



# Effects of Image-Sandplay Therapy on the Mental Health and Subjective Well-Being of Children with Autism

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## Abstract

**Background:** Autism significantly affects mental health and lowers subjective well-being (SWB). The rehabilitation therapy of autism is attracting widespread attention. We aimed to explore the effects of image-sandplay therapy on the mental health and SWB of children with autism.

**Methods:** A total of 90 children with autism treated in Changchun Women and Children Health Hospital from Jan 2019 to Jun 2020 were enrolled by convenient sampling method. They were randomly divided into control (n=45) and observation (n=45) groups. The observation group had a 12-week image-sandplay therapy based on conventional rehabilitation therapy. In the image-sandplay therapy, the one-to-one intervention was provided once a week, 60 min in each. Autism treatment evaluation checklist (ATEC), autism behavior checklist (ABC), Conners parent symptom questionnaire (PSQ), satisfaction with life scale (SWLS), and positive and negative affect scale for children (PANAS-C) of the two groups were assessed.

**Results:** After intervention, the observation group showed lower scores in ATEC scale and ABC scale than the control group, and the difference show statistical significance ( $P<0.05$ ). Meanwhile, the observation group showed significantly lower scores in PSQ scale than the control group, showing a significant difference ( $P<0.05$ ). The observation group shows higher scores in SWLS scale and positive affect scores than the control group, as well as significantly lower negative affected scores than the control groups, showing a significant difference ( $P<0.05$ ).

**Conclusion:** Image-sandplay therapy can improve the symptoms of children with autism and is conducive to promoting mental health and increasing SWB. It is a feasible and effective rehabilitation method.

**Keywords:** Image-sandplay therapy; Autism; Children; Mental health; Subjective well-being

## Introduction

Autism disorder is a representative disease of pervasive developmental disorder which is primarily characteristic of language disorder, social contact disorder, and repetitive stereotyped behavior (1). The prevalence rate of autism in children in the UK is 1% (2). According to the second national sampling survey of the disabled in

China, the population with autism accounts for 36.9% of the total disabled population, and child patients amount to more than 2 million. Autism ranks at the top of mental disorders in children with respect to the prevalence rate (3). Autism influences the physiology, cognition, and language improvement of child patients and restricts



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the development of their social-adaptation behaviors. Some patients who develop conduct disorder in adolescence may even committed crimes and bring heavy burdens to families, schools, and society. Thus, autism has attracted increased attention in the medical, psychological, and education fields (4).

Currently, the etiology and pathogenesis of autism in China are unclear, and the treatment still lacks special effective means, resulting in poor prognosis. Early discovery and early intervention can improve the symptoms of child patients to the maximum extent and help them recover. Intervention methods for autism are numerous, with the common method being the cognitive-behavior intervention method, language-expression training, and parent training and intervention. Cognitive behavior therapy can improve the cognitive functions of patients with autism, increase social-communication ability, and decrease problem behaviors and emotional disorders (5). These intervention methods were significant in promoting the rehabilitation of children with autism, but they were slightly boring and cannot attract the interest of children. Therefore, that intervention method adapting to child characteristics is urgent to explore.

According to developmental psychology, the game is the dominant activity of children. They promote cognitive development, improve personalities, and reflect creativity (6). Sandplay psychotherapy can effectively relieve autism conditions in children and promote their mental health (7). Sandplay originates from children's games and is more easily accepted by child patients than traditional communicating psychological counseling. In the present study, children with autism were intervened with image-sandplay therapy, and a control experiment was designed to analyze the influences of this therapy on their mental health and subjective well-being (SWB). The results can serve as a reference for the rehabilitation of children with autism.

### *Literature Review*

The mental health intervention of children with autistic has always been concerned. The commu-

nication ability, interpersonal communication, and game skills of children with autism are effectively improved through language expression (8). Parent-training intervention is beneficial for the emotional development of children with autism and increases their adaptation behaviors (9). A teacher-led digital social-story intervention can improve the emotional behavior of children with autism (10). Psychological-education intervention can improve the symptoms of children with autism (11). Cognitive-behavior intervention can help improve the communication skills of children with autism (12). Cognitive-behavior therapy has a positive effect on improving the mood and behavior of children with autism (13). Behavioral parenting intervention can reduce the emotional and behavioral disorders of children with autism (14).

Sandplay is a psychotherapeutic method on the principle of Jungian psychology. Based on image therapy, a therapist commonly creates a "space of freedom and protection" to child patients, who use sands and toys in image channels in a relaxed and respected environment (15). The child patients present images on a sand table and create conscious and unconscious images in their inner hearts. Therapists discover information hidden in images on the sand table and guide them. It is a gradual stimulating healing process and promotes personality development (16). Sand-table games play an important role in the intervention of children's behavior problems (17). The intervention of sand-table play can improve children's self-perception ability (18). Sand-table games combined with rehabilitation training significantly improve children's language delay (19).

The intervention for children with autism is particularly important. Current conventional clinical-intervention methods are effective; they are slightly boring and do not elicit children's interest in participating. Therefore, an intervention method suitable for children's characteristics is urgent to find. Sandbox game is an effective psychotherapy method for children. It has been proven to be positive for children's mental health. If proven to have a definite effect on children with autism, it may benefit the majority of them.

We performed a randomized controlled trial to provide a reference for rehabilitation interventions for children with autism.

## Methods

### Research objects

A total of 90 children with autism treated in the Children Health Center of Maternity and Child Care Centers in Changchun City, Jilin Province, China from Jan 2019 to Jun 2020 were enrolled by convenient sampling method.

The inclusion criteria were as follows: 1) conforming to diagnosis standards in the Diagnostic and Statistical Manual of Mental Disorders 5; 2)

aged 4–6; 3) guardian of child patients signed the informed consent. The exclusion criteria were as follows: 1) child patients with Rett syndrome, 2) patients with other non-developmental disorder-induced dysphonia, 3) complications of serious organic diseases, 4) children and parents who cannot comply with the research. A random-number table was used to divide the selected child patients into the control ( $n=45$ ) and observation ( $n=45$ ) groups. Two groups had no statistically significant differences in gender and age ( $P>0.05$ , Table 1).

This study was approved by the Ethics Committee of Northeast Normal University.

**Table 1:** Comparison of general information of the two groups

<i>Groups</i>	<i>Gender (male/female, cases)</i>	<i>Age (<math>\bar{x}\pm s</math>, yr)</i>
Observation group ( $n=45$ )	27/18	5.28 $\pm$ 0.81
Control group ( $n=45$ )	29/16	5.36 $\pm$ 0.74
<i>t/<math>\chi^2</math></i>	0.189	0.489
<i>P</i>	0.664	0.626

### Methodology

#### Image-sandplay therapy

A sandplay room was prepared with references to international standards. The room had two sand tables with white fine sand and more than 2,000 toys, including daily figures, animals, plants, grasses and flowers, military machines, etc. Some pot plants, desks, chairs, and sofa were provided in the sandplay room to form a safe, relaxed, and warm therapeutic environment. Psychological consultants who have practice experiences in sandplay therapy were available to provide one-to-one intervention to child patients. The intervention process of sandplay therapy was divided into three steps:

1) Initial stage: first, therapists established a trust relation with children and then introduced them to various settings in the room, the effect of sand table, and game rules. After the child patients became familiar with the environment in the room, uniform instructions were provided. These instructions included “Now, please put your hands into the sand table to feel the sands. Close your

eyes and then open them. You can play with toys you like on the shelf and place them on the sand table to play with them. You can make a world that you like or you can play as you want. OK?”

2) Creation stage of works: children stayed in a free and relaxed environment and made the sand table work with toys. Beforehand, the therapy emphasized that no comparison and no scoring of works would be conducted. Works can be any content and any scene. Therapists helped children work but did not interfere with their creative ideas. They recorded the preparation steps of children’s works, as well as their behaviors and the toys they used throughout the entire process.

3) Understanding and sharing stage of works: after sand-plate works were finished, therapists guided children, introduced their works, made deep communication with them, listening to their inner feelings, and observed the themes and connotations of their works. Moreover, they enabled the children to experience energy in their work according to potential conscious contents that were reflected by the works. They also provided

psychological guidance and psychological encouragement.

### *Implementation of interventions*

The observation group received 12-week image-sandplay therapy based on conventional rehabilitation therapy. In the image-sandplay therapy, one-to-one intervention in the sandplay therapy room was provided once a week for 60 min each time. The control group had only conventional rehabilitation therapy and maintained the original rehabilitation therapy courses, including the structured education, demonstration learning method, awards, and punishment therapy.

### *Quality control*

1) Research-design stage: a one-month pre-test was performed before the formal experiment to observe problems in the game and optimize them, which laid a foundation for the formal experiment. 2) Implementation stage of intervention: intervention personnel should have had experiences in sandplay therapy and passed the sandplay technological training. 3) Data acquisition and analysis phase: uniform instructions were applied and guidance based on tendency problems was prohibited. The quality of all collected questionnaires was checked promptly. Respondents were asked to refill in the questionnaire for any multiple-choice and missing data to ensure integrity and validity. Data input, check, and analysis was finished by two people together.

### *Measure tools*

The following indices of both groups were measured before and after the intervention.

1) Autism treatment evaluation checklist (ATEC) was compiled by the Autism Research Center of America. It covers four factors, including language, social contact, sensory perception, and behavior (20). The scores range from 0 to 179, and a higher score indicates more serious symptoms. The Cronbach's  $\alpha$  of ATEC is 0.89, and the construct validity (KMO) is 0.87.

2) Aberrant behavior checklist (ABC) covers 58 items, including language competence, athletic

ability, communication ability, sensibility, and self-care ability. It uses four-level scores, and a higher score represents more serious symptoms (21). The Cronbach's  $\alpha$  of ABC is 0.88 and KMO is 0.89.

3) Conners parent symptom questionnaire (PSQ) (22) has 48 items, which can be divided into conduct problem, learning problem, mind-body problem, impulsion-hyperaction, anxiety, and hyperaction index. A higher score indicates a more serious problem for the child. The Cronbach's  $\alpha$  and KMO of PSQ are 0.86 and 0.87, respectively.

4) Subjective Well-being uses a satisfaction with life scale (SWLS) (23) and positive and negative affect scale for children (PANAS-C) (24). SWLS has five items, each containing seven grades from "highly disagree" to "highly agree," which are evaluated by 1-7 scores. Cronbach's  $\alpha$  and KMO are 0.77 and 0.82, respectively. PANAS-C has positive (12 items) and negative (15 items) emotions. It uses the five-point scoring method. Cronbach's  $\alpha$  and KMO are 0.91 and 0.89, respectively.

### *Statistical analysis*

SPSS (Chicago, IL, USA) 22.0 software was applied for data analysis. Measurement data, observed as the normal distribution, were described as ( $\bar{x} \pm s$ ). Comparison used the pairwise (intragroup comparison) or intergroup (intergroup comparison) *t*-test. Enumeration data comparison used the  $\chi^2$ -test.  $P < 0.05$  indicated that differences with statistical significance.

## **Results**

### *Comparison of ATEC scores of the two groups before and after intervention*

Before intervention, the two groups showed no statistically significant differences in ATEC scores. After intervention, the ATEC scores of both groups declined ( $P < 0.05$ ). Moreover, the ATEC scores of the observation group after intervention were lower than that of the control group ( $P < 0.05$ ) (Table 2).

**Table 2:** Comparison of ATEC scores of two groups before and after intervention ( $\bar{x}\pm s$ , scores)

Groups	Timepoint	Language	Social contact	Sensory perception	Behavior	Total
Observation group (n=45)	Before	22.89±8.23	22.68±8.41	24.36±7.65	20.53±8.78	90.46±21.54
	After	17.56±7.64 <sup>ab</sup>	16.92±6.52 <sup>ab</sup>	16.12±5.47 <sup>ab</sup>	15.12±6.57 <sup>ab</sup>	65.72±16.24 <sup>ab</sup>
Control group (n=45)	Before	22.97±6.96	22.71±8.27	24.22±7.54	20.37±8.23	90.27±20.87
	After	20.21±6.23 <sup>a</sup>	19.12±7.55 <sup>a</sup>	20.57±6.21 <sup>a</sup>	17.89±6.75 <sup>a</sup>	77.79±17.65 <sup>a</sup>

Notes: Compared with the result of the same group before intervention, <sup>a</sup> $P<0.05$ ; compared with the control group after intervention, <sup>b</sup> $P<0.05$

### Comparison of ABC scores of the two groups before and after intervention

Before intervention, the two groups had no statistically significant differences in ABC scores. After intervention, the ABC scores of the two

groups declined ( $P<0.05$ ). Moreover, the ABC scores of the observation group after intervention were lower than that of the control group ( $P<0.05$ ) (Table 3).

**Table 3:** Comparison of ABC scores of the two groups before and after intervention ( $\bar{x}\pm s$ , scores)

Groups	Timepoint	Communication ability	Language competence	Self-care ability	Sensibility	Athletic ability	Total score
Observation group (n=45)	Before	15.12±4.25	20.51±6.54	20.89±6.74	12.46±3.74	13.12±4.21	82.10±18.76
	After	10.27±3.76 <sup>ab</sup>	15.23±5.78 <sup>ab</sup>	16.08±5.76 <sup>a</sup>	8.42±2.21 <sup>ab</sup>	8.89±2.23 <sup>ab</sup>	58.89±15.41 <sup>a</sup>
Control group (n=45)	Before	15.21±4.74	20.68±6.47	20.94±6.89	12.53±3.89	13.22±4.13	82.58±19.21
	After	13.24±4.12 <sup>a</sup>	18.24±6.24 <sup>a</sup>	18.21±6.14 <sup>a</sup>	10.36±3.25 <sup>a</sup>	11.34±2.89 <sup>a</sup>	71.39±16.28 <sup>a</sup>

Notes: Compared with the result of the same group before intervention, <sup>a</sup> $P<0.05$ ; compared with the control group after intervention, <sup>b</sup> $P<0.05$

### Comparison of PSQ scores of two groups before and after intervention

Before intervention, the two groups had no statistically significant differences in PSQ scores. After intervention, the PSQ scores of the two

groups declined ( $P<0.05$ ). Moreover, the PSQ scores of the observation group after intervention were lower than that of the control group ( $P<0.05$ ) (Table 4).

**Table 4:** Comparison of PSQ scores of the two groups before and after intervention ( $\bar{x}\pm s$ , scores)

Groups	Timepoint	Conduct problem	Learning problem	Psychosomatic disorder	Impulsion & hyperaction	Anxiety	Hyperaction index
Observation group (n=45)	Before	1.13±0.35	1.46±0.43	1.38±0.41	1.17±0.39	0.72±0.21	1.18±0.23
	After	0.78±0.24 <sup>ab</sup>	0.95±0.31 <sup>a</sup>	1.02±0.38 <sup>ab</sup>	0.75±0.21 <sup>ab</sup>	0.44±0.15 <sup>a</sup>	0.76±0.24 <sup>ab</sup>
Control group (n=45)	Before	1.15±0.32 <sup>a</sup>	1.48±0.45 <sup>a</sup>	1.36±0.43 <sup>a</sup>	1.21±0.42 <sup>a</sup>	0.74±0.22 <sup>a</sup>	1.21±0.25 <sup>a</sup>
	After	0.96±0.31	1.24±0.35	1.16±0.35	0.92±0.30	0.53±0.19	0.98±0.29

Notes: Compared with the result of the same group before intervention, <sup>a</sup> $P<0.05$ ; compared with the control group after intervention, <sup>b</sup> $P<0.05$

**Comparison of SWB scores of the two groups before and after intervention**

Before intervention, the two groups had no statistically significant differences in scores of satisfaction with life, positive emotion, and negative emotion. After intervention, the scores of satis-

faction with life and positive emotion of the observation group were significantly higher than that of the control group ( $P < 0.05$ ), but the scores of the negative emotion were lower ( $P < 0.05$ ) (Table 5).

**Table 5:** Comparison of SWB scores of the two groups before and after intervention ( $\bar{x} \pm s$ , scores)

Groups	Timepoint	Satisfaction with life	Positive emotion	Negative emotion
Observation group (n=45)	Before	22.36±4.51	40.67±11.23	29.12±7.65
	After	25.36±3.46 <sup>ab</sup>	44.36±8.58 <sup>ab</sup>	23.12±5.56 <sup>ab</sup>
Control group (n=45)	Before	22.21±4.25	39.65±10.17	28.56±6.27
	After	23.56±3.96	41.36±8.23	26.28±5.42

Notes: Compared with the result of the same group before intervention, <sup>a</sup> $P < 0.05$ ; compared with the control group after intervention, <sup>b</sup> $P < 0.05$

**Discussion**

Tables 1 and 2 show that after intervention, the ATEC and ABC scores of the observation group were lower than those of the control group, indicating that image-sandplay therapy can effectively promote symptom improvement in children with autism. This finding was similar to the report of McClain et al (25). Autism behavior is inhibited by sandplay game because it can stimulate multi-dimensional cerebral-cortex activities, activate innovative thinking, and promote the recovery of paranoid personality. The combination of 3-month sandplay game and music therapy can improve the recovery of social contact, language, and emotions of children with autism, thereby significantly improving their quality of life (26). The constructed image-sandplay therapy integrated the image dialogue into traditional sandplay and refined the experience content. The subconscious of child patients was projected by putting and making sand plates. Therapists can gain insight into the psychological characteristics of child patients through the images presented on the sand table. They can also acquire objective information and provide specific guidance according to the psychological cognitive-behavioral

theory. In this way, child patients can integrate deep individual-personality analysis of their self-growth power, thereby effectively improving their interpersonal relation sensitivity, alleviate their paranoia, and mitigate their impulsion and attacking behaviors. Consequently, symptoms are relieved.

Table 3 shows that the observation group had lower scores in conduct problem, learning problem, psychological disorder, hyperaction-impulsion, anxiety, and hyperaction index in the PSQ compared with the control group after intervention. This finding proved that image-sandplay therapy can promote the mental health of children with autism, similar to previous reports (27). In the sandplay game, therapists created a supporting, safe, warm, concerned and empathetic space for child patients. Child patients perceived that they were accepted and established a good trust relationship with the therapists, which were beneficial for them to release their inner conflict, anxiety, and other negative emotions and thus improving their psychological state. Game therapy can activate the cerebral nervous system of child patients, which improves their emotions and attentions (28). Sandplay therapy can lower the PSQ scores (mind-body

problems, depression, and anxiety) of child patients and address problems in their psychological behavior (29). These findings supported the present results, indicating that sandplay is beneficial to promote the mental health of children. Sandplay therapy is characteristic of weak language, and child patients promote the development of integration power through the effective guidance of therapists. Considering that children with autism are not good at linguistic expression, sandplay therapy does not depend on linguistic communication between children and therapists. Instead, therapists can recognize problems reflected by sandplay works and provide specific psychological guidance. Moreover, therapists can accept and tolerate child patients unconditionally and help them release negative emotions and recover from psychological trauma gradually, thereby relieving psychological disorders. As a result, sandplay can correct the psychological behavior of children with autism and be a feasible and effective method of promoting mental health.

Table 4 shows that the observation group had higher scores of satisfaction with life and positive emotions than the control group after the intervention but lower scores of negative emotions. This finding indicated that image-sandplay therapy increased the SWB of children with autism, similar to the report of Mathew et al (30). SWB reflects the overall evaluation of individuals with their life conditions and comprises satisfaction with life, positive emotional experiences, and negative emotional deficiency. A higher satisfaction degree with the overall life corresponds with more positive emotions perceived and less negative emotions developed. Hence, individuals have a stronger experience of happiness. SWB is also an important comprehensive psychological index to measure quality of life of individuals. The personality behavior and mental health of children are correlated with SWB (31). Image-sandplay therapy can encourage children to find power for self-growth, facilitate the integration of deep personalities, and improve symptoms in interpersonal relation sensitivity, paranoia, and attacking behaviors, as well as their psychological state. Im-

age-sandplay therapy can increase SWB. Sandplay therapy is conducive to increasing the SWB of children (32). Sandplay therapy can trigger the imagination of children and self-potential, thereby increasing the SWB (33). These findings all agree with the research results in the current study.

## Conclusion

Image-sandplay therapy can effectively improve the symptoms of children with autism and inhibit autistic behavior. It is also conducive to promoting mental health and increasing the SWB. Sandplay therapy provides child patients with relaxed and pleasant game time during their tedious rehabilitation therapy. Image-sandplay therapy can be easily accepted by children and is a rehabilitation therapy worthy of promotion.

## Ethical considerations

Ethical issues (Including plagiarism, Informed Consent, misconduct, data fabrication and/or falsification, double publication and/or submission, redundancy, etc.) have been completely observed by the authors.

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## Conflict of interest

The authors declare that there is no conflict of interest.

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