Effectiveness of Recreational play program on Social Withdrawal Behavior among Children with Autism

[1] Nora Abd El Hakeem Omar, [2] Ghada Mohamed Mourad &[3]Naglaa Fathi Mohamed Elattar

[1] Assistant Lecture of Psychiatric Nursing & Mental Health, Faculty of Nursing, Sohage University., Egypt.

[2] Professor of Psychiatric Nursing & Mental Health, Faculty of Nursing, Ain-shams University, Egypt.

[3] Assistant Professor of Psychiatric Nursing & Mental Health, Faculty of Nursing, Benha University. Egypt.

Corresponding author email Email**: Mostafa.zaglol.kobise@gmail.com**

Phone number: *002-01157751196*

Abstract

Background: Participation in recreation activities is an important contributor to increase social relationships and acceptance, acquire skills for accessing the community**. Aim of the study:** to evaluate the effectiveness of a recreational play program on social withdrawal behavior among children with autism. **Design:** A quasi-experimental design was utilized in this study. **Setting:** The study was conducted at outpatient clinic at psychiatric health hospital at Benha city, Kaluobia Governorate. **Sample:** A purposive sample consisting of 60 children with autism **Tools:** In this study tools were used for data collection: **Tool (I):** A semi-structured interviewing questionnaire included socio-demographic data and knowledge about recreational play activities. **Tool (II)** Social withdrawal behavior scale, for children with autism. **Results:** The main finding of this study indicated that there was an increase in knowledge level and there was highly statistically significant post program implementation among studied autism children, there was highly statistically significant difference for the studied children's total social withdrawal behavior pre and post program implementation and there was high and there was correlation between the total score of the knowledge about recreational activities and the total scores of social withdrawal behavior. **Conclusion:** Recreational play program had positive effect on reducing social withdrawal behavior. **Recommendations:** Recreational play activities should be an integral part of treatment program of autistic children.

Key words; Children with autism, Recreational play program, Social withdrawal.

Introduction

Autism spectrum disorder (ASD) is a complex brain development disorder marked by repetitive activities, as well as social and communication difficulties. Autism is referred to be a "spectrum" disorder since the types and intensity of symptoms experienced by individuals differ greatly. The wide range of symptoms associated with ASD makes its diagnosis a difficult task. ASD affects people of all ethnic, racial, and socioeconomic backgrounds. Despite the fact that ASD is a lifelong illness, studies have shown that early detection and appropriate medical care can enhance a person's long-term outcomes *Mujeeb Rahman & Subashini, (2022).* ASD children are characterized by permanent weakness in mutual social communication between children. The severity and nature of social disability varies according to the age and level of development of the child, but this disability exists from very early childhood and impairs performance at home, at school, and in the community. Because there is a range of presentations depending on the extent of development and chronological age, the term 'spectrum' is used. Weakness persists throughout life. In addition, some clinical features may change through development, so the condition is dynamic rather than static *Harris & Coyle, (2023).*Sports and entertainment may develop the social and emotional skills of children with autism, help them think in healthy ways, increase their language or communication skills, use play methods using recreational games and communicate with other children. And sometimes, incredibly, too, exercise and recreational play can allow parents to take an active role in the growth and development of a child with a pervasive developmental disorder (PDD). Sports and recreation can be exercised for the parents, and over time, parents can come to treat their children while building a stronger and more rewarding bonding relationship. *Swarnakumari & Sankar,(2021).*

Recreational play programs for children with ASD may be beneficial in overcoming social skills deficiency and increasing social interaction. Groups of recreational sports activities which are specific to children with ASD and which include treatment and entertainment are not only an effective method for the development of physical capacities of children but also for changing their behavior *Koçak Uyaroğlu, et al.,(2021).*

Significance of the study

The prevalence of autism spectrum disorder, which is most often identified in early childhood, is increasing year by year. And as the report published by the Centers for Disease Control and Prevention (CDC) states, 1 in 54 children is born with a risk of developing

autism spectrum disorder **Maenner et al., (2020).**

In every society the prevalence of children with autism spectrum disorder (ASD) is increasing. The final reports indicated that the prevalence of ASD affects 1 in 36 children, with an increased rate of diagnosis in male children in the United States of America. The prevalence of ASD in Europe is increasing rapidly, due to the rise in awareness of autism and thus the increased likelihood of being diagnosed with the condition. Findings suggest around 700,000 individuals have ASD in the UK, including 1/100 children with autism *Maenner, (2023).*

In Arab societies, the prevalence of autism varies from 1.4 cases per 10,000 children in the State of Oman to 29 cases per 10,000 children in the United Arab Emirates. Moreover, in Arab societies several influences may contribute to lower incidences of autism. Sometimes it is a given that a child with autism is appropriately diagnosed, because pediatricians are fairly novice in diagnosing and managing psychiatric disorders. In general, there are few psychiatrists who identify childhood developmental problems in the Middle East. In Egypt, the prevalence of autism has reached approximately 1:160 children with autism in Egypt, according to the Ministry of Social Solidarity. *Mansour & Gobrial, 2022; Zoromba et al.,(2022).*

Aim of the study

This study aimed was to evaluate the effectiveness of a recreational play program on social withdrawal behavior among children with autism.

Hypothesis of the study

The recreational play program had a positive effect on reducing social withdrawal behavior among children with autism

Subject and methods

Research design

A quasi-experimental pre-posttest nonequivalent group design was utilized in the current study.

Setting

This study was conducted at the out- patient child psychiatric clinic at out-patient child psychiatric clinic at the Psychiatric Mental Health Hospital at Benha city, Qaluobia Governorate which is affiliated to general secretariat of mental health. It has two building six department (5 female and 1 male), with a capacity of 219 beds. Also, there are six outpatient clinics include two psychiatric clinic, addiction clinic, children clinic, epilepsy clinic and old age clinic. Children clinic works on Monday and Wednesday every week from 9 am to 12 am.

Sample

A purposive sample consisting of 60 autism children who fulfilled the following criteria: age

(6-12) years, mild level of autism. Exclusion criteria: Mentally retarded children and excited children.

Tools of data collection

In order to achieve the aim of the study the following tools were being used:

Tool one: demographic data Sheet:

Semi-Structured interview questionnaire was developed by investigators based on scientific review of literature which consist of two parts:

Part I: Autistic child socio-demographic data sheet. It was concerned with the characteristics of autistic children. The data included sex, age, residence, have siblings, number of siblings, child ranking in the family, receiving education, the place of learning, child live with.

Part II: parents socio-demographic data: It included marital status of parents, father's education, fathers' job, type of father job, mother's education, mother's job, type of mother's job, previous family history of autism spectrum disorders, contagious relationship, sibling with autism ect.

Part III: It was concerned with knowledge autism children about recreational play activities. The data included know recreational play activities, like recreational play activities, play recreational play activities before, feel happy when practice the recreational play activities, change in feeling after playing recreational activities, increase cooperation with peers after recreational play activities, feel happy while playing recreational play activities, want to win in recreational play activities, win in recreational play activities before, help peers to win in recreational play activities**,** take a reward in recreational play activities before, previous participation for recreational play activities, numbers of participation, types of favorite participated recreational activities, feeling during play recreational activities, feeling after play recreational activities and type of motivation /rewards needed after winning in recreational activities.

Tool two - Social withdrawal behavior scale for children with autism:

This scale was developed by *Ghoneim,(2019)*. It was an Arabic inventory scale for children with autism. It consists of 12 a Likert scale items to assess social withdrawal behavior among children with autism.

Scoring system of social withdrawal behavior scale for children with autism

The scoring system for this tool includes a three-point rating scale which provides a range of three response. The three-point scale as the following; never = 1, sometimes = 2& always=3. The total scoring system ranged from 12 to 36 degrees. The higher degree indicated high social withdrawal behavior

Content validity of the tools

The tools were reviewed for appropriateness of items and measuring the concepts through 5 experts in psychiatric & mental health nursing and pediatric nursing to test the content validity. Modifications of the tools done according to the panel judgment on the clarity of sentences, appropriateness of content and sequence of items.

Reliability of the tools

The study tools were tested for its internal consistency by Cronbach's Alpha. Reliability of interviewing questionnaire is 0.87 and social withdrawal behavior scale is 0.89.

Ethical considerations

Approaches to ensure the ethical issues were considered in the study regarding confidentiality and informed consent. Confidentiality was achieved by the use of locked sheets without names of the participants and replaced by numbers. All the participants were informed that the information they provided during the study would be kept confidential and used only for statistical purpose and after finishing the study. Each parent was informed that participation in the study was voluntary, and had the right to withdraw from the study at any time.

Pilot study

A pilot study conducted to test the applicability of the instruments, the feasibility of the study and estimate the time needed for collecting the data. It was conducted on 10% of the total sample (6 children) from outpatient of Psychiatric Mental Health hospital according to the selection criteria. All children participated in the pilot study excluded from the study sample.

Filed work

The investigator started data collection by introducing himself to the studied children and the purpose of the study was simply explained to the parents who agree to participate in the study. Each participant interviewed and assessed individually. Each child was handed the questionnaire and answered it under observation of the investigator. The first Tool:(Semi structured interviewing questionnaire) and the second tool: (Social withdrawal behavior for autism children. The pre-test was collected from each subject every two days/week and collected from 4 to 6 patients per weeks, took two and half months for collected pretest started from the beginning of **October 2021 to the middle of December 2021**. Then implementation of recreational program for autism children who met the previously mentioned inclusion criteria during the study period. The researcher divided children into 6 equal subgroups; each subgroup contained 10 children attended a total 15 sessions, sessions implemented for 60-120 minutes two sessions per week. Each subgroup took 6 weeks and a day. The researcher worked with two groups alternately each week. The total number of weeks were 14 weeks, which was equivalent to 4 months.

The recreational play program consisted of:

Theoretical part: This part consisted of four sessions, as well preliminary session and summary session. Preliminary session aimed to spread the spirit of affection between researcher and autism children, explained to parents of autism children nature of the program, purpose, expected outcomes, schedule, content of program. Other sessions aimed to give brief and simple overview about autism spectrum disorder, types of recreational activities, importance of recreational activities on autism children and effects of recreational activities on reducing social withdrawal and stereotype behavior among autism children.

Practical part: This part consisted of 10 sessions. Every session lasted 60-120 minutes, two session per week. Every session divided into three parts. Part I: lasted 5-10 minutes, included physical and psychological preparation for autism children, warm up and stretching exercise and enthusiasm children for active positive participation in recreational games. Part II lasted 40-100 minutes, children trained on recreational games and practice it. Part III lasted 5-10 minutes, where session concluded in addition to relaxation exercise (take deep breathing), gave reinforcement (greeting, clipping, drink juice, candy, chocolate, toys, singing a song).

Statistical analysis

Upon completion of data collection, the collected data organized, tabulated and statistically analyzed using Statistical Package for Social Science (SPSS) version 25 for windows, running on IBM compatible computer. Descriptive statistics were applied (numbers, percentages, mean and standard deviation). Test of significance, Chi-square test (χ^2) this test used to compared for qualitative variables and correlation coefficient (r) were done for assessment of inter relationship among quantitative variables that were normally distributed or when one of the variables is qualitative, these tests were applied to test the study hypothesis. Reliability of the study tools was done using Cronbach's Alpha. A highly significant level value was considered p- value $\leq$ 0.001, significant level value was

Results

Table (1): Shows that, more than three quarters (78.3 %) of the studied children were male, less than half (48.3 %) of them aged 6 < 8 years with mean age (**7.983±2.062**) years old and less than three quarters (71.7 %) of them were from urban areas. Also, most (93.3%) of the studied children had siblings, more than one third (34.0%) of them had two siblings, most of them (91.7 %) of them received education and less than two thirds

(63.6%) of them learned at Specialized Center for Autism.

Figure (1): Shows that, ٦٥.٠% of the studied children had unsatisfactory level of total knowledge at pre- program implementation compared with, 68.3 % of them had satisfactory level of total knowledge at post- program implementation about recreational play activities. Moreover, there was highly statistically significant difference for the studied children's total knowledge about recreational play activities pre and post program implementation (P, ≤ 0.001).

Figure (2): Clarifies that, 71.7 % of the studied children had high level of total social withdrawal behavior at pre-program implementation, which improved to be 46.7 % of them had low level of total social withdrawal behavior post-program implementation. Moreover, there was highly statistically significant difference for the studied children's total social withdrawal behavior pre and post program implementation (P, ≤ 0.001).

Table (2): Reveals that, there was highly a statistically significant relation between total studied children's' knowledge and their age pre and post program implementation at (P= ≤ 0.001), while, there was a statistically significant relation between total studied children's knowledge and their gender & receiving education pre and post program implementation at (P= ≤ 0.05).

Table (3): Shows that, there was highly a statistically significant relation between total studied children's social withdrawal behavior and their age pre and post program implementation at (P= ≤ 0.001), while, there was a statistically significant relation between total studied children's social withdrawal behavior and their gender & receiving education pre and post program implementation at (P= ≤ 0.05).

Table (4): Clarifies that, there were highly statistical positive correlation between total level of the studied children' social withdrawal behavior behavior at pre and post program implementation at (P= ≤ 0.001) While, there were highly statistical negative correlation among total level of the studied children' knowledge and their total social withdrawal behavior at pre and post program implementation at (P= ≤ 0.001)

Results

Table (1): Socio-demographic characteristics of the studied autism children (n=60).

Socio-demographic characteristics	No.	%
Sex		
Male	47	**78.3**
Female	13	21.7
Age (Years)		
6 < 8 years	29	**48.3**
8 < 10 years	18	30.0
10 ≤12 years	13	21.7
Mean ±SD 7.983±2.062		
Residence		
Rural	17	28.3
Urban	43	**71.7**
Presence of sibling		
Yes	56	**93.3**
No	4	6.7
Number of sibling (n=56)		
One	12	21.4
Two	19	**34.0**
Three	13	23.2
Four	٧	12.5
Five or more	5	8.9
Enrolling education		
Yes	55	**91.7**
No	5	8.3
The place of learning (n= 55)		
Specialized Center for Autism	35	**63.6**
Private School	8	14.6
Kindergarten	6	10.9
Integrate school	6	10.9

Figure (1): The total knowledge level about recreational play activities pre and post program implementation (n = 60)
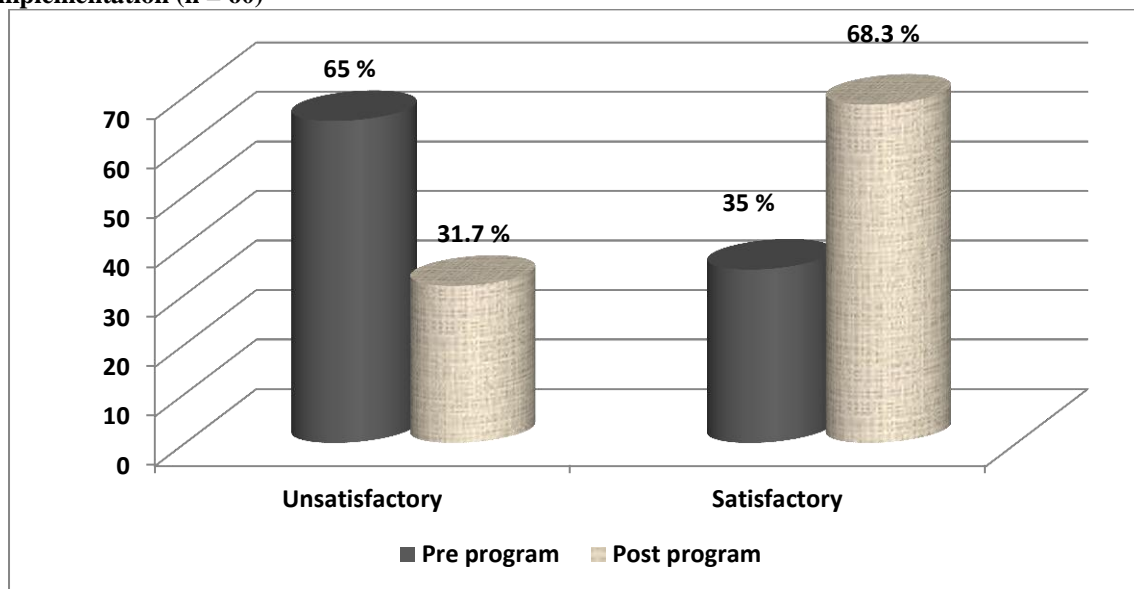

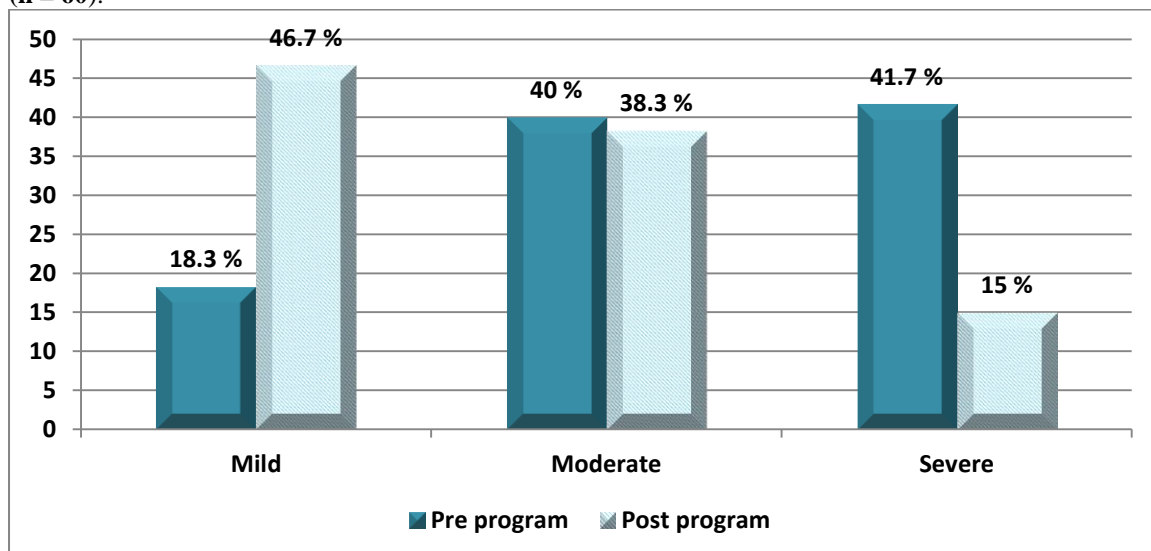**Figure (2): The total level of social withdrawal behavior score pre and post program implementation (n = 60).**

Table (2): Relation between total knowledge and demographic characteristics among the studied children pre and post-program implementation (n=60).

Socio demographic characteristics	Pre						Post					
	Unsatisfactory (n=39)		satisfactory (n=21)		X^2	p-value	Unsatisfactory (n=19)		satisfactory (n=41)		X^2	p-value
	No.	%	No.	%			No.	%	No.	%		
Sex												
Male	27	69.2	20	95.2	5.440	0.017*	11	57.9	36	87.8	6.844	0.013*
Female	12	30.8	1	4.8			8	42.1	5	12.2		
Age (Years)												
6 ≤8 years	27	69.2	2	9.5	20.107	0.000**	17	89.5	12	29.3	18.861	0.000**
8 ≤ 10 years	8	20.5	10	47.6			1	5.3	17	41.5		
10≤12 years	4	10.3	9	42.9			1	5.3	12	29.3		
Receiving education												
Yes	5	12.8	0	0.0	4.937	0.019*	5	26.3	0	0.0	11.770	0.002*
No	34	87.2	21	100.0			14	73.7	41	100.0		

Table (3): Relation between total social withdrawal behavior and demographic characteristics among the studied children pre and post-program implementation (n=60).

Socio-demographic characteristic	Pre								Post								
	Mild (n=11)		Moderate (n=24)		severe (n=25)		X^2	p-value	Mild (n=28)		Moderate (n=23)		Severe (n=9)		X^2	p-value	
	No.	%	No.	%	No.	%			No.	%	No.	%	No.	%			
Gender																	
Male	11	100.0	20	83.3	16	64.0	6.422	0.040*	26	92.9	17	73.9	4	44.4	9.835	0.007*	
Female	0	0.0	4	16.7	9	36.0			2	71.1	6	26.1	5	55.6			
Age (Years)																	
6 ≤8 years	2	18.2	7	29.2	20	80.0	18.245	0.001**	4	14.3	16	69.6	9	100.0	27.321	0.000**	
8 ≤ 10 years	5	45.5	9	37.5	4	16.0			13	46.4	5	21.7	0	0.0			
10≤12 years	4	36.4	8	33.3	1	4.0			11	39.3	2	8.7	0	0.0			
Residence																	
Rural	4	36.4	3	12.5	10	40.0	4.988	0.083	7	25.0	9	39.1	1	11.1	2.788	0.248	
Urban	7	63.6	21	87.5	15	60.0			21	75.0	14	60.9	8	88.9			
Have sibling																	
Yes	2	18.2	0	0.0	2	8.0	4.130	0.127	2	7.1	2	8.7	0	0.0	0.805	0.669	
No	9	81.8	24	100.0	23	92.0			26	92.9	21	91.3	9	100.0			
Receiving education																	
Yes	0	0.0	0	0.0	5	20.0	7.686	0.022*	0	0.0	1	4.3	4	44.4	13.387	0.002*	
No	11	100.0	24	100.0	20	80.0			28	100.0	22	95.7	5	55.6			

Table (4): Correlation between total knowledge, social withdrawal behavior among the studied children pre and post program implementation.

Scale	Total knowledge	
	pre-program	post-program
Total knowledge	-	-
	-	-
Total social withdrawal	- 0.752	- 0.699
	0.000**	0.000**

Discussion

In recent years, the international community witnessed tremendous positive improvements in public awareness and public health response for autism. Among the benefits are the significant improvements in early identification of the condition, which in part, accounts for higher prevalence rates over time. In parallel, epidemiological estimates have been increasing worldwide, especially in previously under-represented regions such as Africa and the Middle Eastern region *Al-Mamari et al., (2019; Alshaban et al., (2019).*

According socio-demographic characteristics of the children with autism, the current study result showed that less than half of them were at age group ranged between 6 less than 8 years, the mean of their age was 7.983±2.062 years old, regarding child sex, more than three quarters of the studied children were male. While the rest of them were female, this result may be due to the fact that male sex is one of the most well-established etiological factors for autism, giving rise to the notion of a "female protective effect," where females would require greater etiologic load to manifest the same degree of affectedness as males.

In relation to Residence, results of the present study revealed that, about less than three quarters of them were from urban areas. This result could be attributed to the technology, parents busy from children due to works and left them for long time front televisions and mobile. These findings support the notion that urbanization is a risk factor for autism. This finding agreed with *Longtin & Principe, (2016)* who studied " The relationship between poverty level and urban African American parents' awareness of evidence-based interventions for children with autism spectrum disorders: Preliminary data" who reported study participants were living in urban African American children with ASD. At same line result supported by *Wu & Jackson, (2017)* who study" Inverse relationship between urban green space and childhood autism in California elementary school districts" who stated that urban areas were positively associated with autism rate. Also, *Garcia & Odahowski, (2023)* Who study " An urban versus rural comparison of obesity between youth with and without autism spectrum disorder" who revealed that most of youth with ASD were living in urban areas.

Regarding to sibling, result of the present study revealed that, most of the studied children had siblings, more than one third of them had two siblings. This result disagreed with *Longtin & Principe, (2016)*, who studied " The relationship between poverty level and urban African American parents' awareness of evidence-based interventions for children with autism spectrum disorders: Preliminary data" who stated that more

than two third of them had one sibling. At same line the result disagreed with *McVey et al., (2023)*, who studied "Examining clinical characteristics of autism and links with parent perceptions of sibling relationship quality" who reported that less than three quarters of them had one sibling. Based on the result of the present study, most of them received education. This result consisted with study with *Huang &Kang, (2021)*,It was entitled " Participation in play and leisure activities of young children with autism spectrum disorder and typically developing children in Taiwan: A preliminary study" who stated that most of them received education Concerning to the place of learning, less than two thirds of them learned at Specialized Center for Autism. This result may be due to need of autism children specific care and specific teaching suitable to their abilities. This finding supported by *Hasnain & Akter (2014)*, It was entitled " The relation of socio-economic factors with autism among children: a study in an urban area of Bangladesh" who revealed that more than half of them were first born Regarding total knowledge level about recreational play activities, less than three quarters of studied children had satisfactory level of total knowledge at post- program implementation about recreational play activities. this result may be due to effectiveness of program to learn children about recreational actives as therapeutic recreational activities.This finding supported with study *Younas, et al., (2022)*, It was entitled " Factors Associated with the Participation of Children with Autism Spectrum Disorder in Leisure Activities" who showed that children with ASD showed willingness to take part in different leisure activities. It is however, important to note that their participation in such activities differ and varied by the types of activities. It was identified that different personal factors such as the family's socioeconomic status, health issues, family pressure, job responsibilities, gender, lack of training and age affect their participation. Concerning, total score for social withdrawal behavior scale, indicates that, more than three quarters of the studied children had high level of social withdrawal behavior at pre-program implementation, which improved to be near half of them had low level of social withdrawal behavior post-program this result may be due to t can be said that therapeutic recreation has an important role in increasing the social skills of children with ASD. This finding is consistent with *García-Villamizar et al. (2017)*, it was entitled " Effects of therapeutic recreation on adults with ASD and ID: a preliminary randomized control trial" who stated in their studies that therapeutic recreation has an indirect effect on the social skills of individuals with ASD. Also, *Pan &Chen*

(2014), who studied " Chinese medical tourists– Their perceptions of Taiwan" who investigated the effects of therapeutic swimming on the social behaviors of children with ASD and revealed that the program consisting of 10 sessions was effective on social behaviors.

According to the relationship between total knowledge and age and sex. The result revealed that, there was a statistically significant relation between total studied children's' knowledge and their gender & receiving education pre and post program implementation. This result may be due to when child become older and receive education this help them to increase level of knowledge of children.

The current study demonstrated that there was highly a statistically significant relation between total studied children's' knowledge and their age post program implementation. This result supported by study *Lin Li-Xin et al., (2021)*, entitled " Effects of Physical Exercise in Ameliorating Symptoms of Children with Autism in China: A Meta-Analysis" stated that he results of current research illustrated that exercise interventions were effective for the treatment of childhood autism.

The current study reported that there were a highly statistical positive correlation between the total knowledge and total social withdrawal behavior at pre and post program implementation. This study may be due to a positive effect of a program on reducing social withdrawal and stereotype behavior. Because of diversity and variety of activities of recreational program and continuity in performance exercise, which help autism children to acquisition new skills to help them to cooperate during a program.

Based on finding of the present study, there were highly statistical negative correlation among total level of the studied children' knowledge and their total social withdrawal behavior at pre and post program implementation. This result may be due to the more increase level of knowledge of recreational play thus make social withdrawal behavior improve and decrease.

The current study reported that there were a highly statistical positive correlation between the total knowledge and total social withdrawal behavior. Because of diversity and variety of activities of recreational program and continuity in performance exercise, which help autism children to acquisition new skills to help them to cooperate during a program.

This result supported by **(Lin,2020)** study entitled "Activity participation and sensory processing patterns of preschools-age children with autism spectrum disorder " reported that Children with ASD had significantly lower scores on participation diversity in activities across areas of play, physical recreation, and social activities and higher scored in each of four sensory quadrants.

For children with ASD, participation in social activities was significantly negative correlated with SSP-2 quadrant scores

Conclusion

From the result of the present study, one can conclude that:

The finding of the present study indicate that recreational play program had positive effect on reducing social withdrawal behavior among autism children. This led to the acceptance of the study hypothesis that social withdrawal behavior undergoing recreational play program has showed better enhancement in recovery. There was improvement in the total scores of knowledges of recreational play and social withdrawal behavior among autism children.

Recommendations

Based on the previous findings and conclusion of the present study the following recommendations were suggested:

❖ Develop therapeutic recreation programs for children with autism including different activities as swimming and riding horse

❖ Implementation of counseling session for parents to increase family awareness about warning signs of ASD for early detection and early intervention.

❖ Conducting practical training programs for members of the families have children with autism spectrum disorder focuses on behavior modification techniques.

References

1. **Al-Mamari, W., Idris, A., Dakak, S., al-Shekaili, M., al-Harthi, Z., Alnaamani, A., Alhinai, F., Jalees, S., al Hatmi, M., el Naggari, M., & Islam, M. (2019):** Revisiting the prevalence of autism spectrum disorder among Omani children: A multicentre study. Sultan Qaboos University Medical Journal, 19(4), e305.

2. **Ghoneim, M., (2019):** Effectiveness of a program based on applied behavior ABA in reducing the degree of withdrawal behavior of a sample of children with autism spectrum disorder. Scientific Journal of faculty of education, Assuit university.35(2) 318-344.

3. **Garcia, J., & Odahowski, C. (2023):** An urban versus rural comparison of obesity between youth with and without autism spectrum disorder. *Autism Research*, *16*(1), 200-207.

4. **García-Villamisar, D., Dattilo, J., & Muela, C. (2017):** Effects of therapeutic recreation on adults with ASD and ID: a preliminary randomized control trial. *Journal of Intellectual Disability Research*, *61*(4), 325-340.

5. **Hansen, S., Blakely, A., Dolata, J., Raulston, T., & Machalicek, W. (2014):** Children with autism in the inclusive preschool classroom: A systematic review of single-subject design interventions on social communication skills. Review Journal of

Autism Developmental Disorders, 1, 192–206. doi:10.1007/s40489-014-0020-y.

6. **Harris, J., & Coyle, J. (2023):** Autism spectrum disorder. In Neurobiology of brain disorders (pp. 69-88). Academic Press. http://dx.doi.org/10.1016/B978-0-12-398270-4.00006-9.

7. **Huang, C., & Kang, L. (2021):** Participation in play and leisure activities of young children with autism spectrum disorder and typically developing children in Taiwan: A preliminary study. *International Journal of Environmental Research and Public Health*, *18*(11), 5787.

8. **Koçak Uyaroğlu, A., Ertüzün, E., & Taş Arslan, F. (2021):** The effect of the therapeutic recreation program for children with autistic spectrum disorder on their social skills. *Baltic Journal of Health and Physical Activity*, *13*(7), 3.

9. **Lin, L. (2020):** Activity participation and sensory processing patterns of preschool-age children with autism spectrum disorder. *The American Journal of Occupational Therapy*, *74*(6), 7406345010p1-7406345010p7.

10. **Li-Xin, L., Hua-xuan, L., & Bik-Chu, C. (2021)**: Effects of Physical Exercise in Ameliorating Symptoms of Children with Autism in China: A Meta-Analysis. *European Journal of Scientific Research*, *159*(2), 6-12.

11. **Longtin, S., & Principe, G. (2016):** The relationship between poverty level and urban African American parents' awareness of evidence-based interventions for children with autism spectrum disorders: Preliminary data. *Focus on Autism and Other Developmental Disabilities*, *31*(2), 83-91.

12. **Maenner, M. (2023)**: Prevalence and characteristics of autism spectrum disorder among children aged 8 years—Autism and Developmental Disabilities Monitoring Network, 11 sites, United States, 2020. MMWR. Surveillance Summaries, 72.

13. **Maenner, M., Shaw, K., Bakian, A. , Bilder, D., Durkin, M., Esler., & Cogswell, M. (2020)**: Prevalence and characteristics of autism spectrum disorder among children aged 8 years—autism and

developmental disabilities monitoring network, 11 sites, United States, 2018. MMWR Surveillance Summaries, 70(11), 1-16. http://dx. doi: 10.15585/mmwr. ss7011a1.

14. **Mansour, V., & Gobrial, E. (2022):** Special Education Practices for Children with Autism Spectrum Disorders in the UK and Egypt. *International Journal of research in Educational Sciences.*, *5*(1), 63-90.

15. **McVey, A., Liu, Q., Bedford, S. , Zaidman-Zait, A., Szatmari, P., Smith, I., & Kerns, C. (2023):** Examining clinical characteristics of autism and links with parent perceptions of sibling relationship quality. *Autism*, *27*(2), 309-320.

16. **Mujeeb Rahman, K., & Monic Subashini, M. (2022):** Identification of autism in children using static facial features and deep neural networks. Brain Sciences, 12(1), 94.

17. **Swarnakumari, P., & Sankar, R. (2021):** Spoerts and recreation for sankar pervasive development disorders (PDD). *Ilkogretim Online*, *20*(4).

18. **Longtin, S., & Principe, G. (2016):** The relationship between poverty level and urban African American parents' awareness of evidence-based interventions for children with autism spectrum disorders: Preliminary data. *Focus on Autism and Other Developmental Disabilities*, *31*(2), 83-91.

19. **Younas, H., Bashir, R., & Ashraf, S. (2022):** Factors Associated with the Participation of Children with Autism Spectrum Disorder in Leisure Activities. Sustainable Business and Society in Emerging Economies, 4(2), 639-646.

20. **Wu, J., & Jackson, L. (2017):** Inverse relationship between urban green space and childhood autism in California elementary school districts. Environment international, 107, 140-146.

21. **Zoromba, M., El-Gazar, H., Loutfy, A., El-Sheikh, O., & El-Monshed, A. (2022)**: Autistic Severity and Psychiatric Comorbidity among Children with Autism Spectrum Disorder. *Port Said Scientific Journal of Nursing*, *9*(1), 283-307.