integrated into the everyday lives of parents, potentially mitigating stress and enhancing their overall well-being.
- c. *Mindfulness-Based Interventions (MBI)*: MBIs encompass a range of mindfulness-based programs designed to promote emotional regulation, reduce stress, and improve overall psychological well-being. Investigating the impact of MBIs on parents of children with autism sheds light on the effectiveness of mindfulness interventions in enhancing the coping mechanisms of these caregivers.
- d. *Five Facet Mindfulness Questionnaire (FFMQ)*: The FFMQ assesses mindfulness across multiple dimensions, providing a comprehensive view of an individual's mindfulness skills. Its application in the context of parenting children with autism allows us to explore which facets of mindfulness are particularly relevant for these parents, potentially guiding tailored interventions.

- e. *Strengths and Difficulties Questionnaire (SDQ)*: While not a mindfulness-specific tool, the SDQ plays a crucial role in assessing children's behavioural and emotional adjustment. By examining parents' responses to the SDQ, we can better understand how their perceptions of their child's behaviour relate to their mindfulness and well-being, thus contributing to a holistic view of the parenting experience.

Instrumentation of Assessment Tools

In this study, we utilized four distinct assessment tools to measure various facets of mindfulness and related constructs. These tools were carefully selected based on their relevance to the research questions and the specific needs of our study. The following section provides a detailed description of each assessment tool:

- a. *Mindful Attention Awareness Scale (MAAS)*:
 - Description: The Mindful Attention Awareness Scale, abbreviated as MAAS, is a self-report instrument designed to assess an individual's general capacity for mindfulness. It evaluates one's ability to maintain present-moment attention and awareness.
 - Content and Items: MAAS comprises 15 items that capture an individual's cognitive and perceptual attentiveness to their daily experiences. Participants are asked to rate the extent to which each statement reflects their typical behaviour.
 - Scoring: Responses are recorded on a Likert scale, with higher scores indicating greater levels of mindfulness awareness.
 - Psychometric Properties: MAAS demonstrates strong reliability and validity, making it a well-established and widely used tool for assessing mindfulness.
- b. *Interpersonal Mindfulness in Parenting Scale (IMP)*:
 - Description: The Interpersonal Mindfulness in Parenting Scale, or IMP, is specifically tailored to evaluate mindfulness in the context of parenting. It assesses a parent's capacity to bring mindful attention to their interactions and relationships with their children.
 - Content and Items: IMP includes items that pertain to listening, responding, and connecting mindfully with one's child, thus capturing the interpersonal aspects of mindfulness within the parenting role.
 - Scoring: Responses are rated on a Likert scale, reflecting the degree to which each item represents the participant's behavior in the context of parenting.
 - Psychometric Properties: IMP has been validated for its use in measuring mindfulness within the parenting context and has demonstrated good reliability.
- c. *Mindfulness in Parenting Questionnaire (MIPQ)*:
 - Description: The Mindfulness In Parenting Questionnaire (MIPQ) focuses on assessing mindfulness skills and practices within the parenting role, emphasizing behaviors such as patience, emotional regulation, and compassionate responses to the child's needs.
 - Content and Items: MIPQ includes items that reflect mindful parenting behaviors, such as empathetic responding and non-reactivity to parenting stressors.
 - Scoring: Responses are rated on a Likert scale, with higher scores indicating a higher degree of mindful parenting behavior.
 - Psychometric Properties: MIPQ is a reliable and validated instrument for assessing mindfulness within the parenting context.
- d. *Five Facet Mindfulness Questionnaire (FFMQ)*:
 - Description: The Five Facet Mindfulness Questionnaire (FFMQ) is a tool that measures multiple facets or aspects of mindfulness. While not specific to parenting, it provides insights into various dimensions of mindfulness relevant to parents of children with autism.

- **Content and Items:** FFMQ assesses five facets, including observing, describing, acting with awareness, non-judging, and non-reactivity to inner experiences.
- **Scoring:** Responses are collected on a Likert scale, and each facet is scored separately.
- **Psychometric Properties:** FFMQ demonstrates strong reliability and validity for assessing different dimensions of mindfulness.

Each of these assessment tools was chosen to address specific research questions and objectives, allowing us to comprehensively explore mindfulness in the context of parenting children with autism. These instruments provide a robust framework for our study, aligning with our focus on mindfulness and related constructs in this caregiving demographic. Below shown is the summary of assessment tools.

Table 1: Comparison of Mindfulness Assessment Tools for Parents of Children with Autism

Assessment Tool	Description	Content and Items	Scoring	Psychometric Properties
Mindful Attention Awareness Scale (MAAS)	A self-report instrument measuring general mindfulness capacity.	15 items evaluating present-moment attention and awareness.	Likert scale (higher scores indicate greater mindfulness).	Strong reliability and validity.
Interpersonal Mindfulness in Parenting Scale (IMP)	Specifically designed to assess mindfulness in parenting.	Items focusing on listening, responding, and connecting mindfully with children.	Likert scale (higher scores reflect higher mindfulness).	Demonstrates good reliability.
Mindfulness in Parenting Questionnaire (MIPQ)	Assesses mindfulness skills and practices within the parenting role.	Includes items related to mindful parenting behaviours, such as patience and emotional regulation.	Likert scale (higher scores indicate more mindful parenting).	Reliable and validated for its use in the parenting context.
Five Facet Mindfulness Questionnaire (FFMQ)	Measures multiple facets of mindfulness.	Assesses five facets: observing, describing, acting with awareness, non-judging, and non-reactivity to inner experiences.	Separate Likert scales for each facet.	Strong reliability and validity for assessing different dimensions of mindfulness.

The following Table 2 presents a comprehensive comparison of mindfulness assessment tools tailored for parents of children with autism. This comparative analysis addresses the research questions posed in the study, focusing on each tool's purpose, dimensions assessed, psychometric properties, as well as the strengths and limitations associated with their use. The findings contribute to a deeper understanding of the suitability of these assessment tools for parents navigating the challenges of raising children with autism.

Table 2: Comparison of mindfulness assessment tools tailored for parents of children with autism

Tool	Purpose	Dimensions Assessed	Psychometric Properties	Strengths	Limitations
Mindful Attention Awareness Scale (MAAS)	Gauging present-centered attention and awareness	Primarily focuses on mindfulness-related aspects	Strong reliability and validity data	Effective in assessing mindfulness in parents of children with autism	May lack specificity to nuances of autism parenting
Mindfulness In Parenting Questionnaire (MIPQ)	Measuring mindfulness in the parenting context	Focuses on mindfulness practices and awareness	Reliability and validity support its effectiveness	Specific to parenting of children with autism	Potential limitations in broader mindfulness assessments beyond parenting
Mindfulness-Based Interventions (MBI)	Enhancing mindfulness and reducing stress	Offers various components and exercises to foster mindfulness	Practical applicability in improving parental well-being	Effective but may come with logistical challenges	Logistical challenges in consistent participation and adherence
Five Facet Mindfulness Questionnaire (FFMQ)	Comprehensive assessment of mindfulness facets	Observing, describing, acting with awareness, non-judging, and non-reacting	Reliability and validity affirmed	Provides a detailed view of individual mindfulness skills	May require interpretation for the parenting context
Strengths and Difficulties Questionnaire (SDQ)	Assessing child behavior and indirectly parental experiences	Indirectly offers insights into parental challenges	Reflects real-life experiences	Reflects the real-life experiences of parents	Indirect nature, primarily focused on child behavior

Conclusion and future recommendation

In response to the research questions, this study has systematically explored mindfulness assessment tools tailored for parents of children with autism. My investigation has unveiled critical insights into the nature of these tools and their potential applications in supporting this caregiving demographic. In conclusion, I highlight the following key points:

Research Question 1 - Systematic Search:

Our search led to the identification of the Mindful Attention Awareness Scale (MAAS) as a well-established instrument, accessible through targeted keywords. The significance of a well-defined search strategy is emphasized, underscoring the importance of inclusive criteria for researchers and practitioners.

Research Question 2 - Characteristics and Psychometric Properties:

The assessment tools, including MAAS, Mindfulness In Parenting Questionnaire (MIPQ), Mindfulness Based Interventions (MBI), Five Facet Mindfulness Questionnaire (FFMQ), and Strengths and Difficulties Questionnaire (SDQ), were discussed in detail. MAAS and MIPQ emerged as robust choices for evaluating mindfulness and mindful parenting. While MBI offered practical benefits, its psychometric data required further validation. FFMQ provided comprehensive insights into mindfulness dimensions but may require context-specific interpretation. SDQ indirectly reflected parental experiences, acknowledging its relevance in understanding challenges faced by parents of children with autism.

Research Question 3 - Strengths and Limitations:

The strengths and limitations of the assessment tools were analysed. MAAS demonstrated strength in assessing present-centered attention and awareness but was limited in its specificity to parenting children with autism. MIPQ excelled in addressing the dynamics of mindfulness in parenting but may require supplementary tools for broader assessments. MBI offered practicality but necessitated considerations for consistent participation. FFMQ provided a detailed view of mindfulness facets but may lack specificity to parenting. SDQ indirectly captured parental experiences, acknowledging its strengths in reflecting real-life challenges but also its indirect nature.

In closing, this study illuminates the potential for parents of children with autism to enhance their wellbeing through the cultivation of mindfulness. It also underscores the need for future research to further validate and expand upon the tools' applications. We recommend that self-actualization, self-growth, and the development of positive habits, supported by emotional intelligence and the Fogg Model, be considered for enhancing the well-being of this caregiving demographic.

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