

Intervention Case Study about Sports Games on the Self-injury Behavior of Children with Severe Autism

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Abstract: This paper utilizes the A-B-A-B reversal experimental design for the single-subject research, to study the self-injurious behavior of a sixth-grade student with severe autism, aiming to explore the intervention effect of sports games on the self-injury behavior of children with severe autism. The results showed that, the self-injury behavior such as, the number of times of biting the back of the hands, and picking the noses is reduced in the study subject following sports games intervention plans, however, the self-injurious still exists, especially when the study subject in an unfamiliar environment, further indicating that the self-injurious behavior of children with severe autism cannot be completely eliminated by sports games alone. Concluding that, self-injurious behavior of children with severe autism cannot be completely eliminated by sports games, a comprehensive intervention with multiple approaches is still required to achieve optimal results.

Keywords: Sports games; Children with autism; Self-harm; Self-injurious behavior

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1. Introduction

There are three core disorders to describe the autism spectrum, namely social interaction disorders, communication disorders, and narrow interests and repetitive stereotypes. Among them, the effect of repetitive stereotyped behavior on autistic patients is more prominent ^[1]. Further, Turner has pointed out that a series of subtypes can be developed due to the repetitive stereotyped behaviors, such as ataxia, obsession with the texture or feel of an object, smell, visual imagery, and self-harming behavior, which can be very serious and latent ^[2]. The causes of self-injury are varied, and can be manifest in different forms, where it can be debilitating, and also cause damage to the external image, which in some serious cases, it can even lead to death ^[3]. People with autism have much higher rates of self-harm, compared to the general population ^[4]. Additionally, due to the risk factors of self-injury, the incidence of mental dysfunction in autistic patients is also higher ^[5]. The report released by the Centers for Disease Control and Prevention (CDC) in 2020 regarding Autism in America, mentioned that, in the year 2016 around 28 percent of children diagnosed with autism spectrum disorder (ASD) in the U.S. showed a self-injury behavior such as head banging, arm biting, and skin scratching among 8-year-olds ^[6].

Severe self-injurious behavior can cause enormous physical damage to the children with autism. Some self-injury behaviors have a low degree of injury, such as biting hands and picking skin, which will not cause a serious injury, however to a certain extent these behaviors can interfere with the physical and mental health of the children with autism. Individuals who show self-injurious behavior is susceptible to collective and social misunderstandings, which may limit their participation in a collective or group social activity. Therefore, it is important and essential to intervene in the self-injury behavior of children with autism. Based on the existing data, this study defines the self-injury behaviors of sub-autism as biting the back of the hand (biting the back of the hand until a callus grows), and picking the nose (picking the alar and bridge of the nose to bleed).

A variety of basic actions, including sports games with strict activity rules and clear activity goals can be included as a therapy for the children with autism. Further, including sports games as therapy can help to develop the children's mind and body, additionally, the content of sports games which is colorful and has various forms may also trigger the children's interest to participate in the activities. Therefore, sports games are an important method of educational rehabilitation for children with autism^[7].

There are three main models, which are included in the intervention methods for sports games as described below^[8], and in this study a combination of group mode and collective sports games were used.

(1) Single mode sports game: Including, naturally exercise such as, muscle coordination and movement, and relax muscles, where the main purpose of the exercise is to relieve stress. Additionally, these types of sport can improve the children's perceptual ability, reduce the fantasies that some children often have, thereby, preventing the children from immersing themselves into their own world, further reducing their problematic behaviors^[9].

(2) Team mode sports games: Including body language as a communication medium, where children can express their inner feelings through cooperative sports games, to improve their cooperation and problem-solving skills. Additionally, can improve the emotional communication with others, and as well can improve the children's physical and mental health.

(3) Group sports games: This type of sports can guide, and show the children, the proper way to express and control their emotions, learn to reduce anxiety and inner conflicts, express or vent their happy and depressive emotions, learn interpersonal skills, cultivate their communication skills, and gradually break out of the self-enclosed world, which goes further improve the problematic behaviors in children with autism^[10].

2. Research procedure

Xingxing, is a pseudonym of the research subject, she is a sixth-grade student of a special education school in Guangdong Province with 11 years old. According to the third-party medical diagnosis, she suffers from severe autism, where her vision, hearing, touch, and kinesthetic are all normal with a good health condition. Through a series of interviews with teachers and parents, as well as the researcher's observation and evaluation, the ability status of Xingxing is as noted below:

- (1) Low ability to listen to instructions and obey, obvious attention deficit, low classroom participation
- (2) Sensory perception ability: The vision and touch are more sensitive, compared to hearing and perception
- (3) Cognitive ability: Poor listening, speaking, reading and writing skills
- (4) Motor coordination: Overall movements are good; however, the movement activities sometimes lack in the goal or random, meanwhile the fine movements can only be performed by pinching the study subject fingers;
- (5) Language and communication skills: No oral language, and there is no physical interaction and communication with other people

(6) Self-care ability: Able to eat by herself, other aspects of self-care need assistance of others.

According to the above observation, the sports game design strategy for Xingxing are as described below:

(1) Pertinence: Each autistic children have differences in their characteristics in the term of physical and mental disabilities, and motor abilities, therefore, the design and implementation of the sports games are based on the existing level, interest and development ability of the autistic children in all aspects^[11].

(2) Diversity: The program needs to formulate a sports game program that is most suitable for the research subject, which will have the best intervention effect, improves the participation of the study subject, and with a maximizes intervention effect of sports games^[12].

(3) The program uses reinforcement methods to maintain the correct behavior, such as verbal encouragement and material reward reinforcement.

The implementation of sports game design and program has the following manifestations. After a week of observation, it was found that, the problematic behaviors frequently appeared, when she was bored and distracted, or when the requirements and tasks from the teacher were difficult to achieve, and also when she could not express her physical and mental needs, and lastly, when her needs could not be immediately understood and satisfied^[13]. Regarding the self-injurious behavior, behaviorism in the psychology propose that, a lack of sensory stimulation, social positive reinforcement, social negative reinforcement and hypotheses. The hypothesis is that, the children with autism perform or indulge in the self-injury behavior, is a way to complement the lack of sensory stimuli^[14], where with relatively poor environmental stimuli, autistic individuals make up for this deficiency through self-injury behavior as indicated by the study subject when she feels bored and distracted^[15].

In this study, a game intervention program was formulated following the design strategy of the sports game program, and the main purpose of the game is for intervention. There are five games in the program, and each game includes the time, place, specific equipment, and a specific operation method of the game. The implementation stage of the intervention is divided into baseline period A1 (5 days), intervention period B1 (10 days), regression period A2 (5 days), and lastly, the intervention period B2 (12 days). The reason why the intervention period B2 was set for 12 days was to strengthen the intervention effect.

The specific implementation process during the intervention period B1, is from Monday to Friday, at the corresponding time and place, and the intervention plan is implemented in a sequence. Meanwhile, during the intervention period B2, the intervention strategy is administered sequentially on the alternate days^[16]. Two more days reserved for B1, are used to repeat the design of the game, where one game is challenging to the study subject, and the other game is comprehensive, and can consolidate the previous intervention effects^[17].

3. Research result

As far as the intervention effect of “biting the back of the hand” is concerned, the observation records from the baseline period (A1), the study subject back-biting behavior reached a maximum of 21 times, indicating that the patient’s problematic behavior of biting the back of the hand was very frequent. The intervention period (B1) is started when the changes at three consecutive points were stable during the baseline period (A1). During the intervention period (B1), the researcher intervened with the study subject problematic behavior through the sports game teaching strategy. The results showed that, the back-biting behavior decreased significantly, and the number of back-biting times was reduced from the original 20 times to 0 times. During this time, the study subject can participate in the sports together with the class collectively during the morning exercise. The data also showed, three consecutive steady declines, thus ending the first intervention period (B1). According to the results, during the retrogression period (A2), the number of biting the back of the hand was 18, 17, 19, 19, and 20 respectively, showing an upward trend. Therefore,

the data collection of the retrogressive period ended, and the intervention period (B2) was started. In the intervention program (B2), using the same intervention program to intervene, the target behavior of the intervention decreased from 18 times to 0 times, indicating that the intervention program can greatly reduce the target behavior of the intervention.

As far as the intervention effect of “nose picking” behavior is concerned, during the baseline period (A1), the number of occurrences of the case’s nose picking behavior reached a maximum of 18 times, indicating that the incidence of this behavior is very high ^[18]. The intervention period (B1) was started, when the changes at the three consecutive points was stable during the baseline period (A1). During the intervention period (B1), the number of occurrences of the target behavior was reduced from 17 times to 0 times. The behavior was significantly reduced, and the study subject was able to participate in sports activities with classmates during the morning exercise. At the same time, the data showed three consecutive steady declines, thus ending the first intervention period (B1). During the retrogression period (A2), the observation results showed that the number of occurrences of nose picking was 18, 17, 17, 18, and 18 respectively, showing an upward trend. Therefore, the observation and data collection of the retrogressive period ended, and the intervention period (B2) was started. In the intervention program (B2), when the same intervention program was used to intervene, the target behavior decreased from 18 times to 0 times, indicating that the intervention program can significantly reduce the problematic behavior.

4. Conclusion and discussion

Combined with the objective data of the intervention results, the self-injury behavior of the study subject showed a significant improvement effect. Further, interviews with individual parents and teachers were conducted after the study ^[19]. The teachers reported that the study subject could basically follow the teacher’s instructions during the morning exercises in a familiar venue and in the classroom, and during the period when the study subject wanted to engage in self-injury behavior, she could be stopped immediately following the teacher’s gestures, language and other prompts. However, when changing to a relatively unfamiliar venue, self-harm behaviors occasionally happen. Parents also responded that after multiple interventions, the study subject problematic behavioral have improved significantly, further, she able to interact with the family members in other environments when they went out. The number of times of biting the back of the hands, and picking the noses has been greatly reduced, but self-injury still exists ^[20]. Which may be due to the insufficient of the intervention time, and the intervention plans need to be further optimized. In summary, it shows that, the sports games need to be combined with other methods to completely prevent the problematic behaviors, thereby solving the self-injurious behavior in children with autism.

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Disclosure statement

The authors declare no conflict of interest.

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