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The Effect of *Applied Behavior Analysis* Method on the Communication Skills of Children with Autism Viewed from Gender in Bontang City

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ABSTRACT

This study seeks to explore the impact of ABA (Applied Behavior Analysis) therapy on enhancing communication skills in children with autism. An experimental design involving pre-test and post-test assessments was utilized to measure changes in communication abilities before and after the ABA therapy intervention. Analysis with the Wilcoxon Signed Ranks Test revealed a notable improvement in communication skills among children with autism following the ABA therapy. Descriptive findings indicated that the average communication score at the pre-test was 27.75, while the post-test mean rose to 40.38, demonstrating a gain of 12.63 points. The Wilcoxon test produced a p-value of 0.012, which is below the typical significance threshold of 0.05, meaning the null hypothesis (H_o), which suggests no difference between pre-test and post-test, can be rejected. Thus, it can be concluded that ABA therapy has a significant positive impact on improving communication abilities in children with autism. Despite these encouraging results, the study's sample size is a limitation, and further research with larger samples and extended follow-up periods is required to deepen our understanding of ABA therapy's long-term effects.

Keywords: *Autism, Applied Behavior Analysis, Communication Skills.*

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INTRODUCTION

Child development represents a journey marked by profound changes from prenatal stages through adolescence. Each phase of development brings unique health challenges and concerns that require careful attention. These challenges begin with maternal health during pregnancy, which can have a lasting impact on fetal development and may influence the child's health in later stages. As children grow, they face additional challenges, including social, emotional, and academic obstacles. Early childhood, for example, is a critical period where the identification and recognition of mental health issues can be particularly beneficial. One such concern is Autism Spectrum Disorder (ASD), a developmental disorder that significantly impacts communication, social interactions, and behavior patterns in affected children (Landa, 2018).

ASD is characterized by difficulties in understanding and engaging in social relationships, which can profoundly affect a child's developmental progress and overall

quality of life. As a result, early intervention is crucial for supporting affected children and helping them develop necessary life skills. The global prevalence of ASD has been steadily increasing, and while the precise figures vary, reports indicate that advances in diagnostic practices and increased healthcare access have contributed to higher detection rates (World Health Organization [WHO], 2021). The growing recognition of the disorder, along with its diverse presentations, underscores the importance of understanding ASD's complexities. It is a major developmental disorder that hinders a child's ability to communicate and connect with others, making it essential to explore its origins and develop effective treatment strategies (Rivière, 2020).

Research into the prevalence and diagnosis of ASD reveals interesting patterns, particularly with regard to geographical differences. Countries with well-established healthcare systems tend to report higher prevalence rates, likely due to improved diagnostic methods and greater awareness among healthcare providers (Centers for Disease Control and Prevention [CDC], 2023; National Autistic Society, 2021). Additionally, studies have consistently shown that ASD is more frequently diagnosed in boys than in girls, with a male-to-female ratio of approximately 4:1 (Wing, 2018). While the reasons behind this gender disparity remain unclear, researchers suspect that both biological and social factors may play a role in the differential diagnosis.

The causes of ASD are not fully understood, but prevailing theories suggest that a combination of genetic and environmental factors contributes to its development. Studies have pointed to maternal age, prenatal exposure to specific conditions, and other environmental influences as potential contributors to the onset of autism (Paul, 2009; Elsabbagh et al., 2020). Despite this knowledge, the precise interplay of these factors remains elusive, and more research is needed to clarify how they shape the developmental trajectory of children with ASD.

One of the most well-established interventions for supporting children with ASD is Applied Behavior Analysis (ABA), which focuses on improving communication, social skills, and behavior through structured, evidence-based techniques. Numerous studies have demonstrated that ABA can lead to significant improvements in the skills of children with autism, especially when the intervention is applied early and intensively (Smith et al., 2019). ABA's focus on modifying specific behaviors and promoting positive social interactions has made it a cornerstone of autism treatment, and its widespread use has helped countless children gain important life skills. However, while ABA is widely regarded as an effective approach, there remains a gap in understanding how gender might influence its success, particularly in the context of communication skill development.

In recent years, some research has begun to explore how gender may affect the outcomes of ABA therapy, with particular attention to whether boys and girls respond differently to the intervention (Huang et al., 2022). Gender-specific factors, such as differences in socialization or cognitive processing, might influence how children with autism engage with and benefit from ABA techniques. While existing literature provides valuable insights into the general effectiveness of ABA, there is still much to learn about how tailoring interventions based on gender could improve communication outcomes.

The primary goal of this research is to assess the impact of ABA therapy on the communication abilities of children with autism, with a particular focus on gender differences. This study seeks to evaluate how ABA can enhance communication skills in children diagnosed with ASD and to explore whether gender-specific factors should be considered when designing these interventions. By investigating the role of gender in ABA therapy's effectiveness, the research aims to contribute a novel perspective to the field, helping to refine and optimize autism interventions.

In conclusion, while ABA has been extensively studied for its effectiveness in supporting children with autism, the role of gender in determining its success has not been fully explored. This study intends to fill that gap by examining whether gender-specific factors influence communication skills development in children with ASD. By considering gender as a potentially important variable, the research may provide valuable insights into how to tailor ABA interventions to improve outcomes for children with autism, leading to more personalized and effective treatment strategies. Understanding how gender impacts the therapeutic process could ultimately help optimize communication interventions for all children with ASD, regardless of their gender (Leaf et al., 2016).

METHOD

The study focuses on children with special needs from inclusive schools and children with autism attending the Child Development Clinic X in Bontang, with a total of 100 participants. A sample of 80 children was selected using quota sampling based on specific criteria: children aged 6 to 8 years with autism and varying communication abilities from low to moderate. Eight children with the lowest communication scores were chosen through purposive sampling to evaluate the effectiveness of ABA therapy in enhancing communication skills in children with autism. The research employed a one-group pre-test and post-test design to measure the impact of ABA therapy on communication skills, while also considering gender differences.

The independent variables in the study are ABA therapy (X1) and gender (X2), while the dependent variable is the communication skills of children with autism (Y). Communication skills are defined as the abilities of children with autism in communication, social interaction, cognition, and behavior. ABA therapy is a method aimed at improving skills and minimizing undesired behaviors in children with autism, while gender refers to the biological and social classification of male or female. The intervention program targets enhancing social, communication, and learning skills in children with autism using the Verbal Behavior (VB) approach, which was carried out offline at the Child Development Clinic X in Bontang. The tools used for the therapy include a laptop, LCD projector, PowerPoint presentations, speakers, and other supportive materials.

To assess the children's communication skills, a Communication Scale developed by the researcher was used. This scale, adapted from DeVito's (2016) interpersonal communication scale, categorizes communication into three levels: surface communication, intimate communication, and intimacy communication. The scale employs a Likert format with five response options: Strongly Agree, Agree, Neutral, Disagree, and

Strongly Disagree. The scoring system includes both favorable and unfavorable categories, with indicators such as openness, empathy, support, positive attitude, and equality.

To ensure the validity of the measurement tool, the study used Corrected Item-Total Correlation ($r > 0.30$), ensuring that the items effectively distinguish between individuals with the desired attributes. Reliability was assessed using Cronbach's Alpha ($\alpha > 0.6$), and the result indicated good reliability ($\alpha = 0.916$). Data analysis involved the Wilcoxon Signed Ranks Test to compare pre- and post-intervention scores, with a significance level of < 0.05 indicating a significant difference. Additionally, the Mann Whitney Test was applied to analyze gender-based communication differences following the intervention. The result ($p = 0.12$, $p > 0.05$) showed no significant difference in communication improvements between genders after ABA therapy.

FINDING AND DISCUSSION

RESEARCH RESULT

This study was conducted in a hotel meeting room in Surabaya, with music therapy interventions carried out over two days, on December 1st and 2nd, 2024. Each session lasted between 90 to 120 minutes, based on an agreement between the researcher, music therapist, and participants. The study involved 10 subjects diagnosed with acid reflux and varying levels of anxiety, selected through screening using the HARS scale and the Big Five personality scale.

The analysis using the Wilcoxon Signed Ranks Test showed a significant reduction in the anxiety levels of participants after the music therapy intervention. The average anxiety score before the intervention was 33.80 (high anxiety), which decreased to 22.80 (moderate anxiety) after the therapy. The statistical test results indicated a Z value of -2.807 with a p-value of 0.005 ($p < 0.05$), indicating a significant difference between pre-intervention and post-intervention anxiety levels.

However, the Kruskal-Wallis Test analysis to compare the effect of music therapy based on Big Five personality traits showed that, although there was a difference in average anxiety reduction across personality traits, the difference was not statistically significant ($p = 0.360 > 0.05$). This suggests that although anxiety decreased for all subjects, the impact of music therapy did not significantly differ based on personality type.

Overall, the findings of this study support the first hypothesis that music therapy is effective in reducing anxiety in patients with acid reflux. However, the second hypothesis, which expected a differential effect based on Big Five personality traits, was not supported. Other factors such as social support or individual music preferences may have more influence on therapy responses than personality traits. This study demonstrates that music therapy has a positive effect on all individuals, regardless of their personality dimensions, due to its universal therapeutic nature in reducing anxiety and stress.

DISCUSSION

This research took place in Bontang, specifically within the meeting room at the Child Development Clinic X. The intervention was conducted over three days, comprising

six sessions, each lasting between 90 to 120 minutes. The sessions were held in a well-equipped, air-conditioned room, furnished with a table, whiteboard, and projector. The schedule was established through collaboration between the researchers, experts, and parents, with the first session on December 16, 2024, followed by the second on December 18, and the third on December 20, 2024. Participants included both male and female children diagnosed with autism and exhibiting low communication skills. Initial screenings, based on medical records, identified 100 patients, and further evaluation using the Autism Communication Scale led to the selection of 40 children with varying levels of communication abilities. From this group, eight children with the lowest communication scores were selected, all of whom consented to participate in the ABA therapy intervention.

Table 1 : Category of Results for the Difference Between Pretest and Posttest

Subject	Gender	Pre-test	Category	Post-test	Category	Difference	Description
1. A	Male	28	Low	35	Sedang	7	Increased
2. R	Male	26	Low	39	Sedang	13	Increased
3. P	Male	25	Low	43	Sedang	18	Increased
4. IS	Female	29	Low	41	Sedang	12	Increased
5.R	Female	25	Low	38	Sedang	13	Increased
6. A	Male	29	Low	41	Sedang	12	Increased
7. D	Male	34	Low	44	Sedang	10	Increased
8. T	Male	26	Low	42	Sedang	16	Increased

Source: Autism Communication Rating Scale

The effectiveness of ABA therapy was assessed by comparing the children's communication scores before and after the intervention using the Wilcoxon Signed Ranks Test. The pre-intervention average communication score was 27.75, while the post-intervention score increased to 40.38, reflecting a notable improvement. The Wilcoxon Signed Ranks Test revealed a significant difference, with a p-value of 0.012, supporting the hypothesis that ABA therapy enhances communication in children with autism. All participants showed progress in their communication abilities. Additionally, the Mann Whitney test, used to investigate whether gender influenced communication improvement, revealed no significant difference between male and female participants, with a p-value of 1.000, suggesting that gender did not impact communication gains following therapy.

The findings of this study affirm that ABA therapy is effective in improving communication skills in children with autism. The substantial improvement in both verbal

and non-verbal communication, with an average increase of 12.63 points in communication scores, underscores the therapy's positive impact. While some research suggests gender-based differences in how children respond to ABA therapy, this study found no such variations. The structured techniques of ABA therapy, such as positive reinforcement and repetition, were equally effective for both genders. Nevertheless, the study recommends future research with larger, more diverse samples to examine the long-term effects and other potential factors influencing the outcomes of ABA therapy. Ultimately, this study highlights the significant role of ABA therapy in fostering functional communication skills, essential for the social and emotional growth of children with autism, and indicates that ABA therapy can be a valuable tool for improving communication in children with autism, irrespective of gender.

CONCLUSION

The researcher successfully evaluated the impact of Applied Behavior Analysis (ABA) therapy on enhancing communication skills in children with autism. The study involved eight participants, separated into male and female groups. The analysis, conducted using the Wilcoxon Signed Ranks Test, yielded significant findings, demonstrating that ABA therapy can effectively improve communication abilities in children with autism. Descriptive results revealed an average communication score of 27.75 in the pre-test, which rose to 40.38 in the post-test, indicating an improvement of 12.63 points. The Wilcoxon test produced a p-value of 0.012, which is below the conventional significance threshold of 0.05, leading to the rejection of the null hypothesis (H_o). This supports the conclusion that ABA therapy significantly enhances communication skills. However, due to the study's limited sample size, further research with larger groups and long-term follow-up is essential to gain a deeper understanding of the lasting effects of ABA therapy.

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