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RESEARCH PAPER

Development of Social Skills by Using Simulation Method for Children with Autism Spectrum Disorder

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ABSTRACT

Simulation has proven effective for teaching skills to children with autism spectrum disorders (ASD). It involves supervised imitation of real-life activities in a controlled environment. As ASD children struggle with observational learning, simulated scenarios help them comprehend and learn appropriate behaviors. Simulation, like video modeling, where kids imitate behavior shown in videos, provides lifelike experiences for exploring and practicing skills. Research on the simulation method's impact on ASD children's social skills is limited, especially in developing countries like Pakistan. This study focused on using video modeling to enhance greeting and sharing skills in ASD students in Lahore. Employing a single-subject ABA design, three ASD students showed significant improvement in goal attainment after the intervention. The findings suggest that simulation method (video modeling) positively influences ASD children's social skills.

KEYWORDS Autism Spectrum Disorder, Simulation Method, Social Skills, Video Modeling

Introduction

Autism spectrum disorder (ASD) is characterized by difficulties in socialization, communication, and engaging in repetitive behaviors or interests. These challenges are expressed as a triad of impairments. The spectrum includes a wide range of symptoms and features that vary from person to person (Crowell, Keluskar, &Gorecki, 2019). Since autism was first described in 1943 by Kanner, difficulties in social interaction have been a defining characteristic of individuals with Autism Spectrum Disorder (ASD). These social impairments are considered the most powerful predictors of diagnostic status. The social challenges exhibited by individuals with ASD vary widely. For instance, someone with Asperger's disorder may desire social interaction but struggle to navigate it effectively, such as by talking excessively without considering others' interest in the conversation. On the other hand, another individual may have little desire to interact with others and avoid social interactions altogether. Even among the most cognitively able individuals with ASD, social difficulties persist as a significant vulnerability (Reichow, Steiner, &Volkmar, F. 2012).

Social skills range from small responses to noticeable behaviors such as smiling, making eye contact, asking questions, giving compliments, and acknowledging others during a social exchange (Little et al., 2017; Rao et al., 2008). The social learning theory of Bandura emphasizes the use of simulation for improving social skills among children. In the simulation, a real-life situation is offered in a secure environment for a child to observe, understand and imitate (Zhou & Brown, 2015). As the experiences provided in the simulation are closer to the actual life setting, it gives a chance to get familiarized with the situation, unpin the demands posed in such a setting, perform according to the demand, revisit the mistakes and practice the skill again to its perfection in supervised sessions. According to Gibson (2013), Wuerzburger and Henriquez, (2019) the simulation method is

a duplication of facts and the actual environment. It provides a chance to analyze the outcome of our chosen response to a particular situation, retry another response and improve by choosing a more suitable one for that setting (Sansosti, 2008).

The simulation method, particularly video modeling, offers a close observation of social situations and flexible practice for responding to social demands. This adaptable approach suits children with ASD due to its simplified practice steps (Lee, 2015). Video modeling involves showing a child with ASD a video of a peer or themselves performing a task, which they then try to emulate (Rhinehart 2011). It can feature the child or others as models, aiding skill generalization across diverse settings like home, school, and stores (Bellini & Akullian, 2007). This effective technique teaches social, functional, and communication skills to children with ASD (Lee 2015; Rhinehart 2011)

Literature Review

Social skills involve communication and interaction within a social context. Little et al. (2017) quote Gresham and Elliott (1984) to define them as learned behaviors that foster positive interactions. Examples include eye contact, questioning, and compliments (Charlton et al., 2020). Deficits in individuals with HFA/AS comprise reduced social orientation, communication issues, misinterpreting cues, emotional incongruence, and empathy loss (Swift, 2018). Adults with HFA/AS struggle with sharing, understanding others' opinions, crucial for social bonds (Gutstein & Whitney, 2002).

Students with Asperger's syndrome (AS) or high-functioning autism (HFA) are deficient in social competencies, they are lacking in the collection of those behavior which is essential for interaction with adults and relevant to societal conference. These deficiencies influence each educational and social improvement. Not similar to other types of individuals with PDD, children with AS/HFA are intelligent and have normal functioning language. Even though their cognitive abilities are maintained, a deficit in social competencies is the central function of HFA / AS and these difficulties affect all regions of educational, emotional, and societal competencies. Also, the deficiency in social competencies affects the interrelationship with family, fellows, and young children. These restricted social capabilities might influence their capability to obtain ordinary developmental milestones and develop satisfied fellows and family interpersonal relations (Krasny, Williams, Provencal & Ozonoff, 2003).

At the initial stage of schooling the students with HFA/AS express deficient social competencies which prominent these children from other normal developed friends. At the primary level of schooling, a student with ASD has substantial societal interpersonal relationship issues; most students with ASD face a lot of problems taking initiative and sustaining relationships with same-elderly friends. In early childhood, their limited social capability may lead to ridicule and avoidance by the members of their fellows (Church Alisanski & Amanullah, 2000).

Social skill interventions significantly enhance communication and interaction in children, yielding lasting impacts across various developmental phases. These interventions foster cognitive, physical, and emotional growth (Fragale, 2014), nurturing comprehensive social competence. Targeted program skills encompass advanced socialization, appropriate communication, coordination, and engaging activities (Jung & Sainato, 2013). Such interventions empower autistic children with effective communication, initiative, turn-taking, and questioning, reducing negative behaviors (Lee, 2015). Social skills intervention also benefits typically developing peers, promoting inclusive relationships and meaningful connections for children with ASD (Øzerk et al., 2021)

Sam, et al. (2020) expressed that the National Professional Development Center on Autism Spectrum Disorders (NPDC) is known as a reliable center for developing

intervention program for ASD which mentioned that the following practices have a positive effect on developing the social skill and competencies for an individual with ASD e.g. (a) reinforcement, (b) self-management, (c) peer-mediated instruction and intervention (PMII), (d) prompting (e) social narratives, (f) social skill groups and (g) video modeling.

Simulation in education entails approximating real-world conditions to teach functional skills, as defined by Rowe et al. (2021). Simulated instruction, often combined with techniques like modeling and prompting, offers cost-effectiveness through reusable materials. Mechling et al. (2003) integrated video methods within computer simulations. Simulated-only teaching benefits mildly disabled individuals more than those with moderate disabilities (Bates et al., 2001).

Fragale (2014) found that Video Modeling (VM) is a effective intervention for improving social play skills in individuals with autism. Alatawi (2023) noted its superiority over in vivo modeling, as VM uses recorded models for behavior demonstration. VM caters to ASD students' visual preferences and aids in understanding relevant cues while filtering out distractions (Kucskar, 2017). ASD individuals rely on clear visual data for skill acquisition due to struggles with environmental stimuli (Lal & Shahane, 2011). VM aligns with Bandura's idea that modeling fosters social learning by imitating appropriate behavior (Edinyang, 2016). This visual method provides tangible insights, employing recorded models to exhibit desired behaviors (Altaf, 2020), thus serving as a potent tool for cultivating positive behaviors in diverse students.

Material and Methods

Research Design

The research design utilized in this study is an experimental single-subject ABA design. This design is commonly employed in educational and clinical research to investigate the effectiveness of interventions on individual participants. The population of this study comprises children with Autism Spectrum Disorder (ASD) from the Punjab province. This group of children represents the target population for examining the impact of the simulation method (video modeling) on developing social skills. The researchers selected a sample of three children with Autism Spectrum Disorder to participate in the study. These three children formed the experimental group for evaluating the effectiveness of the simulation method as an intervention. The selection of participants was done using the purposive sampling technique, which involves purposefully choosing individuals who meet specific criteria relevant to the research objectives.

Participants

Child 1: The first child, a 14-year-old boy from a middle-class family, had Urdu as his native language but struggled with speech. His irregular routines, poor comprehension, attention, and concentration raised concerns. Diagnosed with autism spectrum disorder at 6, he exhibited self-laughing, self-talking, moodiness, weak expressive language, minimal eye contact, repetitive hand movements, and resistance to environmental changes.

Child 2: The child was a boy of 13 years old. The native language of the child was also Urdu at home. In cognition he has memory and poor retention problems, lack of attention and concentration. In the psychosocial area, he was restless, flapping his hand, repetition of words, and poor socialization with children and self-talk. He was diagnosed with a high-functioning autism spectrum disorder. He lacks expressive language.

Child 3: A 10-year-old boy from a low middle-class family attends a government special education school for two years. He struggles with cognitive deficits like comprehension, retention, attention, and concentration. Psychosocially, he exhibits

aggression, echolalia, repetitive speech, self-talk, fear of birds, and repetitive behaviors. He enjoys singing. He has been diagnosed with high-functioning autism spectrum disorder.

Procedure

In this study, the researchers focused on addressing challenges faced by teachers working with students on the Autism Spectrum Disorder (ASD) to enhance their social skills. The study aimed to identify these problems through a Need Assessment Survey Questionnaire. Thirty ASD teachers were purposively selected. The questionnaire encompassed two parts: one gathering demographic data like gender, child age, qualification, and school, and the other containing twelve responsive statements, answered with "Yes," "No," or "to some extent."

A pre-assessment questionnaire was also employed to gauge the issues faced by teachers in developing social skills among ASD students. This questionnaire, also in two parts, gathered demographic details and featured five statements answered as "Yes" or "No."

The researchers crafted a 40 to 50-second video model in Urdu to teach fundamental social skills like greetings and sharing food. An intervention data record sheet was utilized to document participant responses during the intervention, featuring demographic data in the first part and five statements with "Yes" or "No" responses in the second part.

Data analysis

This study employed video modeling to enhance social skills in children with ASD. A Need Assessment Survey gathered teachers' insights on initial conditions and challenges. It formed the basis for the intervention. Graphs were made to analyze children's skill development during the intervention, revealing progress and method effectiveness in fostering social growth in children with ASD.

Table 1
Need Assessment

Sr.	Questions	No	To Some Extent	Yes
1.	Does the child bring lunch from home?	f 1 % 3.3	f 2 % 6.7	f 27 % 90.0
2.	Does the child bring lunch daily/regularly?	f 1 % 3.3	f 5 % 16.7	f 24 % 80.0
3.	Does the child share lunch with his class fellow?	f 20 % 66.7	f 5 % 16.7	f 5 % 16.7
4.	Does the child share lunch without saying or instruction?	f 22 % 73.3	f 6 % 20.0	f 2 % 6.7
5.	Does the child eat lunch hiddenly?	f 23 % 76.7	f 5 % 16.7	f 2 % 6.7
6.	Does the child give his lunch to other if left?	f 13 % 43.3	f 6 % 20.0	f 11 % 36.7
7.	Does the child go to home without eating his lunch?	f 21 % 70.0	f 7 % 23.3	f 2 % 6.7
8.	Does the child quarrel with other child while sharing lunch?	f 5 % 16.7	f 5 % 16.7	f 20 % 66.7
9.	Does the child share his lunch on teacher's instruction?	f 7 % 23.3	f 10 % 13.3	f 13 % 43.3
10.	Does the child eat himself while sharing his lunch?	f 3 % 10.0	f 10 % 33.3	f 17 % 56.7
11.	Does child become stubborn on sharing lunch?	f 8 % 10.0	f 10 % 6.7	f 12 % 83.3
12.	Does the child crying on sharing lunch?	f 4 % 1 3.3	f 5 % 16.7	f 21 % 70.0

The teacher survey offers insights into lunch-sharing behaviors among children with autism. Results show 90% prefer bringing lunch from home for familiar food, while 80% have consistent lunch habits. Around 66.7% don't share lunch with peers, potentially due to sensory considerations. Moreover, 73.3% need prompting to share, indicating a need for guidance. 76.7% eat openly, and 43.3% don't offer leftovers, likely due to routine. Quarrels while sharing were noted by 66.7%, indicating social interaction challenges. 43.3% share only when told, showing teacher influence. 56.7% eat alone while sharing, suggesting personal space preference. Emotional reactions like stubbornness (83.3%) and crying (70%) during sharing also highlight emotional support needs. The survey underscores the significance of tailored support and guidance for enhancing lunchtime interactions for children with autism.

Figures of social skill development among children with Autism Spectrum Disorder:

Child 1:

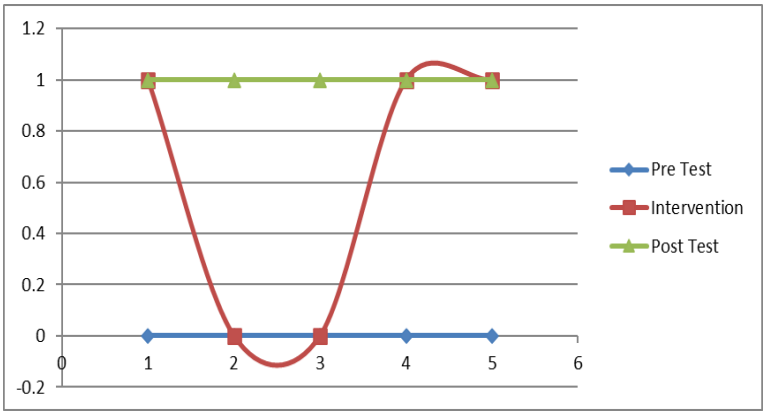

Figure 2: Child share his lunch with another child himself

Initially, Child 1's sharing behavior was observed five times, averaging a score of 0. Following a video modeling intervention to promote sharing, observations were repeated five times, with the average willingness to share increasing by 0.6. After more observations, the score reached 1, indicating consistent lunch sharing with another child post-intervention.

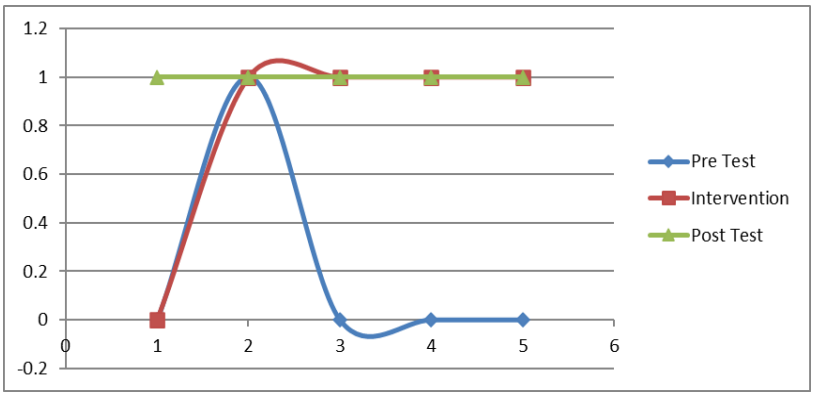

Figure 3: Child share his lunch with another child on his demand

Initially, Child 1's lunch-sharing behavior scored an average of 0.2 across five observations. Through video modeling, an intervention was introduced, resulting in an average increase of 0.8 in willingness to share lunch after five more observations. Subsequent assessments showed a consistent perfect score of 1, indicating consistent sharing post-intervention.

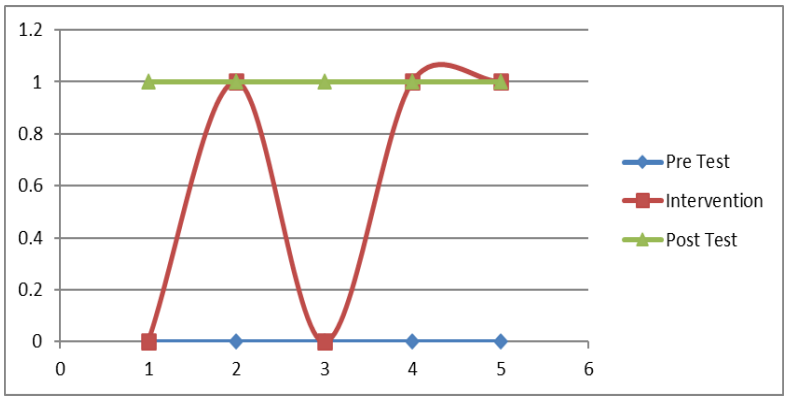

Figure 4: Child demand another child to share his lunch with him when he has not lunch

Child 1's behavior of demanding lunch sharing with others observed five times before an intervention. The average willingness to share was 0. An intervention using video modeling was implemented to increase sharing behavior. After the intervention, sharing was observed five times, with an average increase to 0.8. Post-intervention, sharing was again observed five times, with an average reaching the maximum score of 1. This indicates consistent sharing after the intervention.

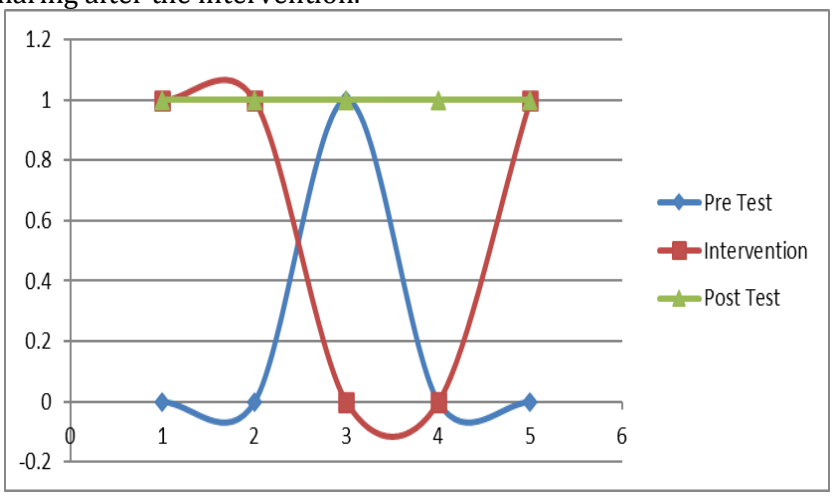

Figure 5: Child share lunch when another child offers him

Prior to the intervention, Child 1's lunch-sharing behavior was studied five times, averaging a 0.2 score. Using video modeling, researchers encouraged more sharing. After the intervention, observed over five instances, sharing increased by 0.8 on average. Subsequent observations showed a constant perfect score of 1, indicating consistent lunch-sharing in response to demand post-intervention.

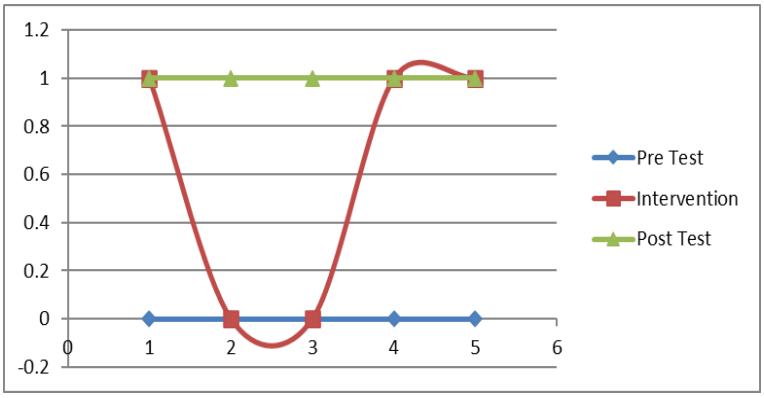

Figure 6: Child share his lunch with another child at the teacher's request

Prior to intervention, child A's lunch-sharing behavior was assessed over five instances, with an average score of 0. Using video modeling, researchers then intervened to enhance sharing. Post-intervention, behavior was assessed five more times, yielding a 0.8 increase in sharing willingness. Subsequent assessments showed a consistent maximum score of 1, indicating the child consistently shared lunch when prompted, post-intervention.

Child 2:

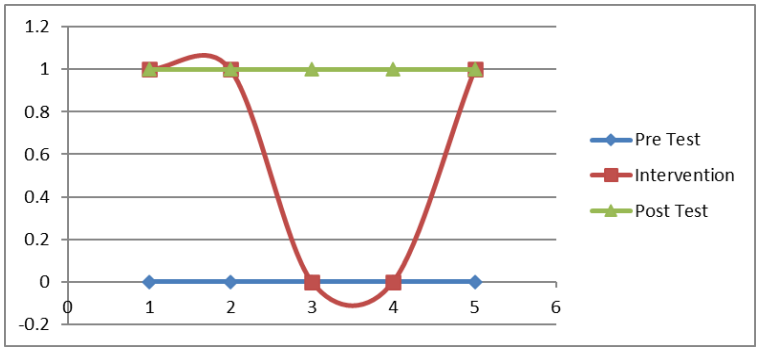

Figure 7: Child share his lunch with another child himself

Initially, Child 2's lunch-sharing behavior was observed five times, averaging a score of 0. Through video modeling intervention, the child's sharing increased by 0.6. Subsequent observations showed a consistent increase, reaching a perfect score of 1, indicating consistent self-initiated sharing post-intervention.

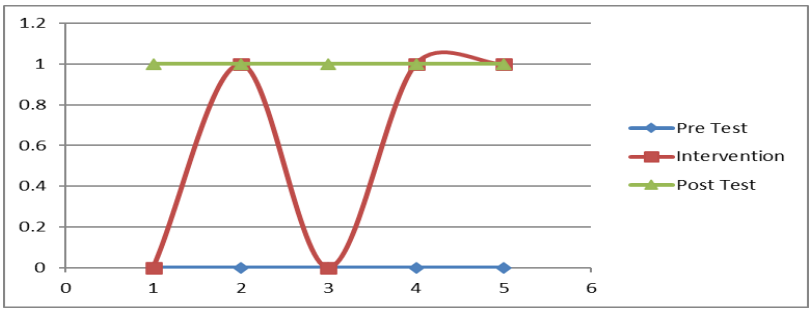

Figure 8: Child share his lunch with another child on his demand

Prior to the intervention, Child A's sharing lunch behavior was observed five times, with an average score of 0. An intervention involving video modeling was then implemented, resulting in an average increase of 0.6 in sharing behavior. After further observation, the child consistently achieved the maximum score of 1, indicating consistent sharing with another child after the intervention.

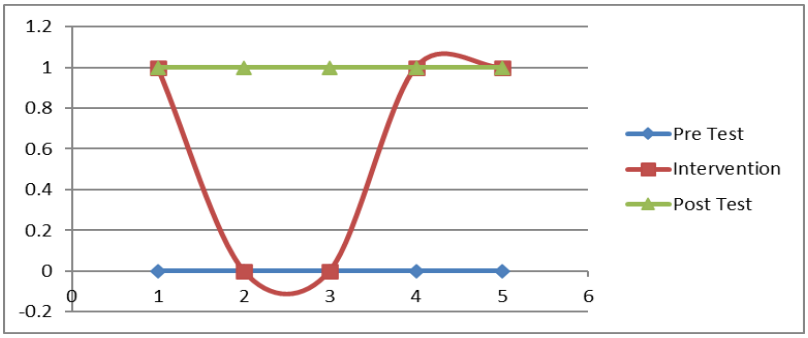

Figure 9: Child demand another child to share his lunch with him when he has not lunch

Before intervention, Child 2 repeatedly displayed a behavior of demanding a peer's lunch without having eaten, averaging a willingness score of 0. An intervention using video modeling aimed to enhance sharing behavior. Post-intervention, the child's sharing behavior was reassessed across five instances, with a willingness increase of 0.6 on average. Subsequent assessments again showed willingness to share, reaching a maximal score of 1. This demonstrates consistent sharing following intervention.

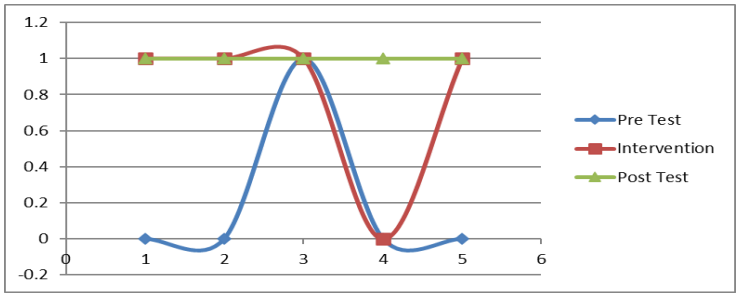

Figure 10: Child share lunch when another child offers him

Before intervention, Child 2 shared lunch when offered on five occasions, averaging a score of 0.2. Video modeling intervention aimed to enhance sharing behavior. Post-intervention, over five instances, sharing increased by 0.8. Following another five instances, the average score reached 1, indicating consistent sharing upon request—a significant change from pre-intervention behavior.

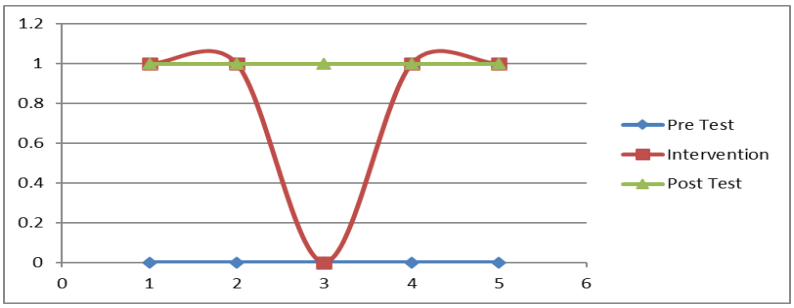

Figure 11: Child share his lunch with another child at the teacher's request

Initially, child 2's lunch-sharing behavior scored 0 in five observations. Video modeling intervention was applied to enhance sharing. Post-intervention, the behavior's average score rose by 0.8 in five more observations. Subsequent observations showed a perfect score of 1, signifying consistent lunch-sharing with peers upon request.

Child 3:

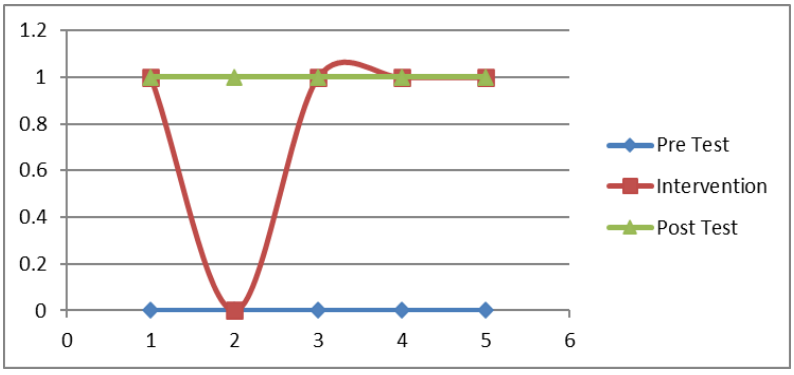

Figure 12: Child share his lunch with another child himself

Initially, child 3's lunch-sharing behavior scored an average of 0 in five observations. A video modeling intervention aimed to increase sharing. After the intervention, the average score rose by 0.8 over five observations. Post-intervention, the child's willingness to share reached a constant score of 1 in five subsequent observations, depicting consistent sharing behavior.

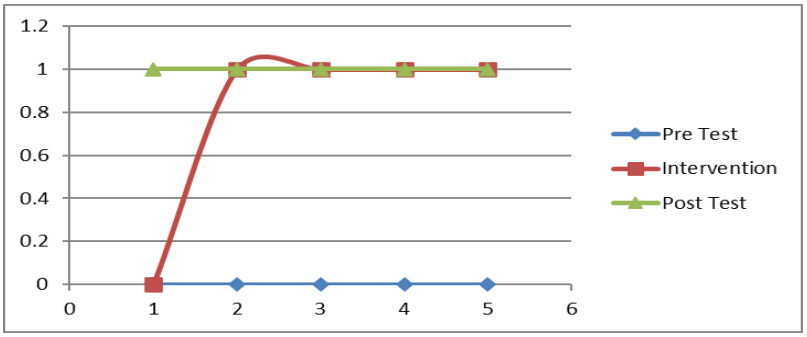

Figure 13: Child share his lunch with another child on his demand

Child 3's initial lunch-sharing behavior was observed five times, averaging a score of 0. An intervention using video modeling aimed to increase sharing. Post-intervention, observed behavior improved, with an average increase of 0.8. After continued observation, the average score reached 1, indicating consistent sharing with another child upon request.

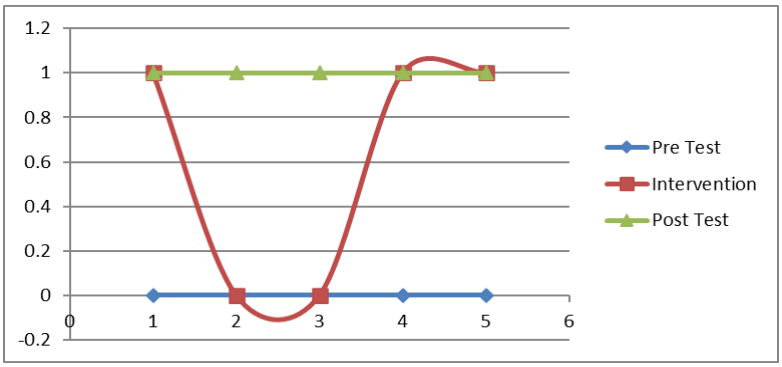

Figure 14: Child demand another child to share his lunch with him when he has not lunch

Prior to intervention, Child 3 was noted demanding sharing lunch, scoring an average of 0 in 5 instances. Post video modeling intervention, sharing behavior was observed five times, showing a 0.6 increase in average sharing willingness. Following another observation set, the average score reached 1, signifying consistent sharing after intervention.

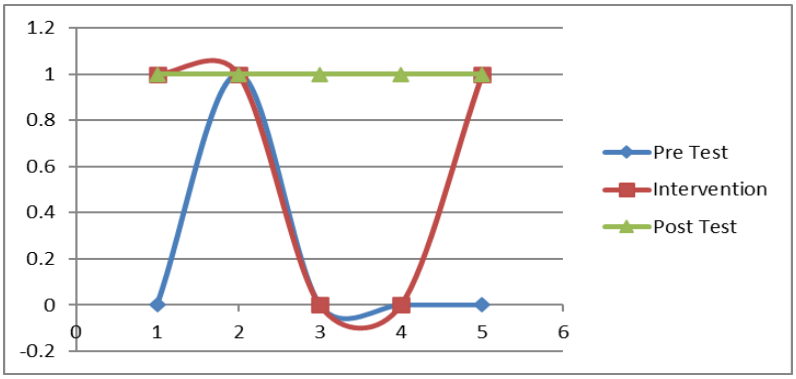

Figure 15: Child share lunch when another child offers him

Prior to intervention, Child 3's lunch-sharing behavior was observed five times, averaging a score of 0.2. An intervention using video modeling was then applied, resulting in an increased average score of 0.6 over five subsequent observations. Following further observations, the average score reached 1, indicating consistent lunch-sharing with another child upon request after the intervention.

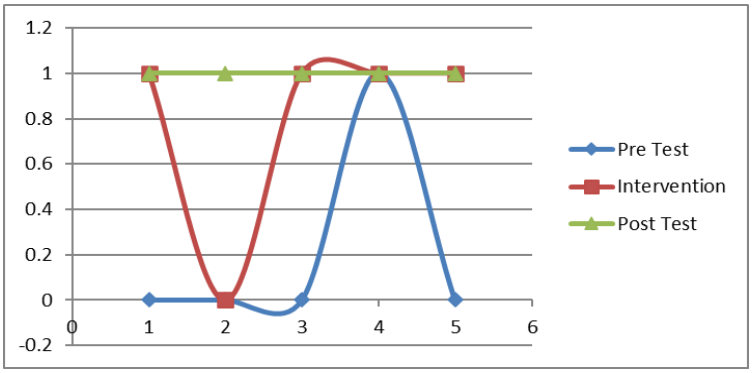

Figure 16: Child share his lunch with another child at the teacher's request

Prior to the intervention, child 3's lunch-sharing behavior was observed five times, with an average score of 0.2. Using video modeling, researchers encouraged increased sharing. Post-intervention, over five instances, the average willingness score rose by 0.8. Subsequent observations saw the child consistently score 1, denoting consistent sharing upon request.

Discussion

The study aimed to assess the effectiveness of the simulation method (video modeling) in enhancing social skills, particularly lunch-sharing behaviors, in children with Autism Spectrum Disorder (ASD). Whalon, et al. (2015) revealed the study of (Bellini &Akullian, 2007) that after a meta-analysis of twenty-three students, the research mentioned that VM have a positive effect on the young student of ASD to generalize their learning at various situations and environment.VM enhances empathy, equanimity, and interpersonal skills paving the way for better communication ability(Seema & Ajithkumar, 2019). Individuals with ASD demonstrate the learned skill in different situations, people, and setting with conversational skills, body language, and intonation which is taught through VM (Charlop et al., 2010). Rhinehart (2011) also mentioned that students with ASD apply their learned skills quickly and generalized in different settings and conditions due to the positive effect of VM e.g. lunch time, break time, and classroom. Fragale, C. L. (2014) found VM to be an effective intervention for improving play-related skills, such as solitary play and social play, of children with ASD The research findings suggest that a combined intervention delivered through a computer-based method (VM) can be effective in addressing social skill difficulties in individuals with High-Functioning Autism/Autism Spectrum Disorder (HFA/AS) (Sansosti & Powell-Smith, 2008). Yakubova and Taber-Doughty (2013) study's results demonstrate that video modeling and verbal prompts are effective methods for teaching social skills and autonomous behaviors to students with autism in natural environments. These interventions were successful in enhancing interactions with unfamiliar people, indicating their potential as valuable tools for social skill development in this population. Gül (2016) expressed that the effectiveness of computer-presented video modeling and Social Stories in teaching various social skills, including self-care, daily life, and independent life skills, is recommended for further investigation with diverse participants (e.g., teachers, peers) and in different settings (e.g., home). These interventions should be included in studies assessing the effectiveness of teaching social skills in small-group settings. Additionally, the effectiveness of interventions using technological tools like iPads or tablets to present videos should be examined as an alternative to using a computer. The consequences showed that the individuals with ASD

confirmed enhanced interpersonal relationships with all types of fellows and natural settings after seeing a video of themselves doing so independently.

Conclusion

The study's findings suggest that utilizing simulation (video modeling) as an intervention method can be a valuable tool in facilitating the development of social skills, especially in the specific context of sharing lunch, for children with Autism Spectrum Disorder. The research provides evidence for the efficacy of this approach and highlights its potential applicability in other social skill training programs for individuals with ASD. The intervention using simulation (video modeling) was successful in promoting the child's lunch-sharing behavior across different social scenarios. The child displayed an increased willingness to share his lunch with others in various situations, and this behavior was consistently maintained even after the intervention was concluded. These results suggest that simulation-based interventions can be beneficial in developing social skills, such as sharing, in children with Autism Spectrum Disorder. However, further research and investigations may be needed to generalize these findings to different social contexts and assess the long-term impact of the intervention on overall social development in children with Autism Spectrum Disorder.

Recommendations

Following are some recommendations:

1. As the needs of the children with autism are different than other special children, therefore it is humbly suggested that the school may provide video tools and related technologies for better learning of children with autism.

2. Social skills are particularly important skills for our survival so for better learning of these skills teachers working with children with autism spectrum disorder may be trained in teaching skills by using video models.

3. Video models should be adopted for the development of social skills by all private institutions.

4. To ensure the well-being of children Parents and Teachers should be trained to apply video models

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