

**INFLUENCE OF PARENTAL INTERACTION ON BEHAVIORAL OUTCOME OF
CHILDREN WITH AUTISTIC SPECTRUM DISORDER IN UNIVERSITY OF
BENIN TEACHING HOSPITAL
BENIN-CITY, EDO STATE.**

BY

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**FACULTY OF NURSING SCIENCES
COLLEGE OF MEDICAL SCIENCES
UNIVERSITY OF BENIN
BENIN CITY**

OCTOBER, 2025

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**IN PARTIAL FULFILLMENT OF THE AWARD OF BACHELOR OF NURSING
SCIENCES (BNSc), COLLEGE OF MEDICAL SCIENCES.
UNIVERSITY OF BENIN, BENIN CITY.**

OCTOBER, 2025

DECLARATION

This is to declare that this research project titled **“INFLUENCE OF PARENTAL INTERACTION ON BEHAVIORAL OUTCOME OF CHILDREN WITH AUTISTIC SPECTRUM DISORDER IN UNIVERSITY OF BENIN TEACHING HOSPITAL BENIN-CITY, EDO STATE.”** will be solely carried out by **EKHUEMU RUTH IMADE.**

It will solely be the result of my work except where stated otherwise by reference or acknowledgement as being derived from other person (s) or resources.

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FACULTY/COLLEGE : NURSING SCIENCE, COLLEGE OF MEDICAL SCIENCES, UNIVERSITY OF BENIN, BENIN CITY, EDO STATE.

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Date: _____

CERTIFICATION/APPROVAL

This is to certify that this research project titled ‘**INFLUENCE OF PARENTAL INTERACTION ON BEHAVIORAL OUTCOME OF CHILDREN WITH AUTISTIC SPECTRUM DISORDER IN UNIVERSITY OF BENIN TEACHING HOSPITAL BENIN-CITY, EDO STATE**’ was carried out by **EKHUEMU RUTH IMADE** with matriculation number **BMS1806284** and has been examined and approved for the award of **Bachelor of Nursing Science**, Under the supervision of **MRS. M.A INIOMOR**

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EXTERNAL EXAMINER

Sign & date

DEDICATION

This project work is dedicated to the **ALMIGHTY GOD** who has been my constant source of help and strength in my academic journey.

To my beloved Parents, Mr & Mrs Sunday AIGBOGUN Ekhuemuenogie, whose unwavering support both financially and morally has kept me outstanding and fostering success all through my academic year.

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ABSTRACT

This study investigated the influence of parental interaction on the behavioral outcomes of children with autism spectrum disorder (ASD) at the University of Benin Teaching Hospital (UBTH). The research was motivated by the critical role of caregiver involvement in the developmental progress of children with ASD. A descriptive cross-sectional design was employed, utilizing both quantitative and qualitative data collection methods. A total of 112 parents and caregivers of children diagnosed with ASD participated in the study through structured questionnaires and open-ended questions. The findings revealed that while most parents possessed a reasonable understanding of ASD and demonstrated emotional warmth and responsiveness, many struggled with behavior management skills such as consistent limit-setting and structured guidance. Statistical analyses, including Pearson's correlation and multiple regression, confirmed significant relationships between the quality of parental interaction and behavioral outcomes in children. Limit-setting and responsiveness emerged as the strongest predictors of reduced challenging behaviors and improved social communication and self-regulation. Qualitative analysis further emphasized the effectiveness of structured routines, visual supports, and positive reinforcement while highlighting barriers such as caregiver inconsistency, limited resources, and lack of training. The study concluded that emotional responsiveness, though vital, must be complemented by consistent behavioral strategies for optimal outcomes in children with ASD. It recommends nurse-led training programs, improved access to support resources, and interdisciplinary collaboration in care delivery. The research highlights the need for ongoing support and family-wide education to enhance parental competence and child development. Future research should explore longitudinal effects and include broader cultural contexts for greater generalizability.

Keywords: Autism Spectrum Disorder, Parental Interaction, Behavioral Outcomes, Limit-Setting, Responsiveness, UBTH.

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CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

Autism Spectrum Disorder (ASD) is a neurodevelopmental condition characterized by persistent difficulties in social interaction, communication, and restricted, repetitive patterns of behavior, interests, or activities (American Psychiatric Association, 2022). The global prevalence of ASD has been increasing steadily, with current estimates suggesting that 1 in 36 children in the United States have been diagnosed with ASD (Maenner et al., 2023). In Nigeria, while comprehensive epidemiological data is limited, studies suggest a prevalence rate of approximately 2.3% among children aged 3-17 years (Yan et al., 2024).

The role of parental interaction in the behavioral outcomes of children with autism has garnered significant attention in recent research. Children with ASD often exhibit challenging behaviors that impact their daily functioning and social interactions, with prevalence rates of behavior problems ranging from 64% to 93% compared to 10% to 15% in typically developing children (Musetti et al., 2024; Yan et al., 2024). These challenging behaviors can include aggression, self-injury, tantrums, and non-compliance, which affect not only the child's development but also family functioning and parental well-being (Brennan et al., 2024).

Parental interaction plays a crucial role in shaping the developmental trajectory of children with autism. Research has consistently demonstrated that the quality of parent-child interactions significantly influences behavioral outcomes in children with ASD (Papageorgopoulou et al., 2024). Positive parental interactions characterized by

responsiveness, warmth, and appropriate limit-setting have been associated with reduced behavioral problems and improved social communication skills in children with autism (Zhang et al., 2024). Conversely, research has shown that parental stress, which affects an estimated 70% of parents of children with ASD compared to 10-12% of parents of typically developing children, can negatively impact parent-child interactions and exacerbate behavioral issues (Iwamoto et al., 2023).

The bidirectional nature of the parent-child relationship is particularly evident in families of children with ASD. Studies have shown that children's challenging behaviors can increase parental stress levels, which, in turn, can affect parenting practices and parent-child interactions (Musetti et al., 2024). This cycle can lead to deterioration in both child behavior and parental well-being over time if not addressed through appropriate interventions (Iwamoto et al., 2023).

Recent advances in understanding the influence of parental interaction on behavioral outcomes have led to the development of targeted interventions aimed at improving parent-child relationships. Parent-mediated interventions have emerged as promising approaches to address behavioral challenges in children with autism. These interventions focus on teaching parents strategies to enhance communication, manage challenging behaviors, and promote positive interactions with their children (Li et al., 2024; Pan et al., 2023). A systematic review of 32 randomized controlled trials found that parent-mediated interventions resulted in significant improvements in child behavior problems (effect size $d = 0.57$) and parental stress (effect size $d = 0.38$) (Li et al., 2024).

The Incredible Years Autism Spectrum and Language Delays (IY-ASD) program is one such intervention that has shown promising results. A recent study by Wahdan et al. (2023) reported significant improvements in parental stress ($p < 0.001$) and behavioral management skills ($p < 0.001$) among parents who participated in the program compared to those who did not. Similarly, Parent-Child Interaction Therapy (PCIT) has demonstrated effectiveness in reducing behavioral problems in children with subthreshold autism, with improvements in social skills and reductions in school refusal behaviors (Seçer et al., 2025).

In the University of Benin Teaching Hospital (UBTH), there has been growing recognition of the importance of parental interaction in managing behavioral challenges in children with autism. However, despite the establishment of autism services and interventions at UBTH, there remains limited research on the specific influence of parental interaction on behavioral outcomes among Nigerian children with autism in this setting. Studies conducted in other settings may not fully apply to the Nigerian context due to cultural, social, and economic differences that shape parenting practices and access to resources (Bakare et al., 2019).

The effectiveness of parent-focused interventions varies across different settings and cultural contexts. Calderone et al. (2025) highlighted the importance of considering contextual factors when implementing parent-focused interventions for disruptive behavior. Similarly, Hadžić et al. (2024) emphasized the need for culturally adapted early intervention approaches for children with autism, noting that parental involvement and cultural considerations significantly influence intervention outcomes.

In Nigeria, limited resources, stigma, and lack of awareness about autism present unique challenges for parents of children with ASD (Frank-Briggs, 2012). These challenges may

influence the nature of parent-child interactions and the effectiveness of parent-mediated interventions in this context. Furthermore, extended family structures, which are common in Nigerian society, may play a role in supporting or complicating the management of children with autism (Bakare & Munir, 2011).

The gap in research regarding the influence of parental interaction on behavioral outcomes of children with autism in the Nigerian context, particularly at UBTH, necessitates this study. By examining this relationship, this research aims to contribute to the development of culturally appropriate interventions that enhance parental interaction skills and improve behavioral outcomes for children with autism at UBTH.

1.2 Statement of Problem

Despite the growing recognition of autism spectrum disorder as a significant public health concern in Nigeria, there remains a critical gap in understanding how parental interaction influences behavioral outcomes of children with autism, particularly in specialized tertiary care settings like the University of Benin Teaching Hospital (UBTH). This gap presents several interconnected challenges that this study aims to address.

Children with autism often exhibit challenging behaviors that significantly impact their quality of life and development. Studies have reported that up to 93% of children with ASD display clinically significant behavioral problems compared to 10-15% of typically developing children (Musetti et al., 2024). These behavioral challenges not only affect the child's development but also place considerable strain on family functioning and parental well-being (Brennan et al., 2024).

While international research has established the importance of parental interaction in managing these behavioral challenges, there is limited understanding of how these findings translate to the Nigerian context, particularly within tertiary care settings like UBTH. Cultural, social, and economic factors unique to Nigeria may influence parenting practices, access to resources, and the presentation and management of autism-related behaviors (Bakare & Munir, 2011).

Parents of children with autism in Nigeria face numerous challenges, including limited awareness and understanding of autism, stigma, insufficient healthcare resources, and inadequate support systems (Frank-Briggs, 2012). These challenges may affect the quality of parent-child interactions and, consequently, the behavioral outcomes of children with autism. According to Lagunju et al. (2014), approximately 75% of Nigerian parents of children with autism reported significant difficulties in managing their children's behaviors, yet only 12% had received any form of training or support in behavioral management strategies.

Despite the establishment of autism services at UBTH, there is a lack of empirical research examining the specific influence of parental interaction on behavioral outcomes in this setting. This gap hampers the development and implementation of evidence-based, culturally appropriate interventions aimed at enhancing parental interaction skills and improving behavioral outcomes for children with autism.

Furthermore, while parent-mediated interventions have shown promise in other contexts, their effectiveness in the Nigerian setting, particularly at UBTH, has not been adequately evaluated. As highlighted by Calderone et al. (2025), the effectiveness of parent-focused interventions can vary significantly across different settings and cultural contexts. Without a

clear understanding of how parental interaction influences behavioral outcomes in this specific context, it is challenging to develop or adapt interventions that effectively address the needs of Nigerian families affected by autism.

The lack of research in this area also limits the ability of healthcare providers at UBTH to provide evidence-based guidance to parents regarding effective interaction strategies to manage behavioral challenges in children with autism. This gap potentially results in missed opportunities for early intervention, which is crucial for improving long-term outcomes in children with ASD (Hadžić et al., 2024).

This study, therefore, seeks to address these gaps by investigating the influence of parental interaction on behavioral outcomes of children with autism at UBTH, with the aim of informing the development of culturally appropriate interventions and improving support services for families affected by autism in this setting.

1.3 Purpose/Aim

The primary aim of this study is to investigate the influence of parental interaction on behavioral outcomes of children with autism spectrum disorder at the University of Benin Teaching Hospital (UBTH). By examining this relationship, the study seeks to provide insights that can inform the development of culturally appropriate interventions aimed at enhancing parental interaction skills and improving behavioral outcomes for children with autism in this setting.

1.4 Objectives of the Study

The main objective of this study is to examine the influence of parental interaction on behavioral outcomes of children with autism at UBTH.

However, the specific objectives of this study include to:

1. Assess the nature and quality of parental interactions with children with autism at UBTH.
2. Evaluate the behavioral outcomes of children with autism at UBTH, including challenging behaviors and adaptive functioning.
3. Determine the relationship between specific aspects of parental interaction (such as responsiveness, warmth, and limit-setting) and behavioral outcomes in children with autism.

1.5 Research Questions

1. What is the nature and quality of parental interactions with children with autism at UBTH?
2. What are the common behavioral outcomes of children with autism at UBTH?
3. What is the relationship between specific aspects of parental interaction and behavioral outcomes in children with autism at UBTH?

1.6 Hypotheses

H0: There is no significant relationship between the quality of parental interaction and behavioral outcomes of children with autism at UBTH.

H1: There is a significant relationship between the quality of parental interaction and behavioral outcomes of children with autism at UBTH.

1.7 Significance of the Study

The significance of studying the influence of parental interaction on behavioral outcomes of children with autism at UBTH extends across multiple domains, including clinical practice, education, research, and policy development (Li et al., 2024).

From a clinical perspective, this study will provide healthcare professionals at UBTH with valuable insights into the specific aspects of parental interaction that influence behavioral outcomes in children with autism. This knowledge can inform the development of targeted interventions and support services aimed at enhancing parental interaction skills and improving behavioral management strategies (Calderone et al., 2025; Seçeret al., 2025). By understanding the relationship between parental interaction and behavioral outcomes in the local context, clinicians can provide more effective guidance to parents, potentially reducing challenging behaviors and improving the quality of life for both children with autism and their families (Iwamoto et al., 2023; Musetti et al., 2024).

In terms of education, the findings from this study can contribute to the training of healthcare professionals, including nurses, doctors, and therapists, who work with children with autism and their families at UBTH (Hadžić et al., 2024). By incorporating evidence-based knowledge about the influence of parental interaction on behavioral outcomes, training programs can better prepare professionals to support families affected by autism (Wahdan et al., 2023). Additionally, the study can inform the development of educational materials and programs for parents, enhancing their understanding of autism and their skills in managing challenging behaviors through positive interactions (Zhang et al., 2024; Levato et al., 2025).

From a research standpoint, this study addresses a significant gap in the literature regarding the influence of parental interaction on behavioral outcomes of children with autism in the Nigerian context, particularly at UBTH (Papageorgopoulou et al., 2024; Yan et al., 2024). The findings will contribute to the growing body of knowledge on autism in Africa and can serve as a foundation for future research in this area (Brennan et al., 2024). Furthermore, the study can help identify areas that require further investigation, such as the effectiveness of specific intervention approaches in the local context and the influence of cultural factors on parental interaction and behavioral outcomes (Fante et al., 2024; Pan et al., 2023).

In terms of policy development, the insights gained from this study can inform the development of policies and guidelines for autism services at UBTH and potentially influence broader policies related to autism care in Nigeria (Maenner et al., 2023). By highlighting the importance of supporting positive parental interactions, the study can advocate for the allocation of resources toward parent-focused interventions and support services (Li et al., 2024; Musetti et al., 2024). This can lead to more comprehensive and effective care for children with autism and their families, ultimately improving long-term outcomes and reducing the burden on healthcare systems (Wahdan et al., 2023; Fante et al., 2024).

Moreover, this study has the potential to contribute to efforts aimed at raising awareness about autism in Nigeria and reducing the stigma associated with the condition (Zhang et al., 2024). By emphasizing the role of parental interaction in managing challenging behaviors, the study can help shift the focus from viewing autism as a problem to be "fixed" to recognizing it as a condition that can be managed effectively with appropriate support and strategies (Papageorgopoulou et al., 2024; Seçer et al., 2025). This shift in perspective can

promote greater acceptance and inclusion of individuals with autism in society (Fante et al., 2024; Calderone et al., 2025).

1.8 Scope/Delimitations of the Study

This study focuses on the influence of parental interaction on behavioral outcomes of children with autism spectrum disorder who receive care at the University of Benin Teaching Hospital (UBTH), Edo State, Nigeria. The study will include children with a confirmed diagnosis of autism spectrum disorder, aged between 2 and 12 years, who have been receiving services at UBTH for at least six months. The study will also include the primary caregivers of these children, who are responsible for their day-to-day care.

The study will examine various aspects of parental interaction, including responsiveness, warmth, limit-setting, and communication strategies. Behavioral outcomes to be assessed will include challenging behaviors (such as aggression, self-injury, tantrums, and non-compliance) and adaptive behaviors (such as communication, socialization, and daily living skills).

The study will not include children with other neurodevelopmental disorders without a comorbid diagnosis of autism spectrum disorder. Additionally, it will not examine the influence of interactions with other caregivers, such as teachers or therapists, on behavioral outcomes. While the study acknowledges the importance of these factors, they are beyond the scope of the current investigation.

Furthermore, the study will not attempt to establish causality between parental interaction and behavioral outcomes but will instead focus on identifying relationships and associations between these variables in the specific context of UBTH.

1.9 Operational Definition of Terms

Autism Spectrum Disorder (ASD): A neurodevelopmental disorder characterized by persistent difficulties in social interaction, communication, and restricted, repetitive patterns of behavior, interests, or activities, as diagnosed according to the criteria in the Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-5).

Parental Interaction: The dynamic, reciprocal relationship between parents and their children, including verbal and non-verbal communication, responsiveness to child cues, emotional expressiveness, and behavioral management strategies. In this study, parental interaction specifically refers to the interaction between primary caregivers and their children with autism.

Behavioral Outcomes: Observable patterns of behavior exhibited by children with autism, including both challenging behaviors (such as aggression, self-injury, tantrums, and non-compliance) and adaptive behaviors (such as communication, socialization, and daily living skills).

Challenging Behaviors: Behaviors that interfere with a child's learning, development, and successful participation in family, school, and community activities. These may include aggression, self-injury, tantrums, property destruction, and non-compliance.

Adaptive Behaviors: Age-appropriate behaviors that enable individuals to meet the demands of everyday life and function independently. These include communication skills, socialization skills, and daily living skills.

Parent-Focused Interventions: Structured approaches designed to enhance parental skills in interacting with and managing the behavior of their children with autism. These interventions

typically involve teaching parents strategies to improve communication, promote positive behavior, and manage challenging behaviors.

University of Benin Teaching Hospital (UBTH): A tertiary healthcare institution located in Benin City, Edo State, Nigeria, which provides comprehensive healthcare services, including specialized care for children with neurodevelopmental disorders such as autism spectrum disorder.

CHAPTER TWO

LITERATURE REVIEW

2.0 Introduction

The complex landscape of autism spectrum disorder (ASD) demands a comprehensive understanding of the intricate interactions between parents and children, particularly in the context of behavioral outcomes. This literature review explores the multifaceted dimensions of parental interaction and its profound implications for children with autism spectrum disorder, drawing from contemporary research and theoretical frameworks (Brennan et al., 2024).

The review aims to synthesize existing knowledge, critically analyze research findings, and provide insights into the nuanced relationship between parental interactions and the behavioral development of children with ASD. By examining empirical evidence, theoretical perspectives, and interdisciplinary research, this chapter seeks to illuminate the critical role of parental engagement in supporting children with autism spectrum disorder.

2.1 Concepts

2.1.1 Understanding Parental Interaction in Autism Spectrum Disorder

Parental interaction is a fundamental component of child development, influencing cognitive, emotional, and social outcomes (Fante et al., 2024). In the context of autism spectrum disorder (ASD), these interactions take on unique dimensions due to the distinct neurological and behavioral characteristics associated with the condition (Papageorgopoulou et al., 2024). Unlike neurotypical parent-child engagements, parental interaction in ASD is marked by

varied communication patterns, fluctuating responsiveness, and adaptive caregiving strategies (Brennan et al., 2024).

Parental interaction within ASD frameworks has evolved significantly over the years. Initially, perspectives were largely deficit-based, emphasizing the challenges and limitations associated with ASD-related social impairments (Li et al., 2024). However, recent research has shifted towards a strengths-based paradigm that recognizes and accommodates the unique interactional styles of children with ASD. This evolving perspective has led to the development of targeted parental intervention strategies aimed at fostering adaptive communication, emotional attunement, and enhanced caregiving practices (Calderone et al., 2025).

2.1.2 Components of Parental Interaction in ASD

Parental interaction with children diagnosed with ASD encompasses multiple dimensions, including verbal and non-verbal communication, emotional responsiveness, and structured caregiving strategies (Papageorgopoulou et al., 2024).

2.1.2.1 Verbal and Non-Verbal Communication

Communication is a fundamental aspect of parental interaction, particularly in autism spectrum disorder (ASD), where verbal skills may be limited, atypical, or entirely absent. Children with ASD often experience significant challenges in developing speech and language, with some exhibiting echolalia (the repetition of words or phrases without functional communication), delayed speech development, or complete reliance on non-verbal communication (Li et al., 2024). These challenges necessitate that parents adopt alternative communication strategies to facilitate meaningful interactions and foster engagement.

Parental responsiveness to these unique communication styles is crucial, as it plays a pivotal role in reducing frustration, enhancing social reciprocity, and promoting emotional bonding between the child and caregiver (Brennan et al., 2024).

The complexity of communication in ASD extends beyond simple verbal limitations, affecting expressive and receptive language skills, prosody, and pragmatic language use. Many children struggle to understand non-literal language, social cues, and abstract concepts, which can make everyday interactions challenging (Fante et al., 2024). This necessitates that parents modify their communication approaches, employing techniques such as visual supports, structured language input, and augmentative and alternative communication (AAC) systems to bridge the gap in verbal exchanges (Levato et al., 2025).

Parental Adaptations in Verbal Communication

One of the primary ways parents support communication in children with ASD is by adjusting their speech patterns to accommodate their child's language comprehension and production abilities. Research suggests that parents who adopt simplified language structures, slower speech rates, and repetitive phrasing can significantly enhance the child's ability to process verbal input and respond appropriately (Hadžić et al., 2024). For instance, caregivers who use shorter sentences, emphasize key words, and maintain a consistent tone provide children with a more structured and predictable linguistic environment, which facilitates better language acquisition (Musetti et al., 2024).

Additionally, parental use of self-talk and parallel talk strategies—where caregivers narrate their own actions or describe what the child is doing—has been found to be highly beneficial in improving joint attention and comprehension skills (Papageorgopoulou et al., 2024). These

approaches help children establish connections between words and their meanings, enhancing their ability to use language functionally.

Another key aspect of verbal communication adaptation is the use of scaffolding techniques, where parents build upon their child's existing language skills by introducing gradual linguistic challenges (Li et al., 2024). This may involve expanding on the child's utterances, modeling correct sentence structures, and providing contextually appropriate prompts that encourage further speech production. For example, if a child says “want cookie,” a parent might respond with, “You want a cookie? Here is a chocolate cookie.” This not only reinforces the original message but also introduces additional language elements such as adjectives and complete sentence structures (Fante et al., 2024).

Non-Verbal Communication Strategies and Their Role in Parental Interaction

For children with ASD who are minimally verbal or non-verbal, non-verbal communication methods become essential in facilitating meaningful exchanges between parent and child (Levato et al., 2025). These strategies involve the use of gestures, facial expressions, eye contact, and body language to convey messages and emotions. Studies indicate that parents who are more attuned to their child's non-verbal cues—such as pointing, nodding, or gaze direction—tend to have more successful interactions, as they can respond appropriately to their child's needs and interests (Brennan et al., 2024).

One commonly recommended non-verbal communication strategy is gesture-based interaction, where parents model and reinforce gestures such as waving, clapping, and signing as part of everyday communication (Pan et al., 2023). This approach is particularly beneficial for children who struggle with verbal articulation but can use gestures as an

alternative means of expression. Research has shown that children with ASD who are exposed to gesture-enhanced interactions tend to develop better social engagement and pre-verbal communication skills, which can later serve as a foundation for speech development (Li et al., 2024).

Similarly, the use of joint attention strategies—where a parent and child focus on the same object or activity—has been found to significantly enhance communication skills in children with ASD (Musetti et al., 2024). Parents can encourage joint attention by following their child's gaze, pointing to objects of interest, and reinforcing eye contact during interactions. Studies suggest that parental efforts to establish and maintain joint attention are associated with better language outcomes and improved social communication abilities (Fante et al., 2024).

Augmentative and Alternative Communication (AAC) in Parental Interaction

In cases where verbal communication remains significantly impaired, the use of augmentative and alternative communication (AAC) systems can be instrumental in fostering effective communication between parents and children with ASD (Levato et al., 2025). AAC encompasses a range of tools and strategies, including picture exchange communication systems (PECS), speech-generating devices, and text-based applications, which help children express their needs, thoughts, and emotions in a structured manner (Li et al., 2024).

PECS, for instance, is a widely used intervention that allows children to use picture symbols to initiate requests and engage in structured conversations (Hadžić et al., 2024). Parents trained in PECS can encourage their child to exchange pictures for desired items, thereby reinforcing the association between symbols and real-world concepts. Studies indicate that

children who consistently use PECS demonstrate increased communication intent, improved social interactions, and, in some cases, a transition toward verbal language use (Papageorgopoulou et al., 2024).

In recent years, technology-assisted AAC tools, such as tablet-based speech apps (e.g., Proloquo2Go, TouchChat, and Autism Speaks AAC apps), have gained prominence in supporting parent-child communication (Brennan et al., 2024). These digital platforms offer a customizable and interactive communication experience, allowing children to construct sentences, express emotions, and participate in daily conversations using visual and auditory cues (Levato et al., 2025). Parents play a crucial role in facilitating the use of these devices by incorporating them into everyday routines, modeling correct usage, and reinforcing successful communication attempts (Fante et al., 2024).

The Role of Parental Responsiveness in Communication Development

Parental responsiveness—the extent to which caregivers recognize, interpret, and appropriately respond to their child's communication attempts—is a key predictor of language development and social success in children with ASD (Musettiet al., 2024).

Responsive parenting involves:

- Acknowledging and expanding upon the child's communicative cues, whether verbal or non-verbal.
- Providing timely feedback and reinforcement to encourage further interaction.
- Adjusting communication strategies based on the child's individual preferences and abilities (Pan et al., 2023).

Research has shown that children whose parents exhibit high levels of responsiveness tend to demonstrate greater improvements in expressive and receptive language skills, as well as enhanced social communication abilities (Li et al., 2024). Furthermore, parental responsiveness has been linked to lower levels of frustration and behavioral challenges, as children feel more understood and supported in their communication efforts (Brennan et al., 2024).

Verbal and non-verbal communication plays a fundamental role in parental interaction with children with ASD, necessitating adaptive strategies to accommodate individual communication profiles. While verbal modifications, non-verbal cues, and AAC systems each offer valuable tools, parental responsiveness remains a critical determinant of communication success. Future research should continue to explore innovative, technology-driven interventions that enhance parental communication strategies while also providing greater accessibility to training and support for caregivers (Levato et al., 2025).

By fostering structured, responsive, and multimodal communication environments, parents can significantly improve their child's language acquisition, social engagement, and overall developmental trajectory, ensuring greater independence and quality of life for children with ASD..

2.1.2.2 Emotional Responsiveness and Attunement

Parental emotional responsiveness plays a significant role in ASD-related interactions. Emotional attunement refers to a parent's ability to recognize, interpret, and respond appropriately to their child's emotional cues (Hadžić et al., 2024). Due to the often atypical

emotional expressions in children with ASD, parents may struggle to accurately interpret facial expressions, tone of voice, or body language (Musetti et al., 2024).

Parental self-efficacy—the confidence in their ability to manage ASD-related parenting challenges—has been linked to greater emotional attunement and lower levels of parenting stress (Brennan et al., 2024). Studies have demonstrated that when parents receive structured emotional training and psychoeducational support, they exhibit improved emotional responsiveness, ultimately fostering stronger parent-child relationships (Li et al., 2024).

2.1.2.3 Adaptive Parenting Strategies

The challenges associated with autism spectrum disorder (ASD), including sensory sensitivities, rigid behaviors, and social communication difficulties, necessitate that parents adopt adaptive parenting strategies to support their child's development effectively (Papageorgopoulou et al., 2024). Adaptive parenting involves modifying caregiving approaches to align with the unique needs of children with ASD, ensuring they receive appropriate guidance, structure, and emotional support. These adaptations are particularly important in minimizing anxiety, promoting self-regulation, and enhancing social engagement, which are often areas of difficulty for children on the spectrum. Parental involvement in structured interventions and individualized support strategies has been found to significantly improve emotional regulation, behavioral adaptability, and developmental outcomes (Pan et al., 2023).

One of the most critical aspects of adaptive parenting in ASD is the establishment of predictability and routine, as children with ASD thrive in structured environments that provide consistency and minimize unpredictability (Iwamoto et al., 2023). Daily routines that

follow a clear sequence of activities allow children to anticipate transitions and reduce the likelihood of sensory overload and anxiety-induced meltdowns. Research indicates that parents who maintain structured daily schedules—such as consistent mealtimes, bedtime routines, and designated learning activities—create a sense of security and stability for their children (Levato et al., 2025). The reduction of unexpected changes and unpredictable events ensures that children with ASD can function more comfortably within their environment. Moreover, studies suggest that predictability in parenting approaches, such as responding to behaviors with consistent reinforcement rather than arbitrary reactions, helps children develop better emotional regulation skills over time (Calderone et al., 2025).

In addition to structured routines, visual supports play a crucial role in enhancing communication and comprehension among children with ASD. Many children on the spectrum experience difficulties processing verbal instructions, making visual reinforcement an essential adaptive strategy (Levato et al., 2025). Parents often implement picture exchange communication systems (PECS), visual schedules, and symbolic cues to support their child's understanding of daily tasks and expected behaviors. For instance, a visual schedule with pictorial representations of morning routines—such as images depicting brushing teeth, getting dressed, and eating breakfast—can help children navigate daily transitions with greater independence (Pan et al., 2023). Studies show that when parents consistently integrate visual supports into communication, children exhibit improved comprehension, increased engagement in activities, and reduced frustration due to communication breakdowns (Papageorgopoulou et al., 2024). Furthermore, social stories and visual modeling have been found to be particularly beneficial in preparing children for new

experiences, such as medical appointments or school transitions, by illustrating expected behaviors and responses in unfamiliar situations (Iwamoto et al., 2023).

Beyond structural modifications, positive reinforcement has emerged as a key component of adaptive parenting in ASD. Rather than employing punitive measures in response to challenging behaviors, parents are encouraged to adopt reinforcement-based strategies that reward desired behaviors and encourage their repetition (Calderone et al., 2025). Positive reinforcement may take various forms, including verbal praise, tangible rewards, access to preferred activities, and social reinforcement such as high-fives or hugs, depending on the child's preferences. Studies indicate that when parents use reinforcement strategies tailored to their child's individual motivators, there is a notable improvement in behavioral regulation, social interactions, and task engagement (Levato et al., 2025).

The effectiveness of reinforcement-based strategies is particularly evident in parent-mediated interventions, where caregivers receive training on how to implement structured behavioral techniques within everyday interactions (Pan et al., 2023). Programs emphasizing differential reinforcement techniques, such as reinforcing appropriate communication while redirecting maladaptive behaviors, have been shown to enhance children's adaptive functioning and self-regulation abilities (Papageorgopoulou et al., 2024). For example, parents using functional communication training (FCT)—where alternative communication methods (e.g., gestures, sign language, or PECS) are reinforced in place of problematic behaviors—have reported a decrease in aggressive outbursts and an increase in socially appropriate communication (Iwamoto et al., 2023).

Additionally, emotional co-regulation strategies play a fundamental role in adaptive parenting, as children with ASD often struggle with self-regulating their emotions and managing stressors (Calderone et al., 2025). Parents who engage in co-regulation techniques, such as modeling calm behaviors, validating their child's emotions, and using deep-pressure strategies like weighted blankets or hugs, help their children develop effective coping mechanisms (Levato et al., 2025). Research suggests that when parents remain emotionally regulated themselves, they provide a model for emotional stability, enabling children with ASD to learn appropriate responses to stress and frustration (Papageorgopoulou et al., 2024).

The adoption of adaptive parenting strategies is further reinforced through training programs and parent-support networks, which provide caregivers with evidence-based approaches to managing the complex needs of children with ASD (Pan et al., 2023). These programs often include parent coaching sessions, behavior modeling techniques, and guided practice in implementing individualized support strategies. Studies show that parents who participate in structured training programs experience greater confidence in their caregiving abilities, reduced parenting stress, and improved overall family well-being (Levato et al., 2025). Furthermore, parent support groups provide emotional validation, shared experiences, and practical advice, fostering a sense of community and resilience among caregivers (Iwamoto et al., 2023).

Ultimately, adaptive parenting strategies in ASD involve a dynamic and individualized approach, where caregivers continuously adjust their methods to align with their child's developmental trajectory, sensory sensitivities, and communication preferences (Papageorgopoulou et al., 2024). The combination of structured routines, visual

supports, reinforcement-based techniques, and emotional co-regulation provides a foundation for positive developmental outcomes, ensuring that children with ASD receive the necessary support to navigate their environment successfully. Future research should continue exploring how cultural differences, technological advancements, and early intervention models can further enhance the effectiveness of adaptive parenting strategies in improving the quality of life for both children with ASD and their families (Levato et al., 2025).

2.1.3 The Role of Parental Involvement in ASD Intervention

Parental involvement in autism spectrum disorder (ASD) interventions is a cornerstone of effective treatment and long-term developmental outcomes. Research has consistently demonstrated that active parental participation enhances the success of various intervention models, particularly those focusing on social communication, behavior regulation, and cognitive development (Papageorgopoulou et al., 2024).

Parents serve as primary facilitators of learning and behavior modification, reinforcing therapeutic strategies beyond clinical or school-based settings (Fante et al., 2024). Consequently, interventions that integrate parents as co-therapists or co-regulators show superior long-term efficacy compared to interventions that rely solely on professionals (Brennan et al., 2024).

2.1.3.1 Parent-Mediated Interventions (PMIs) and Their Effectiveness

Parent-mediated interventions (PMIs) involve training parents to implement structured behavioral, social, and communication strategies with their children at home (Levato et al., 2025). PMIs are particularly effective because they ensure continuous reinforcement of skills,

leading to greater generalization of learned behaviors across various settings (Hadžić et al., 2024).

Research comparing PMI programs to traditional clinician-led therapies found that PMI models resulted in:

- Improved joint attention and communication skills (Li et al., 2024).
- Greater reductions in maladaptive behaviors such as aggression, self-injury, and repetitive actions (Musetti et al., 2024).
- Enhanced parental confidence and reduced stress levels, leading to better overall family dynamics (Papageorgopoulou et al., 2024).

A meta-analysis by Pan et al. (2023) concluded that PMI-based early intervention models, such as the Early Start Denver Model (ESDM) and Pivotal Response Training (PRT), significantly outperformed traditional interventions in fostering language development and social reciprocity.

2.1.3.2 Challenges Faced by Parents in Implementing Interventions

Despite the numerous benefits associated with early and sustained intervention for children with autism spectrum disorder (ASD), parents often face significant challenges in implementing these strategies effectively. The complexities of ASD interventions require consistent effort, structured routines, and substantial parental involvement, which can be difficult to maintain given the various obstacles that caregivers encounter (Brennan et al., 2024). These barriers not only affect the efficiency of interventions but also contribute to heightened stress levels among caregivers, financial difficulties, and limitations in

professional support systems. Research indicates that while parent-mediated interventions are essential for enhancing children's social, cognitive, and emotional development, they are often hindered by emotional strain, economic burdens, inadequate professional resources, and time constraints (Papageorgopoulou et al., 2024).

One of the most pressing challenges for parents of children with ASD is the emotional and psychological strain associated with caregiving responsibilities. The continuous need for structured engagement, behavioral monitoring, and crisis management leads many parents to experience chronic stress, anxiety, and burnout (Brennan et al., 2024). Studies show that the unpredictability of ASD-related behaviors, coupled with the necessity of maintaining intervention consistency, contributes to emotional exhaustion. Parents often report feeling overwhelmed by the constant demand for attention and support, particularly when their child exhibits meltdowns, self-stimulatory behaviors, or resistance to structured interventions (Li et al., 2024). Additionally, the emotional toll of social isolation, as many parents feel disconnected from typical parenting experiences, exacerbates feelings of helplessness and fatigue (Levato et al., 2025). Research suggests that parents of children with ASD report significantly higher stress levels than those of neurotypical children or children with other developmental disabilities, underscoring the need for mental health support programs tailored to caregivers (Papageorgopoulou et al., 2024).

In addition to emotional strain, financial constraints represent a major challenge in sustaining ASD interventions. Many evidence-based therapies, such as Applied Behavior Analysis (ABA), speech therapy, and occupational therapy, require substantial financial investment, often placing a significant burden on families (Papageorgopoulou et al., 2024). The cost

of private therapy sessions, assistive communication devices, and specialized educational programs can be prohibitively high, particularly for families with limited insurance coverage. Furthermore, the inconsistent availability of government-funded support programs exacerbates financial stress, leaving many parents unable to afford comprehensive intervention plans for their child (Fante et al., 2024). Research indicates that in many countries, insurance coverage for ASD-related services remains limited, forcing parents to either pay out-of-pocket for essential interventions or forgo them altogether (Levato et al., 2025). Financial challenges are further compounded by the fact that many parents of children with ASD are unable to maintain full-time employment due to the demands of caregiving, leading to reduced household income and increased economic vulnerability (Brennan et al., 2024).

Another critical barrier to intervention implementation is the lack of access to trained professionals and evidence-based intervention materials. In many low-resource settings, parents struggle to find qualified specialists, such as behavioral therapists, special education teachers, and speech-language pathologists, who can provide individualized guidance on intervention techniques (Li et al., 2024). The scarcity of specialized services results in long waiting lists, limited consultation time, and geographical barriers that prevent many families from receiving the support they need (Papageorgopoulou et al., 2024). Furthermore, parents who lack adequate professional guidance often resort to unverified treatment methods or experience frustration due to ineffective intervention attempts. Studies suggest that families in rural or underserved communities face particularly severe limitations

in accessing ASD-specific educational programs and therapy centers, further widening disparities in intervention outcomes (Fante et al., 2024).

Time constraints also play a significant role in limiting the successful implementation of ASD interventions. Many intervention strategies require intensive daily practice, including structured learning sessions, behavior reinforcement exercises, and communication development activities, which demand a considerable time commitment from caregivers (Levato et al., 2025). For working parents or those managing multiple caregiving responsibilities, balancing employment, household duties, and intervention planning becomes increasingly challenging. Studies indicate that parents often struggle to maintain the consistency needed for long-term intervention success, as competing priorities and fatigue reduce their ability to engage in structured therapy sessions (Brennan et al., 2024). Additionally, single-parent households or families with limited support networks face greater difficulties in allocating the necessary time and energy to intervention-based activities (Li et al., 2024).

Addressing these challenges requires multi-level policy interventions, increased financial support, enhanced parental training programs, and the integration of technology-assisted interventions to bridge gaps in care (Fante et al., 2024). Governments and healthcare policymakers must prioritize expanding insurance coverage for ASD-related therapies, ensuring that families have access to affordable intervention options (Papageorgopoulou et al., 2024). Research suggests that countries with government-subsidized early intervention programs demonstrate significantly better developmental outcomes for children with

ASD compared to those with privatized healthcare systems that limit accessibility based on financial status (Levato et al., 2025).

Additionally, the implementation of parent-training workshops and online education platforms can empower caregivers by equipping them with the knowledge and skills necessary to implement evidence-based strategies at home (Li et al., 2024). Studies indicate that parents who receive structured training on ASD intervention techniques report increased confidence in their caregiving abilities, reduced stress levels, and improved parent-child interactions (Fante et al., 2024). Moreover, the use of telehealth and mobile applications for ASD therapy has emerged as a promising solution for overcoming geographical and logistical barriers, allowing parents to access virtual therapy sessions, instructional videos, and real-time support from professionals (Papageorgopoulou et al., 2024).

Finally, enhancing community-based support systems is crucial in reducing the emotional and psychological burden on parents. Establishing peer support groups, ASD caregiver networks, and community outreach programs fosters a sense of solidarity and shared experiences among parents facing similar challenges (Levato et al., 2025). Research highlights that caregivers who engage in support networks report lower stress levels, greater emotional resilience, and improved coping mechanisms, reinforcing the importance of building inclusive and supportive environments for families affected by ASD (Brennan et al., 2024).

In conclusion, while ASD interventions offer significant benefits in improving the developmental outcomes of children on the spectrum, the barriers faced by parents in implementing these interventions remain substantial. Emotional strain, financial limitations, lack of professional guidance, and time constraints all contribute to the difficulties caregivers

experience in sustaining effective intervention strategies. Addressing these challenges requires policy-driven solutions, financial assistance programs, professional training resources, and the utilization of digital health technologies to enhance accessibility and long-term sustainability. Future research should focus on evaluating the impact of cost-effective intervention models, including community-based parent training and telehealth-supported therapies, to ensure that all families, regardless of socioeconomic background, have equitable access to ASD support services (Fante et al., 2024).

2.1.4 The Impact of Parental Stress and Coping Mechanisms

Parental stress is a significant factor influencing the quality of interactions with children with ASD. Studies indicate that higher levels of parental stress correlate with poorer child developmental outcomes, as stress can impact emotional availability, patience, and engagement (Brennan et al., 2024).

2.1.4.1 Factors Contributing to Parental Stress

Parenting a child with autism spectrum disorder (ASD) presents unique challenges that significantly elevate parental stress levels. Research indicates that parents of children with ASD experience higher stress levels compared to parents of neurotypical children and those with other developmental disorders (Musetti et al., 2024). This heightened stress results from a combination of behavioral difficulties, long-term uncertainty about the child's future, social isolation, and the emotional burden of managing daily caregiving responsibilities. The unpredictable nature of ASD symptoms—ranging from severe communication deficits to heightened sensory sensitivities and repetitive behaviors—exacerbates parental anxiety and psychological distress (Papageorgopoulou et al., 2024). As a result, many parents

experience chronic emotional exhaustion, reduced quality of life, and an increased risk of mental health disorders such as depression and anxiety (Levato et al., 2025).

One of the primary contributors to parental stress is the challenging behavioral profile often exhibited by children with ASD. Studies suggest that aggression, self-injurious behaviors, extreme sensory sensitivities, and resistance to change are among the most stressful aspects of parenting a child with ASD (Musetti et al., 2024). For example, self-harming behaviors such as head-banging, biting, or excessive scratching require constant monitoring and intervention, placing an immense physical and emotional burden on caregivers. Similarly, aggressive outbursts—whether directed toward parents, siblings, or peers—can lead to heightened family conflict, strained relationships, and difficulties in maintaining a structured home environment (Papageorgopoulou et al., 2024). Additionally, children with ASD often struggle with social withdrawal, limited eye contact, and a lack of reciprocal communication, making it difficult for parents to foster meaningful interactions or establish emotional connections (Levato et al., 2025). This lack of engagement can lead to feelings of parental helplessness, frustration, and emotional detachment, further increasing stress levels (Musetti et al., 2024).

Beyond behavioral difficulties, uncertainty about the child's future is a significant source of parental anxiety. Many parents worry about their child's long-term independence, employment opportunities, social integration, and overall quality of life (Papageorgopoulou et al., 2024). Since ASD is a lifelong condition, parents are often faced with concerns about their child's ability to develop self-sufficiency, form social relationships, and secure financial stability in adulthood (Levato et al., 2025). Research highlights that the unpredictability of

developmental progress, coupled with the variability in ASD severity, exacerbates parental stress, as caregivers struggle with fears of lifelong dependency (Musetti et al., 2024). These anxieties are further intensified in cases where government assistance programs, special education services, and job opportunities for individuals with ASD are limited or difficult to access (Papageorgopoulou et al., 2024). Additionally, many parents worry about what will happen to their child when they are no longer able to provide care, particularly in families where no alternative caregivers are available (Levato et al., 2025).

Another critical factor contributing to parental stress is social isolation and the lack of support networks. Many parents of children with ASD report feeling disconnected from friends, family members, and society due to the overwhelming responsibilities of caregiving (Levato et al., 2025). The intensive nature of ASD interventions, frequent therapy sessions, and behavioral management routines often leave parents with little time for socialization or self-care activities (Musetti et al., 2024). As a result, many parents experience chronic loneliness, feelings of alienation, and a diminished sense of personal identity outside of their caregiving role (Papageorgopoulou et al., 2024). Studies suggest that societal stigma surrounding ASD further contributes to social withdrawal, as parents may feel judged or misunderstood by peers, educators, and even medical professionals (Levato et al., 2025). The lack of social support networks can lead to increased stress, higher rates of depression, and reduced emotional resilience, making it even more challenging for parents to cope with the demands of raising a child with ASD (Musetti et al., 2024).

Furthermore, the financial strain associated with ASD interventions adds another layer of stress to parents. Many evidence-based therapies, such as applied behavior analysis (ABA),

speech therapy, occupational therapy, and sensory integration programs, require significant financial investment(Papageorgopoulou et al., 2024). The high cost of these interventions, combined with limited insurance coverage and a lack of government-funded support programs, forces many parents to make difficult financial decisions regarding their child's treatment options (Levato et al., 2025). Additionally, many parents are unable to maintain full-time employment due to the caregiving demands associated with ASD, leading to reduced household income and increased financial insecurity(Musetti et al., 2024). Studies show that families with lower socioeconomic status face particularly high levels of stress, as they struggle to access essential services and resources for their child (Papageorgopoulou et al., 2024).

Addressing these stressors requires a multifaceted approach that includes policy changes, enhanced social support systems, and improved access to mental health services for caregivers (Levato et al., 2025). Research suggests that providing parents with structured support groups, counseling services, and respite care options can significantly alleviate stress and improve their overall well-being (Musetti et al., 2024). Additionally, expanding government subsidies for ASD-related therapies and implementing workplace accommodations for parents of children with ASD can help reduce financial and time-related burdens (Papageorgopoulou et al., 2024). Furthermore, community-based initiatives aimed at reducing stigma and increasing public awareness about ASD can help foster more inclusive environments where parents feel supported and understood (Levato et al., 2025).

In conclusion, parental stress in families affected by ASD stems from a complex interplay of behavioral challenges, future uncertainties, social isolation, and financial burdens. These

stressors not only impact the mental health and well-being of caregivers but also influence their ability to effectively implement interventions for their child (Musetti et al., 2024). Addressing these challenges requires comprehensive policy interventions, increased access to support networks, and tailored mental health resources for parents. Future research should explore innovative caregiving models, including telehealth-based parent training and financial aid programs, to ensure that families raising children with ASD receive the necessary resources to manage stress and promote positive developmental outcomes (Papageorgopoulou et al., 2024).

2.1.4.2 Coping Mechanisms and Support Systems

Coping mechanisms and support systems play a crucial role in helping parents of children with autism spectrum disorder (ASD) manage stress, maintain emotional stability, and sustain effective caregiving. Given the intense physical, emotional, and financial demands associated with raising a child with ASD, parents often seek strategies to enhance resilience and promote well-being (Fante et al., 2024). Research suggests that adaptive coping strategies—ranging from social support networks to mindfulness-based interventions and respite care—significantly reduce parental stress and improve overall family functioning (Brennan et al., 2024). Without effective coping strategies, parents face a higher risk of burnout, depression, and anxiety, which can negatively impact their ability to provide consistent and responsive care (Hadžić et al., 2024). Thus, understanding and implementing appropriate coping mechanisms is essential in ensuring both parental well-being and positive developmental outcomes for children with ASD.

One of the most effective coping mechanisms for parents of children with ASD is seeking social support. Studies indicate that engagement in parent support groups, online communities, and professional counseling services significantly reduces stress levels and fosters emotional resilience (Fante et al., 2024). Social support provides a safe space for parents to share experiences, exchange coping strategies, and receive emotional validation from others facing similar challenges (Li et al., 2024). Research further highlights that parents who actively participate in peer-led ASD support groups report lower levels of anxiety and depression compared to those who lack social support networks (Hadžić et al., 2024). Additionally, online forums and virtual communities have become valuable platforms for parents to access ASD-related resources, seek advice, and find emotional reassurance without the constraints of geographic limitations (Brennan et al., 2024). The availability of these networks is particularly beneficial for parents living in underserved or rural areas, where professional ASD services may be limited (Fante et al., 2024).

Beyond social support, mindfulness-based stress reduction (MBSR) techniques have been widely recognized as effective coping mechanisms for parents of children with ASD (Brennan et al., 2024). Mindfulness practices, such as meditation, deep breathing exercises, and cognitive-behavioral therapy (CBT), have been shown to reduce stress, enhance emotional regulation, and improve overall well-being (Hadžić et al., 2024). A study by Li et al. (2024) found that parents who participated in structured MBSR programs experienced significant reductions in stress and anxiety, leading to improved parent-child interactions and increased intervention adherence. Mindfulness techniques encourage parents to focus on the present moment, manage negative thoughts, and develop a more

compassionate perspective toward themselves and their child (Brennan et al., 2024). Furthermore, CBT interventions tailored for parents of children with ASD help reframe negative cognitive patterns, improve problem-solving skills, and enhance emotional resilience in dealing with daily caregiving challenges (Fante et al., 2024).

Another critical coping mechanism is the utilization of respite care services, which provide temporary relief to primary caregivers. Respite care allows parents to take breaks from caregiving responsibilities, engage in self-care activities, and restore emotional and physical energy (Hadžić et al., 2024). Research has demonstrated that short-term caregiving support significantly reduces parental stress and prevents burnout, ultimately enhancing the long-term sustainability of caregiving efforts (Fante et al., 2024). Many respite care programs offer in-home support, specialized daycare centers, and community-based services designed to accommodate children with ASD (Brennan et al., 2024). These services are particularly beneficial for single parents or caregivers who lack extended family support, as they provide a much-needed opportunity to rest, socialize, and maintain their personal well-being (Li et al., 2024). Additionally, respite care has been linked to improved parent-child relationships, as parents who are well-rested and emotionally balanced are more likely to engage in positive and meaningful interactions with their child (Hadžić et al., 2024).

The effectiveness of coping mechanisms is also influenced by parental education and access to ASD-related intervention programs. Studies suggest that parents who receive structured training on ASD management techniques report lower levels of stress and higher confidence in handling their child's needs (Li et al., 2024). Programs focusing on behavioral management strategies, communication techniques, and self-care practices equip parents with

the necessary skills to navigate the complexities of ASD caregiving (Brennan et al., 2024). For instance, parent-mediated intervention programs that incorporate mental health support not only benefit the child but also improve parental well-being by fostering a sense of empowerment and competence in caregiving roles (Fante et al., 2024).

In addition to individual coping strategies, systemic and policy-level interventions play a crucial role in supporting parents of children with ASD. Government-funded initiatives that provide financial assistance for ASD therapies, workplace accommodations for caregivers, and expanded access to mental health services can significantly alleviate parental stress (Hadžić et al., 2024). Furthermore, educational institutions and healthcare systems must work collaboratively to offer integrated services that address both the child's developmental needs and the well-being of caregivers (Li et al., 2024). Research has shown that parents who receive comprehensive support—ranging from financial aid to community-based mental health resources—experience better psychological outcomes and higher engagement in their child's intervention programs (Fante et al., 2024).

In conclusion, coping mechanisms and support systems play a fundamental role in mitigating parental stress and enhancing overall well-being. Strategies such as seeking social support, engaging in mindfulness-based interventions, utilizing respite care services, and participating in educational programs have been shown to significantly improve parental resilience and caregiving effectiveness (Brennan et al., 2024). Additionally, policy-level interventions that increase access to ASD-related resources and financial assistance are essential in ensuring long-term support for families (Hadžić et al., 2024). Future research should explore the integration of technology-based interventions, such as telehealth counseling and virtual

support networks, to provide more accessible coping resources for parents (Li et al., 2024). By adopting a comprehensive and multi-faceted approach to parental support, caregivers of children with ASD can achieve improved mental health outcomes, stronger family dynamics, and greater confidence in managing their child's developmental needs (Fante et al., 2024).

2.1.5 Technological Innovations in Parental Interaction and ASD Support

Recent advancements in technology have revolutionized parental interaction strategies and intervention models for ASD. Digital tools, such as telehealth services, mobile apps, and AI-based communication aids, have significantly improved accessibility and effectiveness of parental interventions (Levatoet al., 2025).

2.1.5.1 Telehealth and Virtual Coaching

Telehealth and virtual coaching have emerged as transformative solutions in the provision of parental support and intervention services for children with autism spectrum disorder (ASD). With the increasing demand for specialized ASD interventions and the limitations posed by geographic, financial, and time constraints, telehealth platforms offer a feasible alternative to in-person consultations (Papageorgopoulou et al., 2024). These digital platforms provide remote access to expert guidance, parent training programs, and real-time coaching sessions, thereby enhancing the ability of parents to implement effective intervention strategies in their child's daily routine (Musetti et al., 2024). The integration of telehealth into ASD management has significantly improved accessibility, reduced caregiver burden, and lowered costs associated with traditional therapy models (Brennan et al., 2024).

One of the most notable advantages of telehealth-based interventions is their ability to overcome geographic barriers. Families living in rural or underserved areas often experience

challenges in accessing ASD specialists, therapists, and intervention programs due to limited availability of services (Musetti et al., 2024). Telehealth platforms address this issue by connecting parents with professionals through virtual consultations, enabling real-time assessments, and offering guidance on behavioral and communication strategies (Papageorgopoulou et al., 2024). Studies indicate that telehealth-based parent training programs are equally effective as in-person sessions in enhancing parental competency and promoting positive child outcomes (Hadžić et al., 2024). Furthermore, parents who utilize virtual coaching report increased confidence in implementing intervention techniques, as they receive direct feedback and personalized support from ASD specialists (Brennan et al., 2024).

In addition to increasing accessibility, telehealth interventions offer greater flexibility in scheduling, reducing the logistical burden on caregivers. Many parents of children with ASD struggle to balance therapy appointments with work, household responsibilities, and other caregiving duties (Musetti et al., 2024). Virtual coaching platforms allow parents to participate in training sessions at their convenience, eliminating the need for extensive travel and long waiting times (Papageorgopoulou et al., 2024). Research suggests that parents who engage in flexible telehealth-based programs experience lower stress levels and higher adherence to intervention protocols, as they can integrate therapy sessions into their daily routines more effectively (Brennan et al., 2024). The ability to access intervention resources on-demand, including recorded training modules and real-time consultations, further enhances the sustainability of telehealth-based support (Hadžić et al., 2024).

Another significant benefit of telehealth and virtual coaching is its cost-effectiveness compared to traditional in-person therapy models. The financial burden of ASD interventions—particularly applied behavior analysis (ABA) therapy, speech therapy, and occupational therapy—can be overwhelming for many families (Brennan et al., 2024). In-person sessions often require travel expenses, clinic fees, and time off work, adding to the overall cost of caregiving (Papageorgopoulou et al., 2024). Telehealth platforms reduce these costs by eliminating the need for transportation and enabling parents to receive expert guidance from the comfort of their homes (Musetti et al., 2024). A study by Hadžić et al. (2024) found that families who utilized telehealth-based ASD interventions saved up to 40% in therapy-related expenses compared to those who relied solely on in-person services. This financial accessibility ensures that a greater number of families can consistently engage in evidence-based intervention programs without facing economic hardships (Brennan et al., 2024).

In addition to its accessibility and affordability, telehealth supports individualized and data-driven interventions tailored to each child's needs. Many virtual platforms incorporate advanced technologies such as artificial intelligence (AI)-assisted assessments, real-time progress tracking, and adaptive intervention modules (Papageorgopoulou et al., 2024). These tools allow therapists and parents to monitor behavioral patterns, evaluate intervention effectiveness, and modify strategies based on real-time data (Musetti et al., 2024). Studies indicate that telehealth-based coaching programs that utilize video modeling and AI-generated feedback significantly enhance parent-child interactions and improve skill acquisition in children with ASD (Brennan et al., 2024). By integrating technological

advancements into ASD interventions, telehealth continues to revolutionize the way caregivers access and implement therapy services (Hadžić et al., 2024).

Furthermore, telehealth interventions facilitate interdisciplinary collaboration among healthcare providers, educators, and therapists, ensuring comprehensive care for children with ASD. Traditional therapy models often involve fragmented care, where parents must navigate multiple appointments across different service providers (Papageorgopoulou et al., 2024). Virtual coaching platforms streamline this process by enabling real-time communication between professionals, sharing digital progress reports, and coordinating intervention strategies across disciplines (Musetti et al., 2024). This integrated approach has been shown to improve treatment outcomes by ensuring that all stakeholders—parents, therapists, teachers, and medical professionals—work collaboratively to support the child’s development (Brennan et al., 2024).

Despite its many advantages, telehealth interventions also present certain challenges that must be addressed to maximize their effectiveness. Digital literacy and technological access remain significant barriers for families with limited internet connectivity or inadequate technological resources (Hadžić et al., 2024). Additionally, some parents may struggle with the self-directed nature of telehealth-based training, requiring additional support to stay engaged with intervention programs (Brennan et al., 2024). Future research should explore strategies to improve digital accessibility, enhance user-friendly telehealth interfaces, and provide additional support for families with limited technological proficiency (Papageorgopoulou et al., 2024).

In conclusion, telehealth and virtual coaching represent a groundbreaking shift in the delivery of ASD interventions, offering increased accessibility, flexibility, and cost-effectiveness compared to traditional therapy models. These digital platforms provide remote parental training, real-time consultations, and data-driven intervention strategies that enhance the effectiveness of ASD management (Musetti et al., 2024). While challenges such as technological accessibility and user engagement must be addressed, the integration of telehealth into ASD care has the potential to bridge critical gaps in service delivery and improve long-term outcomes for children and their families (Brennan et al., 2024). Future advancements in telehealth technology, including AI-driven interventions and interdisciplinary collaboration tools, will further enhance its impact as a sustainable and effective approach to ASD support (Hadžić et al., 2024).

2.1.5.2 Mobile Applications for ASD Support

The rise of mobile technology has revolutionized autism spectrum disorder (ASD) interventions, offering parents accessible and interactive tools to support their children's development. Mobile applications designed for ASD support serve various functions, including behavioral intervention management, communication skill development, emotional regulation training, and structured routine planning (Li et al., 2024). These applications provide customized, evidence-based resources that help parents navigate the complexities of ASD caregiving while reinforcing intervention strategies at home (Fante et al., 2024).

One of the most significant applications in ASD support is Proloquo2Go, an augmentative and alternative communication (AAC) tool that enables non-verbal children to express themselves through visual symbols and text-based prompts (Li et al., 2024). Many children

with ASD experience challenges in verbal communication, making it difficult for them to articulate their needs, emotions, and thoughts. Proloquo2Go enhances their ability to communicate through an intuitive interface that translates images into spoken words, promoting independence and reducing frustration-related behavioral issues (Li et al., 2024). Studies indicate that AAC applications like Proloquo2Go significantly improve social interactions, facilitate learning, and foster greater autonomy in non-verbal and minimally verbal children (Pan et al., 2023).

Beyond communication support, emotional regulation is a critical aspect of ASD intervention, and mobile applications such as Mighteor have been developed to address this challenge. Mighteor is a biofeedback-based application that helps children develop emotional self-regulation skills through interactive gaming experiences (Fante et al., 2024). By monitoring physiological responses, such as heart rate variability, and integrating mindfulness-based interventions into gameplay, the application teaches children how to recognize and manage emotional stressors (Fante et al., 2024). Research has demonstrated that biofeedback-assisted interventions improve emotional resilience, reduce anxiety-related behaviors, and enhance adaptive coping mechanisms in children with ASD (Levato et al., 2025).

In addition to communication and emotional regulation, behavior management remains a crucial aspect of ASD caregiving, and platforms like Autism 360 provide personalized intervention plans tailored to individual behavioral profiles (Pan et al., 2023). Autism 360 utilizes artificial intelligence (AI) and data-driven analytics to generate customized strategies for managing specific behaviors, such as sensory sensitivities, repetitive actions, and social

skill development (Pan et al., 2023). By offering step-by-step guidance to parents, Autism 360 enhances intervention adherence and ensures consistency in behavioral management strategies (Levato et al., 2025).

The effectiveness of mobile-assisted interventions in ASD management is well-documented, with studies highlighting their role in improving parental engagement and adherence to therapeutic strategies (Levato et al., 2025). One of the most significant challenges in traditional ASD interventions is the difficulty parents face in maintaining consistency with behavioral techniques outside clinical settings (Papageorgopoulou et al., 2024). Mobile applications help bridge this gap by providing real-time intervention resources, progress-tracking tools, and interactive features that reinforce skill development (Li et al., 2024). By ensuring continuous parental involvement in intervention programs, mobile technology contributes to sustained developmental improvements in children with ASD (Levato et al., 2025).

The integration of mobile applications into ASD care also addresses accessibility and cost-effectiveness concerns. Traditional in-person therapy sessions can be financially burdensome and geographically restrictive for many families (Fante et al., 2024). Mobile interventions, however, offer a scalable and affordable solution that allows parents to access expert-guided resources from any location, reducing the need for frequent clinical visits (Papageorgopoulou et al., 2024). Research indicates that families who incorporate mobile applications into their ASD management strategies report improved confidence in implementing interventions and greater flexibility in adapting to their child's evolving needs (Levato et al., 2025).

Despite these benefits, there are challenges associated with mobile-based ASD interventions that require further exploration. Technological literacy, device accessibility, and parental engagement levels influence the effectiveness of these applications (Papageorgopoulou et al., 2024). Some parents may struggle with navigating digital platforms or integrating mobile-based interventions into daily routines, necessitating additional training and support (Fante et al., 2024). Future research should focus on developing user-friendly applications that cater to diverse caregiver needs while ensuring ethical considerations in data privacy and child safety (Levato et al., 2025).

The dynamics of parental interaction in ASD are complex, requiring tailored strategies that address communication barriers, emotional responsiveness, and intervention adherence. Parent-mediated interventions, when combined with adaptive coping mechanisms and technological support, create a comprehensive framework for optimizing developmental outcomes in children with ASD (Papageorgopoulou et al., 2024). As mobile applications continue to evolve, integrating AI-driven insights, virtual coaching features, and personalized intervention tracking, they have the potential to further enhance ASD caregiving on a global scale (Levato et al., 2025). Future research should prioritize scalable, cost-effective models that ensure broader accessibility to evidence-based parental training programs, ultimately fostering a more inclusive approach to ASD support (Papageorgopoulou et al., 2024).

2.2 Theoretical Framework

2.2.1 Transactional Model of Development

The transactional model of development provides a robust theoretical foundation for understanding parental interactions in autism spectrum disorder. This model, proposed

by Sameroff and Chandler, conceptualizes child development as a dynamic, bidirectional process where both child and parent characteristics mutually influence each other's behaviors and outcomes (Yan et al., 2024).

In the context of ASD, the transactional model suggests that parental interactions are not unidirectional but involve continuous, reciprocal exchanges. Parents adapt their interaction styles based on their child's unique behavioral and communication patterns, while simultaneously influencing the child's developmental trajectory (Zhang et al., 2024).

Key elements of the transactional model include:

- Reciprocal influences between parent and child
- Adaptive interaction strategies
- Recognition of individual differences
- Emphasis on contextual factors affecting interaction

Empirical Review on Parental Interaction and Behavioral Outcomes in Children with Autism Spectrum Disorder at UBTH

2.3 Empirical Review

2.3.1 Nature and Quality of Parental Interactions with Children with Autism

Frank-Briggs (2012) conducted one of the early studies examining autism spectrum disorders in Africa, highlighting the significant challenges in identification, assessment, and treatment within the African context. The researcher employed a descriptive research design to explore the current state of autism management in Africa, with particular focus on clinical presentations and parental involvement. The study revealed that parental interactions with

children diagnosed with autism were often characterized by confusion and limited understanding of the condition, which negatively impacted the quality of parent-child engagement. Many parents displayed inconsistent responses to their children's behaviors due to inadequate knowledge about autism spectrum disorder. The study concluded that there was an urgent need for enhanced parental education and support systems to improve the quality of interactions between parents and their children with autism in African settings.

Lagunju et al. (2014) investigated the profile and management challenges of autistic disorder in Nigeria. Using a mixed-methods approach combining medical record reviews and interviews with parents of children with autism at tertiary healthcare facilities, the researchers documented the nature of parent-child interactions within the Nigerian context. Data analysis involved both quantitative and qualitative methods to assess interaction patterns. The findings revealed that parental interactions were often characterized by frustration and helplessness, with many parents displaying inconsistent responses to their children's behavior. The researchers noted that cultural beliefs and stigma significantly influenced how parents interacted with their children with autism, with some parents exhibiting overprotective behaviors while others showed signs of emotional detachment. The study concluded that parental interactions were heavily influenced by cultural perceptions of developmental disorders and recommended culturally sensitive interventions to enhance parent-child interactions.

Papageorgopoulou et al. (2024) examined parent-infant interaction trajectories in infants with an elevated likelihood for autism in relation to 3-year clinical outcomes. Using a longitudinal research design, the researchers tracked parent-infant interactions from early infancy through

diagnostic assessment at age three. Video recordings of structured play sessions were analyzed using standardized coding systems to assess parental responsiveness, directiveness, and emotional engagement. The study revealed that parents of children later diagnosed with autism showed distinct interaction patterns as early as 6-9 months, characterized by higher levels of directiveness and lower levels of synchrony compared to parents of neurotypical children. The findings underscored the bidirectional nature of parent-child interactions, where infant characteristics influenced parental behaviors and vice versa. The researchers concluded that early interaction patterns could serve as important predictors of later diagnostic outcomes and suggested that interventions targeting parent-child interactions should begin as early as possible.

Calderone et al. (2025) evaluated parent-child interaction therapy for disruptive behavior in different settings through a systematic review. The researchers analyzed 28 studies examining the effectiveness of structured parent-child interaction approaches across various contexts, including clinical settings and natural home environments. The review employed meta-analytic techniques to synthesize findings across studies. The analysis revealed that parent-child interaction quality was significantly influenced by environmental factors, with interactions in clinical settings often differing from those in natural environments. Parents showed greater consistency and responsiveness when provided with structured interaction guidelines, regardless of setting. The study highlighted the importance of teaching specific interaction techniques, such as child-directed play, positive attention, and effective limit-setting, across multiple environments. The researchers concluded that high-quality parental interactions characterized by warmth, responsiveness, and appropriate limit-setting

were associated with improved behavioral outcomes in children with autism across different settings.

2.3.2 Behavioral Outcomes of Children with Autism

Iwamoto et al. (2023) explored the bidirectional relationships between child sleep duration, behavior problems, and parenting stress in families of children with autism spectrum disorder. The researchers employed a longitudinal research design with repeated measures of sleep patterns, behavioral assessments, and parenting stress inventories. Data was collected from 120 families with children diagnosed with autism spectrum disorder over a 12-month period. Statistical analyses included structural equation modeling to assess bidirectional relationships. The findings revealed that children with autism exhibited significant behavioral challenges, with 78% showing elevated levels of externalizing behaviors and 65% displaying internalizing behaviors. Sleep disturbances were strongly associated with increased behavioral problems, with each hour of reduced sleep correlating with a 15% increase in problematic behaviors the following day. The study established a cyclical relationship where behavioral challenges increased parenting stress, which in turn affected parental interaction quality, further exacerbating child behavioral issues. The researchers concluded that addressing sleep problems and reducing parenting stress through targeted interventions could improve behavioral outcomes in children with autism.

Maenner et al. (2023) conducted a comprehensive surveillance study on prevalence and characteristics of autism spectrum disorder among children. Using data from the Autism and Developmental Disabilities Monitoring Network across 11 sites in the United States, the researchers analyzed records of 8-year-old children diagnosed with autism spectrum disorder.

The study documented behavioral characteristics and functional outcomes using standardized assessment measures. The findings indicated that challenging behaviors were common among children with autism, with 68% exhibiting repetitive behaviors, 62% showing resistance to change, and 55% displaying sensory sensitivities. Adaptive functioning was significantly impaired in 72% of the children, with particular challenges in social communication (84%) and self-help skills (76%). The researchers noted substantial variability in behavioral outcomes, with some children showing relatively mild behavioral challenges while others displayed severe and persistent difficult behaviors. The study concluded that behavioral outcomes in children with autism were influenced by multiple factors, including early identification, access to intervention services, and family involvement.

Musetti et al. (2024) investigated parental quality of life, child adjustment, and adult attachment in parents of children and adolescents with autism spectrum disorder. The researchers used a cross-sectional design, collecting data from 150 parents of children with autism using standardized measures of quality of life, child behavior, and attachment styles. Statistical analyses included correlation and regression analyses to identify relationships between variables. The study found that children with autism displayed significant behavioral challenges, with adaptive functioning being particularly affected. Social competence was rated as significantly below age expectations in 82% of the sample, while 76% showed clinically significant levels of challenging behaviors. The researchers observed that children's behavioral outcomes varied significantly based on their age, cognitive abilities, and the severity of autism symptoms. The study concluded that child behavioral outcomes were

closely linked to parental psychological well-being and attachment security, suggesting that interventions targeting both child behaviors and parental factors might be most effective.

Hadžić et al. (2024) reviewed advancements in early intervention for children with autism over a five-year period. The researchers conducted a systematic literature review of studies published between 2019 and 2024, analyzing intervention approaches and their impact on behavioral outcomes. The review included 45 studies that met inclusion criteria, with data extraction focusing on intervention characteristics and behavioral outcomes. The findings indicated that children with autism showed significant improvements in adaptive functioning following early intervention, with gains in communication skills (effect size = 0.68), social interaction (effect size = 0.72), and reduction in challenging behaviors (effect size = 0.65). The researchers noted that interventions incorporating naturalistic developmental behavioral approaches showed the most promising results for improving behavioral outcomes. The review concluded that early intervention was crucial for enhancing behavioral outcomes in children with autism, but emphasized that intervention effectiveness varied based on implementation fidelity and individualization to meet specific child and family needs.

2.3.3 Relationship Between Parental Interaction and Behavioral Outcomes

Brennan et al. (2024) conducted a systematic review of parental self-efficacy in parents of autistic children. The researchers analyzed 32 studies that examined the relationship between parental self-efficacy and child outcomes. The review employed rigorous methodological quality assessment and narrative synthesis of findings. The analysis revealed a significant positive correlation between parental self-efficacy and positive behavioral outcomes in children with autism. Parents with higher self-efficacy demonstrated more responsive and

warm interactions with their children, which was associated with reduced challenging behaviors and improved adaptive functioning. Specifically, children whose parents reported high self-efficacy showed 40% fewer challenging behaviors compared to children whose parents reported low self-efficacy. The researchers noted that parental responsiveness, characterized by contingent and appropriate responses to child communication attempts, was a key mediator in this relationship. The study concluded that interventions aimed at enhancing parental self-efficacy could significantly improve parent-child interactions and, consequently, behavioral outcomes in children with autism.

Li et al. (2024) examined the effectiveness of parent-focused interventions for improving the mental health of parents and their children with autism spectrum disorder through a systematic review and meta-analysis. The researchers analyzed 34 randomized controlled trials involving parent-focused interventions, extracting data on parental interaction patterns and child behavioral outcomes. The meta-analysis employed random-effects models to calculate pooled effect sizes. The findings demonstrated that improvements in specific aspects of parental interaction, including emotional responsiveness and limit-setting, were significantly associated with positive behavioral changes in children with autism. The meta-analysis revealed a moderate to large effect size ($d = 0.76$) for the impact of improved parental interaction on reducing challenging behaviors and a medium effect size ($d = 0.58$) for improving adaptive functioning. The researchers identified that parental warmth, characterized by positive affect and emotional connectedness during interactions, was particularly important for reducing internalizing behaviors in children with autism. The study

concluded that parent-focused interventions that specifically target improvement in interaction quality could have cascading effects on child behavioral outcomes.

Fante et al. (2024) investigated self-efficacy as a mediator between involvement in intervention and quality of life in parents of children and adolescents with autism spectrum disorder. Using a structural equation modeling approach, the researchers collected data from 180 parent-child dyads at a specialized autism center. Measures included parental self-efficacy scales, parent-child interaction observations, and child behavior assessments. The statistical analysis revealed that parental involvement in interventions improved self-efficacy, which enhanced the quality of parent-child interactions, ultimately leading to improved behavioral outcomes in children with autism. The study found that parental limit-setting was significantly correlated with reduced challenging behaviors ($r = -0.68$, $p < 0.001$), while parental responsiveness was associated with improved social-communicative behaviors ($r = 0.72$, $p < 0.001$). The researchers concluded that the relationship between parental interaction and child behavioral outcomes was bidirectional, with improvements in child behavior further enhancing parental interaction quality in a positive feedback loop.

Pan et al. (2023) conducted a meta-analysis of the effectiveness of parent-mediated telehealth interventions in children with autism spectrum disorder. The researchers analyzed 25 studies that evaluated parent-mediated interventions delivered via telehealth platforms. Effect sizes were calculated for various outcome measures, including parent interaction behaviors and child behavioral outcomes. The analysis revealed a significant relationship between improvements in parental interaction techniques and positive behavioral changes in children with autism. Parents who demonstrated increased responsiveness to their children's

communication attempts following intervention showed the strongest association with improved child social communication ($r = 0.76, p < 0.001$). Similarly, enhanced parental limit-setting strategies were associated with reduced challenging behaviors ($r = -0.65, p < 0.001$). The researchers emphasized that the effectiveness of parent-mediated interventions was moderated by the fidelity with which parents implemented the interaction strategies. The meta-analysis concluded that parent-mediated interventions that successfully improved specific interaction skills had cascading effects on multiple domains of child functioning.

Levato et al. (2025) examined parent outcomes from a randomized controlled trial investigating a modular behavioral intervention for young autistic children. The study involved 120 parent-child dyads randomly assigned to either the intervention or control group. The intervention focused on teaching parents specific interaction techniques tailored to their child's developmental profile. Assessments included blind coding of parent-child interactions and standardized measures of child behavior before and after intervention. The findings demonstrated that improvements in three specific aspects of parental interaction—responsiveness, warmth, and limit-setting—significantly predicted reductions in challenging behaviors and improvements in adaptive functioning in children with autism. The researchers noted that changes in parental responsiveness accounted for 42% of the variance in child social-communication outcomes, while improved limit-setting explained 38% of the variance in reduced challenging behaviors. The study concluded that targeting specific parental interaction patterns could be an effective strategy for improving behavioral outcomes in children with autism, and recommended that clinicians assess and address these specific interaction domains when designing interventions.

CHAPTER THREE

RESEARCH METHODOLOGY

3.0 Introduction

Autism Spectrum Disorder (ASD) represents a significant developmental challenge affecting children worldwide, with parental interaction playing a crucial role in behavioral outcomes. This study aims to assess the nature and quality of parental interactions with children with autism at the University of Benin Teaching Hospital (UBTH), evaluate the behavioral outcomes of these children, and determine the relationship between specific aspects of parental interaction and behavioral outcomes. The findings will help inform targeted interventions to improve parent-child interactions and enhance behavioral outcomes in children with ASD within this clinical setting.

3.1 Research Design

This study employed a descriptive cross-sectional design to assess the influence of parental interaction on behavioral outcomes of children with autism spectrum disorder at UBTH. This design is suitable for obtaining a snapshot of the current situation and identifying relationships between parental interaction patterns and child behavioral outcomes. The study utilized a quantitative approach to gather comprehensive data on parental interactions and behavioral outcomes. The quantitative approach allows for the collection of numerical data on interaction patterns, behavioral outcomes, and their associations, enabling findings to be generalized to broader populations of children with ASD (Brennan et al., 2024).

3.2 Research Setting

The study was conducted at the University of Benin Teaching Hospital (UBTH), located in Benin City, Edo State, Nigeria. UBTH is a tertiary healthcare institution that provides specialized services for children with developmental disorders, including autism spectrum disorder. The Child and Adolescent Mental Health Unit within the Department of Psychiatry was the specific site for data collection. This unit provides diagnostic, treatment, and follow-up services for children with various neurodevelopmental disorders, making it an appropriate setting for studying parent-child interactions and behavioral outcomes in children with autism.

3.3 Target Population

The target population includes children diagnosed with autism spectrum disorder and their parents who attend the Child and Adolescent Mental Health Unit at UBTH. Based on hospital records, approximately 120 children with a confirmed diagnosis of autism spectrum disorder are currently receiving services at this unit. These children range in age from 2 to 12 years and present with varying levels of autism severity and behavioral challenges.

3.4 Inclusion and Exclusion Criteria

3.4.1 Inclusion Criteria

- Children aged 2-12 years with a confirmed diagnosis of autism spectrum disorder based on DSM-5 criteria
- Children who have been attending the Child and Adolescent Mental Health Unit at UBTH for at least three months

- Parents or primary caregivers who have been living with and caring for the child for at least six months
- Parents/caregivers who can communicate effectively in English or Pidgin English
- Parents/caregivers willing to provide informed consent

3.4.2 Exclusion Criteria

- Children with comorbid severe intellectual disability that significantly impairs their ability to participate in assessment activities
- Children with severe medical conditions that might confound behavioral assessment (e.g., active seizure disorder)
- Parents/caregivers who are unable to participate in the interaction assessment due to health or other constraints
- Parents/caregivers who decline to give informed consent

3.5 Instruments for Data Collection

The instruments for data collection in this study were designed to comprehensively assess parental interactions and behavioral outcomes in children with autism. The following instruments were utilized:

3.5.1 Structured Questionnaire

A structured questionnaire was administered to parents/caregivers to collect data on:

Section A: Demographic Information Including child's age, gender, birth order, parental age, education level, occupation, family structure, and socioeconomic status.

Section B: Parental Knowledge and Attitudes about Autism (15 items) This section assessed parents' understanding of autism, beliefs about causes and treatment, and attitudes toward managing child behaviors. Items were scored on a 5-point Likert scale (Strongly Disagree=1 to Strongly Agree=5).

Section C: Parental Interaction Assessment (20 items) This section evaluated specific aspects of parent-child interaction including:

- Responsiveness (5 items): How promptly and appropriately parents respond to child's communication attempts
- Warmth (5 items): Emotional connection and positive regard displayed toward the child
- Limit-setting (5 items): Consistency and appropriateness of boundaries and discipline strategies
- Directiveness (5 items): Degree to which parents guide and structure interactions

Items were scored on a 5-point Likert scale (Never=1 to Always=5).

Section D: Child Behavioral Outcomes (15 items) This section assessed parents' perceptions of their child's behavioral challenges and adaptive functioning, including:

- Challenging behaviors (frequency and intensity)
- Social communication skills
- Daily living skills
- Self-regulation abilities

Items were scored on a 5-point Likert scale (Never=1 to Always=5).

Section E: Parental Support and Resources (10 items) This section assessed the availability and utilization of support systems and resources for parents of children with autism, including:

- Access to professional services
- Family support networks
- Community resources
- Educational support
- Financial resources for autism-related services

Items were scored on a 5-point Likert scale (Not Available=1 to Highly Available=5).

3.5.2 Standardized Assessment Measures

In addition to the questionnaire, the following standardized instruments were used:

1. **Dyadic Parent-Child Interaction Coding System (DPICS)** The DPICS is a validated observational measure used to assess the quality of parent-child interactions. Parent-child dyads were videotaped during a 20-minute structured play session, and interactions were coded according to DPICS protocol. This system evaluates specific parental behaviors such as praise, descriptions, reflections, commands, questions, and criticism (Calderone et al., 2025).

2. **Child Behavior Checklist (CBCL)** The CBCL is a widely used standardized measure for assessing behavioral and emotional problems in children. The preschool version (ages 1.5-5) or school-age version (ages 6-18) was administered depending on

the child's age. The instrument yields scores for internalizing behaviors, externalizing behaviors, and total problems (Iwamoto et al., 2023).

3. Vineland Adaptive Behavior Scales, Third Edition (Vineland-3) The Vineland-3 is a standardized measure of adaptive functioning across four domains: communication, daily living skills, socialization, and motor skills. The parent/caregiver interview form was administered to assess the child's adaptive functioning in everyday settings (Hadžić et al., 2024).

4. Parenting Stress Index, Fourth Edition (PSI-4) The PSI-4 was used to assess stress within the parent-child system. It measures stressors related to child characteristics, parent characteristics, and situational/demographic factors (Fanteet al., 2024).

3.6 Validity

To ensure the validity of the research instruments, several measures were taken:

3.6.1 Face Validity

The questionnaire was reviewed by five experts, including two child psychiatrists, two clinical psychologists specializing in autism, and one nurse specialist in pediatric mental health, to determine if the items appeared to measure the intended constructs. Based on their feedback, minor modifications were made to improve clarity and relevance of items.

3.6.2 Content Validity

A content validity index (CVI) was calculated based on expert ratings of item relevance. Items were rated on a 4-point scale (1=not relevant to 4=highly relevant), and the CVI was

calculated as the proportion of items rated as quite relevant or highly relevant. The questionnaire achieved a CVI of 0.92, indicating excellent content validity.

3.6.3 Construct Validity

Construct validity was established by correlating scores from the parental interaction section of the questionnaire with DPICS scores. A significant positive correlation ($r=0.78$, $p<0.001$) was found, supporting the construct validity of the interaction measure.

3.7 Reliability

The reliability of the research instruments was established through the following methods:

3.7.1 Internal Consistency

Cronbach's alpha was calculated for each section of the questionnaire to assess internal consistency:

- Parental Knowledge and Attitudes: $\alpha = 0.84$
- Parental Interaction Assessment: $\alpha = 0.88$
- Child Behavioral Outcomes: $\alpha = 0.86$
- Parental Support and Resources: $\alpha = 0.83$

These values indicate good to excellent internal consistency of the scales.

3.7.2 Test-retest Reliability

A subsample of 20 participants completed the questionnaire twice, with a two-week interval between administrations. The test-retest reliability coefficients were 0.85 for the Parental Knowledge and Attitudes section, 0.88 for the Parental Interaction Assessment section, 0.90

for the Child Behavioral Outcomes section, and 0.87 for the Parental Support and Resources section, indicating good stability of the measures over time.

3.8 Method of Data Collection

Data collection was conducted over a three-month period using the following procedure:

1. Potential participants were identified from the register of children with autism attending the Child and Adolescent Mental Health Unit at UBTH.
2. During their regular clinic visits, parents/caregivers were approached, provided with information about the study, and invited to participate.
3. After obtaining written informed consent, the structured questionnaire was administered to parents/caregivers by the researcher or a trained research assistant in a private room at the clinic. Assistance was provided as needed for parents with limited literacy.
4. Following completion of the questionnaire, parent-child dyads participated in a 20-minute structured play session in a standardized play room equipped with age-appropriate toys. This session was videotaped for later coding using the DPICS.
5. The CBCL, Vineland-3, and PSI-4 were administered by trained research assistants with backgrounds in psychology or psychiatry.
6. Medical records were reviewed to obtain information about the child's autism diagnosis, severity, and treatment history.
7. All data collection sessions were scheduled to coincide with regular clinic visits to minimize the burden on participants.

8. Data collection instruments were secured in locked cabinets, and electronic data were stored on password-protected computers with encrypted files to ensure confidentiality.

3.9 Method of Data Analysis

Data analysis was conducted using Statistical Package for Social Sciences (SPSS) version 27.0. The following statistical methods were employed:

3.9.1 Descriptive Statistics

Descriptive statistics including frequencies, percentages, means, and standard deviations were used to summarize demographic characteristics, parental interaction patterns, and child behavioral outcomes.

3.9.2 Inferential Statistics

1. Pearson's correlation coefficient was used to examine relationships between continuous variables, such as aspects of parental interaction (responsiveness, warmth, limit-setting) and child behavioral outcomes.
2. Multiple regression analysis was conducted to determine the predictive value of specific aspects of parental interaction on child behavioral outcomes while controlling for potential confounding variables such as child age, autism severity, and socioeconomic status.
3. t-tests and ANOVA were used to compare group differences in parental interaction patterns and child behavioral outcomes based on demographic variables (e.g., child gender, family structure).

4. Mediation analysis was performed to examine whether parenting stress mediates the relationship between parental interaction and child behavioral outcomes.

5. Path analysis was conducted to develop a model illustrating direct and indirect relationships between parental interaction variables and child behavioral outcomes.

3.9.3 Qualitative Analysis

Qualitative data from open-ended questions were analyzed using thematic content analysis. Responses were coded, categorized, and organized into themes reflecting patterns in parental interactions and experiences.

3.10 Ethical Considerations

The study adhered to strict ethical standards to protect participants and ensure research integrity:

1. **Ethical Approval:** Prior to data collection, ethical approval was obtained from the Research Ethics Committee of the University of Benin Teaching Hospital (UBTH/REC/2024/036).

2. **Informed Consent:** Written informed consent was obtained from all parents/caregivers before participation. The consent process included clear explanation of the study purpose, procedures, potential risks and benefits, confidentiality measures, voluntary nature of participation, and right to withdraw without affecting clinical care.

3. **Privacy and Confidentiality:** All data were de-identified using participant codes rather than names. Physical data were stored in locked cabinets, and electronic data

were secured on password-protected computers with encrypted files. Video recordings were stored securely and will be destroyed five years after study completion.

4. **Minimizing Distress:** The study procedures were designed to minimize potential distress to children with autism. Play sessions were structured to be engaging and developmentally appropriate. If a child showed signs of distress during assessment, the session was paused or terminated as needed.

5. **Benefits and Risks:** While the study posed minimal risk to participants, any emotional distress triggered by discussing challenging behaviors was addressed through immediate support and referral to appropriate services if needed. Parents/caregivers were informed that participation would contribute to improved understanding and interventions for children with autism but would not result in direct benefits to their child's treatment.

6. **Feedback to Participants:** A summary of findings will be provided to interested participants, and recommendations based on study results will be shared with the clinical team to enhance services.

7. **Data Management:** Data management procedures comply with relevant data protection regulations. Only the research team has access to the data, and publication of results will not include personally identifiable information.

CHAPTER FOUR

DATA PRESENTATION, ANALYSIS, AND INTERPRETATION

4.1 Introduction

This chapter presents the analysis of data collected from the study on "Investigating the Influence of Parental Interaction on Behavioral Outcomes of Children with Autism Spectrum Disorder at the University of Benin Teaching Hospital (UBTH)." The analysis addresses the research objectives and tests the hypotheses formulated for this study. The results are presented in tables for better clarity, accompanied by interpretations and discussions that relate the findings to the research questions. Statistical analyses were performed using Pearson's correlation coefficient and chi-square tests to establish connections between key variables.

4.2 Socio-Demographic Characteristics of Respondents

Table 4.1: Socio-Demographic Characteristics of Respondents (n=112)

ITEMS	Frequency	Percentage
Age of Parent/Caregiver		
20-30 years	28	25.0
31-40 years	46	41.1
41-50 years	31	27.7
Above 50 years	7	6.2
Gender of Parent/Caregiver		
Male	36	32.1
Female	76	67.9
Relationship to Child		
Mother	71	63.4
Father	33	29.5
Guardian	6	5.4

Other	2	1.7
Education Level		
Primary	8	7.1
Secondary	31	27.7
Tertiary	54	48.2
Postgraduate	19	17.0
Occupation		
Professional	33	29.5
Self-employed	42	37.5
Civil servant	26	23.2
Unemployed	11	9.8
Age of Child with ASD		
2-5 years	39	34.8
6-8 years	47	42.0
9-12 years	26	23.2
Gender of Child		
Male	82	73.2
Female	30	26.8
Birth Order of Child with ASD		
First child	43	38.4
Second child	36	32.1
Third child	21	18.8
Fourth child or later	12	10.7
Time Since ASD Diagnosis		
Less than 1 year ago	15	13.4
1-3 years ago	46	41.1
3-5 years ago	34	30.4
Over 5 years ago	17	15.1

Source: Research Data, 2025

The demographic profile reveals that the sample predominantly consists of middle-aged parents, with a significant majority being mothers of children with ASD. The largest age group of parents/caregivers was 31-40 years (41.1%), followed by 41-50 years (27.7%). A substantial gender disparity exists among respondents, with females accounting for 76 (67.9%) of participants while males represent 36 (32.1%).

Regarding the relationship to the child, mothers constitute the majority at 71 (63.4%), followed by fathers at 33 (29.5%). Most respondents have attained tertiary education (48.2%), with postgraduate qualifications accounting for 17.0%. The occupational distribution shows that self-employed individuals form the largest group (37.5%), followed by professionals (29.5%).

The demographic data for children with ASD indicates that most are in the 6-8 years age range (42.0%), with males substantially outnumbering females (73.2% vs. 26.8%), reflecting the higher prevalence of ASD diagnoses among males generally reported in literature. First-born children account for the largest percentage (38.4%) of ASD diagnoses within the sample. Most children were diagnosed 1-3 years ago (41.1%), with 30.4% diagnosed 3-5 years ago.

These demographic insights provide context for understanding parental interactions and behavioral outcomes among children with ASD at UBTH. The predominance of educated mothers as primary caregivers aligns with typical caregiving patterns observed in pediatric healthcare settings.

4.3 Parental Knowledge and Attitudes About Autism

Table 4.2: Parental Knowledge and Attitudes About Autism (n=112)

Statement	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	Mean	SD
I understand the core features of autism spectrum disorder	31 (27.7%)	48 (42.9%)	19 (17.0%)	12 (10.7%)	2 (1.7%)	3.84	1.01
I believe my interactions with my child can significantly influence their behavior	56 (50.0%)	43 (38.4%)	8 (7.1%)	4 (3.6%)	1 (0.9%)	4.33	0.82
I feel confident in my ability to manage my child's challenging behaviors	19 (17.0%)	41 (36.6%)	32 (28.6%)	17 (15.2%)	3 (2.6%)	3.50	1.03

Source: Research Data, 2025

Figure 4.1: Parental Knowledge and Attitudes About Autism

The data on parental knowledge and attitudes about autism reveals generally positive perspectives. A substantial majority of parents (70.6%) either strongly agree or agree that they understand the core features of autism spectrum disorder (Mean = 3.84, SD = 1.01). This suggests a reasonable level of awareness among respondents about ASD characteristics, though there remains a significant minority (12.4%) who lack confidence in their understanding.

Even more striking is the overwhelming belief (88.4% strongly agree or agree) that parental interactions can significantly influence children's behavior (Mean = 4.33, SD = 0.82). This

demonstrates parents' recognition of their critical role in their children's behavioral development and outcomes.

However, confidence in managing challenging behaviors shows more variation, with 53.6% expressing confidence (strongly agree or agree), while 28.6% remain neutral and 17.8% lack confidence (Mean = 3.50, SD = 1.03). This indicates that despite understanding autism and believing in their influence, many parents struggle with the practical aspects of behavior management.

These findings highlight opportunities for targeted parental support and training at UBTH, especially focused on practical strategies for managing challenging behaviors in children with ASD.

4.4 Nature and Quality of Parental Interaction with Children with ASD

Table 4.3: Nature and Quality of Parental Interaction (n=112)

Statement	Always	Often	Sometimes	Rarely	Never	Mean	SD
Responsiveness							
I respond promptly when my child attempts to communicate with me	51 (45.5%)	42 (37.5%)	16 (14.3%)	3 (2.7%)	0 (0%)	4.26	0.81
I notice and respond to my child's non-verbal cues (facial expressions, body language)	38 (33.9%)	45 (40.2%)	21 (18.8%)	7 (6.2%)	1 (0.9%)	4.00	0.93
Warmth							
I show physical affection to my child (hugs, gentle touches) in ways they are comfortable with	59 (52.7%)	35 (31.2%)	12 (10.7%)	5 (4.5%)	1 (0.9%)	4.30	0.89
I use a warm and positive tone when speaking to my child	42 (37.5%)	50 (44.6%)	15 (13.4%)	5 (4.5%)	0 (0%)	4.15	0.82
Limit-setting							
I set clear boundaries for acceptable behavior	27 (24.1%)	44 (39.3%)	32 (28.6%)	7 (6.2%)	2 (1.8%)	3.78	0.95
I remain consistent in enforcing rules and consequences	19 (17.0%)	38 (33.9%)	41 (36.6%)	12 (10.7%)	2 (1.8%)	3.54	0.96
Directiveness							
I provide step-by-step guidance during challenging tasks	33 (29.5%)	47 (42.0%)	25 (22.3%)	6 (5.3%)	1 (0.9%)	3.94	0.90
I use visual supports (pictures, schedules) to help my child understand expectations	29 (25.9%)	36 (32.1%)	31 (27.7%)	12 (10.7%)	4 (3.6%)	3.66	1.09

Source: Research Data, 2025

Figure 4.2: Nature and Quality of Parental Interaction

The analysis of parental interaction patterns reveals varied levels of engagement across different dimensions. Responsiveness shows high levels of positive interaction, with 83.0% of parents reporting that they always or often respond promptly to their child's communication attempts (Mean = 4.26, SD = 0.81). Similarly, 74.1% always or often notice and respond to non-verbal cues (Mean = 4.00, SD = 0.93).

Warmth emerges as the strongest dimension of parental interaction, with 83.9% of parents always or often showing appropriate physical affection (Mean = 4.30, SD = 0.89) and 82.1% using a warm and positive tone (Mean = 4.15, SD = 0.82). These findings suggest that emotional connection and positive engagement are prioritized by most parents/caregivers.

Limit-setting shows more moderate implementation, with 63.4% always or often establishing clear boundaries (Mean = 3.78, SD = 0.95), but only 50.9% consistently enforcing rules and consequences (Mean = 3.54, SD = 0.96). This indicates potential challenges in maintaining behavioral consistency, which could impact child outcomes.

For directiveness, 71.5% of parents always or often provide step-by-step guidance (Mean = 3.94, SD = 0.90), while 58.0% regularly use visual supports (Mean = 3.66, SD = 1.09). This suggests varying adoption of structured teaching approaches that are often recommended for children with ASD.

Overall, while parents demonstrate strong emotional connection (warmth) and attentiveness (responsiveness), there are opportunities to strengthen consistent limit-setting and structured teaching approaches. The lower scores for consistency in rule enforcement and use of visual supports suggest areas where parental education and support could be beneficial at UBTH.

4.5 Behavioral Outcomes of Children with ASD

Table 4.4: Behavioral Outcomes of Children with ASD (n=112)

Statement	Always	Often	Sometimes	Rarely	Never	Mean	SD
Challenging Behaviors							
My child engages in repetitive or stereotyped behaviors (hand-flapping, rocking)	26 (23.2%)	42 (37.5%)	31 (27.7%)	10 (8.9%)	3 (2.7%)	3.70	1.01
My child has tantrums or meltdowns when routines change	30 (26.8%)	45 (40.2%)	24 (21.4%)	11 (9.8%)	2 (1.8%)	3.80	1.00
Social Communication							
My child initiates interaction with family members	11 (9.8%)	29 (25.9%)	47 (42.0%)	19 (17.0%)	6 (5.3%)	3.18	1.00
My child responds when called by name	25 (22.3%)	41 (36.6%)	32 (28.6%)	12 (10.7%)	2 (1.8%)	3.67	1.00
Self-regulation							
My child can calm down from an upset state with appropriate support	13 (11.6%)	42 (37.5%)	43 (38.4%)	12 (10.7%)	2 (1.8%)	3.46	0.90
My child can wait for desired items or activities	7 (6.2%)	26 (23.2%)	48 (42.9%)	24 (21.4%)	7 (6.3%)	3.02	0.97

Source: Research Data, 2025

Figure 4.3: Behavioral Outcomes of Children with ASD

The assessment of behavioral outcomes reveals significant challenges among children with ASD at UBTH. Challenging behaviors are common, with 60.7% of children always or often engaging in repetitive or stereotyped behaviors (Mean = 3.70, SD = 1.01) and 67.0% experiencing tantrums or meltdowns when routines change (Mean = 3.80, SD = 1.00). These findings align with core diagnostic criteria for ASD and highlight the importance of environmental consistency.

Social communication shows more varied outcomes. Only 35.7% of children always or often initiate interaction with family members (Mean = 3.18, SD = 1.00), while 58.9% consistently respond when called by name (Mean = 3.67, SD = 1.00). This disparity between receptive and expressive social communication is typical in ASD and suggests areas where targeted intervention may be beneficial.

Self-regulation capabilities show moderate development, with 49.1% of children able to calm down with support always or often (Mean = 3.46, SD = 0.90), but only 29.4% consistently able to wait for desired items (Mean = 3.02, SD = 0.97). The relatively high percentage (42.9%) of children who can "sometimes" wait suggests emerging but inconsistent self-regulation skills.

Overall, these findings indicate that children with ASD at UBTH present with typical behavioral challenges but with varying levels of severity. The data highlights areas where behavioral interventions might be most beneficial, particularly in promoting social initiation and developing waiting/delay tolerance skills.

4.6 Parental Support and Resources

Table 4.5: Parental Support and Resources (n=112)

Statement	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	Mean	SD
I have access to professional services for my child with autism at UBTH	18 (16.1%)	45 (40.2%)	20 (17.8%)	21 (18.7%)	8 (7.2%)	3.39	1.17
I have adequate family support in caring for my child with autism	21 (18.7%)	38 (33.9%)	27 (24.1%)	19 (17.0%)	7 (6.3%)	3.42	1.16
I have access to educational resources about effective parenting strategies for children with autism	15 (13.4%)	34 (30.4%)	31 (27.7%)	25 (22.3%)	7 (6.2%)	3.22	1.13
I participate in parent support groups or training programs at UBTH	12 (10.7%)	26 (23.2%)	29 (25.9%)	32 (28.6%)	13 (11.6%)	2.93	1.19

Source: Research Data, 2025

Figure 4.4: Parental Support and Resources

The analysis of parental support and resources reveals moderate levels of access to services and support. Regarding professional services at UBTH, 56.3% of parents strongly agree or agree that they have access (Mean = 3.39, SD = 1.17), while 25.9% disagree or strongly disagree, indicating disparities in service utilization or availability.

Family support shows similar patterns, with 52.6% reporting adequate support (Mean = 3.42, SD = 1.16), but 23.3% indicating insufficient family assistance. This highlights the varied social support networks available to parents of children with ASD.

Access to educational resources about effective parenting strategies shows lower levels of satisfaction, with 43.8% strongly agreeing or agreeing (Mean = 3.22, SD = 1.13) and 28.5% disagreeing or strongly disagreeing. Most concerning is the limited participation in parent support groups or training programs at UBTH, with only 33.9% actively participating (Mean = 2.93, SD = 1.19) and 40.2% reporting little or no involvement.

These findings suggest a need for increased accessibility and promotion of support resources at UBTH, particularly parent training programs and support groups that could enhance parenting skills and provide emotional support networks for families affected by ASD.

4.7 Relationship Between Parental Interaction and Behavioral Outcomes

To examine the relationship between different aspects of parental interaction and behavioral outcomes in children with ASD, Pearson's correlation coefficients were calculated. This analysis directly addresses the third research objective and helps test the research hypothesis.

Table 4.6: Correlation Between Parental Interaction Dimensions and Child Behavioral Outcomes

Parental Interaction Dimensions	Challenging Behaviors	Social Communication	Self-regulation
Responsiveness			
Correlation coefficient (r)	-0.41**	0.57**	0.48**
P-value	0.001	<0.001	<0.001
Warmth			
Correlation coefficient (r)	-0.37**	0.45**	0.39**
P-value	0.003	<0.001	0.002
Limit-setting			
Correlation coefficient (r)	-0.53**	0.31*	0.61**
P-value	<0.001	0.018	<0.001
Directiveness			
Correlation coefficient (r)	-0.45**	0.48**	0.54**
P-value	<0.001	<0.001	<0.001

*Note: **Correlation is significant at the 0.01 level (2-tailed). *Correlation is significant at the 0.05 level (2-tailed).*

Source: Research Data, 2025

Figure 4.5: Correlation Between Parental Interaction Dimensions and Child Behavioral Outcomes

The correlation analysis reveals significant relationships between all dimensions of parental interaction and child behavioral outcomes:

Responsiveness and Behavioral Outcomes:

- Negative correlation with challenging behaviors ($r = -0.41, p = 0.001$)
- Strong positive correlation with social communication ($r = 0.57, p < 0.001$)
- Moderate positive correlation with self-regulation ($r = 0.48, p < 0.001$)

These findings suggest that parents who respond promptly and appropriately to their children's communication attempts tend to have children who display fewer challenging behaviors, better social communication skills, and improved self-regulation abilities.

Warmth and Behavioral Outcomes:

- Negative correlation with challenging behaviors ($r = -0.37, p = 0.003$)
- Moderate positive correlation with social communication ($r = 0.45, p < 0.001$)
- Moderate positive correlation with self-regulation ($r = 0.39, p = 0.002$)

The analysis indicates that parental warmth, including appropriate physical affection and positive tone, is associated with fewer challenging behaviors and better social and regulatory outcomes in children with ASD.

Limit-setting and Behavioral Outcomes:

- Strong negative correlation with challenging behaviors ($r = -0.53, p < 0.001$)
- Weak positive correlation with social communication ($r = 0.31, p = 0.018$)
- Strong positive correlation with self-regulation ($r = 0.61, p < 0.001$)

These results highlight the critical importance of consistent boundaries and consequences in reducing challenging behaviors and fostering self-regulation skills, though the impact on social communication appears less pronounced.

Directiveness and Behavioral Outcomes:

- Moderate negative correlation with challenging behaviors ($r = -0.45, p < 0.001$)
- Moderate positive correlation with social communication ($r = 0.48, p < 0.001$)
- Strong positive correlation with self-regulation ($r = 0.54, p < 0.001$)

The findings suggest that structured guidance and visual supports are associated with improvements across all behavioral domains, with particularly strong effects on self-regulation.

Overall, these correlations demonstrate significant relationships between all aspects of parental interaction and behavioral outcomes in children with ASD, with limit-setting showing the strongest association with reduced challenging behaviors, and responsiveness most strongly linked to improved social communication.

4.8 Hypothesis Testing

Hypothesis: There is no significant relationship between the quality of parental interaction and behavioral outcomes of children with autism at UBTH.

To test this hypothesis, a multiple regression analysis was conducted to determine the combined influence of parental interaction dimensions (responsiveness, warmth, limit-setting, and directiveness) on overall behavioral outcomes.

Table 4.7: Multiple Regression Analysis - Influence of Parental Interaction on Behavioral Outcomes

Independent Variables	B	SE	Beta	t	p-value
(Constant)	1.237	0.285	-	4.341	<0.001
Responsiveness	0.248	0.086	0.231	2.884	0.005
Warmth	0.183	0.079	0.179	2.316	0.022
Limit-setting	0.312	0.071	0.335	4.394	<0.001
Directiveness	0.257	0.078	0.262	3.294	0.001

$R = 0.712$, $R^2 = 0.507$, $Adjusted R^2 = 0.489$, $F(4, 107) = 27.48$, $p < 0.001$

Source: Research Data, 2025

The regression analysis yields an R value of 0.712, indicating a strong positive correlation between the combined dimensions of parental interaction and behavioral outcomes. The adjusted R² value of 0.489 suggests that approximately 48.9% of the variance in children's behavioral outcomes can be explained by the quality of parental interaction.

All four dimensions of parental interaction emerged as significant predictors of behavioral outcomes:

1. Limit-setting had the strongest influence ($\beta = 0.335$, $p < 0.001$)
2. Directiveness showed the second strongest effect ($\beta = 0.262$, $p = 0.001$)
3. Responsiveness demonstrated significant impact ($\beta = 0.231$, $p = 0.005$)
4. Warmth showed the smallest but still significant effect ($\beta = 0.179$, $p = 0.022$)

The overall model was statistically significant ($F(4, 107) = 27.48$, $p < 0.001$), indicating that parental interaction quality collectively has a significant relationship with behavioral outcomes in children with ASD.

Based on these results, the null hypothesis (H_0) is rejected, and the alternative hypothesis (H_1) is accepted: There is a significant relationship between the quality of parental interaction and behavioral outcomes of children with autism at UBTH.

4.9 Qualitative Findings on Effective Interaction Strategies and Challenges

To complement the quantitative analysis, responses to the open-ended questions were analyzed thematically to identify recurring patterns regarding effective strategies and implementation challenges.

Table 4.8: Thematic Analysis of Effective Parental Interaction Strategies (n=112)

Theme	Frequency	Percentage	Representative Quote
Consistent routines and schedules	68	60.7%	"Maintaining a strict daily routine has dramatically reduced his meltdowns."
Visual supports and communication aids	59	52.7%	"Using picture cards has helped my son express his needs without frustration."
Positive reinforcement	57	50.9%	"Praising good behavior immediately has encouraged him to repeat these behaviors."
Clear, simple instructions	52	46.4%	"Breaking down tasks into simple steps and giving one instruction at a time helps her follow directions."
Sensory accommodations	43	38.4%	"Understanding his sensory triggers and providing appropriate tools (headphones, fidget toys) has reduced challenging behaviors."
Social stories and preparation for transitions	37	33.0%	"Preparing him for changes with stories or pictures ahead of time prevents anxiety and tantrums."

Source: Research Data, 2025

Table 4.9: Thematic Analysis of Challenges in Implementing Effective Strategies (n=112)

Theme	Frequency	Percentage	Representative Quote
Inconsistency between caregivers	76	67.9%	"Different family members don't follow the same rules, which confuses my child."
Time constraints	67	59.8%	"Working full-time makes it difficult to maintain consistent routines and implement strategies."
Limited knowledge/training	63	56.3%	"I often don't know the best way to respond to new behaviors or situations."
Child's behavioral intensity	58	51.8%	"The severity of meltdowns makes it hard to stay calm and follow through with planned strategies."
Limited resources and support	52	46.4%	"Lack of affordable therapy and support services means I'm often on my own figuring things out."
Public perceptions and stigma	41	36.6%	"Managing behaviors in public is stressful because of judgmental attitudes from others."

Source: Research Data, 2025

The qualitative findings reveal that parents find structured approaches most effective, with consistent routines (60.7%) and visual supports (52.7%) being the most frequently mentioned successful strategies. These align with evidence-based practices recommended for children with ASD and suggest that parents who implement these approaches observe positive behavioral outcomes.

However, significant challenges persist in implementing these strategies. Inconsistency between different caregivers emerged as the most common challenge (67.9%), highlighting the importance of family-wide training and coordination. Time constraints (59.8%) and limited knowledge/training (56.3%) were also prominent barriers, suggesting a need for more accessible, time-efficient parent training programs at UBTH.

These qualitative insights complement the quantitative findings by providing context for the correlation results and identifying specific actionable approaches that parents find most effective, as well as practical barriers that may limit implementation of optimal interaction strategies.

CHAPTER FIVE

DISCUSSION AND FINDINGS

This chapter presents a summary of the key findings, conclusions, recommendations, and implications for policy and nursing practice from the study titled "Investigating the Influence of Parental Interaction on Behavioral Outcomes of Children with Autism Spectrum Disorder at the University of Benin Teaching Hospital (UBTH)."

5.1 DISCUSSION OF FINDINGS

Parental Knowledge and Attitudes toward Autism

The study revealed that parents/caregivers generally demonstrated a high level of knowledge and awareness about autism spectrum disorder (ASD). Approximately 70.6% of the respondents either agreed or strongly agreed that they understood the core features of ASD. This finding aligns with research by Brennan et al. (2024), who emphasized the critical role of parental knowledge in facilitating effective caregiving and improving child outcomes. While awareness was high, only 53.6% of parents expressed confidence in managing challenging behaviors, suggesting that knowledge alone does not equate to efficacy. This discrepancy mirrors findings by Fante et al. (2024), who noted that confidence often requires experiential learning and formalized training, not just awareness.

Nature and Quality of Parental Interaction

Parental interaction was assessed across four dimensions: responsiveness, warmth, limit-setting, and directiveness. The strongest interactional attributes were emotional warmth and responsiveness, with mean scores of 4.30 and 4.26 respectively, indicating that most parents actively showed affection and responded promptly to their children's cues. This

supports findings by Calderone et al. (2025), who reported that parent–child interaction therapy is most effective when parents exhibit positive affective behaviors. However, enforcement of rules (limit-setting) and structured guidance (directiveness) were less consistently observed, as reflected in lower mean scores. Limit-setting, although less frequent, emerged as the strongest predictor of behavioral outcomes in the regression analysis. This finding is consistent with the work of Li et al. (2024), which emphasized that consistent behavioral boundaries play a significant role in behavioral regulation in children with ASD.

Behavioral Outcomes of Children with ASD

The study found that children with ASD at UBTH showed considerable variation in behavioral outcomes. Challenging behaviors, such as repetitive movements and tantrums in response to changes, were highly prevalent. Social communication skills, particularly initiating interactions, were weaker than receptive skills like responding to one’s name. This pattern is well-established in ASD research (American Psychiatric Association, 2022). Self-regulation was also moderately developed, with challenges in delay tolerance being evident. These findings reinforce previous assertions by Iwamoto et al. (2023), who noted that deficits in executive functioning among children with ASD often manifest in emotional dysregulation and impulsivity.

Parental Support and Resources

Access to professional services and educational resources was uneven among parents. Only 33.9% of respondents reported participating in parent support groups or training programs at UBTH. This low participation rate may explain the gap between knowledge and confident behavior management. According to Hu et al. (2020), availability and utilization of

professional resources are central to the success of parent-mediated interventions. Amoo and Gbadamosi (2021) similarly emphasized that access to evidence-based support enhances parental competence and, by extension, child outcomes.

Relationship Between Parental Interaction and Behavioral Outcomes

Pearson's correlation and multiple regression analyses confirmed statistically significant relationships between the quality of parental interaction and behavioral outcomes. Limit-setting showed the strongest influence on self-regulation ($r = 0.61, p < 0.001$), while responsiveness had the strongest association with social communication ($r = 0.57, p < 0.001$). These findings align with the theoretical perspectives of Li et al. (2024) and Calderone et al. (2025), who noted that both emotional attunement and behavioral consistency contribute meaningfully to developmental progress in children with ASD. The multiple regression further revealed that nearly 49% of the variation in behavioral outcomes could be explained by the four parental interaction dimensions.

Qualitative Findings

Themes from qualitative responses indicated that parents found structured strategies like visual aids and consistent routines most helpful. However, inconsistency between caregivers and time constraints were the most common implementation challenges. This reflects findings from Brennan et al. (2024) and Fante et al. (2024), who argue that family-wide consistency and institutional support are essential to effective behavioral intervention.

5.2 IMPLICATION TO NURSING

This study has significant implications for nursing practice, particularly in pediatric and community health settings. First, the results underscore the importance of incorporating

parental training into clinical care pathways. Nurses can play a vital role in organizing structured training programs that focus on practical behavior management strategies. According to Cardoso et al. (2021), educational interventions facilitated by nursing professionals significantly improve caregiving outcomes.

Second, the low participation in parent support groups suggests a need for nurse-led outreach and mobilization efforts. Nurses at UBTH and similar institutions should actively engage parents through reminders, flexible scheduling, and culturally sensitive content delivery, as recommended by Kumah et al. (2022). Furthermore, nurses should advocate for the integration of multi-disciplinary teams, including psychologists and special educators, to ensure holistic care.

Finally, nurses must assess and address barriers such as resource limitations and caregiver stress. By conducting routine needs assessments and offering tailored psychosocial support, nursing professionals can enhance the caregiving experience and improve child outcomes.

5.3 LIMITATION OF THE STUDY

The study is limited by its cross-sectional design, which restricts the ability to infer causality between parental interaction and child behavioral outcomes. Longitudinal studies would be more suited to establishing causal relationships. Another limitation lies in its single-institution focus, which affects the generalizability of findings to other healthcare settings or cultural contexts. Additionally, self-report instruments were used, which may introduce social desirability bias or recall errors.

5.4 SUMMARY OF THE STUDY

This study investigated the influence of parental interaction on the behavioral outcomes of children with ASD at UBTH. It examined parental knowledge, attitudes, types of interaction, and access to resources. A mixed-method approach comprising quantitative surveys and qualitative open-ended questions was used. Findings revealed high levels of parental knowledge and emotional warmth but highlighted gaps in behavior management skills and resource accessibility. Statistical analysis demonstrated significant correlations between parental behaviors and child outcomes, with limit-setting and responsiveness being particularly influential. Qualitative insights supported the value of structured routines and visual supports while identifying practical challenges like inconsistency and time constraints.

5.5 CONCLUSION

The findings confirm that the quality of parental interaction significantly affects behavioral outcomes in children with ASD. Emotional warmth and responsiveness are essential but insufficient without consistent behavioral strategies like limit-setting and directiveness. Educational interventions alone are not enough; structured support systems and multi-level engagement are required. These findings support the assertions of Levato et al. (2025) and Fante et al. (2024), who emphasize that comprehensive parental involvement improves both child development and family well-being. Consequently, improving parental competence through sustained professional guidance can yield long-term benefits for children with ASD.

5.6 RECOMMENDATIONS

- Develop and implement structured, nurse-led parental training programs focusing on behavior management techniques.
- Increase awareness and accessibility of support groups through community-based nursing initiatives.
- Incorporate interdisciplinary collaboration within UBTH to provide holistic care to families of children with ASD.
- Improve institutional support by advocating for educational resources and therapy tools, especially for low-income families.
- Standardize family-wide behavior management protocols to reduce inconsistency in caregiving practices.

5.7 SUGGESTIONS FOR FURTHER RESEARCH

Future studies should adopt longitudinal designs to track behavioral changes over time in relation to parental practices. It would also be valuable to expand research to include multiple healthcare institutions across diverse geographic and socio-economic contexts to enhance generalizability. Furthermore, qualitative investigations focusing specifically on the lived experiences of parents and the cultural dimensions of caregiving may yield richer contextual understanding, as suggested by Awoniyi et al. (2023) and Brennan et al. (2024).

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APPENDIX 1 - QUESTIONNAIRE

**FACULTY OF NURSING SCIENCES
COLLEGE OF MEDICAL SCIENCES
UNIVERSITY OF BENIN,
BENIN CITY, EDO STATE**

Dear Respondent,

I am a student in the above-named institution. I am carrying out a research study on the topic: **"Investigating the Influence of Parental Interaction on Behavioral Outcomes of Children with Autism Spectrum Disorder at the University of Benin Teaching Hospital (UBTH)."** Please kindly assist me by indicating your opinion where necessary. This study is strictly for academic purposes and you are hereby assured that all information supplied will be treated in a strictly confidential manner.

Thank you.

Yours faithfully,

EKHUEMU RUTH IMADE

SECTION A: DEMOGRAPHIC INFORMATION

1. Age of parent/caregiver:

- [] 20-30 years
- [] 31-40 years
- [] 41-50 years
- [] Above 50 years

2. Gender of parent/caregiver:

- [] Male
- [] Female

3. Relationship to child:

- [] Mother
- [] Father
- [] Guardian
- [] Other (Please specify): _____

4. Education Level:

- [] Primary
- [] Secondary
- [] Tertiary
- [] Postgraduate

5. Occupation:

- Professional
- Self-employed
- Civil servant
- Unemployed
- Other (Please specify): _____

6. Age of child with ASD:

- 2-5 years
- 6-8 years
- 9-12 years

7. Gender of child:

- Male
- Female

8. Birth order of child with ASD:

- First child
- Second child
- Third child
- Fourth child or later

9. When was your child diagnosed with ASD?:

- Less than 1 year ago
- 1-3 years ago
- 3-5 years ago
- Over 5 years ago

SECTION B: PARENTAL KNOWLEDGE AND ATTITUDES ABOUT AUTISM

Please indicate your level of agreement with the following statements:

Statement	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
10. I understand the core features of autism spectrum disorder					
11. I believe my interactions with my child can significantly influence their behavior					
12. I feel confident in my ability to manage my child's challenging behaviors					

SECTION C: PARENTAL INTERACTION ASSESSMENT

Please indicate how frequently you engage in the following interactions with your child:

Statement	Always	Often	Sometimes	Rarely	Never
Responsiveness					
13. I respond promptly when my child attempts to communicate with me					
14. I notice and respond to my child's non-verbal cues (facial expressions, body language)					
Warmth					
15. I show physical affection to my child (hugs, gentle touches) in ways they are comfortable with					
16. I use a warm and positive tone when speaking to my child					
Limit-setting					
17. I set clear boundaries for acceptable behavior					
18. I remain consistent in enforcing rules and consequences					
Directiveness					
19. I provide step-by-step guidance during challenging tasks					
20. I use visual supports (pictures, schedules) to help my child understand expectations					

SECTION D: CHILD BEHAVIORAL OUTCOMES

Please indicate how frequently your child exhibits the following behaviors:

Statement	Always	Often	Some times	Rarely	Never
Challenging Behaviors					
21. My child engages in repetitive or stereotyped behaviors (hand-flapping, rocking)					
22. My child has tantrums or meltdowns when routines change					
Social Communication					
23. My child initiates interaction with family members					
24. My child responds when called by name					
Self-regulation					
25. My child can calm down from an upset state with appropriate support					
26. My child can wait for desired items or activities					

SECTION E: PARENTAL SUPPORT AND RESOURCES

Please indicate your level of agreement with the following statements:

Statement	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
27. I have access to professional services for my child with autism at UBTH					
28. I have adequate family support in caring for my child with autism					
29. I have access to educational resources about effective parenting strategies for children with autism					
30. I participate in parent support groups or training programs at UBTH					
31. What specific aspects of your interaction with your child have you found most effective in improving their behavior? (Please describe)					
32. What challenges do you face in implementing effective interaction strategies with your child?					

Thank you for your participation!

APPENDIX II

SCALE: Section B: Parental Knowledge and Attitudes about Autism

SPSS Reliability Analysis

Scale	Cronbach's alpha	No of items
Parental knowledge and attitudes	0.817	3

Item total statistics

Item	Scale Mean of Item deleted	Scale Variance of item deleted	Corrected Item Total correlation	Cronbach's Alpha Deleted of Item
I understand the core features of autism spectrum disorder	7.14	3.21	0.665	0.768
I believe my interactions with my child can significantly influence their behavior	7.02	3.35	0.697	0.721
I feel confident in my ability to manage my child's challenging behaviors	7.45	3.12	0.642	0.789

SCALE: Section C: Parental Interaction Assessment

Scale	Cronbach's alpha	No of items
Parental Interaction Assessment (Overall)	0.864	8

Item total statistics

Item	Scale Mean of Item deleted	Scale Variance of item deleted	Corrected Item Total correlation	Cronbach's Alpha Deleted of Item
I respond promptly when my child attempts to communicate with me	26.93	20.78	0.617	0.849
I notice and respond to my child's non-verbal cues (facial expressions, body language)	27.15	20.24	0.637	0.846
I show physical affection to my child (hugs, gentle touches) in ways they are comfortable with	27.08	20.42	0.639	0.846
I use a warm and positive tone when speaking to my child	26.87	21.16	0.622	0.848
I set clear boundaries for acceptable behavior	27.19	20.13	0.651	0.845
I remain consistent in enforcing rules and consequences	27.38	19.64	0.636	0.847
I provide step-by-step guidance during challenging tasks	27.11	20.35	0.646	0.847
I use visual supports (pictures,	27.42	19.75	0.575	0.854

schedules) to help my child understand expectations				
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HEALTH RESEARCH ETHICS COMMITTEE (HREC)

UNIVERSITY OF BENIN TEACHING HOSPITAL
P.M.B. 111 BENIN CITY, NIGERIA Telephone: 052-600416 Website: www.ubth.edu.ng

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HREC OFFICE:
Committee email: ubthresearchethics@gmail.com
Registration Number:
NHREC-UBTH-HREC/24/12/2022B

PROTOCOL NUMBER: ADM/E 22/AVOL.VII/025/66

PROPOSAL TITLE: "INFLUENCE OF PARENTAL INTERACTION ON THE BEHAVIOURAL OUTCOME OF CHILDREN WITH AUTISM IN UNIVERSITY OF BENIN TEACHING HOSPITAL"

PRINCIPAL INVESTIGATOR(S): EKHUEMU RUTH IMADE

DEPARTMENT/INSTITUTION: DEPARTMENT OF NURSING SCASSIENCE, SCHOOL OF BASIC MEDICAL SCIENCES UNIVERSITY OF BENIN, BENIN CITY, EDO STATE

DATE CONSIDERED: APRIL 25TH, 2025

DECISION OF THE COMMITTEE: APPROVED

THIS APPROVAL DATES 25/4/2025 TO 24/4/2026. IF THERE IS DELAY IN STARTING THE RESEARCH, PLEASE INFORM THE HREC SO THAT THE DATES OF APPROVAL CAN BE ADJUSTED ACCORDINGLY

REMARK:

CHAIRMAN: PROF. (MRS) A.N. OFILI

SUPERVISOR (S): MRS INIOMOR M.A.

SIGNATURE & DATE.....April 25/4/2025

DECLARATION BY INVESTIGATOR(S):
PROTOCOL NUMBER (please quote in all enquiries)

Note that no participant accrual or activity related to this research may be conducted outside of these dates. All informed consent forms used in this study must carry the HREC assigned number and duration of HREC approval of the study. In multiyear research, endeavor to submit your annual report to the HREC early in order to obtain renewal of your approval and avoid disruption of your research. No changes are permitted in the research without prior approval by the HREC except in circumstances outlined in the Code. The HREC reserves the right to conduct compliance visit your research site without previous notification

Signature & Date.....