

THE APPLICATION OF AUGMENTATIVE ALTERNATIVE COMMUNICATION (AAC) THROUGH PICTURE EXCHANGE COMMUNICATION SYSTEM (PECS) MEDIA TO IMPROVE COMMUNICATION SKILLS OF CHILDREN WITH AUTISM

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ABSTRACT

The subjects in this research were autistic individuals. Based on observations, it is known that individuals experience problems in non-verbal communication that result in individuals being unable to convey or communicate an activity they want to others. The purpose of this research is to determine the improvement of communication skills of autistic children by applying Augmentative Alternative Communication (AAC) through Picture Exchange Communication System (PECS) media. The research method used is experimental research with the type of Single Subject Research (SSR) research with the design A₁-B-A₂. Data collection techniques in this study used tests, while the target behavior in this study was 1) able to show pictures of daily activities. The results showed that the application of Augmentative Alternative Communication (AAC) through Picture Exchange Communication System (PECS) media can improve the communication skills of autistic children. The increase is indicated by the mean level value that increases in each phase through percentage measurement. Baseline phase 1 (A₁) obtained a mean level of 28%, intervention phase (B) obtained a mean level of 47%, and baseline phase 2 (A₂) obtained a mean level of 46%. From the acquisition of the mean level, it can be seen that the mean level shown in baseline 1 with baseline 2 has increased significantly. This shows that the application of Augmentative Alternative Communication (AAC) through Picture Exchange Communication System (PECS) media can improve the communication skills of autistic children.

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1. INTRODUCTION

Humans are social creatures who interact to convey desires, information, ideas, ideas, and express feelings to others through communication (Purnama et al., 2019). Communication barriers experienced by individuals can affect this, as experienced by autistic children. According to (Koswara, 2013) autistic children are a condition of individuals who experience perceptual, linguistic, cognitive developmental barriers, have their own world, and are characterized by an inability to communicate both verbally and non-verbally with their environment. According to Lorna Wing and Judy Gould in (Yuwono, 2012) there is a term from Wing's Triad Impairment that autism refers to three obstacles, namely behavior, communication, and social interaction.

Communication has an important role so that autistic children can communicate by conveying and can understand messages or feelings conveyed by others both in commands, speech, and words (Hermawan, 2016). One of the communication barriers experienced by autistic children is non-verbal communication such as through hand gestures, facial expressions, and eye contact (NIDCD (National Institute of Deafness and Other Communication Disorder), 2010). These communication barriers can be called expressive communication barriers. Expressive communication is the ability of individuals to convey messages to others (Bondy, A., & Frost, 2011). The above review raises concerns for all parties regarding the epidemiological incidence of people with autism. According to Tincani (2004) about half of children suspected of autism will experience communication difficulties until adulthood. Communication difficulties in autistic children can lead to uncontrollable behavior such as kicking, throwing things, hurting themselves or others around them, and other tantrum behavior.

Based on the results of observations made at SKh Madina Serang City, it was found that one of the students aged approximately 13 years at the school had expressive communication barriers. This is evidenced in the form of the subject's inability to communicate an activity he wants to do, the subject has not been able to answer simple questions asked by the teacher or others and is unable to respond to other people's words and conversations, does not turn his head when his name is called.

In improving expressive communication skills can be through the application of AAC (Augmentative and Alternative Communication) using PECS (Picture Exchange Communication System). The American Speech Language-Hearing Association (Beukelmen & Light, 2020) in (Saleh & Mutahara, 2023) suggests that AAC is a field of clinical practice that addresses the needs of individuals who experience meaningful and complex communication disabilities, characterized by barriers to understanding and/or production of speech language. Part of AAC is PECS (Picture Exchange Communication System) which is a method developed to teach functional communication skills to children with autism and other developmental disabilities (Wiwahani, 2017). PECS has six phases including (Bondy, A., PhD & Lori Frost, MS, n.d.) Phase I (how to communicate), the individual learns to exchange one picture for the desired object or activity. Phase II (distance and persistence), individuals learn generalizing skills using a single image in different places, with different people, and across distances. Phase III (picture discrimination), the individual learns to select two or more pictures of things he/she likes. Phase IV (sentence structure), the individual learns to construct simple sentences using the picture "I want" followed by a picture of the object he wants. Phase V (responsive individual requesting), the individual learns to answer questions such as "What do you want?" using PECS. Phase VI (commenting), individuals learn to respond to the questions "What do you see?", "What do you hear?" and "What is this?" by making sentences starting from "I see", "I hear", "I feel", "That is", and others.

From the above problems, researchers focus on children's ability to point to pictures to communicate their desires by applying AAC (Augmentative and Alternative Communication) through PECS (Picture Exchange Communication System) media. The child's ability to point to pictures to communicate his desires starts from daily activities such as the child being able to communicate when he wants to urinate, when he defecates, when he wants to eat, when he wants to drink, when he wants to sleep, and when he wants to bathe. The phase given to the subject by the researcher is phase I, the individual will point to the picture and exchange the picture with the activity he wants.

2. METHOD

The research method used in this study is an experimental research method that aims to determine the application of AAC through PECS media to improve the communication skills of children with autism. The approach used is a quantitative approach with the type of research Single Subject Research (SSR). According to Tawney & Gast in (Sunanto, J., 2006) suggests that single-subject research is experimental research conducted to determine the effect of the treatment given to the subject repeatedly within a certain time.

In this study using the A1-B-A2 design, by measuring condition A (1st baseline) before B (intervention) and after intervention A2 (2nd baseline). Measurement of target behavior is measured continuously before the application of media in the baseline condition (A1) then given intervention (B) in the form of applying AAC through PECS media which is carried out continuously, and measurement in the baseline condition (A2). The 2nd baseline condition (A2) is added as a control for the intervention phase which makes it possible to draw conclusions on the existence of a functional relationship between the independent variable (application of AAC through PECS media) and the dependent variable (improving communication skills of children with autism).

Data collection was carried out based on the research objectives, namely tests through 6 items, with the scoring guidelines used, namely scores 1-4 as in table 1.

Table 1. Test Scoring Guidelines

Score	Scoring Items
1	If the child is not yet able to do
2	If the child is able to do with physical assistance
3	If the child is able to do with verbal assistance
4	If the child is able to do it independently

The research was conducted at SKh Madina Serang City which is located at Jalan Jagarayu Komplek Griya Gemilang Sakti Blok B4 No. 4 and 7, Ciracas, Serang City, Banten, 42116. This research was conducted for 2 weeks, starting from November 13-24, 2023. Details of the implementation of research activities were carried out in 14 sessions. One session is one meeting for one lesson hour with a duration of 30 minutes. In baseline 1 (A1) conditions, 4 sessions were carried out, intervention (B) was carried out for 6 sessions, and baseline 2 (A2) was carried out for 4 sessions.

The research subject is an individual with autism barriers with the results of observations, namely having obstacles to expressive communication, where individuals have not been able to communicate an activity they will do and have not been able to answer simple questions. The subject is $\pm$ 13 years old who is in grade 1 of SMPKh and attends SKh Madina Serang City.

3. RESULT AND DISCUSSION

Result

The data obtained from the results of research with the application of Alternative Augmentative Communication (AAC) through Picture Exchange Communication System (PECS) media to improve communication skills in autistic children, with data collection for 14 sessions consisting of 4 baseline 1 sessions (A1), 6 intervention sessions (B) and 4 baseline 2 sessions (A2), are described in the following table.

Table 2. Measurement results of the use of PECS media to improve communication skills in children with autism.

Baseline-1 (A1)	
Sesion	Percentage
1	25%
2	25%
3	29%
4	33%

Intervensi (B)	
Sesion	Percentage
1	42%
2	42%
3	46%
4	46%
5	50%
6	58%
Baseline-2 (A2)	
Sesion	Percentage
1	38%
2	46%
3	46%
4	54%

Based on Table 2. The results of measuring the target behavior, namely the use of Picture Exchange Communication System (PECS) media to improve communication skills in Autistic children, can be seen in Figure 1.

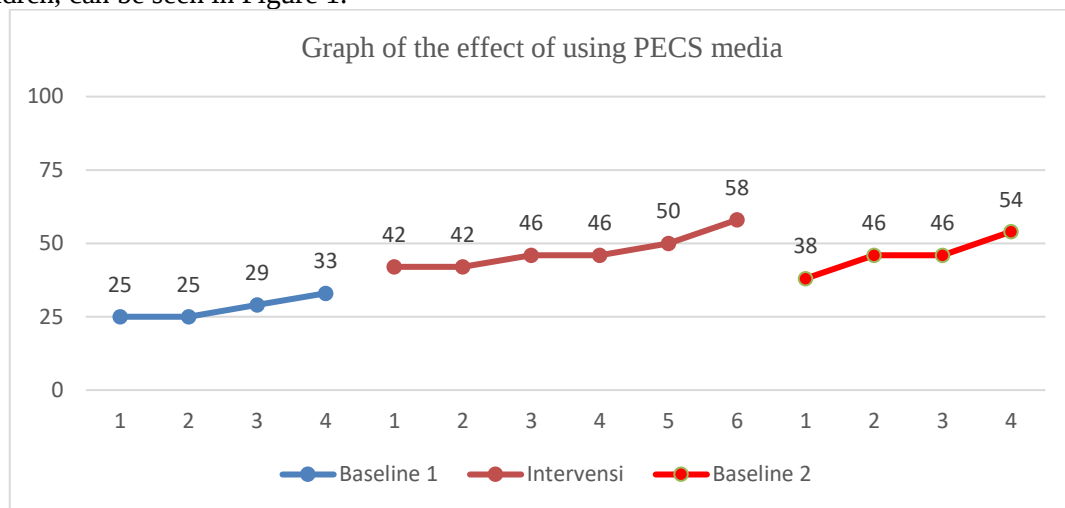


Figure 1. Baseline

In Figure 1, it can be seen that the data in baseline 1 conditions get a stable score or there is no change in each session. There was an increase of 9% that occurred in the intervention condition, while for baseline 2 the subject decreased by 26% in session 11 but experienced a significant increase in the value of the next session. The results of the data in figure 1 are put into the form of an average graph of the A1-B-A2 conditions which can be seen in the figure below.

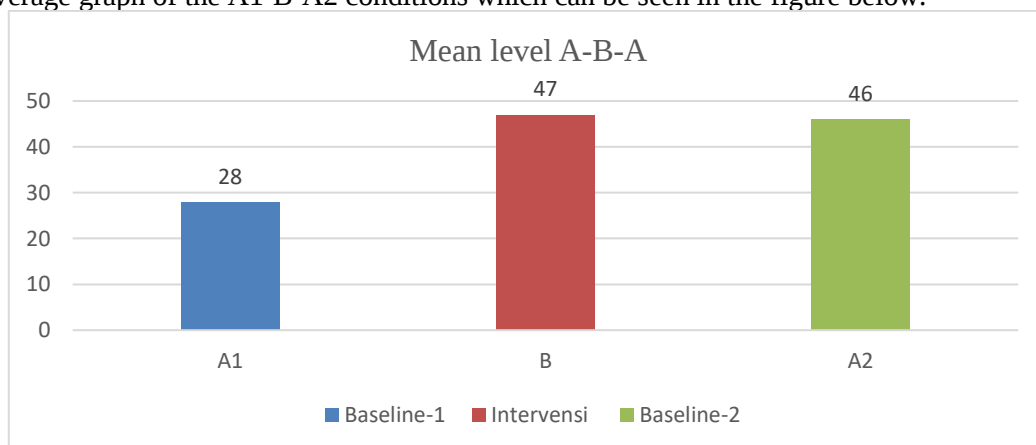


Figure 2 Mean level A₁-B-A₂

In the target behavior (developing communication skills from daily activities), the average obtained in phase A1 (baseline 1) is 28%, the data is obtained from natural conditions without treatment or intervention (B). In the intervention phase (B), an average of 47% was obtained from the results of providing intervention to the subject using PECS media. As for phase A2 (baseline 2), an average of 46% was obtained after the subject received intervention and these results in phase A2 were to determine the effect of the application of AAC through PECS media that had been given.

Based on the average of the data above, it is then analyzed using analysis in conditions and analysis between conditions. The following are the results of data analysis within conditions and between conditions.

1. Results of Analysis in Condition

The summary of the results of visual analysis in conditions on the target behavior of communication skills of children with autism can be seen in the following table:

Table 3. Analysis in conditions

In-condition analysis			
Condition	A1	B	A2
Condition length	4	6	4
Directional tendency	_____	_____	_____
Stability level and range	33 x 0,15 = 4,95	58 x 0,15 = 8,7	54 x 0,15 = 8,1
Stability tendency	Stabilized	Stabilized	Stabilized
Rate of change	33 – 25 = 8	58 – 42 = 16	54 – 38 = 16
Data trace	_____	_____	_____

2. Results of Inter-Condition Analysis

Analysis between these conditions shows whether or not the effect of the intervention on the dependent variable depends on the stability of the baseline data, level changes, and the size of the overlap data between the two conditions being analyzed. The summary of the results of the analysis between conditions on the target behavior of autistic children's communication skills can be seen in the table below:

Table 4. Analysis between conditions

Analisis antar kondisi		
Condition	B/A1	A2/B
Change in directional tendency and its effects	_____	_____

Change in stability	Stable to stable	Stable to stable
Change in data level	$42 - 25 =$ $+17$	$38 - 58 =$ -20
Overlap	0 (0 : 8 x 100)	0 (0 : 4 x 100)

Discussion

Based on the results of the research that has been carried out, the application of AAC through PECS media has a good influence in improving the communication skills of children with autism. Expressive communication skills are needed for individuals to interact with others. The effect of the application of AAC through PECS media in improving the communication skills of autistic children is influenced by daily activities that are often encountered, so that individuals can communicate non-verbally by showing a picture of the activity they want to do. This is because PECS develops communication using pictures, especially for autistic students who have nonverbal abilities by exchanging the objects needed according to the picture. (Taryadi, 2018). These results are reinforced by the theory of learning styles of autistic children, namely through visual, audio and kinesthetic (learning by doing what is learned). In general, autistic children are helped by visual learning styles (text and images) (Hillier et al., 2018).

The results of the mean level comparison on the target behavior, namely in the baseline 1 (A1) phase, get a value of 28%, in the intervention or treatment phase get a value of 47%, and the baseline 2 (A2) phase get a value of 46%. From the results of this comparison, the intervention phase has a high mean value compared to the baseline phase. These results are relevant to the theory that PECS teaches children to communicate in a structured and disciplined manner (Jurgens et al., 2019) and can provide opinions from a selected image (Alsayedhassan et al., 2016).

So, for the provision of treatment that has been carried out to the subject by applying AAC through PECS media can have an effect on the baseline 1 phase which is a condition where the subject has not been able to communicate his daily activities and the provision of intervention also affects the baseline 2 phase by showing an increased value in his communication skills. According to Dattolo et al (2016) autistic children generally think visually in the form of images and represent concepts by imagining a series of images of the same object. PECS for autistic children is not only useful for social communication but also for learning needs at school (Iacono et al., 2016). The use of PECS can improve students' communication skills compared to smartphones and computers (Wang et al., 2021). However, smartphones and computers play a role in the recognition of voice imitation when communicating with others (Erna et al., 2021).

With the results of this study, it is hoped that educators and teachers will analyze the needs of students for their learning styles (Irfandi et al., 2023). This is no exception for children with autism. This is done in order to facilitate the communication skills of autistic children in expressing or conveying information that they want to convey to others. The application of AAC through PECS media can be applied by parents in teaching children at home for other activities, because PECS media can not only be applied to children with special needs but can also be applied to children in general.

4. CONCLUSION

Based on the results of the research conducted, it can be concluded that the use of Picture Exchange Communication System (PECS) media can improve the communication skills of autistic children in class VII junior high school at SKh Madina Serang City. This is indicated by an increase in the mean level. In the baseline-1 phase (A1) data was obtained with an average of 28%, in this phase the data was taken naturally without any treatment or intervention. In the intervention phase (B) the subject experienced an increase in data with an average of 47%, in this phase the subject experienced an increase due to treatment or intervention using Picture Exchange Communication

System (PECS) media. In the baseline-2 phase (A2) the subject obtained a score with an average of 46%, in this phase the data was taken naturally after the treatment or intervention (the effect of the intervention). Changes in data in the baseline-1 (A1), intervention (B), and baseline-2 (A2) phases show stable data..

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