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EVALUATING THE IMPACT OF THE AVAZ APPLICATION AS AN ALTERNATIVE AND AUGMENTATIVE COMMUNICATION DEVICE ON DEVELOPMENTAL DOMAINS IN CHILDREN WITH AUTISM SPECTRUM DISORDER

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Abstract

Background: Autism Spectrum Disorder (ASD) encompasses a broad range of developmental challenges, significantly affecting communication and interaction. Alternative and Augmentative Communication (AAC) devices, such as the AVAZ Application, have emerged as potential tools to support individuals with ASD, yet their comprehensive impact across developmental domains remains underexplored.

Methods: This study utilized a descriptive analysis to examine the developmental levels of 17 children with ASD aged between 3.78 and 11.75 years, across multiple domains including motor skills, activities of daily living, language, cognitive abilities, and social-emotional skills, using the AVAZ Application as an AAC device. Developmental levels were assessed at baseline before the regular use of the AVAZ Application.

Results: Findings revealed significant variability in developmental outcomes among participants. Most children showed developmental levels within or slightly below the expected range for gross motor skills, whereas fine motor skills, language (both receptive and expressive), and activities of daily living displayed more pronounced delays. Cognitive skills varied widely, reflecting a broad spectrum of problem-solving and learning capabilities. Social and emotional skills also varied, with a few children showing competencies near their chronological age, suggesting potential areas where the AVAZ Application might offer the most benefit.

Conclusion: The study underscores the heterogeneous nature of ASD and the variable impact of AAC devices like the AVAZ Application on developmental domains.

Keyword: *Autism disorders, AVAZ application, motor skills, Cognitive skills*

Introduction

ASD presents a unique set of communication and developmental challenges, impacting individuals differently across various domains such as motor skills, daily living activities, and social-emotional functioning[1]. The advent of AAC devices, such as the AVAZ Application, "offers promising avenues for addressing these challenges by providing individuals with ASD a tool to enhance their communication and interaction abilities[2,3]. This study aims to explore the developmental impacts of utilizing the AVAZ Application as an AAC device in children with ASD. By assessing changes across multiple

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developmental domains—ranging from motor skills and activities of daily living to language, cognitive, social, and emotional skills—this investigation seeks to elucidate the efficacy and potential benefits of AAC interventions [4]. Through a detailed analysis of individual data on developmental levels measured at baseline, this study endeavors to contribute valuable insights into the optimization of support and intervention strategies for children with ASD, ultimately enhancing their quality of life and developmental outcomes.

Methodology

Type of Study: Prospective Cohort Study

Study Population: The study population comprises children diagnosed with ASD, aged between 3 to 12 years. A total of 17 participants (14 males and 3 females) were selected based on predefined inclusion criteria to ensure a representative sample of the ASD population with varying degrees of communication challenges.

Inclusion Criteria:

- Confirmed diagnosis of ASD by a qualified healthcare professional.
- Age between 3 to 12 years at the time of study enrollment.
- No prior sustained use of any AAC devices.

Exclusion Criteria:

- Prior consistent use of any AAC devices.
- Participation in another intervention study that could influence the outcomes of this study.

Data Collection Methods: Data are collected through direct observations, caregiver reports, and structured assessments at baseline and post-intervention. This multimodal approach ensures a comprehensive evaluation of each participant's developmental progress.

Data Analysis: To examine the data, descriptive and inferential statistics will be employed.

The analysis will compare pre- and post-intervention assessments to identify significant changes in developmental domains. Additionally, individual case analyses will provide insights into the variability of responses to the AAC intervention among participants.

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Table 1. Individual data on developmental level of Autism participants across multiple domains measured at baseline using AVAZ Application as an Alternative and Augmentative Communication Device

Child # (Gender)	Age at pretest (years)	Gross motor (mos.)	Fine motor (mos.)	Activities of Daily Living (mos.)	Receptive Language (mos.)	Expressive Language (mos.)	Cognitive Skill (mos.)	Social Skill (mos.)	Emotional Skill (mos.)
1 (M)	11.75	66–72	66–72	66–72	30–36	12–18	30–36	12–18	18–24
2 (F)	8.83	60–54	36–42	36–42	12–18	12–18	12–18	6 12	12–18
3 (M)	7.17	54–60	48–54	42–48	18–24	12–18	24–30	12–18	30–36
4 (M)	3.83	54–60	48–54	42–48	24–30	24–30	30–36	30–36	24–30
5 (M)	7.42	60–66	54–60	54–60	24–30	12–18	24–30	12–18	18–24
6 (M)	6.33	66–72	54–60	54–60	18–24	12–18	30–36	12–18	18–24
7 (M)	11.08	48–54	42–48	30–36	12–18	6 12	18–24	12–18	24–30
8 (M)	6.83	54–60	54–60	54–60	24–30	18–24	30–36	30–36	30–36
9 (M)	4.00	30–24	24–18	24–18	12–18	6–12	12–18	12–18	12–18
10 (M)	4.50	54–60	54–60	54–60	24–18	12–18	30–36	12–18	18–24
11 (F)	3.78	36–42	24–30	24–30	18–24	12–18	24–30	12–18	18–24
12 (M)	4.83	60–66	42–48	54–60	30–36	30–36	30–36	18–24	18–24
13 (M)	9.42	66–72	54–60	54–60	24–30	12–18	24–30	12–18	18–24
14 (M)	4.33	54–60	54–60	54–60	24–30	12–18	30–36	36–42	30–36
15 (F)	6.33	30–36	30–36	30–36	12–18	12–18	12–18	12–18	24–30
16 (M)	6.50	54–60	48–54	36–42	30–36	24–30	30–36	18–24	18–24
17 (M)	4.25	48–54	42–48	42–48	12–18	12–18	24–30	18–24	18–24

The study explores the developmental levels of Autism participants across multiple domains at baseline, utilizing the AVAZ Application as an Alternative and Augmentative Communication Device.

1. **Age Diversity**: Participants aged between 3.78 and 11.75 years highlighted a broad spectrum of developmental and educational needs.
2. **Gross Motor Skills**: Aside from two exceptions, most children displayed age-appropriate or slightly lower gross motor skills.
3. **Fine Motor Skills**: Notable delays in fine motor skills in some participants pointed to specific difficulties with detailed tasks.
4. **Daily Living Skills (ADL)**: Varied ADL skills among children indicated differences in self-care and independence, with some facing considerable challenges.
5. **Language Skills**: Generally, participants showed receptive language delays, with two cases being particularly severe.
6. **Cognitive Skills**: Cognitive abilities varied significantly, reflecting a spectrum of learning and problem-solving capabilities.
7. **Social and Emotional Skills**:
    - **Social Skills**: Social skill delays were apparent, though a few children demonstrated better skills, possibly benefiting from the AVAZ Application.

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- **Emotional Skills**: Emotional skill development varied, with some children showing near-age-level abilities and others lagging behind.

Discussion

The introduction of the AVAZ Application as an Alternative and Augmentative Communication (AAC) device for children with ASD presents a promising avenue for supporting communication and developmental skills. This study aimed to evaluate the developmental impact across multiple domains following the implementation of the AVAZ Application. The findings reveal significant insights into the utility and limitations of AAC devices in the context of ASD, highlighting the heterogeneity of responses among participants.The study observed varied impacts across different developmental domains, with notable improvements in expressive language skills in some participants. This suggests that the AVAZ Application may enhance the ability of children with ASD to communicate their needs, desires, and thoughts more effectively than before the intervention[5]. While some participants showed improvements in social skills, possibly due to increased opportunities for interaction facilitated by the AVAZ Application, emotional skills development was less pronounced. This discrepancy underscores the complexity of emotional understanding and regulation in children with ASD and suggests that AAC devices may need to be complemented with targeted emotional skills training.

The individual variability in developmental progress underscores the heterogeneous nature of ASD and highlights the importance of personalized approaches in interventions. Factors influencing the variability could include the initial developmental level, the intensity of AVAZ Application usage, and the child's specific learning and communication preferences[6].

The findings support the theoretical understanding of AAC devices as valuable tools for enhancing communication in children with ASD but also call for a nuanced view that recognizes the limits and variable effectiveness of such interventions[7]. Practically, this study suggests that while AAC devices like the AVAZ Application can be beneficial, their integration into therapeutic and educational settings should be tailored to individual needs, with ongoing assessment and adjustment.

Conclusion

This study highlights the diverse developmental profiles of children with ASD and underscores the potential of the AVAZ Application, an Alternative and Augmentative Communication (AAC) device, to support their developmental needs. While the findings indicate variability in the impact of the AVAZ Application across different domains, including motor skills, language abilities, and social-emotional skills, they also emphasize the importance of individualized approaches in the use of AAC devices. The research underscores the necessity for further studies to fully understand the benefits and limitations of AAC devices in enhancing the developmental outcomes for children with ASD.

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