



The Effectiveness of Applied Behavior Analysis (ABA) Therapy on Language Development in Toddlers Aged 1-2 Years with Speech Delay

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ABSTRACT

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Speech delay is one of the most common developmental disorders in toddlers, potentially affecting communication and social skills. The age of 1–2 years is a golden period of brain development, where appropriate language stimulation is crucial. This study aimed to determine the effectiveness of Applied Behavior Analysis (ABA) therapy on language development in toddlers aged 1–2 years with speech delay. A pre-experimental design was used with one group pre-test and post-test. The sampling technique applied was total sampling, involving 15 toddlers at Rumah Terapi Ridha Sidoarjo. Language development was assessed using the Capute Scales. ABA therapy was administered weekly over 8 weeks, involving structured activities such as vowel recognition, syllable repetition, and word formation. Prior to intervention, all participants (100%) were categorized as poor, with an average score of 67.17. After therapy, 40% of children moved to the fair category, with an average score of 79.82. The Shapiro-Wilk test confirmed normal data distribution, and the paired t-test showed a significant difference ($p = 0.001$). These findings indicate that ABA therapy significantly improves language development in toddlers with speech delay and may serve as a practical intervention for early language support.

INTRODUCTION

Language development is a critical aspect of a child's growth, as it influences not only communication but also learning and social interaction. The first five years of life, especially between the ages of 1–2 years, are considered a golden period of brain development, during which appropriate language stimulation plays a crucial role in optimizing cognitive and linguistic functions⁽¹⁾. However, speech delay remains one of the most prevalent developmental disorders in toddlers. The prevalence of speech and language delays and disorders among children aged 2-5 in developed countries like the United States is estimated to range between 5% and 12%⁽²⁾. In Indonesia, the prevalence of speech delay among preschool-aged children is reported to be between 5% and 8%⁽³⁾, while specific regions show even higher rates, such as Surabaya with 12.5%⁽⁴⁾.

Several factors contribute to speech delay, including inadequate stimulation, improper parenting patterns, hearing impairments, and excessive gadget use⁽⁵⁾. If left untreated, delayed speech may lead to long-term learning difficulties, decreased academic achievement, the child becoming passive, and socialization problems during later developmental stages⁽⁶⁾.



Various interventions have been implemented to address speech delays, such as stimulation implemented by parents through home communication strategy training, which has been shown to significantly improve the expressive skills of children with speech delays⁽⁷⁾. Furthermore, professional speech therapy has also been shown to be effective, particularly when implemented in a structured and targeted manner, such as small-group interventions that improve vocabulary mastery, phonology, and sentence structure in children with language disorders⁽⁸⁾. Another intervention used is Applied Behavior Analysis (ABA), a structured behavioral approach that focuses on providing reinforcement to encourage desired behaviors. Previous research has shown that ABA, particularly through Discrete Trial Training (DTT), is effective in improving expressive language skills in children with developmental disorders, including autism spectrum disorders⁽⁹⁾. However, research on the effectiveness of ABA therapy in toddlers aged 1–2 years with speech delays is still limited, especially in the Indonesian context. Therefore, this study aims to examine the effectiveness of ABA therapy in enhancing language development among toddlers aged 1–2 years with speech delay.

METHOD

This study employed a quantitative method with a pre-experimental design using a one-group pre-test post-test approach. The research was conducted at Rumah Terapi Ridha Sidoarjo from September 2024 to July 2025. The population included all toddlers aged 1–2 years who experienced speech delay. The sample size was determined using the total sampling technique, in which the entire population that met the inclusion and exclusion criteria was selected, resulting in 15 children as the study sample. The intervention was ABA (Applied Behavior Analysis) therapy provided once a week for 8 weeks. Each therapy session lasted approximately 60 minutes and was conducted with the assistance of a therapist. The therapy followed the Discrete Trial Training (DTT) approach, involving instruction, modeling, prompting, and positive reinforcement to encourage correct verbal responses. The activities targeted early communication skills, such as imitation, object naming, and responding to simple verbal cues. Various visual aids, flashcards, toys, and picture books were used as supporting media. The independent variable was the application of ABA therapy, while the dependent variable was language development, measured using the Capute Scales (CAT/CLAMS). ABA therapy procedures were documented using observation sheets and SOPs. Data collection involved pre-test and post-test assessments of language development. Ethical clearance was obtained from the research ethics committee, and informed consent was secured from each respondent's parent or guardian. Data analysis was conducted using SPSS software. The Shapiro-Wilk test was used to assess normality, and the Paired Sample T-Test was employed to determine the effect of ABA therapy. Scoring and coding procedures were applied to quantify the variables, and univariate analysis described the respondent characteristics, while bivariate analysis tested the hypothesis of the study.

RESULT AND DISCUSSION

Before analyzing the effect of ABA therapy, the characteristics of respondents were first described to provide an overview of the study population. The distribution of respondents based on age, sex, and history of genetic disorders is presented in Table 1.

Table 1.
Characteristics of respondents

Category	f	%
Age		
1 year	5	33.3
2 years	10	66.7
Total	15	100





Table 2. (continued)

Category	f	%
Sex		
Male	12	80
Female	3	20
Total	15	100
History of Genetic Disorders		
Present	8	53.3
Not Present	7	46.7
Total	15	100

Based on Table 1, it was found that out of 15 respondents, the majority were 2 years old, totaling 10 respondents (66.7%). Regarding gender, nearly all respondents were male, totaling 12 respondents (80%). In terms of genetic history, more than half of the respondents had a family history of genetic disorders, totaling 8 respondents (53.3%).

Table 2.

Cross-tabulation of ABA therapy on language development in toddlers aged 1–2 years

Therapy Regularity	Language Development						Total	
	Poor		Fair		Good			
	f	%	f	%	f	%	f	%
Regular	0	0	6	40	5	33.3	11	73.3
Irregular	4	26.7	0	0	0	0	4	26.7
Total	4	26.7	6	40	5	33.3	15	100

Based on Table 2, it is known that out of 15 respondents who received regular ABA therapy, 11 respondents (73.3%) showed improvements, with nearly half (6 respondents or 40%) categorized as having fair language development, and the remaining 5 respondents (33.3%) categorized as good. Meanwhile, respondents who received irregular ABA therapy, totaling 4 respondents (26.7%), were all categorized as having poor language development.

Table 3.

Effectiveness test of ABA therapy on language development

Intervention	Language Development						Mean; SD Median Min - Max	<i>p-value</i>
	Poor		Fair		Good			
	n	%	n	%	n	%		
Before Intervention	15	100	0	0	0	0	67.17; 3.46 67.2 60.45 – 71.73	0.444*
After Intervention	4	26.7	6	40	5	33.3	79.82; 6.08 79.99 70.42 – 88.33	<0.001**

Source: Primary Data & SPSS Analysis, 2025

* Shapiro-Wilk Normality Test

** Paired Samples T Test



Based on Table 3, language development of toddlers aged 1-2 years before receiving ABA therapy showed that all respondents (100%) were categorized as having poor language development, with a mean score of 67.17 (SD = 3.46). This indicates that the variation in language development scores among children was relatively small, with scores clustering closely around the mean. The minimum and maximum scores were 60.45 and 71.73, respectively. Following the ABA therapy intervention, 6 respondents (40%) improved to the fair category, with a mean score of 79.82 (SD = 6.08), indicating a wider variation in scores. The post-intervention scores ranged from 70.42 to 88.33.

The Shapiro-Wilk normality test demonstrated that the data were normally distributed, with significance values of 0.444 before therapy and 0.315 after therapy ($p > 0.05$). Furthermore, the Paired Samples T-Test yielded a significance value of 0.001 ($p < 0.05$), leading to the acceptance of H1, which indicates that ABA therapy was effective in enhancing language development among toddlers aged 1-2 years with speech delays.

This study demonstrated a statistically significant improvement in language development following structured ABA therapy in toddlers with speech delays ($p = 0.001$). Prior to therapy, all respondents (100%) were categorized as having poor language development. After eight therapy sessions over eight weeks, 40% of respondents improved to the fair category, and 33.3% achieved good language development. The effectiveness of ABA therapy is influenced by the application of structured stimulus-response-positive reinforcement principles, which motivate children to repeat the desired behavior. Through the Discrete Trial Training (DTT) method and consistent repetition, ABA is able to train basic communication skills such as eye contact, imitation, and word formation, thereby gradually improving language development in toddlers with speech delay.

Gender and genetic disorder history were identified as influential factors in language development. The majority of respondents were male (80%), which aligns with findings by Zulkarnaini et al.⁽¹⁰⁾ indicating that male children are more susceptible to speech delays due to hormonal influences, specifically testosterone's impact on verbal-related brain areas. Similarly, Harahap et al.⁽¹¹⁾ emphasized that higher testosterone levels in boys are associated with slower language development compared to girls.

The effectiveness of ABA therapy in this research is consistent with studies conducted by Fitri and Widiastri⁽¹²⁾, who reported that structured ABA interventions enhance both receptive and expressive language skills in children with developmental delays. Moreover, a meta-analysis by Collins et al.⁽¹³⁾ highlighted that ABA-based interventions, including Naturalistic Developmental Behavioral Interventions (NDBI), significantly improve communication and adaptive behavior in children with speech and language disorders.

Consistency in therapy sessions emerged as a critical factor influencing the therapy's success. Respondents who attended therapy regularly exhibited more substantial progress. This observation is supported by Jessy and Diswantika⁽¹⁴⁾, who found that the frequency and consistency of ABA sessions are directly proportional to improvements in children's speech development. Additionally, Aswandi et al.⁽¹⁵⁾ concluded that higher therapy intensity is essential to maximize the outcomes of ABA interventions. Unlike most previous studies involving preschoolers or children with autism spectrum disorders, this study focused on toddlers aged 1-2 years with speech delays. This age is considered a golden period of language development, during which interventions are expected to yield more optimal outcomes. Thus, this study contributes new insights by examining the effectiveness of ABA therapy at an earlier age compared to prior research.

Therefore, Applied Behavior Analysis (ABA) therapy can be recommended as an effective alternative intervention to support language development in toddlers experiencing speech delays, provided it is implemented with structured programs, adequate frequency, and active parental involvement.





CONCLUSION

This study concludes that Applied Behavior Analysis (ABA) therapy is effective in improving language development in toddlers aged 1–2 years with speech delay. The therapy supports early communication skills when implemented consistently with structured sessions. Future research is recommended to involve larger samples, longer intervention durations, and comparative studies to strengthen evidence on the effectiveness of ABA therapy in early language development.

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