

IMPROVING NONVERBAL COMMUNICATION SKILLS THROUGH THE BERKATA APPLICATION IN CHILDREN WITH AUTISM

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ABSTRACT

This study aims to determine the improvement of nonverbal communication skills through the BerKata application in children with autism. This study used a Single Subject Research design with a baseline 1 (A1) – intervention (B) – baseline 2 (A2) method, involving one subject. This study used a modified Goutman scale. Data were obtained from observation and intervention activities to improve nonverbal communication according to Dedi Mulyana (2021) and analyzed descriptively and quantitatively, including the calculation of the Percentage of Non -Overlapping Data (PND) to assess improvement in the form of non-overlapping percentages and overlaps to see improvement in communication ability in overlapping percentages. The results showed an increase in nonverbal communication skills from 0% at the first baseline (A1) to 40% at the second baseline (A2). The PND calculation showed an increase of 85.71%. With an overlap percentage of 14.28%, the intervention showed a positive effect on the nonverbal communication skills of children with autism.

Keywords: Children with autism, nonverbal communication, augmentative and alternative communication, BerKata application.

1. INTRODUCTION

Autism is a severe or complex developmental disorder caused by a disturbance in the central nervous system, specifically the brain. Autism is a severe developmental disorder that results in impaired communication and social-. According to Desiningrum (2007), autism is an abnormality in the development of social interaction and communication that leads to limited activities and interests. These basic needs often become barriers and challenges. Thus, a child with autism is a child with social interaction and communication difficulties caused by a neurological disorder of the brain. Children with autism have distinctive characteristics. According to Irdamurni (2020), the characteristics of children with autism include communication difficulties. Communication difficulties in children with autism can result in the person they are speaking with being unable to provide feedback that meets the child's expectations. A situation that occurs repeatedly can cause the child to have tantrums, scream, and exhibit aggressive behaviors such as anger, harming others or themselves, and destroying objects around them (Sumarti, 2017). One of the consequences of communication difficulties is that children tend to become more passive in social interactions. This results in their inability to express their desires. Children will experience difficulties in developing appropriate behavior, limited learning processes, minimal employment opportunities, and poor social networks (Iacono et al., 2016)

In accordance with its definition and characteristics, children with autism generally experience social, language, and behavioral interaction barriers, leading to difficulties in two-way communication both verbal and nonverbal- (Marlina, 2015). The communication limitations experienced by children with autism make it difficult for them to express their needs or desires, causing their communication partners to struggle in understanding the information. Children with autism face various developmental challenges, including in

language skills, which affect how they interact and participate in communication with their surroundings (Fakhiratunnisa et al., 2022).

According to the Ministry of Basic and Secondary Education of the Republic of Indonesia, as published in the Statistics on Special Education Schools (SLB) for the 2024/2025 academic year, the total number of students with autism enrolled in public and private schools across Indonesia is approximately 18,700 students. This data was obtained from Dapodik, which has undergone a rigorous verification and validation process by the data provider. In the Riau Province, there are 696 students with autism enrolled in various special education schools. However, this data does not yet include all children with autism in Indonesia and the Riau Province. This is due to the large number of children with autism who are not attending school or have not been registered in the formal education system. Consequently, it is estimated that the actual number of children with autism is significantly higher.

One of the students enrolled at the Pendowo Limo Special Education School in Pekanbaru, identified by the initials SA, has been diagnosed by a doctor with specific needs, namely autism and an articulation disorder. SA has communication difficulties, particularly in the development of expressive language and in conveying his desires through nonverbal communication. Based on an interview with the parents, SA faces challenges in speaking verbally. SA has an articulation disorder where the palate-or roof of the mouth is arched too high, hindering optimal speech organ function. Despite difficulties with verbal communication, SA is able to understand simple instructions, indicating that his receptive language skills continue to develop. SA demonstrates several nonverbal communication skills, such as greeting and waving goodbye, offering an object to ask for help, turning when called, and pointing to objects to convey desires. The communication skills demonstrated by SA have reached the third stage of communication development, known as the early communication stage, where the child is able to understand commands in the form of both verbal instructions and pictorial gestures.

One communication alternative that can be used for children with autism is Augmentative and Alternative Communication (AAC). According to the American Speech-Language-Hearing Association (Beukelman & Light, 2020), AAC is a field of clinical practice that focuses on the needs of individuals with severe communication difficulties, characterized by impairments in speaking or understanding spoken language. The use of technology-supported AAC is considered effective in meeting the communication needs of children with autism. Berkata communication app serves as one alternative to support the communication success of children with autism. The Berkata app is a communication platform that utilizes Augmentative and Alternative Communication (AAC) in the form of an Indonesian-language mobile application. The BerKata app is specifically designed to support individuals with communication difficulties, particularly children with autism spectrum disorder and non-verbal children. According to Christjahja and Yusuf (2021), this app serves as a bridge for children with special needs, enabling them to express their desires, emotions, and needs through a combination of images and sounds. The app functions as a speech assistant that facilitates communication between the child and their conversation partner in daily life.

Based on research by Dewi & Tjasmini (2019), the use of communication apps can improve communication skills in children with special needs. Respondents with experience using Alternative and Augmentative Communication (AAC) consider AAC to be 97% effective, and a significant improvement in communication skills was observed following intervention using the I-Talk alternative communication method. It was found that in Phase A2, individual skills continued to improve and remained stable at an average of 67%. AAC-based assistive technology is commonly used as a general communication tool. Researchers have not only utilized the BerKata app as a communication tool but also as a means for developing

nonverbal communication. Various previous studies have discussed and examined the effectiveness of using Augmentative and Alternative Communication (AAC). However, there are few research studies that utilize smartphone-based (high-tech) applications, particularly in the province of Riau, specifically in the city of Pekanbaru, employing a single-subject research design with individual interventions.

Therefore, the researcher is interested in conducting a study titled "Improving Nonverbal Communication Skills Through the BerKata App in Children with Autism" by applying an experimental method based on the Berkata app and measuring the stages of nonverbal communication. It is hoped that this study will provide concrete evidence and practical guidance for teachers and parents in supporting communication in children with special needs through AAC technology.

2. METHODOLOGY

The research design used is A-B-A. The baseline phase (A1) describes the initial abilities of the research subjects. The researcher will observe the subjects' behavior without any intervention. The intervention phase (B) involves providing an intervention in the form of communication enhancement activities using AAC via the BerKata app. The final phase is baseline phase 2 (A2). In this phase, the researcher will assess which abilities or aspects the subjects have achieved following the intervention.

Subject of this study is a 10-year-old child with autism who experiences difficulties with verbal communication. The subject is identified by the initials SA; the subject has autism spectrum disorder; the subject experiences difficulties with verbal communication; and the subject has never received intervention in the form of app-based augmentative and alternative communication strategies.

The implementation stage is divided into three phases. In the initial or baseline phase (A1), the subject will be observed to assess their baseline abilities before intervention is provided. The researcher will observe, record, and assess the subject's baseline abilities without using any media or intervention. This phase consists of three sessions. The behaviors observed during the baseline phase (A1) will serve as the basis for assessing the subject's communication abilities. The second phase is the intervention phase (B). This phase consists of 7 sessions, each lasting 30 minutes. The researcher will provide the intervention using AAC strategies based on the Berkata app and will work to develop the subject's nonverbal communication skills. The researcher will introduce activities that the research subject typically performs, as available within the app. In the third phase, baseline 2 (A2), the researcher will observe the subject without any treatment using AAC strategies and monitor the development of the subject's nonverbal communication skills. During this phase, the researcher will observe changes in the subject's behavior and assess the impact of the intervention.

This study uses descriptive statistical analysis by calculating the Percentage of Non-Overlapping Data (PND). This method is frequently used in single-subject research to assess the extent to which data obtained after the intervention show improvement compared to the initial phase. Interpretation of Results The use of visual analysis combined with the calculation of the Non-Overlapping Data Percentage (NODP) provides deeper insights into the impact of the intervention. The analysis results are expected to show that the intervention leads to an improvement in the communication skills of children with autism.

Observation is a data collection technique conducted through the observation and recording of the condition or behavior of the research subject. The researcher used a nonverbal communication development checklist, administered across three research phases: baseline (A1) consisting of 3 sessions, intervention (B) consisting of 7 sessions, and baseline 2 (A2) consisting of 3 sessions. The focus of the intervention was on five indicators

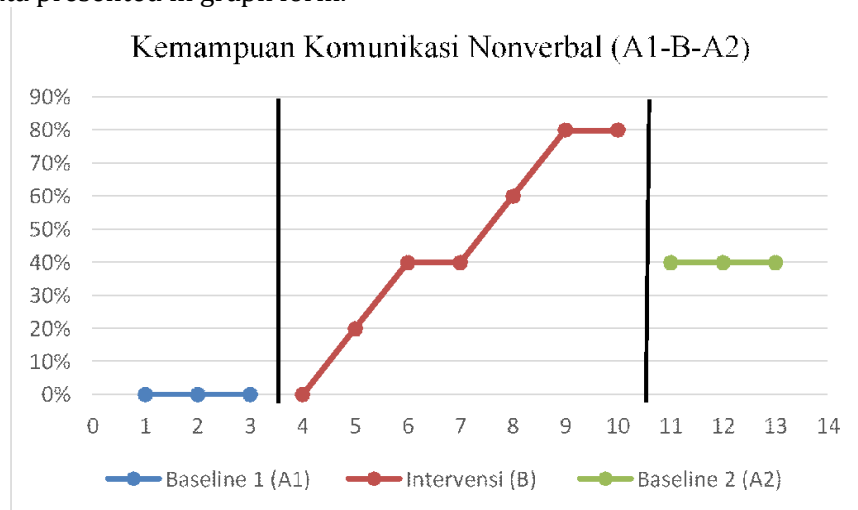
of nonverbal communication and specific communication behaviors of children with autism. These observations were conducted directly at SLB Pendowo Limo and in the participants' homes.

3. RESULTS

This phase was conducted to assess the students' initial abilities before the intervention began. Observations were conducted over three sessions: the first session on January 8, 2026, the second session on January 9, 2026, and the third session on January 10, 2026. The following is an explanation of the research findings from Phase A1 (baseline). The data graph for Phase A1 (Baseline 1) shows that students' nonverbal communication scores were 0% in the first session, 0% in the second session, and 0% in the third session.

The observations were conducted over seven sessions, beginning on January 11, 2026, and ending on January 17, 2026. In this phase, students received an intervention using Augmentative and Alternative Communication (AAC) strategies via the BerKata app. Students were asked to imitate nonverbal communication gestures and daily activities they had not yet mastered based on images in the app, such as: touch, pull, nod, pee, and bathroom. The following is a detailed discussion based on the research results from Phase B (intervention).

This phase was conducted to assess the students' abilities following the intervention. Observations were conducted over three sessions: the eleventh session on January 22, 2026, the twelfth session on January 23, 2026, and the thirteenth session on January 24, 2026. The following is an explanation of the research results for Phase A2 (baseline). The following is research data presented in graph form.



4. DISCUSSION

This study aims to examine whether there is an improvement in nonverbal communication through the BerKata app among children with autism at the Pendowo Limo Special Education School in Pekanbaru. Hypothesis: The data analysis conducted by the author indicates that students' communication skills improved, with an overlap score of 28.57%. The BerKata app can enhance the nonverbal communication skills of children with autism, with a PND score of 85.7%. Based on these findings, Hypothesis A, which states that there is an improvement in nonverbal communication in children with autism, is accepted.

The subject has difficulty demonstrating nonverbal communication; this is related to the challenges faced by children with autism, such as social interaction and communication disorders (Santrock, 2019), resulting in a consistent baseline score of 0% for A1. The subject is unable to touch the communicant (message recipient) when wanting something, pull their

hand when wanting something, nod to indicate agreement, follow simple instructions promptly, and demonstrate contextual accuracy when communicating. The subject's abilities at the Alphase reflect initial capabilities prior to intervention; these are natural abilities the subject possesses.

Upon entering the intervention phase (B), a gradual increase in scores from 0% to 80% was observed. This indicates an improvement in nonverbal communication following the intervention. During the fourth session, the student's score was 0% because the student had not yet adapted to the new learning environment and exhibited resistance to the intervention. This is common among children with autism, as they often struggle with changes in routine and require time to adapt to new environments, methods, or materials (American Psychiatric Association, 2022).

From the seventh to the tenth session of intervention phase (B), the student consistently failed to practice the nonverbal communication skill of "touching." This may be due to the characteristic hypersensitivity to stimuli commonly observed in children with autism. According to Santrock (2019), children with autism have different responses to stimuli. These sensory issues manifest as hypersensitivity or hyposensitivity to light, sound, texture, and touch. Consequently, due to this characteristic, the student was unable to practice the nonverbal communication of "touching." Additionally, the student has a mild severity of autism, enabling them to process information more quickly. Smith's (2010) research indicates that the severity of autism affects the success of interventions, with children with milder autism showing greater progress in communication skills compared to those with more severe autism.

The subject had never previously received AAC instruction using high-tech tools, making the use of the BerKata app an engaging learning experience for the subject. This is also supported by Normawati's (2025) research, which indicates that the use of advanced technologies such as artificial intelligence, robots, assistive technology, and games can enhance the achievement of learning objectives. New, interactive, and engaging learning methods are known to boost motivation, attention, and engagement in children with autism, ultimately leading to positive outcomes in interventions (Normawati et al., 2025).

In the study by Christjahja and Yusuf (2021), the BerKata app demonstrated significant benefits in improving communication skills and social interaction among children with autism. Based on user documentation in the book "BerKata Tanpa Batas ()", several children, such as AG, CJ, HW, and JS, showed improvements in expressing needs, a reduction in tantrum behavior, and increased focus during therapy sessions after using this app. Additionally, the use of mobile devices as an AAC medium has been proven to enhance children's engagement and motivation during the communication process (Christjahja and Yusuf, 2021). Other studies also support the effectiveness of mobile apps in improving communication in children with autism, such as the study conducted by Lorah et al. (2015), which showed that the use of tablets with AAC apps can significantly improve requesting skills and speech imitation in children with autism.

The implementation of AAC strategies based on the BerKata app is also tailored to the visual-kinesthetic learning style of children, as it incorporates visual symbols, audio, direct interaction, and technology-based activities. Children with autism are more interested in lessons that utilize learning media such as illustrations, photos, picture books, and posters to enhance their interest in learning. The most effective learning style is the visual style, with an average score of 80% (good), compared to the Gestalt Learner style and the rote-learning style (Yolanda et al., 2021).

Receptive skills in children with autism are generally easier to maintain compared to expressive skills. According to Santrock (2022), children with developmental disorders often demonstrate an understanding of simple instructions earlier than the ability to engage in

spontaneous social communication. Children with autism can understand commands such as "go to the bathroom," but still struggle to initiate communication on their own using touch or nods. This explains why, at baseline stage 2 (A2), students were able to follow instructions and communicate contextually but could not yet independently practice expressive nonverbal communication

This study was conducted to the fullest extent possible both within and outside the school setting. However, the researcher encountered several limitations during the study. In the early intervention phase (B), particularly during the first session, students had not yet fully adjusted to the research situation, so the expected nonverbal communication skills did not emerge effectively. According to Neil et al. (2016), children with autism have difficulty adapting to sudden changes; this study, involving 64 children with autism and 85 typically developing children aged 6 to 14 years, found that the level of IU (Intolerance of Uncertainty) in children with ASD was significantly higher than in typically developing children ($t(113) = 11.19$, $p < .001$).

Activities were conducted in stages because the students were not yet able to sit quietly for a full 30 minutes. Researchers need to adjust the timing and flow of the intervention according to the students' conditions and readiness to ensure the learning process remains effective. This aligns with the findings of Al Mahdi's (2025) study, which showed that the attention span of autistic students is generally shorter and often requires structured strategies such as the Pomodoro Technique to extend the duration of focus from approximately 12.85 minutes to 19.44 minutes during the intervention phase. This study confirms that the attention span of students with autism in learning situations appears limited. Technical issues also arose during the intervention, such as power outages at students' homes, which disrupted their focus. Children with autism are highly influenced by their physical environment and surrounding stimuli; sudden or uncontrollable factors such as sounds or lights can disrupt them during activities (Kahveci et al., 2024).

During baseline phase 2 (A2), the student showed improvement in nonverbal communication. The student was able to give clear signals when needing to use the restroom and also understood where to go, so he no longer wet his pants or had tantrums as before. This indicates an improvement in functional communication through purposeful movements and behaviors to convey his needs. Previously, the student always reacted with anger when the message they wanted to convey was not understood by those around them. This situation aligns with the characteristics of children with autism who experience difficulties in social communication and emotional regulation. David R. Shaffer and Katherine Kipp (2014) explain that children with autism often experience frustration or anger when they struggle to express their needs or when their communication is not understood by those around them.

Based on this discussion, it can be concluded that the use of AAC through the BerKata app can improve the nonverbal communication skills of children with autism. The improvements observed during the intervention phase and the stability of the data at the baseline 2 phase indicate that the BerKata app is an appropriate tool to help children with autism develop their nonverbal communication skills more effectively.

5. CONCLUSION

The BerKata app can improve the nonverbal communication of children with autism, with a Percentage of Non-overlapping Data (PND) analysis reaching 85.71%, which is considered an increase, and an overlap percentage of 14.28%. It is hoped that the results of this study can be utilized by teachers as one of the teaching and intervention strategies to improve the nonverbal communication skills of children with autism through the BerKata application. Schools are encouraged to use the findings of this study as a basis for developing

educational programs and intervention services for children with autism. The use of the BerKata app as an AAC tool can support schools' efforts to improve students' nonverbal communication skills and increase the use of technology-based learning tools in special education settings. The results of this study can serve as a source of information and a reference for other researchers interested in the topic. It is hoped that this study will provide a foundation for further research on the development of AAC strategies based on the BerKata app, involving a larger sample size and other groups of children with special needs.

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