Journal of Contemporary Educational Research, 2023, Volume 7, Issue 11
http://ojs.bbwpublisher.com/index.php/JCER
ISSN Online: 2208-8474
ISSN Print: 2208-8466

Research on the Intervention of Visual Cue Strategy on Self-Care Ability of Children with Autism

Zuqin Lu[1]*, Xiulin Chen[2]

[1]Department of Special Education, Lingnan Normal University, School of Educational Science, Zhanjiang 524048, Guangdong Province, China
[2]Qizhi School, Guangzhou 510999, Guangdong Province, China

Corresponding author: Zuqin Lu, 2602185428@qq.com

Abstract: The formation of self-care ability is the first step for children with autism to enter the society, and it is also a prerequisite and guarantee for their independent survival. This study aimed to explore the impact of visual cue strategies on the self-care ability of children with autism. Based on the ABA design of a single case study, this research conducted a four-month intervention on a seven-year-old child with autism via visual cue strategy as independent variables and sock-wearing skills as dependent variables, in order to explore the effect of visual cue strategy on self-care ability of children with autism. It turned out that visual cue strategy exerts a positive immediate sustained effect and social validity on the self-care ability of children with autism. Lastly, suggestions were provided for future related research based on the research process, results, and limitations.

Keywords: Children with autism; Self-care ability; Visual cue strategy

Online publication: November 23, 2023

1. Introduction

In recent years, China has paid more and more attention to the development of special education. Since the 18th National Congress of the Communist Party of China, the state has organized and implemented two special education promotion plans, which have greatly promoted the development of special education in China. Various types of special needs children have garnered increased attention, and the autism community has grown considerably, attracting greater awareness and recognition. According to a survey conducted by the Centers for Disease Control and Prevention in the United States, the prevalence rate of autism in children reached 1:54 in 2020, compared with 1:36 in 8-year-olds in 2023. The "China's 2021 Blue Book of Rehabilitation Industry for Children with Developmental Disabilities" issued by the China Maternal and Child Health Association and the National Autism Rehabilitation Research Center pointed out that the prevalence of autism is still increasing year by year, and there are nearly 3 million autistic children in China. In the face of large autistic groups, people are increasingly concerned about autistic children.

The definition of autistic children is slightly different in each country and region, but generally,

the definition of autistic children includes the three core symptoms of difficulties in social interaction, communication disorders, and abnormal interests and behaviors. According to the new *Diagnostic and Statistical Manual of Mental Disorders (Fifth Edition)* (DSM-V) published by the American Association of Mental Disorders, children with autism should meet the following four criteria:

(1) Current or past persistent deficiencies in communication and social activities
(2) Restricted and repetitive behavioral interests and activity symptoms
(3) Presence of symptoms in early childhood
(4) Signs that the individual's ability to live is limited or impaired

Children with autism in the study were 5 to 8 years old with a formal hospital diagnosis of autism and enrolled in the lower grades of a special education school. The subject was a 7-year-old boy, currently studying in the first grade of a special education school in a city.

As one of the necessary basic survival capabilities, self-care ability is the behavior capability to take good care of oneself, which is the essential skill to adapt to the external environment independently [1]. Concerning the rehabilitation treatment of children with autism, most parents concentrate on intelligence, speech, and other aspects, but ignore the cultivation of self-care ability, which leads to the deficiency of children in this aspect [2]. The deficiency of self-care ability not only affects the independence of children with autism, but also exerts great pressure on the families and schools of this group. The improvement of the self-care ability of children with autism has a far-reaching impact on their growth and development. The deficiency of self-care ability is common in autistic groups and seriously affects the children's future life and work. Thus, it is important to focus on the cultivation of self-care ability in autistic children. The improvement of autistic children's self-care requires the cooperation of parents, special education teachers, and special education institutions [3-7].

On the basis of the strategy system combined with visual aids, visual cue strategy can stimulate children's participation in daily activities, figure out time sequences, and better respond to the needs of the surroundings [8,9]. In short, visual cues are visual media such as photos, pictures, text, line drawings, patterns, signs, timetables, calendars, work plans, etc., for students to clarify the purpose of their actions and know what they want to do and should do by receiving visual information. In our daily lives, visual cue strategies can be seen everywhere, such as text pictures in books, body language in communication, facial expressions, etc., which are part of visual cues. The steps of implementing visual cue strategy teaching are as follows [10,11]: firstly, the target behavior is defined and measured; secondly, the criteria for the completion of the target behavior are established; thirdly, the visual cue strategy is chosen; fourthly, visual cue strategy teaching materials are made and collected; fifthly, the reinforcement used in teaching is determined; lastly, the visual cue strategy teaching is removed and the teaching effectiveness is evaluated.

Visual cue strategy is an effective intervention strategy for children with autism in aggressive behavior, language ability, self-care skills, and so on [12,13]. Zeng intervened the behavior of children with autism in washing hands, brushing teeth, and going to the toilet through visual cue strategy, and concluded a good immediate, classified and retention effect [14]. Van Laarhoven *et al.* intervened the self-care skills of autistic adolescents with video cues and picture cues, revealing that both cue strategies showed good intervention effects [15]. As mentioned above, the effectiveness of visual cue strategies in the intervention of self-care ability of children with autism can be seen.

Most of the existing academic studies on children with autism only focus on communication ability, social communication, and behavior modification, and there are few studies on the self-care skills of children with autism in domestic and abroad. Visual cue strategy has been proven to be an effective intervention strategy for children with autism [11]. With the aim of exploring the impact of visual cue strategies on the self-care ability

of children with autism, this study provides guidelines for the cultivation of self-care ability in children with autism.

2. Study subject and methods

2.1. Study subject

The selected subject was a seven-year-old boy diagnosed with autism by a reputable hospital, his vision and hearing are within standard, without other diseases. The boy is the only child in the family who lives with their parents and is mainly taken care of by his mother. However, his education methods are relatively strict. The boy has normal cognitive ability and cannot maintain his attention for a period of time, and his fine motor ability needs to be improved. However, he is good at imitating and interested in pictures, he follows instructions and is emotionally stable. With assistance, he can wear his own coats, trousers, and shoes, but fails to wear socks on his own. He can eat on his own, and go to the toilet under instruction, but fails to wipe his bum himself.

2.2. Methods

Based on the ABA design of a single case study, this research did not enter the intervention period until there were at least three data points and a steady downward trend in the baseline period after collecting the subject's baseline data. In this way, it is helpful to understand the completion rate of wearing socks for children with autism, and then use the interview method to understand the current self-care status of children with autism after visual cue teaching. Visual analysis included intra-stage analysis and inter-stage analysis, and the trend data was analyzed by the middle division method. In this study, if the stability level of the stage reached 80% or above, the data point was regarded as stable, and if it was below 80%, it was regarded as unstable. Parents and class teachers were interviewed to analyze the social effects of teaching intervention. Parents and class teachers were denoted by J and T respectively; the code of the research data date, such as 210903, indicated that the research data was collected on September 3, 2021. Interviews were represented by interview records. For example, the record of the interview with the parents on September 3, 2021, was expressed as "J, 210903, interview record."

2.3. Research tools

The research tools used in this study included evaluation tools and teaching tools. There were seven evaluation tools used in this study, including the questionnaire of students' basic information, the questionnaire of students' self-care skills, the questionnaire of students' enhancement, the stocking evaluation scale, the outline of parents' interview, the checklist of visual cue strategy teaching procedure, and the outline of teaching effect interview. The teaching tool included a sock-wearing flow chart card. Each picture card was inserted into the Word document with the photos taken by the researcher herself, adjusted to the appropriate size, and then printed in color. There were numbers in the bottom right corner of each card, representing the steps of the process. The process diagram for wearing socks was pasted on the wall of the shoe storage area for easy case study.

3. Intervention process and analysis

3.1. Proposal

Through the self-designed self-care activity completion rate scale, this research evaluated the self-care activity skills completion rate of the subject during the baseline period, intervention period, and maintenance period in the past four months. The teaching intervention during the intervention period was conducted five times a week for 15 minutes each time, which explained the visual flow chart for five minutes, and provided ten minutes for

the subject to react. The independent variable was visual cue strategy, including visual flow chart and instructor demonstration. The dependent variable was the completion rates of wearing socks, which refers to that the subject wears the socks correctly. The whole process included: (1) lifting one foot and bending knees on the chair; (2) putting two thumbs into the sock tube; (3) pointing the socks at the toes; (4) pulling the socks up. The control variables were the teaching place, teaching time, and the instructor.

3.2. Reliability and validity

In order to ensure the reliability of the study, this research followed the principle of inter-observer consistency, and the classroom teaching assistant was a collaborative researcher who had rich work experience and worked with researchers to carry out case intervention experiments. The data obtained under the principle of inter-observer consistency were 92% in the baseline period, 88% in the intervention period, and 92% in the maintenance period. The validity of the study was tested by visual analysis and social validity, and in order to ensure the validity of the study, parents and head teachers were interviewed by telephone on socks-wearing skills improvement.

4. Results and discussion

Based on the completion rate of the subject's target behavior in the intervention phase, the teaching effectiveness curve with visual cue strategy is shown in **Figure 1**, in which the Y-axis is the socks-wearing completion rate and the X-axis is the number of days of observation, as follows.

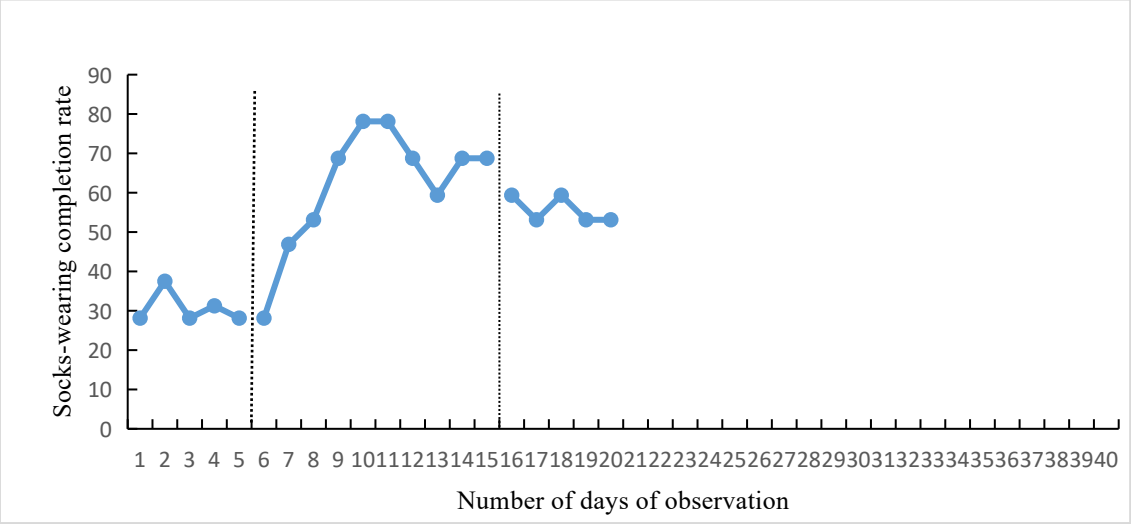

Figure 1. Teaching effectiveness curve with visual cue strategy

4.1. Visual analysis and social validity

The following analysis is based on the curve of **Figure 1**:

(1) Baseline period: The completion rate of socks-wearing behavior of the subject tended to be stable between 28.13% and 37.50%, the average level was 30%, the trend and level stability were both 80%, which reached a stable status suitable for intervention.

(2) Intervention period: The level ranged from 28.13% to 78.13%, with an average level of 61.88%, which was 31% higher than that of the baseline period, showing a positive trend of progress and reaching a significant level of 0.05.

(3) Maintenance period: Excluding the visual cue strategy teaching, the trend stability and level stability reached 100%, the level range was between 53.12% and 59.37%. During this period, the level remained good.

(4) From baseline period to intervention period: The trend had changed from steady to upward, the average level between stages had risen from 30% to 61.88%, the overlap rate was 10%, and there was an obvious trend of progress. It can be seen that the application of visual cue strategy had a good immediate effect on the self-care ability of the subject.

(5) From intervention period to maintenance period: The trend of the completion rate of socks-wearing increased to a stable level, the average level between stages decreased from 61.88% to 52.46%, the overlap rate was 100%, and there was a retrogression trend in the maintenance period; but the maintenance period still improved compared with the baseline period, indicating that the maintenance period remained at a good level.

After communicating with the parents of the subject and his head teacher, this research was evaluated as having good social validity.

(1) Parents gave positive comments on the socks-wearing performance of the subject. Parents: "Since the end of the intervention, Chen's self-care ability has improved. I used my own method to teach him to wear socks, but the effect was not great. Now Chen can wear socks by himself, although the speed is still relatively slow, but he has made a lot of progress compared with before" (J, 211228, interview record).

(2) After the intervention, the head teacher thought that the subject had made great progress in wearing socks at school. Head teacher: "During this period, Chen still made some progress in wearing socks, returning to the classroom after lunch break every day to wear his socks, he could take the initiative to take the chair to the front of the visual process card to wear his socks and shoes, and the success rate was much higher than before the intervention" (T, 211229, interview record).

4.2. Discussion

It turns out that visual cue strategy has immediate maintenance effect and social validity on improving the self-care ability of children with autism, which is consistent with the results of Zeng [14] and Van Laarhoven [15]. Both verify the intervention effect of visual cue strategy on the self-care ability of children with autism. The results of this research are generally consistent with those of Shrestha *et al.* [16], the difference is that it uses video model law to interfere with the self-care skills of children with autism, while this research uses visual process cards and instructor demonstration. It is inconsistent with the study by Zhou [13], which interferes with the symbolic play ability of autism children, while this research interferes with the self-care ability.

Teaching materials and rating scale need to be prepared in advance before teaching with visual cue strategy. Researchers should simply interact with subject to keep the subject in a good mood, and then use a visual flow chart to attract the attention of the subject and explain and demonstrate the instruction. The research was limited by time and place, which lasted only four months and was mainly carried out in the school environment. The number of research cases was small, thus the research lacks representation.

5. Conclusions and suggestions

5.1. Conclusions

(1) It can be seen that visual cue strategy exerts a positive and effective immediate effect on the acquisition of self-care ability in children with autism. For socks-wearing skills, the positive trend

from the baseline period to intervention period had been increasing, and there was no overlap percentage between the baseline period and the intervention period. Therefore, the visual cue strategy is positive for the subject's acquisition of self-care skills.

(2) Visual cue strategy has a good maintenance effect on the acquisition of self-care ability in children with autism. After teaching the self-care ability of the visual cue strategy, re-evaluating when entering the maintenance period, and then removing all cues, the socks-wearing rate was higher than that of the intervention period, and the overlap with the intervention period was higher.

(3) Intervention of visual cue strategy teaching has good social validity for the self-care ability in children with autism. At the end of the research, the researchers interviewed the subject's parents and head teachers, and they all affirmed the effectiveness of visual cue strategy teaching on the subject's self-care ability.

5.2. Suggestions

(1) In terms of the teaching materials selection, the teaching materials should not only take full account of the existing ability of the target behavior of the research subjects, but should also pay attention to their interests. Due to the fact that the researchers' own photos were used to make the visual card, and the color of the card was poor, the visual cue card was unattractive. In the related research in the future, if the choice of the teaching materials is attractive to the research subjects, it may make the teaching more effective.

(2) In terms of the teaching methods selection, visual flow chart and teacher demonstration were used as specific strategies to interfere with the self-care ability of children with autism in this study. Even though these methods have visual advantages, first-grade children with autism still have some difficulties in understanding the visual process cards. Although the visual flow chart was analyzed in each teaching, it was still difficult for the subject to understand and combine each step of the process. If combined with the video model method, it may be easier for children with autism to understand the process.

(3) In terms of the research subject selection, the scope of this group should be expanded, and if there is an increase in quantity, the research results can be enriched. This research only involved one research subject, and the research results were limited to one individual case.

(4) In terms of the research methods selection, the intervention research of visual cue strategy to improve the self-care ability of children with autism has immediate effect and maintenance effect. There was only one research subject in this study, thus future researches can further adopt the quasi-experimental method to increase the research subjects and further explore the effectiveness of teaching.

(5) For the target behavior of the research, it should be in line with the actual situation of the research subjects. The physical and mental conditions of the subjects and the expectations of their parents should be fully taken into account. Besides, whether the research can be achieved on time within a limited time, and the difficulty of the intervention of the target behavior should also be considered.

Funding

(1) Philosophy and Social Science Planning Project (Zhanjiang, 2023): Research on School Adaptation Situation and Influencing Factors of Children with Autism Learning in Regular Class (ZJ23YB60)

(2) Peak-Building Project for the High-Quality Development of Basic Education (Lingnan Normal University, 2023): Research on School Adaptation Situation and Influencing Factors of Preschool Children with Autism (JCJYZD202303)

Disclosure statement

The authors declare no conflict of interest.

References

[1] Kang H, 2013, Research on the Effectiveness of Video Demonstration Teaching on Learning Self-Care Skills in Children with Autism, dissertation, Chongqing Normal University.

[2] Zhang H, Wei N, Li N, 2016, The Application of Self-Care Flowchart in Improving the Self-Care Ability of Children with Autism. Nursing and Rehabilitation, 15(01): 51–53.

[3] Li X, 2017, Action Study on the Development of Life Care Curriculum for Children with Autism Spectrum Disorders, dissertation, Northwest Normal University.

[4] Ran Y, 2019, Social Work Intervention in Life Skills of Children with Autism, dissertation, Guizhou University.

[5] Zhang Y, 2021, A Study on Improving the Self-Care Ability of Children with Autism by Applying Micro Courses. Education Information Technology, 2021(10): 48–51.

[6] Huang Y, 2021, The Impact of Parental Group Cognitive Behavioral Intervention on Treatment Compliance and Self-Care Ability in Children with Autism. Nursing Practice and Research, 18(22): 3420–3423.

[7] Lu D, Chen J, 2021, The Impact of Family Rehabilitation Training Mode on Self-Care Ability and Social Function of Children with Autism. Grassroots Medical Forum, 25(13): 1918–1919.

[8] Westling DL, Fox L, 2000, Teaching Students with Severe Disabilities, Merrill Publishing, Englewood Cliffs, NJ.

[9] Cao S, Fang J, 2008, "Visual Support" Strategy in Language Intervention for Children with Autism Spectrum. China Special Education, 2008(05): 26–32.

[10] Rao SM, Gagie B, 2006, Learning Through Seeing and Doing. Teaching Exceptional Children, 38(6): 26–33.

[11] Zhang Y, 2017, Research on the Effectiveness of Visual Cue Strategy Based Teaching on Leisure Skills in School-Age Children with Autism, dissertation, Chongqing Normal University.

[12] Schopler E, 1997, Implementation of TECH Philosophy, John Wiley, New York.

[13] Zhou W, 2019, A Case Study on Improving the Symbolic Play Ability of Preschool Children with Autism Through Visual Cueing Strategies, dissertation, Chongqing Normal University.

[14] Zeng Y, 2002, A Study on the Effect of Visual Cueing Strategies on Self Care Learning of Autistic Students in Elementary Schools, dissertation, Institute of Education, Chiayi University.

[15] Van Laarhoven T, Kraus E, Karpman K, et al., 2010, Comparison of Picture and Video Prompts to Teach Daily Living Skills to Individuals with Originality. Focus on Autism and Other Developmental Disabilities, 25(4): 195–208.

[16] Shrestha A, Anderson A, Moore DW, 2013, Using Point of View Video Modeling and Forward Chaining to Teach a Functional Self-Help Skill to a Child with Autism. Journal of Behavioral Education, 22(2): 157–167.