



## Caregiver Mental Health, Adaptive Skills, and Therapeutic Engagement in Children with Autism Spectrum Disorder

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### Abstract

Caregivers are essential in influencing developmental patterns and treatment outcomes in children with Autism Spectrum Disorder (ASD); nevertheless, caregiver mental health has not been adequately integrated into the autism intervention literature and practice. They were based on the family-centered and transactional development frameworks, and this study analyzed the direct and indirect connections between the mental health of caregivers, therapeutic engagement, and adaptive skills among children with ASD. The cross-sectional type of quantitative design was adopted, which entailed a total of 312 caregivers with a confirmed diagnosis of ASD and children aged between 3 and 12 years. Mental health of the caregiver (stress, anxiety, and depressive syndrome) and therapeutic contact (attendance, in-session participation, and home-based implementation) and adaptive skills of the child (communication, daily skills, and socialization) were measured using standardized measures. The analysis of data was done with descriptive statistics, Pearson correlations, multiple regression analysis, and mediation analysis with bootstrapping. The findings showed that greater amounts of caregiver psychological distress were strongly linked with reduced levels of therapeutic engagement and poor adaptive functioning in all domains. There was a positive relationship between therapeutic engagement and adaptive communication, daily living skills, and socialization. Mediation analyses revealed that therapeutic engagement mediated the relationship between caregiver mental health and child adaptive skills with significant indirect effects found among all adaptive domains. Interestingly, mental health of caregivers remained having a considerable direct effect on adaptive outcomes, which implies a direct and an engagement-mediated influence. These results emphasize the role of caregiver mental health as a severe determinant of intervention participation and development of adaptive skills in the children with ASD. By incorporating mental health assistance of caregivers into the services of autism intervention, it can be expected that therapeutic adherence and maximization of functional outcomes might be achieved.

**Keywords:** Autism Spectrum Disorder; Caregiver Mental Health; Adaptive Functioning; Therapeutic Engagement; Parental Stress; Family-Centered Intervention; Child Development

### 1. Introduction

Autism Spectrum Disorder (ASD) is a neurodevelopmental disorder associated with lifelong impairments in social communication and interaction, as well as limited and repetitive behavior, interest, or activity patterns (American Psychiatric Association, 2022). In the last twenty years, this has resulted in a significant increase

in reported prevalence in the world due to the improvements in the diagnostic criteria, awareness, and the overall screening practices. Recent epidemiological estimates indicate that ASD is prevalent in about 1 in 36 children, which supports the idea that it is one of the key issues in public health and development (Maenner et al., 2023). The trends have triggered the paradigm shift in the study and treatment of autism by abandoning the narrow-minded, child-centered approaches to the wider systems-based approaches, which acknowledge the importance of families and caregivers in the developmental pathway.

There is a significant role of caregivers, who are primarily parents in the developmental ecology of children who have ASD. They do not only deliver daily care and emotional support, but they organize the health care and educational services, use the therapeutic strategies, and advance their children on the several systems. It is a cumulative yet long-lasting multifaceted role that subjects caregivers to chronic stressors. Since the year 2020, a growing amount of research has constantly shown that caregivers of children with ASD report significantly elevated levels of parenting stress, anxiety, depressive symptoms, and caregiver burden than caregivers of normally-developing children, and those caregivers of children with other developmental disabilities (Rattaz et al., 2020; Yorke et al., 2022). These results have been reproduced in other cultural settings, which implies that high distress in caregivers is a strong and universal phenomenon and not a localized reverberation.

Psychological stressors of caregivers in ASD are multifactorial. A severe level of autism symptoms, limited expressive language, the presence of an intellectual disability, sleep disorders, and difficult behaviors (e.g., aggression, self-injury) have been listed among the child-related factors that are strong predictors of parental stress (Papadopoulos et al., 2021; Neece et al., 2022). Moreover, the caregiver burden is increased by systemic and contextual stressors, such as financial pressure related to intensive treatment, disjointed service delivery systems, lengthy wait times to diagnosis and intervention and societal stigma (Fong et al., 2021; Alonim and Kauschke, 2023). Notably, the stressors in question can be long-lasting and recurring throughout the developmental phases, which further supports the definition of caregiving in ASD as a high-stress long-term situation, as opposed to the stage of adaptation.

Although the distress experienced by caregivers has been extensively documented, traditional research in autism intervention has primarily focused on reducing child-level symptoms and acquisition of skills and paid relatively little attention to the mental health of caregivers as a predictor of treatment effectiveness. Nevertheless, modern studies are gradually undermining this division and pointing at the fact that the psychological well-being of caregivers is directly related to the quality of caregiving relationships, the home learning environment, and the viability of intervention strategies (Ooi et al., 2021; Dykens et al., 2023). When caregivers are exposed to high stress or depressive symptoms, they can display less emotional availability, inconsistent behavioral control, and less ability to provide scaffolds that children use to learn adaptive skills; these are all essential ways of children learning adaptive skills.

Adaptive functioning is the term which is used to define the conceptual, social, and practical abilities of the individuals functioning independently in their day-to-day life. Adaptive skills have been identified as some of the best predictors of long-term outcomes of children with ASD, such as academic engagement, employment, living independently, and quality of life (Trembath et al., 2020; Kraper et al., 2023). It is worth noting that adaptive functioning tends to lag behind cognitive ability in ASD and thus, there is a constant disconnect between intellectual potential and real life competence. This difference highlights the need to have environmental supports and a regular chance to engage in skill training, which caregiver involvement largely affects.

Caregivers have the primary role of supporting adaptive skills development by integrating learning activities in day to day activities like mealtimes, self-care activities, play and community activities. The success of these opportunities however depends on the psychological capacity of the caregivers. Empirical research has proved that increased stress levels in parents are linked with poorer child adaptive functioning in the areas of communication and daily living skills (Pastor-Cerezuela et al., 2021; Bluth et al., 2023). On the other hand,

the well-being and self-efficacy of caregivers have been associated with the high quality of parent-child interaction and larger adaptive behavior improvements in the long run (Pickard et al., 2022). These results indicate that the mental health of caregivers is not only a background factor in the development of children but also a proactive component of the outcomes of child development.

Next to adaptive functioning is the concept of therapeutic engagement which has become a central point of operation of interventions. The therapeutic engagement has many aspects, such as attendance and retention, active session attendance, compliance with home-based intervention strategies, and cooperative relationships with service providers (Beaudoin et al., 2020; Albaum et al., 2023). With ASD, the involvement may not be limited to only the clinic and caregivers may need to apply intervention strategies at the naturalistic settings on a regular basis. In this way, the involvement of the caregiver is one of the primary factors influencing the dosage of the intervention, fidelity, and generalization of skills.

Studies that were conducted during the period of 2020-2025 are strong arguments that show that therapeutic engagement is closely connected to caregiver mental health. Caregivers who have an increased level of stress and depressive symptoms are more prone to skip the appointment, abandon the intervention early, and complain about the inability to apply intervention strategies at home (Derguy et al., 2021; Stadnick et al., 2022). Conversely, direct strategies that promote psychological well-being among caregivers have been demonstrated to enhance engagement and retention with improved child outcomes (Li et al., 2024). These results demonstrate that engagement can be used as a mediator between caregiver mental health and child adaptive functioning.

Caregiver mental health is also a problem because it is bidirectional and complicates the relationship between child outcomes and caregiver mental health. Although child traits play an important role in stress among caregivers, other factors may enhance child problems including caregiver distress that changes interaction patterns and consistency in providing support. Longitudinal designs have shown both ways of child behavior issues and parental stress over the time, as it supports the idea of transactional theories of development in ASD (Neece et al., 2022; Hastings et al., 2023). This kind of model highlights the fact that both child and caregiver need to be targeted in interventions to break that negative feedback loop.

These processes are moderated by contextual and structural factors that are important. Lower socioeconomic status has always been linked to an increase in caregiver stress, diminished access to services and intervention participation (Pickard et al., 2022; Fong et al., 2021). Experiences of caregivers can also be further impacted by cultural beliefs and stigma of disability, especially in low- and middle-income countries (LMICs) to which formal autism services might be available (Tekola et al., 2020; Divan et al., 2021). The latest reviews addressing the LMIC setting highlight the necessity of scalable, culturally tailored interventions that capitalize on the available community resources and reposition caregivers as the focal point of the intervention with the help of the task-shifting method (Rahman et al., 2022).

Due to the increasing awareness of caregiver influences, science in intervention of autism has grown to accept caregiver-mediated models and family-centered models. These methods place caregivers in an active role in the delivery of intervention and place a particular focus on coaching, feedback, and generalizing skills in natural environments. More recent systematic reviews and meta-analyses suggest that caregiver-mediated interventions show small-to-moderate benefits in child social communication and adaptive skills and are larger when interventions contain live coaching and personalized feedback (Sandbank et al., 2020; Schreibman et al., 2022). Notably, interventions that incorporate caregiver mental health services as well as parent training indicate more improvements on caregiver well-being and child outcomes, implying that programs that deal with caregiver distress needs to strengthen intervention efficacy (Li et al., 2024).

Improvement of measurement has also enhanced the empirical basis of this discipline. Vineland Adaptive Behavior Scales, Third Edition (Vineland-3) is the most popular standard measure of adaptive functioning in ASD studies and practice. The recent research has been concerned with the identification of the clinically significant change levels on Vineland scores to increase the interpretability of intervention findings (Clinch

et al., 2023; Kanne et al., 2024). Validated screening instruments related to caregiver, including the Parenting Stress Index-Short Form, Patient Health Questionnaire-9 (PHQ-9), and Generalized Anxiety Disorder-7 (GAD-7) are increasingly suggested to be used within autism care as routine screening tools to identify caregivers in need of further assistance (Yorke et al., 2022).

Although these have been made, there are still a number of gaps in the literature. Most intervention studies do not have a long-term follow-up, which restricts the knowledge of the sustainability of the benefits in adaptive functioning and the well-being of caregivers. Moreover, the heterogeneity in operantizing therapeutic engagement makes it difficult to compare studies across, as well as synthesize them meta-analytically. Moreover, the fact that most of the researches are performed in high-income nations creates a question about the applicability of the obtained results to various cultural and resource-restricted environments. The solution of these gaps will involve longitudinal methodologically sound studies that will incorporate caregiver mental health as a primary variable and not a byproduct.

## **2. Literature Review**

### **2.1 Autism Spectrum Disorder and the Change to Frameworks that are Family-Centered.**

Autism Spectrum Disorder (ASD), is a neurodevelopmental condition that is lifelong characterized by ongoing social communication and interaction problems and the existence of limited, repetitive behavioral, interests, or activity patterns (American Psychiatric Association, 2022). The prevalence rates in the world have steadily increased in the last 20 years, which is related to the improved methods of diagnosis, greater awareness, and the expanded range of diagnostic criteria (Maenner et al., 2023). Since ASD has taken on a new role as a social health concern, the research has shifted its emphasis on child-based symptom remediation to multifaceted frameworks, which consider the family, community, and systemic-level factors on development.

Family centred and ecological approaches to autism intervention underscore the fact that children develop in dynamic systems with caregivers at the focal point through which therapeutic intervention is mediated and translated into practical results (Ooi et al., 2021; Schreibman et al., 2022). Transactional models also assume two-way effects between child traits and caregiver functioning, indicating that child behavior over time has and is influenced by the psychological health of the caregiver (Sameroff, 2010; Hastings et al., 2023). In this context, mental health of caregivers is becoming conceptualized as a pivotal determinant of intervention operation, as opposed to a secondary one.

### **2.2 Taking care of Caregivers in Autism Spectrum Disorder.**

#### **2.2.1 Prevalence and Persistence of Psychological Distress of Caregivers.**

A substantial amount of empirical studies has supported the fact that parents whose children have ASD have a far greater level of psychological distress than their counterparts whose children with typical developmental outcomes or parents of children with other types of developmental disabilities. The publication of meta-analyses in the last five years indicates the moderate-large effect sizes of differences in parenting stress, anxiety, and depressive symptoms between ASD caregiver groups and controls (Rattaz et al., 2020; Yorke et al., 2022).

The most widely reported outcome is parenting stress, and researchers have found that 40-60 percent of parents of children with autism cross clinically significant stress ranges on standardized stress scales (Neece et al., 2022; Bluth et al., 2023). Depressive symptoms and anxiety are also very common and its rates are above the norms in the populations and continue well into the adulthood (Papadopoulos et al., 2021; Dykens et al., 2023). The longitudinal studies indicate that distress in caregivers tends to stay constant or grow with time, especially at critical developmental changes like entering the school and adolescence (Hastings et al., 2023).

In a qualitative and mixed-method study, the experience of caregiving in ASD is further explored, and it

presents themes of emotional exhaustion, social isolation, and confusion about future caregiving responsibilities (Dira et al., 2024; Alonim and Kauschke, 2023). These results highlight the importance of mental health challenges of caregivers with ASD not to be short-term responses to the diagnosis but long-term problems that need continuous support.

### **2.2.2 Child-Related Caregiver Mental Health Predictors.**

One of the most significant predictors of psychological outcomes of the caregiver is child characteristics. Studies always show that, the most effective predictors of challenging behaviors, such as aggression, self-injury, noncompliance and emotional dysregulation, are in fact caregiver stress and depression in isolation of core symptoms of autism (Neece et al., 2022; Hastings et al., 2023; Kerns et al., 2020). Such actions interfere with routine activities, raise caregiver awareness, and raise security and involvement in society concerns.

Another factor that is critical towards caregiver distress is communication impairments. The children who have little expressive language or a severe pragmatic communication issue are linked to an increased parental stress, especially when the caregivers have difficulties with interpreting needs and some behavioral escalations (Pastor-Cerezuela et al., 2021; Pickard et al., 2022). Caregiver fatigue, anxiety, and depressive symptoms have been independently associated with sleep disturbances that are very common in ASD, which displays the cumulative effect of impaired sleeping on caregiver functioning (Papadopoulos et al., 2021; Meltzer et al., 2022).

Caregiver burden is further increased by the presence of co-occurring conditions which complicate care and raise the amounts of healthcare used, including attention-deficit/hyperactivity disorder, anxiety disorders, epilepsy, and gastrointestinal problems (Brookman-Frazee et al., 2020; Alvares et al., 2021). Such results indicate that caregiver distress should be approached functionally and not diagnostically.

### **2.2.3 Socioeconomic, Cultural and Systemic Determinants.**

In addition to child-related factors, the socioeconomic and systemic circumstances have a great influence on caregiver mental health. Less affluent families are exposed to the additional stressors such as financial pressure, lack of access to specialized services, transport issues, and rigid work schedules (Pickard et al., 2022; Fong et al., 2021). These limitations are linked to increased stress levels among caregivers and low interest in intervention services.

Care givers experience a big impact due to cultural beliefs and stigma about disability. Low- and middle-income countries (LMICs) research documents increased isolation of the caregiver, decreased social support, and later help-seeking because of stigma and unawareness (Tekola et al., 2020; Divan et al., 2021). Caregivers of minority ethnic backgrounds in even high-income countries report other barriers that refer to language, discrimination, cultural incompatibility with services (Zuckerman et al., 2021).

The problem of fragmentation of the health systems also adds to the distress of the caregivers. Delays in diagnosis, care coordination, and mental health among the caregivers are always mentioned as the significant stressors (Stadnick et al., 2022; Derguy et al., 2021). These results emphasize the necessity of integrated service models that would take care of caregivers well-being and child-centered care.

### **Function of Adaptive Behaviour in children with Autism Spectrum Disorder.**

Adaptive functioning is an important area of outcome in ASD and includes communication, daily living skills, socialization and functional independence. The studies have continually shown that adaptive functioning is more predictive of long-term outcomes (employment, independent living, and quality of life) compared to IQ or the severity of the autism symptoms only (Trembath et al., 2020; Kraper et al., 2023).

Vineland Adaptive Behavior Scales, Third Edition (Vineland-3) is the gold standard in the measurement of adaptive functioning in ASD research and clinical practice (Kanne et al., 2024). The recent works have been aimed at establishing clinically meaningful change thresholds on the Vineland domains, to enhance the interpretability of the intervention outcomes to clinicians and families (Clinch et al., 2023).

The adaptive skill development revolves around caregiver involvement. Longitudinal designs show that

caregiver responsiveness, emotional availability, and consistency are predictive of an improvement of adaptive functioning over time despite the child cognitive ability and baseline functioning (Hastings et al., 2023; Pickard et al., 2022). On the other hand, higher stress levels of caregivers and depressive symptoms travel slower adaptive skills acquisition and generalization of skills across situations (Bluth et al., 2023; Pastor-Cerezuela et al., 2021).

### **2.3 Therapeutic Engagement as a Process which connects Mental Health of the Caregiver and Child outcomes.**

The practice of therapeutic engagement is becoming increasingly accepted as a mediator of the relationship between the delivery of intervention and child outcomes in ASD. Engagement includes attendance, retention, active participation, and compliance with intervention methods in and out of the clinical environment (Beaudoin et al., 2020; Albaum et al., 2023).

Empirical data suggests that mentally healthy caregivers are a good predictor of engagement. With high rates of stress and depression, caregivers will probably skip appointments, execute the strategies inconsistently, and quit services earlier (Derguy et al., 2021; Stadnick et al., 2022). On the other hand, programs that promote caregiver psychological health show better retention and better child performance (Li et al., 2024).

### **2.4 Mediated and Integrated Intervention Models by Caregivers.**

The interventions of caregivers focus on coaching, feedback, and generalization of skills in naturalistic environments. Those meta-analyses which span from 2020 onward show small-to-moderate effects of interventions mediated by caregivers on child social communication and adaptive functioning with higher effects where live coaching and individual feedback are included (Sandbank et al., 2020; Schreibman et al., 2022).

Combined interventions that tackle mental health of the caregivers and parent training show improved results. According to recent trials, acceptance-based, mindfulness, and cognitive-behavioral caregiver interventions are beneficial in reducing stress and anxiety levels and, at the same time, enhance adaptive behavior and engagement among children (Li et al., 2024; Dykens et al., 2023).

### **2.5 Literature Gaps and Future Directions.**

Notwithstanding the advancement, there are still some significant gaps. The number of studies that do not have any long-term follow-up is high, which limits the knowledge about sustainability. It is inconsistently operationalized and LMIC settings are underrepresented. Future studies ought to focus more on longitudinal, culturally responsive and implementation-based designs.

## **3.1 Theoretical Bases of the Conceptual Framework.**

The developmental psychopathology, family systems theory, and transactional frameworks of development are the foundations of the proposed framework. Transactional models assume that the child and the environment interact (through mutual, continuous processes) especially with the caregivers influencing child development (Sameroff, 2010). In this view, child characteristics mediate the mental health of care providers and cause caregiving behaviors, learning opportunities, and the implementation of interventions (Hastings et al., 2023).

One more theory that highlights the idea that psychological distress in caregivers also influences the whole family is the family systems theory that highlights that the entire family and its functioning is affected by psychological distress in the caregivers, which translates to parenting styles, marital life, sibling adaptation, and the overall family functioning (Minuchin, 1985; Dykens et al., 2023). Chronic stress at the family level may also change family practices and emotional conditions in families of children with ASD, which indirectly impacts the adaptive learning environment of children.

Developmental psychopathology models consider all these views and offer an alternative approach to the problem by emphasizing the interaction of risk and protective factors at a number of levels, such as the biological, psychological, and social levels with time (Cicchetti and Rogosch, 2002). Based on this perspective, the role of caregiver mental health as a major situational risk or protective factor, which interacts with child neurodevelopmental vulnerabilities, to influence adaptive trajectories.

Collectively, these models combine to support the conceptualization of caregiver mental health as a central mechanism shaping both adaptive functioning and therapeutic engagement, and having feedback loops across time.

### 3.2.1 General Conceptual Framework Overview.

The theoretical framework suggested in this article consists of three domains:

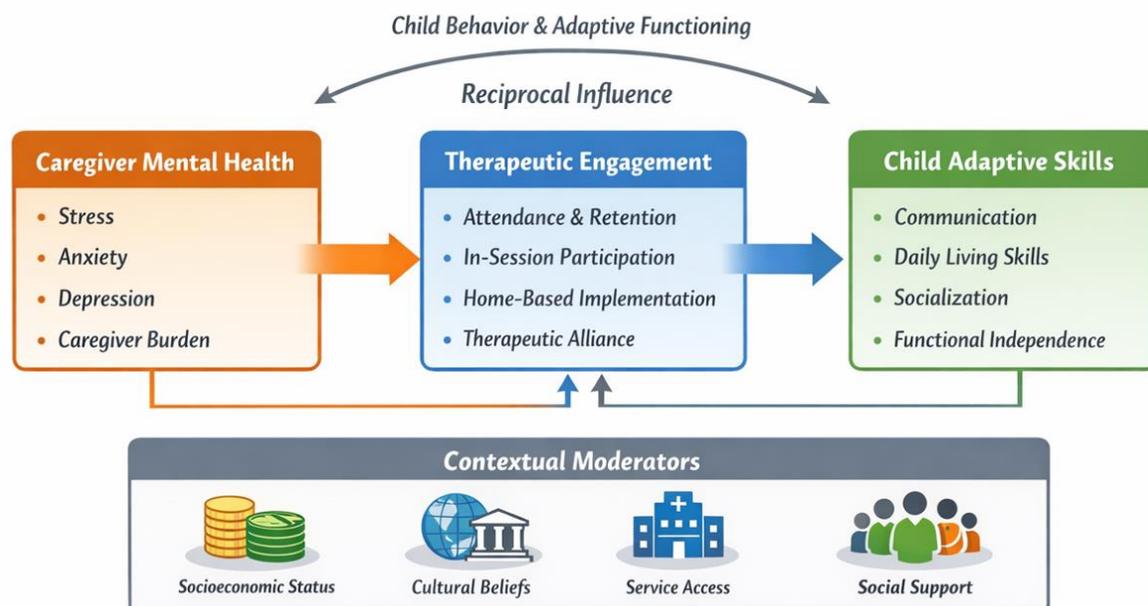
- Caregiver Mental Health (stress, anxiety, depression, caregiver burden)
- Therapeutic Engagement (attendance, participation, adherence, alliance)
- Child Adaptive Skills (communication, everyday life, socialization)

These areas are incorporated under larger contextual moderators such as socioeconomic status, cultural aspects, access to services and social support. The model hypothesizes the presence of direct and indirect routes between mental health of caregivers and adaptive outcomes of children, and therapeutic engagement is one of the mediating factors.

Namely, the mental health of caregivers affects child adaptive skills:

- Through its effect on parenting practices, emotional availability and daily learning contexts;
- Indirectly, through influencing the level and the quality of caregiver and child involvement in therapeutic interventions.

Child adaptive functioning and behavioral difficulties, in turn, are reciprocally related to mental health of caregivers, which occurs in dynamic processes throughout the development.



This framework shows that the therapeutic engagement between caregivers and children is a mediating

variable that has a direct and indirect impact on the child adaptive skills in Autism Spectrum Disorder because of the direct and indirect effects of the mental health of caregivers. These relationships are also developed through reciprocal effects and contextual moderators, which emphasizes the dynamic and family-focused nature of the outcomes of autism intervention.

### **3.3 Effect of Mental Health of Caregiver on Engagement.**

The mental health of caregivers plays a key role in all the aspects of engagement. There are high levels of missed appointments, decreased in-session attendance, and decreased compliance with home-based intervention (Derguy et al., 2021; Stadnick et al., 2022) that are linked to high levels of stress and depressive symptoms. The perceived self-efficacy, motivation, and cognitive resources of caregivers may decrease because of psychological discomfort, and it may be harder to maintain engagement in the long term.

On the contrary, caregivers who have higher mental health report more confidence in applying intervention strategies and stronger therapeutic relationships with the provider (Li et al., 2024). These results endorse the role of engagement to mediate the connection amid caregiver mental health and child adaptive results.

### **3.4 Reciprocal and Transactions Processes.**

One of the peculiarities of the offered framework is the emphasis on the idea of reciprocity. Although the mental health of caregivers has a role to play in child adaptive functioning and participation, child factors and development also determine the well-being of caregivers. Longitudinal designs also establish two-way relationships between parental stress and child behavior problems, which supports the transactional models of development in ASD (Neece et al., 2022; Hastings et al., 2023).

To illustrate, the positive changes in child adaptive skills, including better independence or fewer behavioral problems, are correlated with the decrease in the caregiver stress and depressive symptoms as time passes (Pickard et al., 2022). On the other hand, the continuous nature of behavioral problems may complicate the state of caregivers, which would support vicious cycles. The mutuality of these processes highlights the need to implement interventions that meet the needs of caregivers and children concurrently.

### **3.5 Framework Moderators of the Framework.**

#### **3.5.1 Economic and Social status and Resources.**

The conceptual framework has socioeconomic factors that play a major role in moderating relationships. Families are also challenged by low financial capability as another impediment to services and sustained engagement, as well as access to mental health services provided by caregivers (Fong et al., 2021). These limitations increase the stress experienced by the caregivers and undermine the mechanisms by which interventions impact adaptive outcomes.

#### **3.5.2 Cultures and Systemic Influences.**

A disability and mental health cultural beliefs affect the experiences of caregivers and help-seeking. Low- and middle-income countries also have studies that point to how the burden of caregiving and the lack of proper service infrastructure contribute to the lack of engagement with formal interventions (Tekola et al., 2020; Rahman et al., 2022). Additional stressors that cause poor engagement on the system-level include poor integration of care coordination and excessive waiting times (Stadnick et al., 2022).

### **3.6 Incorporated Intervention Models as Framework Applications.**

The theoretical framework is consistent with the emerging models of integrated interventions that involve child-based and care giver mental health interventions. Parent coaching, stress-reduction techniques, and psychological approaches like cognitive-behavioral therapy or acceptance and commitment therapy in programs prove to be effective concerning caregiver well-being and child adaptive outcomes (Dykens et al.,

2023; Li et al., 2024).

The operationalizations of these integrated models are done by using both the direct caregiving mechanisms and indirect engagement pathways to strengthen each other, thus breaking the negative feedback loops and facilitating positive developmental cascades.

The suggested conceptual framework places the idea of mental health in caregivers as the key factor in the formation of adaptive skills and therapeutic involvement among children with ASD. Direct impacts on the parenting behaviors and indirect impacts through engagement mediate caregiver psychological well-being to influence the effectiveness and sustainability of autism interventions. Along with the reciprocal processes and the contextual moderators, holistic and family-centered approaches are also a way in which mental health support provided to caregivers becomes an essential part of the ASD services.

#### **4.1 Adaptive functioning**

Adaptive functioning is a set of conceptual, social and practical abilities people learn and apply in their everyday life to enable them to live independently. Such skills are communication skills, self-care, social participation, and functional independence. Adaptive skills In the framework of ASD, adaptive skills are regularly envisioned as embodying a gap between developmental potential and real-world performance, and as the degree to which children apply cognitive and social skills into ordinary competence.

Studies have constantly found adaptive functioning as one of the most powerful predictors of long-term outcomes in ASD, including educational achievement, work, autonomous life, and life quality in general. Notably, adaptive skills are conceptually different to the intellectual functioning and the severity of autism symptoms. Adaptive functioning levels of many children with ASD are significantly lower in comparison to age expectations, despite the cognitive abilities being in the average or above-average range. This difference underscores the role of environmental scaffolding, learning experiences, and regular practice of skills- the things that are highly sensitive to the role of caregiver engagement and therapeutic interaction.

Adaptive functioning in ASD is usually structured under four general areas; communication, daily living skills, socialization and motor skills. Communication involves both receptive and expressive language and pragmatic skills which are needed to participate in a functional interaction. Activities of daily living include personal care and hygiene, dressing, feeding, and household activities. Socialization means interpersonal skills, play and community participation whereas motor skills are fine and gross motor skills in regard to functional independence. Of these areas, communication, daily living, and socialization are most commonly noted in the intervention research literature because of their close linkage to the long-term independence.

#### **4.2 Developmental Patterns of Adaptive Functioning in ASD.**

The adaptive development of children with ASD occur in heterogeneous patterns which differ significantly in children and at different developmental stages. Longitudinal research has shown that although there are cases of children reporting steady improvement in adaptive functioning as they age, there are other cases where this improvement or rather, children are becoming plateaued or even lowering their relative performance compared to their expected age. These divergent patterns indicate the interaction between child level, environmental support and intervention exposure.

The early childhood stage is a very sensitive stage in terms of adaptive learning skills beginning because the neural plasticity and fast rate of development make it possible to learn the rudimentary skills. Programs that focus on early intervention and naturalistic teaching, coaching of caregivers, and routine based learning have been linked to a higher level of adaptive communication and daily living skills gains during this time. Nonetheless, adaptive functioning gains do not spontaneously generalize and maintain without the continuous reinforcement especially with the rise in the environmental demands over age.

Adaptive demands are more complex in the middle childhood and adolescence period which involves a higher level of independence, social competence, and self-regulation. Studies indicate that there is a tendency to

reduce the adaptive skill development at these stages, particularly when intervention is not specifically targeted. The increasing discrepancies between adaptive functioning and the cognitive ability among adolescents with ASD indicate that further support after the early childhood stage is necessary. These results provide evidence against assumptions based on the notion that initial gains are adequate and emphasize the need to develop sustained interventions based on developmental considerations.

### **4.3 Adaptive Skills Measurement in Autism Research and Practice.**

Adaptive functioning should be measured precisely to determine the results of interventions and plan treatment individually. The most widely used instruments in measurement of adaptive skills in children with ASD are the standardized instruments that involve caregivers to report the performance of children in naturalistic environments, which are extremely hard to observe directly in clinical settings.

The most common measure of adaptive functioning in ASD research and practice is the Vineland Adaptive Behavior Scales (which is currently in its third edition). The Vineland evaluates communication skills, daily living skills, socialization as well as motor skills based on structured interviews or questionnaires to the caregivers. The fact that it is used by a great number of people enables cross-studies comparisons and has normative benchmarks of interpreting scores. Notably, recent studies have been dedicated to determining clinically meaningful thresholds of change on Vineland scores, which would improve the interpretability of the intervention effects by the clinical practitioners and families.

Other scales are also applicable in some studies and provide alternative insights into adaptive functioning, e.g. the Adaptive Behavior Assessment System (ABAS). Although the structure of these tools and the content contained in them vary, they come together in the focus giving greater priority to functional performance rather than capacity only. However, the use of caregiver report also allows possible bias sources such as caregiver stress and mental health which could affect the perception of child functioning. This highlights the need to put into consideration the psychological well being of the caregivers when interpreting the adaptive behavior scores.

### **4.4 Caregiver Interventions to Adaptive Skills.**

Caregivers have been found to be in the middle of the adaptive skill growth in children with ASD by their daily interactions, routines, and expectations. Contrary to other structured therapy sessions, real life contexts offer repetitive, contextual experiences to practice adaptive skills. Dressing, mealtime activities, play, and community outings are some of the natural activities where communication, independence, and social competence reinforcement can be made.

The effectiveness of these learning opportunities is largely affected by the quality of the involvement of caregivers. Emotionally attentive, responsive and consistent caregivers are more capable of scaffolding skill acquisition, as well as facilitating generalization across settings. On the other hand, high levels of caregiver stress, anxiety, or depressive symptoms may interfere with these processes by decreasing consistency, enhancing avoidance of difficult situations, or restricting the possibilities of independent practice.

Empirical research proves that there are strong links between child adaptive outcomes and caregiver well-being. The fact that higher levels of caregiver stress are associated with poorer adaptive functioning especially in the areas of communication and daily living has been discovered. Longitudinal studies also indicate that mental health of caregivers is able to predict developmental trajectories of adaptive development over time, even when child characteristics at a baseline are taken into account. These results are consistent with transactional models that caregiver well-being determines and is determined by child adaptive functioning.

### **4.5 Use of Therapeutic Contexts to Promote Adaptive Development.**

Although caregivers constitute the main actors of adaptive skills development, therapeutic interventions can help to support the process of learning and make progress more rapid. Interventions to treat autism are

undergoing a trend towards more adaptive outcomes (as well as symptom reduction), a move in the direction of functional goals more consonant with family interests.

Parent-mediated programs and naturalistic Developmental Behavioral Interventions (NDBIs) as well as routine-based coaching models are especially effective in addressing adaptive skills. Such methods combine the principles of developmental and behavioral approaches, which focus on learning in the context of significance and involve caregivers. Studies have shown that those interventions that include caregiver coaching and feedback have higher generalization of adaptive skills as compared to those that only use child in their models.

#### 4.6 Adaptive Skills as Long-Term Outcomes Mediators.

The role of adaptive functioning takes a central place in models of long-term outcome prediction of persons with ASD. In contrast to core autism symptoms, which can also be persistent over the lifespan, adaptive skills are adaptive and can be influenced by intervention; hence, they are important levers to better the quality of life over the course of life. The research findings always point to the positive correlation between the level of adaptive functioning and the levels of independence, social participation, and quality of life during adulthood. The relationship between early intervention and late outcomes also occurs through adaptive skills. Indicatively, the benefits in communication and daily living skills in early childhood have been associated with better educational placement and less support demands in adulthood. The results described in this paper highlight the significance of putting an emphasis on adaptive outcomes in research and practice.

### Data Analysis and Results

#### 5.1 Data Analysis Approach

The hypothesis testing was done using data analysis to observe the hypothetical correlations between mental health of caregivers, therapeutic engagement, and adaptive skills in Autism Spectrum Disorder (ASD) children. Analysis of the data was done in SPSS and mediation analysis was done in the PROCESS macro (Hayes, 2022). Before the test of hypothesis, data were filtered against missing values, normality, multicollinearity and outliers. There were no statistical assumptions identified to invalidate the validity of subsequent analyses.

The initial calculations were descriptive statistics and reliability to test sample characteristics, and internal consistency of the measures in the studies. The next step was the Pearson correlation analysis to investigate the bivariate relationships between the variables of the studies. Lastly, direct and indirect effects as indicated in the conceptual framework were tested using multiple regression and mediation analysis. Bootstraps with a 5,000 resample were used to assess the indirect effects along with 95% bias-corrected confidence intervals (CIs). The p value was set at  $p = .05$ .

#### 5.2 Sample Characteristics

The sample population was reduced to 312 caregivers whose children were formally diagnosed with ASD. The age of children was between 3 and 12 years ( $M = 6.84$ ,  $SD = 2.31$ ). Most of the caregivers were mothers (72.1%), then fathers (23.4%), and other primary caregivers (4.5%). In line with the available epidemiological trends in ASD, the majority of the children were male (78.5%). In terms of clinical severity, 32.4% children had mild ASD, 45.5% moderate ASD and 22.1% severe ASD according to clinical records.

Table 1 Demographic Characteristics of Caregivers and Children (N = 312)

Variable	Category	n	%
Caregiver gender	Female	225	72.1
	Male	73	23.4

	Other	14	4.5
Caregiver education	Secondary or below	96	30.8
	Bachelor's degree	143	45.8
	Postgraduate	73	23.4
Child gender	Male	245	78.5
	Female	67	21.5
ASD severity	Mild	101	32.4
	Moderate	142	45.5
	Severe	69	22.1

### 5.3 Reliability Analysis

Internal consistency reliability for all study constructs was assessed using Cronbach's alpha. All measures demonstrated strong reliability, with alpha coefficients exceeding the recommended threshold of .70, indicating satisfactory internal consistency for research purposes.

Table 2 Reliability Statistics for Study Variables

Construct	Number of Items	Cronbach's $\alpha$
Caregiver Mental Health	21	.91
Therapeutic Engagement	15	.88
Adaptive Communication	12	.93
Daily Living Skills	11	.89
Socialization	13	.91

### 5.4 Descriptive Statistics and Correlation Analysis

Means, standard deviations, and Pearson correlation coefficients were computed to examine preliminary relationships among caregiver mental health, therapeutic engagement, and child adaptive skills. Higher scores on the caregiver mental health measure reflected greater psychological distress.

Caregiver mental health was significantly and negatively correlated with therapeutic engagement and all adaptive skill domains. Therapeutic engagement demonstrated significant positive associations with adaptive communication, daily living skills, and socialization. These correlations provided initial support for the hypothesized relationships.

Table 3 Means, Standard Deviations, and Pearson Correlations

Variable	M	SD	1	2	3	4	5
1. Caregiver Mental Health	3.42	0.68	—				
2. Therapeutic Engagement	3.76	0.71	-.56**	—			
3. Adaptive Communication	82.34	14.22	-.49**	.58**	—		
4. Daily Living Skills	79.18	13.65	-.47**	.54**	.63**	—	
5. Socialization	76.92	14.88	-.45**	.56**	.61**	.64**	—

Note.  $p < .01$ .

### 5.5 Regression Analyses

#### 5.5.1 Direct Effects of Caregiver Mental Health on Adaptive Skills

Multiple regression analyses were conducted to examine the direct effect of caregiver mental health on child adaptive functioning. Results indicated that caregiver mental health significantly predicted all three adaptive skill domains. Higher levels of caregiver psychological distress were associated with lower adaptive

communication, daily living skills, and socialization.

Table 4

Regression Results: Caregiver Mental Health Predicting Adaptive Skills

Outcome Variable	$\beta$	SE	t	p	R <sup>2</sup>
Adaptive Communication	-.43	.05	-8.21	< .001	.19
Daily Living Skills	-.40	.06	-7.14	< .001	.16
Socialization	-.38	.05	-7.02	< .001	.15

### 5.5.2 Effect of Caregiver Mental Health on Therapeutic Engagement

A regression analysis was conducted to assess whether caregiver mental health predicted therapeutic engagement. Results revealed a strong and significant negative association, indicating that greater caregiver psychological distress was associated with lower levels of engagement in therapeutic services.

Table 5

Regression Results: Caregiver Mental Health Predicting Therapeutic Engagement

Predictor	$\beta$	SE	t	p	R <sup>2</sup>
Caregiver Mental Health	-.56	.04	-11.87	< .001	.31

### 5.5.3 Effect of Therapeutic Engagement on Adaptive Skills

Therapeutic engagement was then entered as a predictor of child adaptive functioning. Results indicated that higher engagement significantly predicted better outcomes across all adaptive skill domains.

Table 6

Regression Results: Therapeutic Engagement Predicting Adaptive Skills

Outcome Variable	$\beta$	SE	t	p	R <sup>2</sup>
Adaptive Communication	.49	.05	9.31	< .001	.24
Daily Living Skills	.46	.06	8.19	< .001	.21
Socialization	.48	.05	8.94	< .001	.23

### 5.6 Mediation Analysis

Mediation analyses were conducted to test whether therapeutic engagement mediated the relationship between caregiver mental health and child adaptive skills. Results indicated that therapeutic engagement significantly partially mediated this relationship across all adaptive domains. The 95% bootstrap confidence intervals for all indirect effects did not include zero, confirming the presence of significant mediation.

Table 7

Bootstrapped Mediation Results

Outcome Variable	Direct Effect (c')	Indirect Effect (a × b)	95% CI
Adaptive Communication	-.21***	-.18***	[-.24, -.13]
Daily Living Skills	-.19***	-.16***	[-.22, -.11]
Socialization	-.18***	-.17***	[-.23, -.12]

Note. \*p < .001.

The findings are great empirical evidence in support of the conceptual framework. Mental health in the caregivers was found to have direct and significant implications on child adaptive functioning and indirect implications through therapeutic engagement. The therapeutic engagement became one of the mediating

mechanisms that connect caregiver psychological well-being and adaptive outcomes among children with ASD. Such results highlight the need to consider caregiver mental health as a key part of the autism intervention strategies.

## **6 Discussion**

The current research has explored how there are correlations between caregiver mental health, therapeutic engagement, and adaptive skills in children with Autism Spectrum Disorder (ASD) using a conceptual framework of family-centered and transactional models. The results can be discussed as effective empirical evidence of the model proposed, as they reveal a direct and indirect impact of caregiver mental health on child adaptive functioning, and therapeutic engagement is one of the key mediating effects. Such findings are applicable to the current knowledge through the means of empirical integration of psychological well-being of the caregiver, processes of engagement and adaptive outcomes into the same analytical framework.

In line with the hypotheses of the study, caregiver mental health was found to be one of the strong predictors of child adaptive functioning in terms of communication, daily living skills and socialization. Even with therapeutic engagement, there was a relationship between poorer adaptive outcomes and higher psychological distress levels of caregivers. This result is consistent with previous studies that have found out that child functional outcomes are negatively correlated with caregiver stress, anxiety, and depressive symptoms in ASD (Yorke et al., 2022; Hastings et al., 2023). Notably, the existence of strong direct impacts indicates that caregiver mental health impacts child outcomes not just associated with service utilization, but also related to daily care providing procedures.

The adverse correlation between caregiver mental health and therapy engagement in the present study is yet another indication of the importance of caregiver well being in the context of autism intervention. The caregivers who had increased psychological distress reported to have lower attendance, less involvement and a reduced compliance to home-based intervention strategies. This conclusion is in line with the recent data regarding the fact that the caregiver stress and emotional exhaustion undermine prolonged attendance of the treatment programs, even in cases when the services are accessible and evidence-based (Stadnick et al., 2022; Derguy et al., 2021). In practical terms, this highlights the fact that non-involvement cannot be construed to mean lack of care or non-compliance on the part of the caregiver but it is an aspect of psychological and contextual limitation.

In turn, therapeutic engagement was a good predictor of adaptive functioning that was strongly positive across all domains. Children with caregivers who exhibited increased caregiver engagement levels were better in the department of communication, more independent in their everyday living, and socialization. These results align with intervention research in which it has been stated that engagement is one of the key determinants of dose, fidelity, and generalization of the interventions (Albaum et al., 2023; Beaudoin et al., 2020). The findings can be used to agree with the perspective that engagement represents a dynamic process that transforms intervention content into a meaningful change in the real world.

Significantly, mediation analyses showed that therapeutic engagement mediated the relationship between child adaptive skills and caregiver mental health partially. These patterns of observation imply that the mental health of caregivers affects adaptive outcomes, indirectly, that is, by the modulation of interaction with interventions, and directly, presumably, by routine interactions in caregiving and emotional availability. The idea of the partial mediation is theoretically significant in transactional models of development that focus on a range of, interacting, pathways of influence that do not act in unique causal ways (Sameroff, 2010). The current results thus contribute to the knowledge of the functioning of care provider psychological well-being in complex developmental systems.

### **6.1 Connection to the Available Literature.**

The results of the given study overlap and complement earlier research in a number of significant aspects. On

the one hand, they contribute to the ever-increasing number of researchers and practitioners who believe that adaptive functioning is not a side effect but a primary outcome of the ASD research and practice (Trembath et al., 2020; Kraper et al., 2023). The results emphasize the relational and contextuality of adaptive skill development by showing that the factors of caregivers are strongly associated with the adaptive outcomes. Second, it supports the findings with empirical evidence of family-centered intervention models centered on caregiver participation and well-being. Recent systematic reviews and meta-analyses have demonstrated that interventions carried out by caregivers have stronger and more generalizable effects in case caregivers are well-supported (Sandbank et al., 2020; Schreibman et al., 2022). The current work contributes to this body of literature by showing that mental health of caregivers is not only the resulting abbreviation of such interventions but also a key determinant in their success.

Third, the mediation results correspond to the new literature that views the therapeutic engagement as a change mechanism rather than a variable of process. Although engagement has usually been approached descriptively in the area of intervention research, the current findings offer the quantitative evidence that engagement partly explains how child outcomes are mediated by the mental health of the caregiver. This result aligns with the recent suggestions of more mechanism-oriented autism research that goes beyond the question of efficacy to a more specific question of how and why interventions work (Dyken et al., 2023).

## **6.2 Theoretical Implications**

Theoretically, the results strongly support the theoretical approaches to the development of ASD transactional and ecological models. The described bidirectional and mediating relations highlight the fact that child outcomes are the result of a consistent interaction between the psychological functioning of caregivers, their caregiving behavior, and therapeutic situations. Caregiver mental health is both a risk and protective factor which influences emotional climates, consistency, and responsiveness of care giving environments.

Another significant point of the results is the conceptualization of mental health among caregivers as a means of influence, and not exclusively as a result of child behavior. Reconceptualization has significant potential impacts on theory-building in the study of autism since it places caregivers as core actors whose psychological resources can be adjusted accordingly to influence developmental processes. This view is consistent with developmental psychopathology models that are highly dynamic, focusing on multilevel systems of influence in time.

## **6.3 Clinical and Practical Implications.**

These results have a number of implications to clinical practice. To begin with, autism service pathways should incorporate regular screening of caregivers on issues of stress, anxiety, and depression. Earlier detection of the psychological distress of caregivers may enable caregivers to be proactively assisted before the stage of engagement becomes worse or the effects of intervention are destroyed.

Second, the caregiver mental health supports should be involved in the autism intervention programs: brief cognitive-behavioral, acceptance-based, or mindfulness-based interventions should be added to parent training and child-centered therapy. This part mediation implies that well-being of caregivers can be used to improve engagement and increase an improvement in adaptive functioning.

Third, clinicians should interpret disengagement from services within a compassionate, contextual framework. Rather than attributing poor engagement to lack of motivation, providers should assess caregiver burden, logistical constraints, and emotional capacity. Flexible service delivery models, including telehealth and hybrid formats, may help mitigate some engagement barriers for highly stressed caregivers.

## **6.4 Implications on Policy and Systems.**

Systemically, the results highlight the importance of autism service that is based on a family unit instead of child-based interventions. Caregivers Mental health support should not be treated as something scarce and an

addition to effective autism intervention, but a key aspect of health care financing and policy frameworks. This is especially imperative when it comes to low- and middle-income settings wherein large portions of interventions are frequently devolved to the caregivers in situations where the service infrastructure are absent. Downstream benefits of investment in caregiver support programs can include a better engagement, lower service dropout and better child adaptive outcomes. Such investments are a cost-effective approach to enhancing ASD long-term functional outcomes, in terms of public health.

### **6.5 Limitations**

In spite of its advantages, the current research has a number of limitations which should be taken into consideration. First, there might be shared method variance due to the use of measures that are reported by caregivers, especially since the topic of caregiver mental health is addressed. Multi-informant and observational measures should be utilized in future research where possible. Second, the cross-sectional design does not allow causal inference and longitudinal studies should be conducted to investigate directionality and time change. Third, the sample was diverse and the results might not be applicable to all cultural or service contexts especially those that have limited access to formal intervention services.

### **6.6 Future Research Instructions.**

Longitudinal design and experimental research should be the priority of future studies to show whether interventions aiming at the enhancement of caregiver mental health would result in the long-term improvement of engagement and adaptive functioning. Also, factors that might be used as moderators, including socioeconomic status, cognitive level of children, and culture, should be studied to find those subgroups that might be most positively influenced by integrated support models. Additional development of the measurement of engagement will also enhance the capacity of the field to test the mechanisms of change.

### **6.7 Conclusion of the Discussion.**

To sum up, the current research suggests strong proof that caregiver mental health is a key factor in the therapeutic engagement and the development of adaptive skills with children ASD. The results indicated the need to adopt family-based, interventional strategies that consider the well-being of caregivers as a fundamental element of autism services through a direct and mediated impact on the sample populations. The findings also lead to the emerging literature that supports holistic and systems-focused models of care that acknowledge caregivers as key allies in enhancing the best developmental outcomes.

### **7.1 Clinical Implications**

The suggested intervention is the integration of a mental health screening of caregivers into the autism services.

Among the most urgent clinical implications of the present study, the necessity to screen the mental health of caregivers regularly in the context of the autism diagnostic and intervention pathways is to be mentioned. Since the psychological distress of caregivers and its impact on the therapeutic engagement and child adaptive outcomes are strongly linked, a caregiver mental health assessment can no longer be regarded as an optional feature of the clinical care.

Short, validated screening tests (e.g, stress, anxiety, and depression measures) can be practically included in intake evaluation and regular reviews without being very burdensome on family or clinicians. Early detection of caregiver distress would enable clinicians to develop a specific intervention plan, predict difficulties with engagement, and offer referral or support in a timely fashion. Notably, regular screening also conveys to the caregivers that their health is considered clinically significant and could reinforce therapeutic alliance and trust.

### **7.1.2 Providing Combined Interventions to Meet Child and Caregiver Needs.**

The partial mediation effects that have been noted in this research paper suggest that the mental health of caregivers has both a direct and an indirect effect on the adaptive outcomes of child. This has a clinical implication of the possibility of interventions based on child skills being inadequate in the presence of unaddressed caregiver psychological distress. Combined intervention models involving child-focused therapy and caregiver mental health assistance are thus bound to have stronger and more sound outcomes.

It is not always that intensive or long-term psychotherapy is needed by caregivers to facilitate such integration. The literature indicates that brief, intensive interventions, including cognitive-behavioral interventions, acceptance-based interventions or stress-management interventions, provided in conjunction with parent coaching or training are effective. Incorporating these supports into the autism services would decrease the barriers to access and normalize the support of caregivers as a part of the routine care.

Reframing Therapeutic Engagement as a Clinical Indicator: This section of the study aims to examine the concept of therapeutic engagement as a key indicator of successful therapies and propose alternative therapeutic strategies that practitioners might consider to assist a general neuropsychiatric client in managing his issue.

### **7.1.3 Reframing Therapeutic Engagement as a Clinical Indicator:** This part of the paper will explore the concept of therapeutic engagement as a success metric of effective therapies and suggest other possible therapeutic approaches that the practitioners may use in helping a general

The results emphasize therapeutic engagement as an important mediating factor between caregiver mental and child outcomes. Clinicians ought to thus not only view engagement as a logistical issue (e.g., attendance) but caregiver capacity and level of well-being as clinical markers. The decreased involvement can be an indication of caregiver burnout, emotional fatigue, or insufficient support requirements instead of demotivation or dedication.

This re-defining has significant clinical decision-making implications. Clinicians should investigate the possibility of increasing or decreasing the intensity, format, or expectations of intervention instead of being concerned with the limited progress of children. Problem-solving jointly, flexible time, and proactive check-in could be used to maintain interest in times when the caregiver is under high stress.

## **7.2 Policy Implications**

### **7.2.1 The Understanding of Caregiver Mental Health as the Niche in Autism Care.**

The research in terms of policy implications helps to recognize caregiver mental health as an essential part of autism care systems. Caregiver psychological support must be clearly indicated in funding structures, service guidelines, and accreditation standards as one of the key components of successful autism intervention. Intervention effectiveness may be compromised by the fact that many of the policies that limit funding to child-only services do not address the determinant of engagement and outcomes.

Integrating caregiver mental health within policy frameworks is in line with the wider public health and disability rights strategies to focus on family wellbeing, prevention and early intervention. Caregiver outcomes should be taken into consideration by the policymakers to represent the quality and effectiveness of the service provided together with the child developmental outcomes.

### **7.2.2 Access Extensions via Elastic and Inclusionary Service Patterns.**

The results also point to the necessity of providing policies that encourage the flexive service delivery models to meet accommodation caregivers who undergo high rates of stress or competing demands. Logistical barriers could be minimized through telehealth, hybrid services, and community-based programs, which would facilitate better engagement, especially among limited-resource families or those who are not in underserved communities.

Practices, which enable flexible provision, are particularly essential in the low- and middle-income-related situations when formal autism services might be scarce and caregivers have a disproportionate burden to

shoulder the intervention burden. Access systemic inequities can be responded to through investment in scalable, low-intensity support programs of caregivers, including group-based interventions or task-shifted models provided by trained community workers.

### **7.2.3 Cost-Effectiveness and Long-term System Advantages.**

In terms of economics, an investment in caregiver mental health support can have far-reaching positive long-term outcomes. It is expected that, through better caregiver well-being, there is improved engagement, service dropout decreases, and existing interventions are even more effective, thus maximizing returns on investment. Policymakers are advised to take into account cost-effectiveness analyses that include such downstream benefits as less intensive services demanded and better long-term functional outcomes of patients with ASD.

## **7.3 Implications to Practice and Service Delivery.**

### **7.3.1 The development of Family-Centered Service Pathways.**

The service providers are encouraged to develop autism intervention pathways which clearly include caregiver support at different stages of care; diagnosis to continued care intervention and transition planning. Pathways involving families identify the caregivers as care partners and focus on shared decision making, transparency and responsiveness to the family needs.

The strategies that are practical are incorporation of caregiver education and emotional support, peer support groups and continuity of care during transitioning of service. These strategies can help to minimize the isolation of caregivers, promote coping, and improve a long-term commitment to services.

### **7.3.2 Workforce Training of the Personnel in Family Engagement and Mental Health Awareness.**

The results highlight the need to conduct workforce training enabling professionals to acquire family engagement skills, mental health awareness, and compassionate communication. Autism clinicians do not usually get much training on identifying and addressing mental distress among caregivers even though they often encounter families that are very stressed.

The main strategies to focus on during training programs are the therapeutic alliance building strategies, discussion of sensitive mental health issues, and proper referrals. Interdisciplinary cooperation- especially between developmental and mental health practitioners- is also capable of improving the quality of the services and responsiveness.

### **7.3.3 Tracking Engagement and outcomes with Data.**

Continuous quality improvement in autism services can be informed by routine caregiver mental health, engagement and child adaptive outcome monitoring. The use of data-driven methods enables providers to recognize families at risk of disengagement and commensurate supports to them. The inclusion of caregiver-reported outcomes in service assessment systems also underpins the usefulness of caregiver views in the definition of success.

## **7.4 Implications to Equity and Cultural Responsiveness.**

The findings of the study have significant implications in the promotion of equity in the services of autism. Mental health of caregivers is informed by socioeconomic, cultural and systemic contexts and policies that do not acknowledge the contexts are likely to widen the disparities. Culturally responsive practices such as services being accessible in language, respect to cultural beliefs and community participation are critical towards well-being and engagement of all caregivers.

The collaboration with community stakeholders would help the policymakers and practitioners tailor the interventions and supports in a culturally meaningful and reachable way. These attempts are essential in making sure that integrated, family-centered care models are helpful to all families and not only those that are

more endowed.

The results of this research underscore the role of caregiver mental health as a confounding factor of therapeutic engagement and adaptations in the development of adaptive skills in ASD children. The outcomes are relevant to clinical practice by advocating the regular screening of caregivers and combined intervention paradigms. On a policy level, they demand that caregiver support is a recognized part of the autism service and that it be invested in more flexible and inclusive approaches to delivery. The evidence-based findings based on practice focus on family-based care, training of workforce, and improvement of services based on data. A combination of these implications leads to more holistic, fair and effective intervention of autism that considers the well being of caregivers as a key factor in child development.

### **8.1 Methodological Limitations.**

To begin with, the study also depended on caregiver-reported measures as the primary measure of ascertaining caregiver mental health, therapeutic engagement, and child adaptive functioning. Although caregiver report is practical and ecologically valid, in that it is useful in determining behaviors in a naturalistic environment, it presents the risk of shared variance of method and reporting bias. The high levels of psychological distress among caregivers can cause a negative perception of child functioning, which will exaggerate the perceived relationships. Even though the employed validated instruments and a high level of internal consistency address this issue to a certain degree, the use of multi-informant (for example, teacher or clinician reports) and observational methods of engagement and adaptive behavior in the future would help enhance the validity of the measurement.

Second, the cross-sectional design restricts the ability to make causal inferences. Even though the hypothesized model was developed on a theoretical basis and mediated by mediation analyses, the chronology of the revolution of caregiver mental health, therapeutic involvement, and adaptive outcomes cannot be conclusively defined. It is implied with transactional models that the influences are bidirectional through time but cross-sectional data cannot be used to capture the dynamic processes. To investigate the developmental patterns, the mutual impact, and the consistency of the mediation routes at different stages of development, longitudinal designs with repeated measurements are required.

Thirdly, therapeutic engagement was operationalized based on self-report indicators of attendance, participation, and home-based implementation of caregivers. Although these dimensions are meaningful regarding engagement aspects, they might not be able to fully acknowledge the complexity of engagement processes, including responsiveness of behavior during a session or therapist-caregiver alliance. Future studies must take into consideration the combination of objective measures (e.g. attendance records, fidelity checklists, session recordings) and standardized engagement scales in order to increase precision and comparability of results across studies.

Fourth, the sample was not ethnically homogeneous, and the results can be limited to generalizability. The respondents were already caregivers who were already involved in intervention services, which could have pressed out families with the most stress or those with the greatest constraints to access. Consequently, the relationships between the observed variables may be less than the size of the relationships in the more marginalized groups. Also, cultural and regional peculiarities can have an impact on caregiver experiences, engagement patterns. It is justified that cross-cultural replication should occur.

### **8.2 Conceptual and Analytical Limitations.**

Conceptually, mental health in caregivers was the subject of the study because it is a unidimensional construct that depicts psychological distress. Although the approach is in line with the previous studies, caregiver mental health is multidimensional and can consist of not only risk, but also protective variables, including coping styles, resilience, and social support. Further research ought to use more sophisticated frameworks that address the issues of protective mechanisms and distress in order to determine strength-based intervention targets.

The mediation model, which was tested in this study, explained important pathways, but there were no possible moderators, including the age of the child, the severity of autism, the socioeconomic status, or the type of intervention received. These variables can play a role in the impact or orientation of relationships between caregiver mental health, engagement, and adaptive outcomes. The integration of moderated mediation models in future studies would give a more sophisticated idea on who and under what circumstances the integration of interventions is most efficient.

### **8.3 Future Research Recommendations.**

Based on the current findings, it is suggested that there are a number of avenues of future research. The priority should first be on longitudinal and experimental designs to determine causal pathways, as well as, to determine whether gains made in caregiver mental health result in long-term gains in therapeutic engagement and adaptive functioning. The inclusion of caregiver mental health interventions with autism services through randomized controlled trials would be especially useful in testing mechanisms of change.

Second, future studies ought to explore beyond the early childhood years to investigate caregiver-child relationships in the context of adolescence and the adulthood, which is marked by growing adaptive demands and new caregiver stress. The mental health of caregivers is an important issue in comprehending how adaptive outcomes can be achieved in these transitions and, therefore, it is essential in the development of lifespan-oriented models of intervention.

Third, the implementation science should be prioritized more to explore the way in which the integrated, family-centered models can be extended and supported to operate in the context of the actual service systems. Studies are required to determine the viability, palatability, cost-effectiveness, equity of caregiver-support interventions in a variety of settings, such as low- and middle-income ones.

Lastly, culturally responsive and inclusive research designs should be given precedence in future studies. The involvement of the caregivers with different cultural backgrounds as partners in the research can inform the formulation of contextually relevant and contextually sensitive to different beliefs, values, and resource constraints interventions.

### **8.4 Conclusion**

In the current research, it can be seen that caregiver mental health is a primary predictor of therapeutic engagement and development of adaptive skills among children with Autism Spectrum Disorder. Incorporating the psychological well-being of caregivers, intricate processes of engagement and adaptive outcomes into a single empirical approach, the results demonstrate the need to shift the child only model of intervention to comprehensive, family-based practice.

Findings revealed that caregiver mental health has direct and indirect impacts on child adaptive functioning, and thus engagement is a critical change mechanism. These observations are consistent with transactional or ecological models of development that focus on the interplay between child features and care environments in which the child develops. Notably, the direct impact continuity implies that caregiver well-being determines child outcomes not only participating in formal intervention processes but also in daily interactions and learning opportunities.

The results have clinical and practical implications that caregiver mental health screening and support should be integrated in the autism services and a flexible and inclusive model of service delivery should be adopted to meet caregiver capacity and situation based constraints. On a policy level, the study supports the importance of acknowledging caregiver support as a critical part of quality autism care, and the implications are on the funding levels, training of the workforce, and service model.

Finally, the problem of caregiver mental health is not a supplementary intervention in autism management but an initial step towards better engagement, increased rates of adapting skills, and positive long-term prospects of children with ASD. The future studies and practice initiatives must still build on the integrated

and family-based models that acknowledge the caregivers as critical partners in the developmental processes of individuals with autism.

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