

Original Article

Joint Attention, Language Development, and Social Communication among Children with Autism Spectrum Disorder in Tunisia: A Mixed-Methods Study

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Corresponding Email. chrigui.hajer11@gmail.com**Abstract**

This study explores the relationship between autism spectrum disorder (ASD), joint attention (JA), language acquisition, and social communication from the perspective of psycholinguistics. It explores the problems of establishing and responding to joint attention and its importance in relation to children's communication, language acquisition, and social interaction. The study also looks at the methods used in education and therapy for improving joint attention and communication development. A mixed-methods approach was adopted, where the data obtained from descriptively analyzed questionnaires were combined with observations and semi-structured interviews and analyzed using the thematic analysis approach. Methodological triangulation was used in order to improve understanding of the problem under investigation. The study concludes that joint attention plays a crucial role in the language development and social interaction of children with ASD. Findings highlight issues with eye contact, social understanding, initiating interaction, and maintaining joint attention, indicating varying skill levels among children. This suggests that joint attention should be regarded as a multi-skilled competency rather than a singular ability.

Keywords. Autism Spectrum Disorder, Joint Attention, Language Development, Social Communication, Tunisia.

Introduction

Autism Spectrum Disorder (ASD) is a neurodevelopmental disorder. This is because it is characterized by persistent difficulties with social communication and social interaction, along with restricted or repetitive patterns of behaviour and interests. The communication problems related to ASD are both verbal and non-verbal and can significantly affect children in their social and learning interactions. Additionally, the process of language acquisition in children diagnosed with ASD can vary considerably. This variability entails differences in vocabulary, grammar and pragmatics, along with language use. Due to this diversity, it is necessary to study the social and communication processes that could help in language acquisition in children with ASD (Hodges et al., 2020).

Joint Attention (JA) is a developmental skill that has been widely researched with respect to autism and communication skills. Joint attention refers to the capacity of individuals to focus their attention towards an object, event or activity through coordination with another individual through eye contact, pointing, gaze following and other gestures. This is a vital aspect of social communication during the early stages, as this enables the individual to share their experience and form a common point of focus for attention. JA is usually talked about as Initiation of Joint Attention (IJA) in which the child tries to direct the attention of another person towards an object or an event and Responding to Joint Attention (RJA), where the child focuses on the attention cues of the other social individual (Charman, 2003; Mundy, 2018).

JA has been considered highly significant in relation to ASD because joint attention impairments have been identified as one of the early social-communication skills in connection with autism. Charman (2003) states that shared attention is a vital skill in autism that can be connected to general social and communicational development. Moreover, Mundy and Crowson (1997) refer to the importance of shared attention in early social communication and its potential value for intervention. Poor skills in coordinating joint attention can limit children's possibilities for shared experience, which is the usual means of acquiring social and linguistic knowledge.

Thus, the link between JA and language development has been a considerable area of research. Language is learned by children through the prism of their social experiences, and being exposed to people, objects, and communication-related situations help develop children's vocabulary and other aspects of language. As previous research presented above indicated, there have been findings about links between JA and language outcomes in children diagnosed with ASD. For instance, some recent findings have revealed the positive link between coordinated attention and language outcomes, specifically expressive language and vocabulary development (Bottema-Beutel et al., 2024). In addition, according to longitudinal studies, the link between responding to JA and language development has been found (Lasch et al., 2023), and moreover, some other research has found that the duration of JA can be especially meaningful for the future language outcomes of those children who have verbal difficulties.

However, the link between JA and language acquisition should not be interpreted as a one-way or universal causal process. Children suffering from ASD are highly heterogeneous in terms of communicative and developmental abilities and might acquire language without many interactionally social means. Indeed, several works investigating language acquisition of Tunisian children with ASD have found abnormal patterns of language acquisition where certain children

have developed productive skills in speaking Modern Standard Arabic although they experienced difficulties with socializing. According to Kissine et al., (2018), non-interactive sources of knowledge such as television and cartoons might act as the secondary means of acquiring linguistic knowledge in autistic children. Recent research has also revealed the possibility of having atypical patterns of language development among children with autism. Thus, even if joint attention provides important opportunities for language learning and social interaction, it should not be considered as the only means of developing language skills.

Behaviours such as eye contact, pointing, imitation, turn taking, and participating in joint activities are directly linked to children's ability to interact with others. Any problems with these activities in children with autism could affect their participation in conversations with other people and their ability to learn through social interactions. According to the literature reviewed for this thesis, shared attention is important not only for vocabulary acquisition and language development, but also for social responsiveness and social interaction. This broader definition becomes especially important for children in educational and therapy settings because of the multidimensional nature of communication. In the realm of intervention, joint attention has gained increased recognition as a valuable target that could help improve communication skills. Various intervention techniques have included mimicry, visual cues, play-based tasks, repetition, modelling and reinforcement, among others, to increase engagement and improve communication. Nonetheless, there is no evidence that the same therapy technique could be effective in the development of all children with ASD. The considerable variation in terms of the development of each individual with autism has made it important for there to be interventions that would be appropriate to the child's developmental characteristics, ability to communicate and specific needs.

This study aims at exploring the role of joint attention among children with ASD in autism specific settings in Tunisia with regard to their language development and social communication skills. In this study, Data will be gathered through the use of a variety of sources, including questionnaires filled out by teachers and psychologists, observations of the children's behaviors, and semi-structured interviews with professionals dealing with ASD children. This approach to gathering information will allow us to take into consideration both professional perceptions and communicative behaviors and will help us identify similarities and differences between various types of evidence. The purpose of the approach is to provide information that is specific to a particular context regarding the significance of joint attention with regard to language development and social communication.

Problem Statement

ASD is a neurodevelopmental disorder that affects language development and social communication and interaction. Difficulties with JA are among the major problems associated with ASD children. This problem entails the sharing of attention with someone else with regard to some object, event, or action through eye gaze and pointing gestures. ASD children cannot participate in social activities and benefit from communication due to JA problems.

JA is particularly important since language learning cannot be separated from social interaction. Language learning takes place for children through the interactions that they make with other individuals and their ability to pay attention to shared objects and shared actions. Children with ASD who have trouble synchronizing their attention with other individuals may find it hard to understand the communicative intent behind these interactions.

This problem is particularly relevant to the Tunisian context because children with ASD may show considerable variability in terms of their communicative skills as well as in terms of their responses to JA. The importance of studying the concept of joint attention lies in gaining an understanding of the nature of the communicative and linguistic problems faced by these children and the ways of helping them in social communication. Thus, the study examines joint attention in children with ASD in specialized autism centers in Tunisia, emphasizing their joint attention skills, language development, and social communication.

Research Objectives

The study investigates the complex relationship between ASD, JA, and Language Development from a psycholinguistic perspective. It highlights how ASD impacts JA, an essential socio-communicative skill, and its role in early linguistic development, drawing from theories by Vygotsky, Bruner, and Tomasello. The research focuses on the challenges ASD children face in engaging in joint attention and its implications for vocabulary, word-referent association, and pragmatic development. JA is defined as a regulative system linking social interaction to language development, and disruptions in this process are seen as key contributors to language impairment. The study also aims to assess how deficits in shared attention influence language difficulties, explore intervention strategies to enhance language development and social interaction, and provide theoretical and practical implications for supporting ASD children's communicative abilities and social integration.

Research Questions

1. Why is Joint Attention an essential skill in Autism?
2. How Do Children with Autism Use Speakers' Gaze Direction to Acquire Language?
3. How do we catch the attention of autistic children to motivate them acquiring their first language and to engage them in the social references?
4. What are the major causes behind the Autism syndrome?
5. To what extent do Autistic children respond to Joint Attention?

Research Hypotheses

- H1: Autistic children are not expected to engage consistently in joint attention.
- H2: The absence or limitation of joint attention is associated with difficulties in language development and social communication.
- H3: Joint attention is a social skill that supports language development and engagement in the social world.
- H4: Intervention programs targeting joint attention are available for children with ASD.

Literature Review

JA has been found to be an important aspect of social interactions and language development from an early age. JA has been studied with respect to its association with language development by Mundy et al. (1990), with an emphasis on how JA is important not only to receptive language but also to expressive language. In the same way, joint attention was described by Mundy and Newell (2007) as an important relationship in social interaction, attention, and more complex communication.

Studies conducted on ASD children have provided further evidence in favor of difficulties associated with joint attention. In particular, Kissine et al. (2018) reported the use of Modern Standard Arabic by five Tunisian children with ASD, and noted the effectiveness of such use due to the low level of their social interactions. The results of the research showed that the process of language acquisition among those with autism can sometimes be associated with the use of non-interactive media such as TV.

De Belen et al. (2023) investigated responsiveness to JA in ASD preschoolers using eye-tracking methods. The researchers found that children with ASD engaged less frequently in eye following than did typically-developing children. In addition, they were less precise in their eye-gaze responses as compared to the responses to eye-gaze with head-turning movements. Better accuracy of eye following was linked to enhanced cognitive and adaptive skills, while poorer accuracy to higher levels of ASD.

Lasch et al. (2023) explored the response to JA as a predictor of subsequent language and social responsiveness. These findings support the idea that responding to JA may have consequences for development not related to attention itself but rather to language and social communication. The study therefore allows for longitudinal exploration of joint attention as an important factor in children with ASD.

Recently, the correlation between JA and language acquisition has also been studied. Bottema-Beutel et al. (2024) noted that there is a significant positive correlation between coordinated attention and language skills, particularly expressive language and vocabulary. However, it was also pointed out by the researchers that the change in the way JA is assessed might affect the outcome of research studies as well.

Abdelaziz et al. (2024) examined the effect of JA and collaborative joint participation in language acquisition. Observation of joint action between caregivers and children with ASD increased collaboration, and the language outcomes were measured two years later. The findings indicated that the duration of JA was a strong predictor of language development, particularly in children with ASD and low verbal skills. This relationship did not persist in children with ASD who have high verbal skills and in normally developing children.

Research Gap

Despite many studies that have been conducted regarding ASD, JA, and language development, there are still many gaps in the existing literature on these subjects. Firstly, the definition and measurement of JA differ between various studies, thus making the comparison of results rather difficult. Most studies focus on structured tasks and eye gaze rather than spontaneous interactions, while longitudinal studies that explore the impact of difficulties in JA on language development is noticeable. In addition to that, quite a few studies use the deficit model of autism and poorly consider alternative forms of communication among autistic individuals.

Another gap involves the diversity of the participants. Most studies lack individuals who are minimally verbal or whose backgrounds are culturally and linguistically diverse. Furthermore, the development of JA in natural environments is largely ignored since research takes place in experimental settings. The connection between joint attention abilities and language development continues to be contentious since there is insufficient empirical support for the influence of joint

attention problems on language development, although gains in JA skills in interventions usually correlate with improvements in language skills.

Importantly, while there has been an increase in research on the connection between JA and language acquisition in children with autism spectrum disorder at an international level, research at a Tunisian level has remained quite limited. While there has been some research carried out in Tunisia on the issues of autism, language acquisition, and social communication in general, little research has examined arch that has actually examined the link between JA as a specific variable and language acquisition in children with ASD. The same holds true for the research on IJA versus RJA in relation to receptive and expressive language acquisition, respectively.

Methodology

Research Design

The study adopted a mixed-methods research design to examine the association between joint attention JA, language development, and social communication in children with ASD. The mixed-methods approach enabled the researcher to blend quantitative and qualitative data and explore the phenomenon from both descriptive and behavioural perspectives. Using multiple data sources also enabled methodological triangulation and deepened understanding of the phenomenon under study.

Research Setting

The study was conducted in four specialised autism centers in Tunisia, namely, the El Fath Center in Sahloul, Sousse; the Raya Center in Monastir; the Egali Ted Center in Manzah 9, Tunis; and the Al Intilakah Center for Children with Autism Spectrum Disorder in Massken, Sousse. The facilities offer educational and therapeutic services for children with ASD and employ interdisciplinary teams of professionals working on communication, language, social interaction, and behavioural development.

Participants and Sampling

The study involved two groups of participants. The first group consisted of 100 children with ASD aged between 6 and 10 years. They were observed during learning and treatment activities in the natural setting. Observations were focused on shared attention, visual interest, mimicry, language comprehension, social cognition, turn-taking, and communicative behaviors.

The second group involved 33 teachers and psychologists working at the selected autism centers. They were selected because of their direct experience with children with ASD and their knowledge of communication and language, as well as social interaction. A Purposive sampling technique was used to select the participants with the characteristics relevant to the objectives of the study.

Data Collection Instruments

Three instruments were used to collect the data: observation, a questionnaire, and semi-structured interviews.

Questionnaire

A questionnaire was handed out to teachers and psychologists. The questionnaire included mainly Yes/No questions and evaluated different areas concerning JA, social interaction, communication and language skills, language and social development, as well as therapy. The questionnaire was administered face to face with the respondents in their respective settings.

Observation

Observations of children were carried out in normal classrooms as well as therapy settings using an observation checklist. The behaviors that were focused on included those concerning JA, such as making eye contact, following gaze, pointing, imitation, taking turns, receptive language, social awareness, and various forms of communication. There were no interventions made during the observation process.

Semi-Structured Interviews

Semi-structured interviews were conducted with teachers and psychologists to explore issues related to JA in children, language acquisition, communication problems, social interactions, as well as educational and therapeutic approaches. These interviews were conducted face-to-face in Arabic using an interview guide with open-ended questions.

Data Analysis

Given that most of the questions in the questionnaire were dichotomous, SPSS descriptive statistics such as frequency and percentage were used to analyze the questionnaire data. The key areas that were covered by the observation checklist include joint attention, communication, social interaction, imitation, receptive language, and social awareness. The interview data were analyzed using thematic analysis following the guidelines provided by Braun and Clarke (2006). After becoming familiar with the interview data, the researcher classified the related codes according to broader themes covering communication, language development, joint attention, and interventions. In order to perform methodological triangulation and provide a comprehensive analysis of the findings, the findings from the three instruments were compared and integrated.

Results and Analysis

Three research instruments were used to gather the results of this study: semi-structured interviews with professionals who work with children with autism spectrum disorder (ASD), direct observation of children with ASD in educational and therapeutic settings, and a questionnaire given to teachers and psychologists. While the observational data were evaluated qualitatively based on the primary behavioral categories, the quantitative questionnaire data were analyzed using frequencies and percentages in SPSS. The six phases of Braun and Clarke (2006) were followed in the thematic analysis of the interview data. In order to provide a thorough explanation of joint attention (JA), language development, and social communication among children with ASD, the results from the three sources were then taken into consideration collectively.

Statistical Analysis of the Questionnaire

The data from the questionnaire were analyzed using descriptive statistical analysis to provide a complete overview of the responses. The study was based on finding out frequencies and percentages since the questions in the questionnaire were of Yes/No type. This descriptive statistical technique was used to summarize the responses provided by teachers and psychologists and to identify major trends regarding the role of JA in promoting language development and social interaction among children with ASD. The findings are presented in a series of tables and figures in the order of the five categories of the questionnaire.

Joint Attention Skills

Findings from the participants on JA skills demonstrated by children affected by ASD are shown in (Table 1) above. It can be observed that the development of JA skills varied for the different types of behaviors tested, thus demonstrating the variety of features of children with ASD. Some of the shared attention skills were observed relatively frequently, while others demonstrated difficulties.

The greatest agreement was observed for Item 2, with 66.7% of participants affirming that children react when their names are mentioned, while 33.3% disagreed. This discovery indicates that the ability to reply to one's name is one of the most robust elements of shared attention noted in the children involved. Conversely, merely 39.4% of participants indicated that children reliably sustain visual communication during interactions (Item 1), whilst 60.6% responded in the negative. This trend suggests that sustaining eye contact continues to be a difficulty for a significant number of youngsters with ASD.

Table 1. Joint Attention Skills among Children with Autism Spectrum Disorder

Item	Yes n (%)	No n (%)
The child maintains visual communication during interaction.	13 (39.4%)	20 (60.6%)
The child responds when his/her name is called.	22 (66.7%)	11 (33.3%)
The child follows another person's gaze or pointing gesture.	16 (48.5%)	17 (51.5%)
The child points to objects to attract the attention of others.	17 (51.5%)	16 (48.5%)
The child shares attention with others during activities or play.	9 (27.3%)	24 (72.7%)

Respondents to items 3 and 4 had a fairly equal share of both positive and negative responses. Respondents who agreed that children look at what other people are looking at in Question 3 were 48.5%, while those who disagreed comprised 51.5%. In Question 4, those who agreed that children point at things to draw the attention of other people made up 51.5% of the total participants, while those who disagreed formed 48.5% of the participants. This shows that there is a big variation in joint attention behaviors of ASD children.

Regarding the lowest level of agreement, it was observed in Item 5, which measured whether children can share their focus with other people while working or playing. Only 27.3% of the subjects answered affirmatively, and 72.7% reported

that children lack this behavior. Therefore, this finding means that sharing focus in teamwork is still one of the hardest things in JA for the ASD children under investigation.

The findings suggested that joint attention skills are not always developed amongst children suffering from ASD. Basic activities like responding to one's name are usually recognized more frequently than complex activities requiring joint social involvement, for example, maintaining eye contact and engaging together in play. Additionally, the differences observed in Items 3 and 4 further confirm the specific differences between the children with ASD, since certain children show emerging JA skills whereas others continue to struggle with difficulties in JA tasks. Thus, the findings show that while certain JA skills are evident in some of the children, other more complex joint social skills are missing in many of them.

Joint Attention Skills – Questionnaire Results

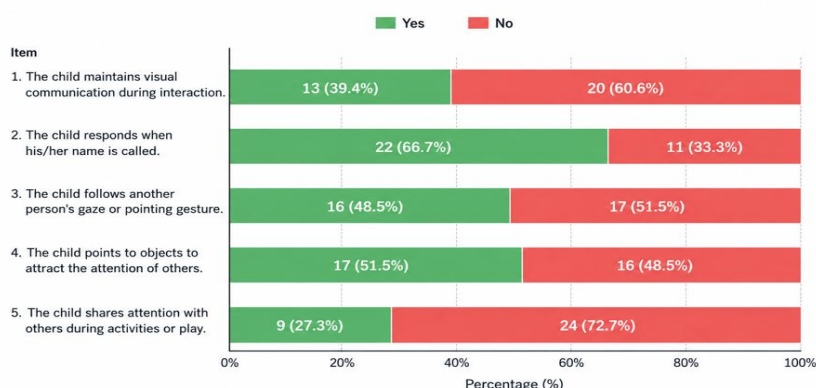


Figure 1. Joint Attention Skills among Children with Autism Spectrum Disorder

Social Communication

Table 2 shows the responses of participants regarding the social communication skills of children with ASD. It appears from the findings that there was great variation among the children in terms of their competence in various aspects of social communication. While some of the receptive social skills appeared well-developed, others proved to be complicated and limited. The results indicate that only 36.4% of the participants claim that children with ASD make contact with teachers and other children, whereas 63.6% of participants maintain that they do not. It clearly shows that spontaneous social interaction remains an important form of communication barrier that is being faced by children with ASD, as many children respond to social interaction initiated by their peers but cannot initiate one on their own.

Table 2. Social Communication in ASD Children

Item	Yes n (%)	No n (%)
The child initiates interaction with teachers or peers	12 (36.4%)	21 (63.6%)
The child demonstrates awareness of the people around him/her.	24 (72.7%)	9 (27.3%)
The child imitates the gestures or actions of others.	17 (51.5%)	17 (51.5%)
The child participates in turn-taking activities.	9 (27.3%)	24 (72.7%)
The child understands simple verbal instructions.	20 (60.6%)	13 (39.4%)

On the other hand, 72.7% agree that children showed signs of awareness of their environment, compared to 27.3% who disagree. Thus, many children recognize the presence of other people and have some form of social awareness, but this does not necessarily result in interaction and communication between them. Likewise, 60.6% agree that ASD children understand simple commands, which shows that receptive communication skills are more developed compared to expressive skills.

The findings regarding imitation reveal a balanced representation of answers. About 51.5% of people report that kids imitate other people's gestures or behaviors, while 48.5% believe that kids do not imitate other people. This balanced proportion shows great diversity in children with ASD, which means that imitation skills depend on personal developmental characteristics. Turn-taking is the most difficult one among all activities. Only 27.3% of the respondents believed that ASD children participate in activities that require turn-taking, while 72.7% feel that they do not. The finding suggests that reciprocal interaction, which involves cooperation, patience, and joint participation, remains quite a difficult task for some children. Turn-taking plays an important role in social interactions, and the fact that there is little participation in this form of behavior implies that there are also difficulties in having interactive conversations with other people. The results show that the ASD children demonstrate strengths in certain receptive abilities such as recognition of other individuals and understanding of simple instructions, yet at the same time have difficulties in spontaneous social

approach and interaction with others. It should be added that the differences found among all five factors imply that social communication abilities are not always developed in children, which means the need for a special approach to the issue.

Social Communication Skills – Questionnaire Results

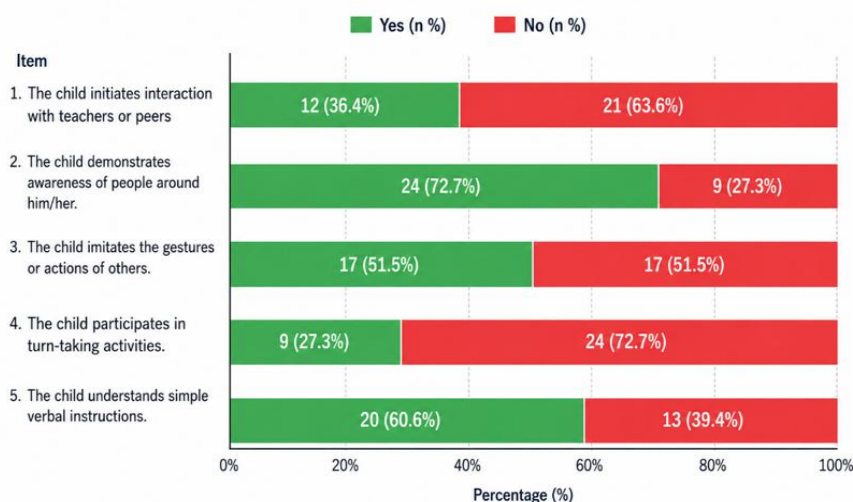


Figure 2. Social Communication ASD Children

Communication and Language Skills

Table 3. Communication and Language Skills among Children with Autism Spectrum Disorder

Item	Yes n (%)	No n (%)
The child uses verbal language to express his/her needs or feelings.	14 (42.4%)	19 (57.6%)
The child uses gestures or facial expressions for communication.	13 (39.4%)	20 (60.6%)
Communication difficulties negatively affect the child's social interaction.	26 (78.8%)	7 (21.2%)
The child demonstrates communication difficulties in daily interactions.	31 (93.9%)	2 (6.1%)
The child prefers group activities during interaction	31 (93.9%)	2 (6.1%)

(Table 3) shows the reactions of the participants regarding the communication and linguistic skills of children with Autism Spectrum Disorder (ASD). From the data gathered, there is a notable variance in the communication skills of children with ASD, depending on the communication actions. There is a small number of children who effectively used verbal and non-verbal communication; however, communication difficulties remain one of the key issues facing the children.

These findings demonstrate that only 42.4% of respondents said that children make use of verbal language in conveying their requests and feelings, and 57.6% said they did not. In the same manner, 39.4% of the subjects said that they used gestures and facial expressions as other means of communication, but 60.6% disagreed. The above findings show that expressive verbal and non-verbal communication are limited among many children with autism.

On the other hand, the responses received for item 13 reveal clear agreement on communication challenges affecting the ASD children's behavior. The number of participants who agreed that communication problems negatively affect the children's ability to interact socially is quite high (78.8%), while only 21.2% disagreed. The finding demonstrates the close link between communication skills and good social interaction, and reveals that poor communication skills can reduce the chance of success in interacting socially.

The most prevailing agreement between participants is seen in items 14 and 15, where 93.9% opted for "Yes" and only 6.1% opted for "No". The level of agreement found here is very high, indicating that participants have consistently recognized the importance of the communication skills in question. The research highlights the consistency of a common professional belief between teachers and specialists that effective communication skills are an integral part of a child's development and greatly influence his/her academic performance and social interactions.

The findings indicate that, although some children with ASD demonstrate improvements in their communication skills, significant challenges remain in both verbal and nonverbal communication. The consistently high levels of agreement found in the concluding items show how crucial it is to promote communication development through specific learning programs and intervention strategies. In conclusion, all the findings indicated that communication development is a key factor in helping to develop better interactions.

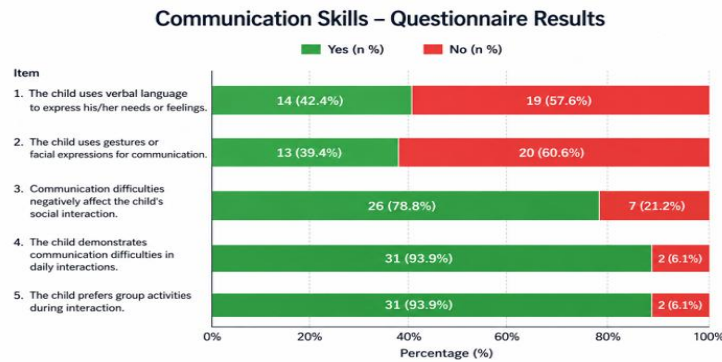


Figure 3. Communication and Language Skills among Children with Autism Spectrum Disorder

Language and Social Development

Table 4. The Impact of Joint Attention on Language and Social Development among Children with Autism Spectrum Disorder

Item	Yes n (%)	No n (%)
Joint attention contributes to the development of children's language skills.	33 (100.0%)	0 (0.0%)
Joint attention helps improve children's communication skills.	33 (100.0%)	0 (0.0%)
The child demonstrates progress in expressive language skills.	25 (75.8%)	8 (24.2%)
The child has difficulty understanding social cues.	33 (100.0%)	0 (0.0%)
The child responds positively to activities and play-based tasks.	29 (87.9%)	2 (6.1%)

(Table 4) summarises the findings on the importance of JA in developing the language and social skills of the ASD children. Each participant (100%) noted that shared attention was vital for linguistic development, increasing vocabulary and understanding as well as verbal communication. Complete agreement (100%) on the progress of communicative skills through shared attention was identified, showing progress in verbal and non-verbal communication.

Concerning expressive language skills, 75.8% of the participants found significant progress, while 24.2% disagreed on the issue, showing differences in language development in children with ASD depending on many things, including the severity of symptoms. Each participant (100%) acknowledged the challenges faced by children in comprehending social cues.

In addition, 87.9% agreed that there were positive responses from children in relation to education and play activities, implying that such strategies were effective in increasing involvement in interventions. The findings reveal the significant role of JA in the development of language skills and social abilities, with emphasis being put on the continued problems that ASD children face in social information processing.

Impact of Joint Attention on Language and Communication Development

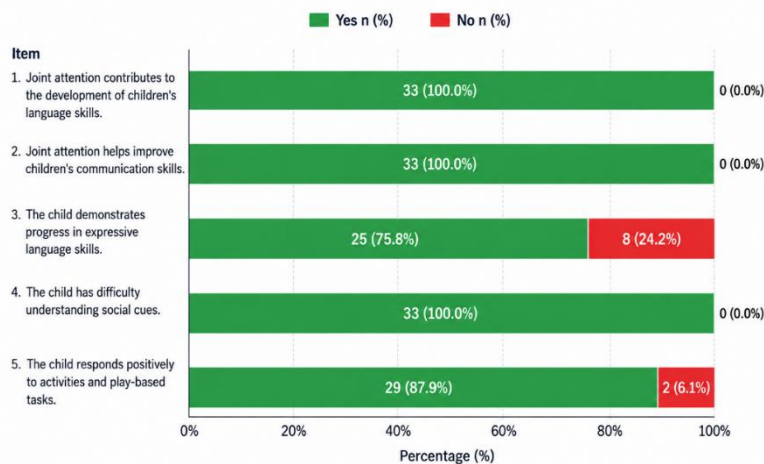


Figure 4. The Impact of Joint Attention on Language and Social Development among Children with Autism Spectrum Disorder

Therapeutic Activities and Skills Development

Results shown in (Table 5) present the opinions of teachers and psychologists about the effect of therapeutic intervention on the development of communicative skills in children with ASD.

Firstly, all participants (100%) agree that activities based on repetition and imitation play an important role in the improvement of communication skills (Item 22). Moreover, they believe that increased joint attention is extremely helpful in the improvement of social skills (Item 24), and the efforts made by therapists and teachers are effective in developing the communication skills of children with ASD (Item 25). Besides, a large number of participants 90.9% agree that children can follow the routine and commands (Item 23), while only 9.1% disagree with that statement.

Table 5. Therapeutic Activities and Their Contribution to Improving Communication Skills among Children with Autism Spectrum Disorder

Item	Yes n (%)	No n (%)
The child shows enthusiasm when interacting with peers.	14 (42.4%)	19 (57.6%)
Repetition and imitation activities help improve the child's communication.	33 (100.0%)	0 (0.0%)
The child is able to follow routines and daily instructions.	30 (90.9%)	3 (9.1%)
Social interaction improves when joint attention behaviors increase.	33 (100.0%)	0 (0.0%)
Therapeutic and educational activities help improve communication skills among children with ASD.	33 (100.0%)	0 (0.0%)

However, the problem remains valid in the area of enthusiasm for peer interactions. Only 42.4% of participants stated that children have a great interest in peer interaction (Item 21), which means that 57.6% of participants did not notice it. This statistic shows that despite the effectiveness of organized therapy in improving communication and social skills, unorganized peer interaction is a problem for many children with ASD.

To conclude, it is necessary to point out that it is of utmost importance to have organized intervention programs including repetition, imitation, routine-based learning, and JA exercises.

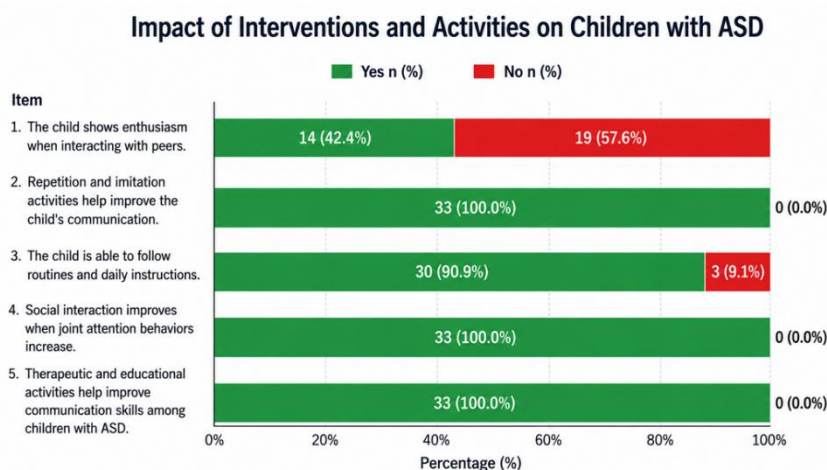


Figure 5. Therapeutic Activities and Their Contribution to Improving Communication Skills among Children with Autism Spectrum Disorder

Analysis of the Observation

The analysis employed a qualitative methodology to explore behavior patterns in children with ASD during treatment. The data were categorized by developmental stages rather than quantitative measures, focusing on aspects such as JA, communication, social interaction, behavior patterns, cognitive skills, and motor skills. Variability was noted among ASD children, with some showing emerging development while others required adult support for organizing activities.

Joint Attention Behaviours

JA is a crucial developmental area influencing communication and social interactions. Children exhibited varying abilities in maintaining attention and responding to their names, with some needing prompts to engage visually and socially. Many communicated by physically guiding therapists' hands instead of verbally. JA skills improved through well-structured and motivating tasks, with interactive and sensory activities enhancing peer interactions. While some children demonstrated effective attention and social cue responses, others needed significant support.

Communication Skills

The findings reveal considerable differences in communication skills, which are tied to linguistic abilities, JA, cognitive development, and past therapies. Some children communicated verbally while others relied solely on non-verbal cues like gestures and expressions. Observations indicated that structured therapy sessions, particularly music and sensory activities, promoted more frequent communication than unstructured environments. Visual aids, brief verbal commands, and interactive learning facilitated continuous communication, showcasing a multifaceted approach that transcended verbal communication alone. The findings highlight diverse communication methods employed in therapy, emphasizing the importance of a supportive and structured environment for enhancing communication skills in children with ASD.

Social Interaction

The findings on social interaction and cognitive/motor skills in children with ASD highlight the significant impact of treatment environments and structured activities. In music therapy sessions, children displayed increased physical, imitative, and emotional engagement, especially in group settings where shared experiences fostered involvement. However, individual preferences were evident, with some children showing discomfort in unstructured environments and favoring one-on-one interactions with therapists over peer engagement. Results indicate that children participated more positively when activities were structured and when they interacted with same-gender peers.

Cognitive and Motor Skills

Concerning cognitive and motor skills, disparities were noticed among children across different intervention centers. Various structured activities aimed at improving cognitive abilities and self-reliance revealed that while some children could perform tasks independently, others required sustained support. Issues with fine motor skills, such as difficulties in writing and coordination during tasks like cutting and coloring, were common, necessitating therapists' intervention. Imitation as a learning strategy emerged as crucial, with children often able to replicate therapists' actions in structured activities. Incorporating practical life skills, like hand washing and personal grooming, into therapy was also emphasized, facilitating independence. A variety of creative educational tasks such as puzzles and sorting games were used to engage children, supported by the therapists' guidance. Consistent repetition of organized activities was highlighted as foundational to skill development, enabling children to achieve gradual improvement. Overall, the organized intervention approach is crucial in enhancing cognitive and motor skills, although performance variances persist among individuals.

Psychomotor and Sensory Interventions

Psychomotor and sensory interventions were integral to therapy programs at autism centers, emphasizing a structured approach to aid children's development. Therapists conducted psychomotor sessions featuring sensory-motor activities, adhering to defined protocols. Common practices included babbling games to enhance concentration and facilitate eye contact. Sensory stimulation activities, such as rolling a ball on different body parts, were employed to provide organized sensory experiences. Additionally, therapists utilized puzzles and visual tools to aid body awareness, allowing children to identify anatomical parts in a structured manner. A specific psychomotor intervention program with clear developmental goals was crafted, focusing on improving visual concentration, body awareness, motor coordination, and communication skills. Activities were systematically organized by therapists using teaching aids to maintain children's engagement. The consistency of these methods across centers indicated that psychomotor interventions were a vital part of multidisciplinary involvement.

Learning Environment and Educational Materials

The therapy environments were well-equipped with a variety of educational and sensory materials, such as toys, puzzles, and storybooks, facilitating structured education. Activities included categorization and matching exercises, supported by visual materials like picture books, which were important for educational engagement. Smooth transitions between activities in therapy rooms ensured access to materials aligned with intervention objectives, reflecting a resource-rich setting conducive to learning for children with autism.

Instructional Strategies Used by Therapists

Therapists in autism centers employed systematic educational approaches throughout intervention processes, integrating functional language into children's routines for both educational and therapeutic purposes. Common instructional strategies included the use of simple functional instructions, such as "Close the door" and "Sit down," which became part of normalized communication between therapists and children, reflecting the importance of functional language in standard therapy practices. Individual sensory intervention sessions allowed therapists to work closely with each child, providing continuous guidance. Daily living skills were integrated into therapy through organized activities that mimicked everyday tasks, with therapists offering verbal instructions.

Intervention Process in the Participating Centers

The intervention process in the participating centers follows a systematic approach that begins before activities commence. After initial diagnosis and referral, therapists conduct a developmental assessment to tailor interventions to each child's needs. This assessment guides the creation of personalized therapy programs, which may include individual or group therapy. Therapists adapt their strategies based on the children's abilities and continuously monitor progress, ensuring that interventions remain individualized rather than generalized. The process includes diagnosis, evaluation, program development, and ongoing supervision, emphasizing decisions based on each child's specific developmental requirements.

Analysis of the Interview

Thematic analysis was employed to examine qualitative data from semi-structured interviews, following Braun and Clarke's (2006) procedure. This method's organized and flexible structure facilitates the identification and interpretation of meaning patterns in qualitative data. The analysis adhered to six phases: familiarization with transcripts, coding significant passages, grouping codes into themes, refining themes for accuracy, labeling themes, and organizing them into a coherent narrative supported by participant quotations.

Theme One: Teachers' Professional Experiences in Working with ASD Children

The Analysis of the interviews revealed that teachers viewed their working experience with children with ASD as both enjoyable and difficult at the same time. Teachers were aware of the challenges in teaching these children, but they all unanimously agreed that one must be patient, adaptable, continuously educated, and must develop an approach in order to meet the needs of each child. Three interrelated subthemes emerged from the data analysis: recognition of the individual differences of children with ASD, the skills required for effective teaching, and continuous professional development through experiential learning.

Subtheme 1: Recognizing Individual Differences among Children with ASD

The majority of teachers highlighted that children with ASD vary significantly in their capabilities, learning approaches, and developmental traits. Teachers highlighted that adaptations in instructional strategies are essential for engaging ASD students effectively. For instance, Teacher A emphasized the importance of "variations in capabilities across children," while Teacher C noted the necessity for adaptability in teaching methods. This perspective was shared among multiple teachers, indicating a consensus that recognizing individual differences is vital for effective educational strategies.

Another significant theme is the role of early intervention and family involvement in child development. Psychologists stressed that interventions should extend beyond school environments, advocating for collaboration among families and professionals. Psychologist A pointed out that "timely intervention and cooperation with the family" are crucial for developmental progress, echoed by Psychologist B, who mentioned the importance of partnerships among experts, teachers, and families. A clinical psychiatrist conveyed that working with ASD children, though fulfilling, is challenging and necessitates precise clinical observations. She underscored that successful intervention relies on understanding individual child needs, family collaboration, and coordination with various professionals. Furthermore, psychologists like Psychologist E articulated that their role encompasses enhancing children's communication and social skills, proposing a broader approach that prioritizes effective communication and social engagement, rather than solely addressing behavioral issues. This comprehensive perspective highlights the critical goals of communication and social development in the education of ASD children.

Subtheme 2: Professional and Personal Competencies Required for Effective Practice

Participants emphasized patience as a vital quality, indicating that teachers consider it crucial when addressing diverse needs. Additional qualities mentioned include adaptability, perseverance, careful observation, and collaboration with parents. Teacher B characterized interactions with autistic children as "an amazing professional human experience," noting that achieving the best results necessitates patience, adaptability, and family cooperation. Teacher F stated that the role demands patience and vigilant observation due to the unique traits of each child. Teacher I pointed out that progress relies on "determination and constant learning," while Teacher J also underscored patience as a pivotal quality for effective teaching.

Subtheme 3: Continuous Professional Development through Experience

The participants in the study perceived their career progression as a continuous learning journey that fostered confidence and skill development. Teacher D stated that it is a "process that involves many challenges and learning," noting the importance of understanding children's needs to select suitable activities. Teacher G emphasized the necessity of specialized training for therapeutic techniques, which "require regular supervision." Similarly, Teacher H pointed out that

despite extensive experience, teachers must constantly adapt their approaches to meet the individual learning needs of each child. The findings suggest that teachers and psychologists regard their interactions with children with ASD as a dynamic professional journey characterized by individualized instruction, personal attributes, and ongoing professional growth. Even with daily challenges, participants maintained a positive outlook on their profession, recognizing the need to adapt teaching methods to cater to the unique characteristics of each child. This context sheds light on the learning environment where communication skills and Joint Attention (JA) are developed among children with ASD.

Theme 2: Communication Difficulties among ASD Children

The results reveal that the majority of teachers agree on the various communication problems faced by children with ASD. Teachers noted that the communication problems affected verbal and non-verbal communication and involved the ability to initiate and maintain social interactions, social cueing skills, sustaining conversation, and communicating personal needs. There were three main subthemes that emerged from this analysis.

Subtheme 1: Difficulties in Social Communication and Interaction

Most teachers observed that children with ASD encounter significant challenges in establishing and maintaining social contacts. Key difficulties include engaging in two-way communication, participating in conversations, and understanding social situations and non-verbal cues. Specific comments from teachers highlighted issues such as "social communication challenges," initiating social interactions, and maintaining verbal conversations. Many students exhibited limited verbal communication skills, with some relying more on sign language due to late language development, as noted by several teachers. Psychologists corroborated these observations, emphasizing verbal communication and delayed language development as primary barriers. They noted that many children struggle with effective verbal language use in daily scenarios, and often display difficulties in maintaining conversations and reciprocal interactions. The consensus among educators and psychologists is that communication difficulties are central to the challenges faced by children with ASD, affecting their social skills in educational contexts. Communication barriers acknowledged by clinical psychiatrists included not only verbal but also social communication challenges, such as initiating conversations and echolalia, along with reduced reciprocity of communication. Furthermore, non-verbal communication deficits, such as inadequate eye contact, were highlighted as critical obstacles. Many children use gestures or sign language when spoken language is inadequate, indicating that these non-verbal issues significantly hinder their ability to forge social connections.

Subtheme 2: Difficulties in Emotional Expression and Behavioral Regulation

Participants observed that many children, particularly those with severe autism spectrum disorder (ASD) symptoms, struggle to express basic emotions such as pain, hunger, fear, and anger. Teacher E noted that many autistic children have difficulty vocalizing their needs, while Psychologist F highlighted that these communication challenges often lead to frustration and behavioral issues. Impulsivity was identified as another behavior problem that hinders effective communication and social interaction. Overall, there was a consensus among teachers, psychologists, and a clinical psychiatrist regarding the communication traits of children with ASD, including problems in social communication, delayed verbal language skills, limited conversational abilities, and challenges in expressing feelings and needs. The findings indicate that communication difficulties in children with ASD are multifaceted, affecting both language and emotional regulation, ultimately complicating social interactions.

Theme 3: Communication Patterns of ASD Children

Teachers and psychologists generally agree that children with autism spectrum disorder (ASD) primarily use simplified communication methods, including gestures, pictures, sign language, and simple vocabulary. Teacher A explained that "Many children struggle with verbal communication and rely on non-verbal cues to express needs, often guiding adults through gestures". Teachers D, E, F, G, H, and I indicate that children sometimes express emotions through crying when they cannot communicate verbally, highlighting the importance of non-verbal communication as a compensatory mechanism. Additionally, Psychologist B highlighted that some children display limited interaction due to reliance on echolalia, confirming that spontaneous language development is challenging for those with ASD, particularly in educational contexts where teachers often serve as primary communicators.

The findings reveal that children predominantly communicate with teachers rather than peers, relying on familiar adults for motivation to engage socially. Teacher B noted that children need encouragement to participate in social activities, while Teacher G pointed out that teacher-facilitated communication is more common than peer interactions. Psychologist A added that children use basic language and simple vocabulary primarily when addressing teachers. Furthermore, children with ASD are shown to frequently employ AAC techniques, highlighting the importance of creating supportive learning environments that promote both spoken and non-verbal communication.

Theme 4: Social Interaction Behaviours among ASD Children**Subtheme 1: Limited Peer Interaction and Preference for individual Play**

The analysis of responses from participants indicated significant challenges in socialization among children with ASD. Several teachers observed a tendency for these children to engage in "individual play" and exhibit "little peer interaction," preferring solitary activities over group participation in the classroom. This viewpoint was consistently echoed among teachers involved in the study. I noted that many children were "preoccupied with favorite games," reinforcing the idea of a preference for individual activities over social engagement. A clinical psychiatrist also reported similar findings, emphasizing social behaviors characterized by isolation, lack of sharing, and a tendency to play alone. Psychologist D highlighted the inadequacy of social interactions in these children, while Psychologists B and C commented on their weak social drive and limited common interests. Overall, the observations suggest that limited peer interactions and a preference for solitary play dominate the social behaviors of children with ASD.

Subtheme 2: Difficulties in Reciprocal Social Engagement

Observations from multiple teachers highlight issues such as poor eye contact, solo play, and an inability to take on different social roles, which hinder successful group learning and peer interactions. Psychologist A further described difficulties related to patience and impulsivity, along with some children's delayed recognition of peers, which restricts social participation due to inadequate turn-taking and interaction skills. A clinical psychiatrist noted behaviors indicative of social isolation and reluctance to share or change routines, affirming the tendency of these children to play alone. However, some psychologists suggest that structured group work could enhance behavioral regulation and social skills, acknowledging the potential benefits of organized collaborative activities. Overall, there is agreement that children with ASD exhibit limited peer interactions, with poor eye contact and social reciprocity being the most frequently cited issues, underscoring the critical need for interventions focused on fostering peer interactions.

Theme Five: Joint Attention Behaviours among ASD Children

Many children ignore pointing gestures, eye contact, and actions from peers and teachers, which hinders their engagement in classroom activities. Teacher B noted occasional imitation of gestures by some children, but this was inconsistent across the group. Teachers F and G highlighted that many children do not respond to teachers' cues, while Teachers E, H, and I observed that students often disregard pointing gestures directed towards objects, indicating a general inconsistency in responding to these cues among ASD children. This aligns with psychological assessments, where psychologists B, E, and F pointed out that some children do not respond to their names or conform to gestures and maintain minimal engagement in their environment. These difficulties in responding to social stimuli are characteristic of ASD and impede effective communication and socialization. However, some variability was noted, with Psychologist A indicating that while certain children can respond to non-verbal cues, most require ongoing practice. A clinical psychiatrist further mentioned that many children struggle with following another person's gaze, reflecting a lack of joint attention (JA) response skills crucial for social interactions. Overall, these findings suggest a prevalent issue with poor JA response abilities in both classroom and clinical contexts.

Participants also observed that children exhibit a lack of enthusiasm in sharing attention with adults and peers, necessitating ongoing motivation from caregivers to sustain their engagement. Teacher A noted a "lack of interest in common with others," while Teacher C echoed concerns regarding children's diminished shared attention with both teachers and peers. Teacher D emphasized the need for motivation and prompting to facilitate participation in attention-sharing activities. Psychologist A indicated that many children learn to respond to gestures and eye gaze through consistent training, suggesting that shared attention skills might develop more naturally in organized play settings, as noted by Psychologist C. The speech therapist highlighted developmental behaviors indicative of shared attention, such as shifting focus between objects and people, responding to gaze, and engaging in communication, which can be enhanced through structured language strategies. These insights suggest a prevalence of Joint Attention (JA) deficits in children with ASD, with variability in severity that can improve with targeted educational and therapeutic interventions. Additionally, the clinical psychiatrist identified challenges with proto-declarative pointing, underscoring difficulties in intentionally directing someone's focus towards an object or event for shared interest rather than merely seeking assistance, which may hinder the development and maintenance of JA behaviors in children with ASD.

Theme Six: Language Difficulties among ASD Children

The findings indicate that linguistic difficulties are key traits of children with autism. Participants reported challenges in various linguistic aspects, including delayed language development, expressive and receptive language abilities, vocabulary acquisition, and social language use. These problems encompass not only delayed articulation but also syntax, grammar, comprehension, and pragmatics issues.

Subtheme 1: Delayed Language and Speech Development

The primary language-related challenge for children with ASD is the slow development of speech and language. Many educators note that a significant number of these children learn to speak and use language at a much slower pace than their peers, which leads to poor verbal communication skills and hampers their ability to express themselves. Teachers A and F identified delayed language acquisition as a prevalent issue, with terms like "delayed speech" frequently cited as a characteristic of children in autism centers. Additional observations include "expressive language delay" and limited vocabulary, indicating that the oral language development of these children is significantly delayed compared to their peers.

Subtheme 2: Difficulties in Expressive Language and Vocabulary Development

The participants reported that many children have difficulty forming sentences, having vocabulary appropriate for their age level, and using their language properly. Teachers B, C, and E mentioned "problems with sentence formation" and late vocabulary development on all occasions. Teacher D further clarified that many children have "limited vocabulary and repetition of words that lack practical meaning," which suggests that speech is more repetitive than conversational. These results show that problems with expressive language in children with autism include not only limited vocabulary but also problems with sentence formation and proper usage of language.

Subtheme 3: Difficulties in Receptive and Social-Pragmatic Language

Participants, including teachers and psychologists, noted that many children possess age-appropriate vocabulary yet struggle with sentence formation and understanding spoken language, especially in social contexts. Teachers A and F highlighted difficulties in understanding social communication, while Teachers B and C focused on issues with appropriate language use in social settings. Teacher C specifically pointed out difficulties with functional language that hamper effective communication. Teacher H also observed that many children have trouble grasping complex questions and sentences. Psychologist A supported these observations by stating that children have challenges in using language appropriately in social contexts, in addition to issues with expressive language. Psychologist B noted persistent deficits in functional and receptive language skills. A clinical psychiatrist further added that children often display echolalia, agrammatical speech, and limited vocabulary, which hinder their ability to engage in reciprocal conversations and understand socially relevant dialogues. Overall, the findings suggest that language problems in children with ASD are complex and encompass multiple facets of language acquisition.

Theme Seven: Joint Attention and Communication Development

Analysis of participant feedback indicates strong agreement on the significance of joint attention (JA) in fostering communication skills in children. JA is deemed essential for verbal communication, socialization, language acquisition, and educational success. The data revealed three sub-themes, with the first highlighting that effective JA enhances both verbal and social communication. Participants noted that proficient JA skills correlate with improved verbal abilities, classroom participation, and social interactions, facilitating better expression of needs and feelings. Teachers and psychologists recognized JA as foundational for effective communication, reinforcing that it is crucial for understanding others and engaging socially. This agreement underscores the integral role of JA in children's communication and social development. JA significantly enhances children's engagement in classroom activities, linguistic comprehension, and participation in learning. Teacher C noted that as children improve their JA skills, they excel in focusing, understanding teachers, and participating, which facilitates language acquisition. Psychologist F highlighted that shared attention enriches vocabulary and language comprehension, underscoring its role in language development. Similarly, a speech therapist observed that better JA correlates with improved communication skills—both receptive and expressive. Overall, these findings emphasize that shared attention provides vital opportunities for children's successful language acquisition and practical application.

Participants also highlighted the positive effect of JA on the social interaction and enthusiasm of the child in learning settings. Many of them explained that children who show greater abilities in joint attention had a higher chance of getting engaged with adults and other children, which means that the opportunity to communicate became greater.

Teacher G revealed that "greater joint attention leads to increased interaction with teachers and children's enthusiasm for learning." This finding proves that JA impacts not only communication but also the child's engagement and interaction with teachers and peers. Participants, therefore, saw JA as an important factor in promoting social and educational development of the child.

Theme Eight: Supporting Children's Response to Verbal Instructions through Joint Attention Interventions**Subtheme 1: Children's Responses to Verbal Instructions and the Importance of Visual Support**

Responses to verbal instructions require a combination of clarity, brevity, and visual or gestural support, particularly for children with receptive language difficulties. Teachers A, C, and D noted that children displayed better comprehension and attentiveness when instructions were accompanied by gestures and visual aids, which alleviate cognitive load. Techniques such as reiteration and positive reinforcement were also emphasized to enhance understanding and acceptance of verbal commands. Psychologists and speech therapists supported these findings, highlighting the impact of calm environments, individualized approaches, and the necessity of specialized therapy for children facing communication challenges due to ASD. Overall, a multidisciplinary approach tailored to each child's unique needs is crucial for effective communication.

Subtheme 2: Intervention Strategies for Enhancing Joint Attention and Communication

Analysis reveals consensus on the significance of structure, play, and visual aids in fostering Joint Attention (JA) and communication skills in children with ASD. Participants emphasized that effective interventions necessitate engaging children in social interactions using visuals, demonstrations, and positive reinforcement to sustain attention and encourage reciprocal communication. Teachers A and D highlighted the value of interactive play, positive stimulation, and visual resources like pictures and flashcards as effective tools for promoting JA and language participation. Teacher A specifically noted these elements as fundamental to engaging children. Teacher B advocated for the incorporation of interactive play, mimicry, and storytelling through visuals, emphasizing the necessity of educating parents to extend these practices at home, thereby recognizing the importance of parental involvement. Teacher C agreed on the efficacy of games and illustrations in stimulating JA and communication. Teachers E and F reinforced these views by stressing the benefits of interactive learning and collaborative activities to enhance communication and attention sharing. All educators voiced the need for interventions to extend beyond educational contexts, advocating for collaborative efforts among teachers, psychologists, speech therapists, and parents to create a consistent support system across school and home environments. This collaborative approach fosters opportunities for children to observe peers, take turns, and engage in significant social interactions, ultimately contributing to their language development and social communication skills.

Discussion**Discussion of Quantitative Findings**

The results obtained from the questionnaire revealed that teachers and psychologists recognize the importance of JA as a factor for the development of language skills and social engagement. The finding corresponds to the research conducted by Bottema-Beutel et al. (2024). They stress the link between JA and the linguistic performance of children in terms of expressive language and vocabulary in particular. According to Kissine et al. (2019), certain children diagnosed with autism could learn language using other means of communication. These results are also in line with Kissine et al. (2023), who examined 71 studies and came to the conclusion that shared attention is crucial to the development of language in children with autism. They also highlighted the heterogeneity of language development in autism, emphasizing that some autistic children may learn language while having poor joint-attention abilities.

Discussion of Qualitative Findings

Observations showed that there were problems with maintaining eye contact, following gaze, and initiating interaction, as well as high individual variability. Such findings are consistent with the research carried out by De Belen et al. (2023) and Abdelaziz et al. (2024) studying joint attention and its relationship to linguistic and developmental outcomes. The aforementioned variability is consistent with the findings of Belhadj et al. (2006). Moreover, the importance of structured activities and interventions is consistent with the findings of Pinto et al. (2024) and Hajri et al. (2019) on the developmental benefits of intervention and cognitive therapy.

Integration of Findings

The findings from the questionnaire, observations, and interviews collectively highlight the importance of JA but also show vast differences in the language development skills of the children and how they respond to interventions. In line with the studies conducted by Eissa (2015) and Halayem et al. (2024), the findings emphasize the need for well-organized assistance and efficient collaboration between professionals and families. Nevertheless, instead of proving a direct relationship between joint attention (JA) and language acquisition, the present research focuses on finding correlations and exploring the views of professionals.

Conclusion

The study concludes that joint attention has an important role in the language development and social interaction of children with ASD. From the research findings, it is clear that there were problems with eye contact, social understanding, initiating an interaction, and maintaining joint attention. However, there were different levels of skills among children, and this implies that joint attention should be viewed as a set of related skills rather than a single skill.

The research findings reveal that there is a need for organization, play, visual, and personalized tasks to encourage engagement and interaction. The research highlights the importance of regular assessment of joint attention and collaboration between the educator, psychologist, speech-language therapist, and family members. However, the findings cannot show any cause-and-effect relationship between joint attention and language acquisition.

The results of the study conducted confirm the four proposed hypotheses. First, the results confirm the hypothesis H1 since the children with Autism Spectrum Disorder (ASD) may face problems while participating in joint attention, particularly in sustaining eye contact, following gaze or gestures, and sharing attention during activities and play. Second, the results confirm hypothesis H2 by pointing out the relationship between limitations in joint attention and problems in language development and social interactions. The limitations may pose some problems for children as far as communicating and playing in social settings is concerned. Third, the results confirm hypothesis H3, and this involves the importance of joint attention as an aspect of social communication that helps in language development and interactions with the social environment. Lastly, the results confirm the fourth hypothesis, as they provide strategies used in schools and therapies in order to improve joint attention and communication in children with ASD through planned activities and play.

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