



The Effect of a Group-Based Play Therapy on Executive Function, Working Memory and Self-Efficacy in Children with ADHD

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Abstract

Introduction: Group play therapy teaches children conflict resolution skills, which can enhance their cognitive abilities and help manage psychological conflicts, ultimately resulting in an enhanced quality of life.

Objective: Hence, current study aims to explore the effects of group-based play therapy on executive function, working memory, and self-efficacy in children with ADHD.

Methods: This study employs a quasi-experimental research design with a pre-test-post-test design in Tehran in 2023. A sample of 40 children with ADHD (mean age = 9.66 years) was selected using convenience sampling and were randomly allocated to experimental or control group. The experimental group engaged in group-based play therapy sessions, consisting of 10 sessions held twice a week. Data was collected using standard test and questionnaire. The data was analyzed by SPSS software version 26 using a t-test and ANCOVA.

Results: No significant differences were between groups in terms of age ($P=0.752$), height ($P=0.910$), weight ($P=0.803$) and BMI ($P=0.588$). The posttest results revealed a significant difference between groups in terms of executive function ($F=12.58$, $P<0.001$), working memory ($F=15.48$, $P<0.001$) and self-efficacy ($F=6.09$, $P<0.001$). Here, group play group showed better scores in terms of executive function, working memory and self-efficacy in the posttest than the control group.

Conclusions: These results suggest that play therapy can play a crucial role in enhancing the cognitive and psychological health of children with ADHD. Therefore, it is highly advised that physical education teachers and professionals consider incorporating play therapy to help alleviate ADHD symptoms in children.

Keywords: Play Therapy, Cognition, Self-Efficacy, ADHD, Child

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1. Introduction

Attention-deficit/hyperactivity disorder (ADHD) is a behavioral inhibition disorder that encompasses difficulties in waiting, refraining from responding, or failing to react to various stimuli (1,2). ADHD is a prevalent and chronic disorder characterized by inappropriate levels of developmental activity, low tolerance for deprivation, an inability to sustain attention and concentration, impulsive and disorganized behaviors, as well as confusion (3). This disorder has garnered significant attention from the public, scientific community, and clinicians in recent years. It is a frequently diagnosed neurodevelopmental disorder in children and adolescents, often leading to referrals to psychiatrists and pediatricians. Systematic reviews have indicated a wide range of prevalence rates for ADHD, varying from 1 to 21 percent. In the United States, the prevalence rate stands at approximately 7%, while internationally it ranges from 1 to 19% (4,5). However, most reports emphasize a prevalence rate of 0 to 5% for this disorder. Furthermore, the prevalence of ADHD differs based on gender, with boys exhibiting a higher prevalence rate compared to girls in the

general population (approximately 0:2), and in clinical cases, the ratio ranges from 6:2 to 9:2 (1,3,5).

Children with ADHD exhibit a significant deficiency in executive function, resulting in numerous challenges in terms of planning, purposeful behavior, and communication both at school and at home (2,6). This disorder falls under the category of executive function and working memory disorders. Extensive research has revealed that children with ADHD tend to be impulsive, taking risks without much thought or thorough investigation. They often engage in actions without a clear purpose, driven by impulsivity (3,4,7,8). Additionally, these children struggle with limited adaptability in social relationships. Executive functions encompass cognitive control skills, which are vital for self-regulation. These functions include attention shifting, problem-solving, planning, inhibition, and working memory. They serve as the control, guidance, and coordination mechanisms for other cognitive processes. Executive functions encompass all the intricate cognitive processes required for purposeful, challenging, or novel tasks. They are responsible for task-switching, multitasking, and parallel dual-tasking within the brain (2,5,8). Longitudinal studies have demonstrated that these abilities are closely linked to



academic achievement, social adjustment, and career success. Youth with ADHD exhibit significant deficiencies in planning, inhibition, verbal memory, spatial awareness, and cognitive flexibility when compared to the general population. Hence, it is most important to find out interventions and strategies to improve ADHD symptoms in children (1,3).

Play therapy offers a way for them to overcome these obstacles and communicate their feelings more effectively (9-13). Since children's world revolves around action and activity, play therapy enables the therapist to step into their world. This allows children to not only verbally describe their experiences, but also to relive them and the associated emotions during play. Consequently, the therapist gains insight into the child's emotional world and experiences it firsthand (14-16). In play therapy, regardless of the reason for the child's participation, the therapist can identify and address the child's issues as they arise during play. Play therapy proves to be a valuable intervention for traumatized children and those with post-traumatic stress disorder (9,17-19). It helps break down resistance, instill a sense of worth and capability, foster creative thinking, emotional release, role-playing, imagination, symbolic learning, and enhance relationships and attachments. Additionally, it promotes positive excitement and aids in overcoming fears associated with developmental stages. Group play therapy combines two effective therapies seamlessly (11,20-23). It serves as a psychological and social process for children, offering a platform for personal growth and understanding of themselves and others (24,25). Group play therapy also teaches children conflict resolution skills, which can enhance their cognitive abilities and help manage psychological conflicts, ultimately resulting in an enhanced quality of life. Despite the fact that the impact of play therapy on cognitive and behavioral components in children has been repeatedly investigated, its effect on ADHD children has rarely been considered. Hence, due to the possibility that play therapy can be considered as an effective strategy for reducing ADHD symptoms in children, current study aims to explore the effects of group-based play therapy on executive function, working memory and self-efficacy in children with ADHD.

2. Methods

2.1. Design and Participants

The current study employs a quasi-experimental research design with a pre-test-post-test design and includes a control group. The statistical population for this research consists of children with ADHD aged 7-12 years old (mean=9.66 years) in Tehran in 2023. A sample of 40 eligible participants was selected using convenience sampling and randomly allocated to the experimental or control groups using the coin-flipping method (n=20 per group). The selection of the sample was based on G-Power software, considering an effect size of 1.60, a test power of 0.90, and a significance level of 0.05 (22).

2.2. Measures

The Tower of London Test (26) was utilized to measure executive function. This assessment involves the individual manipulating a collection of colored

beads positioned on three vertical bars in order to match a specific target arrangement. The primary measure of performance in this test is the number of movements required to achieve the target arrangement. Additionally, other performance criteria such as planning time, time taken to touch the first ring, and overall time can also be considered. The computer accurately records various parameters including the number of problems solved in each round, delay time or design time, test time, total test time (including both delay time and test time), number of errors, and total score. The reliability coefficient of this test has been reported as 0.90 in this study, using the test-retest method.

The direct digit span test (27) was employed to assess working memory. During this assessment, individuals are presented with lists containing 3 to 9 digits orally and are required to recall them from memory. The second part of the test involves the subject repeating a series of numbers (ranging from 2 to 8) in reverse order. The reliability coefficient of this test in the current research has been documented as 0.93 through the test-retest method.

The measurement of self-efficacy was conducted using the self-efficacy questionnaire (SF-12) (28). It has 12 items and measures social, academic, and emotional aspects of self-efficacy. The items scored based on a 5-point scale from "not at all" (1) to "very well" (5). In this particular study, the Persian version of the scale was validated by eight experts, resulting in a CVI of 0.90 and a CVR of 0.90. Furthermore, in this study, the Cronbach's alpha coefficient was 0.94.

2.3. Procedure

Initially, the researcher presented an overview of the research plan and discussed the methods of delivering services to the children involved, addressing the school principal and counselor. To commence the treatment, the children were divided into two groups of 20 through a random selection process. The experimental group engaged in group-based play therapy sessions, consisting of 10 sessions held twice a week. Each session lasted for 45 minutes. Following the completion of the group-based play therapy intervention, all participants underwent posttest, same as the pre-test. Group-based play therapy included various activities aimed at promoting different skills and addressing specific needs. These activities encompassed a range of exercises and games designed to enhance concentration, emotional release, anger management, relaxation, and problem-solving abilities. Additionally, the therapy sessions incorporated elements such as diaphragmatic breathing, paper and pen exercises, sand tray play, book therapy, balance exercises, finger painting, dating skills, crafts, and learning to recognize illogical requests. The therapy also focused on building self-awareness, self-esteem, courage, compliance with rules, maintaining relationships with peers, decision-making, muscle relaxation, and empathy. Through these diverse activities, the therapy aimed to foster personal growth, emotional well-being, and social skills development in a group setting.

2.4. Data Analysis

SPSS version 26 software was used for data analysis. Mean and standard deviation were utilized for data description. Independent t-test and ANCOVA were used

for group comparisons in the pretest and posttest. Significant level was set as $P < 0.05$.

3. Results

The demographic information presented in [Table 1](#) indicated that the average age of the participants was

9.66 years. Furthermore, the mean age for the experimental group was 9.38 years, while for the control group it was 9.89 years. Additionally, the participants' BMI fell within the normal range, with a mean of 16.97. There were no significant differences between groups in terms of age ($P=0.752$), height ($P=0.910$), weight ($P=0.803$), and BMI ($P=0.588$).

Table 1. Demographic Data Across Group.

	Group	No.	Mean±SD	P-Value
Age (Year)	Play Therapy	20	9.38±0.84	0.75
	Control	20	9.89±0.93	
Height (M)	Play Therapy	20	1.28±0.07	0.91
	Control	20	1.26±0.06	
Weight (Kg)	Play Therapy	20	29.33±3.64	0.80
	Control	20	30.08±4.22	
Body Mass Index (Kg/M ²)	Play Therapy	20	17.04±1.42	0.58
	Control	20	16.93±1.63	

Based on the results of Kolmogorov-Smirnov tests ([Table 2](#)), all research variables were normally distributed (all $P > 0.05$).

Table 2. Results of Normal Distribution of Research Variables.

	Chi Square	P-Value
Executive Function	0.013	0.20
Working Memory	0.009	0.20
Self-Efficacy	0.010	0.20

No significant difference was observed in executive function between groups in the pretest ($t=0.68$, $P=0.63$). However, the results of ANCOVA showed a significant difference between groups in the posttest ($F=12.58$, $P < 0.001$). Specifically, the experimental group showed a

significant improvement in executive function performance than the control group. Therefore, it can be concluded that play therapy had a positive impact on the executive function ([Table 3](#) and [Figure 1](#)).

Table 3. Comparison of Executive Function Scores among Groups.

	Pre-test		Post-test	
	Mean	SD	Mean	SD
Play Therapy	13.68	2.45	20.48	3.94
Control	14.13	3.08	14.10	3.22

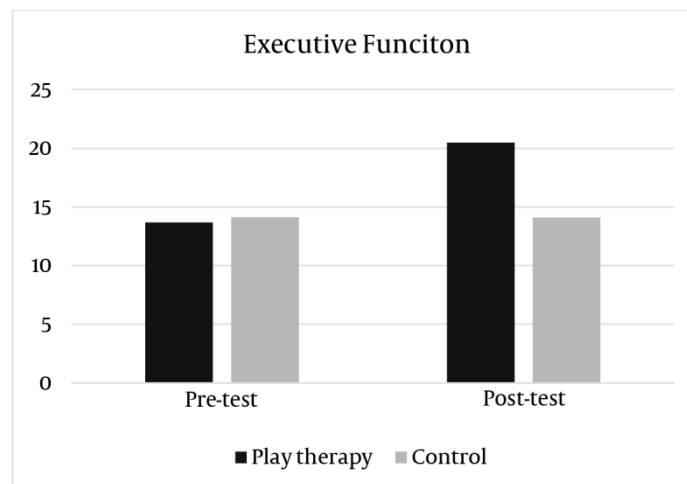


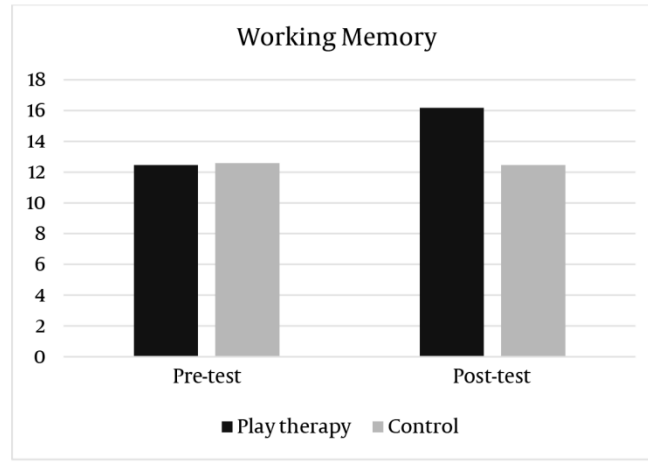
Figure 1. Mean of Executive Function Scores among Groups.

Also, no significant difference was observed in the working memory between groups in the pretest ($t=0.15$, $P=0.86$). Nevertheless, the results of ANCOVA showed a significant difference between the groups in the posttest ($F=15.48$, $P < 0.001$). Specifically, the experimental group exhibited a significant enhancement in working memory than the control group. Hence, it can be inferred that the

implementation of play therapy had a beneficial influence on the working memory ([Table 4](#) and [Figure 2](#)).

Table 4. Comparison of Working Memory Scores among Groups.

	Pre-test		Post-test	
	Mean	SD	Mean	SD
Play Therapy	12.47	2.69	16.19	3.50
Control	12.58	2.53	12.47	2.13

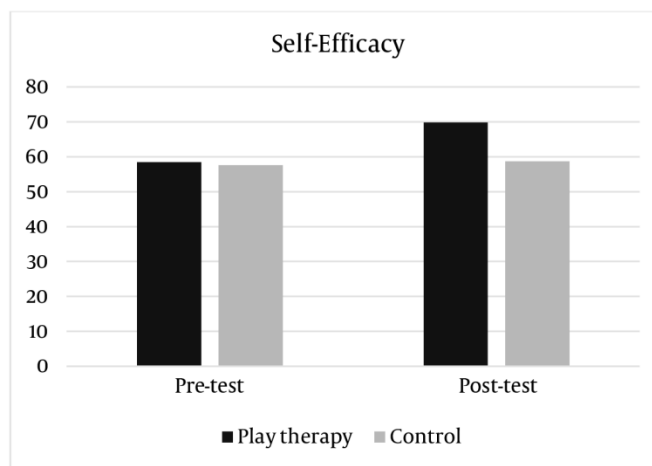
**Figure 2.** Mean of Working Memory Scores among Groups.

Moreover, no significant difference was observed in self-efficacy between groups ($t=0.29$, $P=0.75$). Nevertheless, the results of ANCOVA showed a significant difference between groups in the posttest ($F=6.09$, $P<0.001$). Specifically, the experimental group

showed a significant improvement in self-efficacy than the control group. Hence, it can be inferred that the inclusion of play therapy positively impacted the self-efficacy (Table 5 and Figure 3).

Table 5. Comparison of Self-Efficacy Scores among Groups.

	Pre-test		Post-test	
	Mean	SD	Mean	SD
Play Therapy	58.46	12.47	69.87	16.41
Control	57.63	11.07	58.71	13.30

**Figure 3.** Mean of Self-Efficacy Scores among Groups.

4. Discussion

Group play therapy also teaches children conflict resolution skills, which can enhance their cognitive abilities and help manage psychological conflicts, ultimately resulting in an enhanced quality of life. Therefore, play therapy can be considered as an influential strategy for improving ADHD symptoms in children. Hence, current study aims to explore the effects of group-based play therapy on executive function, working memory, and self-efficacy in children with ADHD. The results indicated that play therapy enhanced executive function. These findings

confirm those of previous studies (18,21,22,25). To interpret these findings, it can be argued that play holds such significance in psychology that experts refer to it as a child's way of thinking. Through play, children can acquire and develop fundamental and social skills, with the game equipment playing a crucial role in enabling them to explore the world around them (29,30). Moreover, play enhances the quality of a child's life by fostering the development of creative thinking. Within the context of play, it becomes possible to thoroughly examine a child's behavioral patterns and address all aspects of the issue

at hand. Numerous psychologists and researchers have affirmed its effectiveness over the course of several decades. Presently, play therapy stands as the foremost method for treating mental and emotional disorders in children, and it has even proven effective in treating various mental disorders in adults (31,32).

Furthermore, this study indicated that play therapy enhanced working memory. Hence, it can be inferred that the utilization of play therapy had a positive influence on the working memory assessment of children diagnosed with ADHD. These results align with previous research studies (13,16,18,19). To interpret this finding, it can be posited that children with ADHD possess a limited attention span, making it arduous for them to concentrate. They struggle with various cognitive abilities such as visual-spatial short-term memory, deficient working memory, inflexible thinking, planning skills, abstract verbal reasoning, visual processing speed, complex information processing speed, selective attention, inhibiting impulsive behavior, spatial recognition memory, sustaining attention, motor control, verbal learning, production of strategies, and dividing attention. Consequently, these deficiencies impede their academic progress, contribute to behavioral issues, and hinder the development of their social skills (33-36). If educational programs are delivered through games that are tailored to the children's age, interests, and needs, it proves to be more advantageous and plays a more impactful role in enhancing their attention. Conversely, play therapy grounded in the cognitive-behavioral approach operates under the assumption that individuals' behavior is contingent upon their interpretation of the world. In other words, how a person perceives and comprehends a situation determines their emotional and behavioral reaction to it. To ensure the effectiveness of play therapy from this perspective, the activities must be well-structured, goal-oriented, and capable of motivating the child (13,17,32).

Moreover, this study found that play therapy enhanced self-efficacy. Hence, it can be inferred that the integration of play therapy had a beneficial impact on the self-efficacy of children diagnosed with ADHD. These results align with previous research (10,15,22,24). According to Bandura's theory, self-efficacy is influenced by four sources. Firstly, the history of personal behavior plays a significant role. Through play therapy sessions, children have the opportunity to engage in successful interactions with their peers, which enhances their self-efficacy by providing them with pleasant experiences and valuable information. Secondly, substitute experience is important. By observing peers who excel in interpersonal interactions, children in the tested group have role models to look up to, which strengthens their self-efficacy. Thirdly, verbal persuasion plays a part (37-39). The coach and peers in the experimental group encourage individuals to focus on their capabilities, leading to an increase in self-efficacy. Lastly, physiological anxiety affects self-efficacy. If the sympathetic nervous system dominates during a task, the person may feel tense and overwhelmed, indicating that the task exceeds their abilities. However, during play therapy, children experience a peaceful and comfortable environment, allowing them to effectively handle the demands of the game and consequently boosting their self-efficacy. Play therapy, combined with positive reinforcement, encourages

bold behaviors in children and further enhances their self-efficacy (37). It enables children to assess their social skills in conflict situations, learn appropriate social interactions, and utilize play as a means to express their emotions, thoughts, and interests while gaining a sense of mastery over their surroundings (37,39).

A limitation of current study was the lack of assessment of the participants' social-economic status. Therefore, future research should prioritize investigating socio-economic status as a potential influential factor in the effects of play therapy on psycho-behavioral changes. Additionally, the study used questionnaires for data collection, which may introduce self-reporting bias. Lastly, the use of convenience sampling method in this study may lead to biased results in some cases.

4.1. Conclusion

The impact of ADHD on children's cognitive and psychological well-being has been shown to be negative. A recent study demonstrated significant cognitive and psychological improvements in children with ADHD after engaging in play therapy. Specifically, executive function, working memory, and self-efficacy were found to have increased post-intervention. These results suggest that play therapy can play a crucial role in enhancing the cognitive and psychological health of children with ADHD. Therefore, it is highly advised that physical education teachers and professionals consider incorporating play therapy to help alleviate ADHD symptoms in children.

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Footnotes

Authors' Contribution: This study was carried out solely by the corresponding author.

Conflict of Interests: The researcher confirms that there is no conflict of interests in this study with any participant.

Data Availability: The data that support the findings of this study are openly available upon request from the corresponding author.

Ethical Approval: Approval for this study was obtained from the university. The author confirms that all steps . The requirements of this study comply with ethical guidelines. Participants were informed about the characteristics of the study and gave written informed consent.

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Informed Consent: Informed written consent was obtained from all participants.

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References

- Birchwood J, Daley D. Brief report: the impact of attention deficit hyperactivity disorder (ADHD) symptoms on academic performance in an adolescent community sample. *J Adol.* 2012;**35**(1):225-231. [PubMed ID: 20880572]. <https://doi.org/10.1016/j.adolescence.2010.08.011>
- Goulardins JB, Marques JCB, DeOliveira JA. Attention Deficit Hyperactivity Disorder and Motor Impairment: A Critical Review. *Percept Mot Skills.* 2017;**124**(2):425-40. [PubMed ID: 28361657]. <https://doi.org/10.1177/0031512517690607>
- Gallego-Méndez J, Perez-Gomez J, Calzada-Rodríguez JI, Denche-Zamorano AM, Mendoza-Muñoz M, Carlos-Vivas J, Garcia-Gordillo MÁ, Adsuar JC. Relationship between Health-Related Quality of Life and Physical Activity in Children with Hyperactivity. *Int J Environ Res Public Health.* 2020;**17**(8):2804. [PubMed ID: 32325730]. [PubMed Central ID: PMC7216053]. <https://doi.org/10.3390/ijerph17082804>
- Li R, Liang X, Liu F, Zhou Z, Zhang Z, Lu Y, Wang P, Yang B. Mediating Effect of Motor Competence on the Relationship between Physical Activity and Quality of Life in Children with Attention Deficit Hyperactivity Disorder. *Biomed Res Int.* 2021;**24**:4814250. [PubMed ID: 34980998]. [PubMed Central ID: PMC8720293]. <https://doi.org/10.1155/2021/4814250>
- Banaschewski T, Becker K, Döpfner M, Holtmann M, Rösler M, Romanos M. Attention-Deficit/Hyperactivity Disorder. *Dtsch Arztebl Int.* 2017;**114**(9):149-159. [PubMed ID: 28351467]. [PubMed Central ID: PMC5378980]. <https://doi.org/10.3238/arztebl.2017.0149>
- Posner J, Polanczyk GV, Sonuga-Barke E. Attention-deficit hyperactivity disorder. *Lancet.* 2020;**395**(10222):450-462. [PubMed ID: 31982036]. [PubMed Central ID: PMC7880081]. [https://doi.org/10.1016/S0140-6736\(19\)33004-1](https://doi.org/10.1016/S0140-6736(19)33004-1)
- Faraone SV, Bellore MA, Brikell I, Cortese S, Hartman CA, Hollis C, Newcorn JH, Philipson A, Polanczyk GV, Rubia K, Sibley MH, Buitelaar JK. Attention-deficit/hyperactivity disorder. *Nat Rev Dis Primers.* 2024;**10**(1):11. doi: 10.1038/s41572-024-00495-0. Erratum in: *Nat Rev Dis Primers.* 2024;**10**(1):29. [PubMed ID: 38388701]. <https://doi.org/10.1038/s41572-024-00495-0>
- Sapkale B, Sawal A. Attention Deficit Hyperactivity Disorder (ADHD) Causes and Diagnosis in Adults: A Review. *Cureus.* 2023;**15**(11):e49144. [PubMed ID: 38130507]. [PubMed Central ID: PMC10733572]. <https://doi.org/10.7759/cureus.49144>
- Koukourikos K, Tsaloglidou A, Tzeha L, Iliadis C, Frantzana A, Katsimbeli A, Kourkouta L. An Overview of Play Therapy. *Mater Sociomed.* 2021;**33**(4):293-297. [PubMed ID: 35210953]. [PubMed Central ID: PMC8812369]. <https://doi.org/10.5455/msm.2021.33.293-297>
- Francis G, Deniz E, Torgerson C, Toseeb U. Play-based interventions for mental health: A systematic review and meta-analysis focused on children and adolescents with autism spectrum disorder and developmental language disorder. *Autism Dev Lang Impair.* 2022;**7**:23969415211073118. [PubMed ID: 36438159]. [PubMed Central ID: PMC9685160]. <https://doi.org/10.1177/23969415211073118>
- Gupta N, Chaudhary R, Gupta M, Ikehara LH, Zubiar F, Madabushi JS. Play Therapy As Effective Options for School-Age Children With Emotional and Behavioral Problems: A Case Series. *Cureus.* 2023;**15**(6):e40093. [PubMed ID: 37425518]. [PubMed Central ID: PMC10328142]. <https://doi.org/10.7759/cureus.40093>
- Chirico I, Andrei F, Salvatori P, Malaguti I, Trombini E. The Focal Play Therapy: A Clinical Approach to Promote Child Health and Family Well-being. *Front Public Health.* 2019 Apr 5;7:77. [PubMed ID: 31024878]. [PubMed Central ID: PMC6460255]. <https://doi.org/10.3389/fpubh.2019.00077>
- Godino-láñez MJ, Martos-Cabrera MB, Suleiman-Martos N, Gómez-Urquiza JL, Vargas-Román K, Membribe-Jiménez MJ, Albendín-García L. Play Therapy as an Intervention in Hospitalized Children: A Systematic Review. *Healthcare (Basel).* 2020;**8**(3):239. [PubMed ID: 32751225]. [PubMed Central ID: PMC7551498]. <https://doi.org/10.3390/healthcare8030239>
- Gjærde LK, Hybschmann J, Dybdal D, Topperzer MK, Schrøder MA, Gibson JL, Ramchandani P, Ginsberg EI, Ottesen B, Frandsen TL, Sørensen JL. Play interventions for paediatric patients in hospital: a scoping review. *BMJ Open.* 2021;**11**(7):e051957. [PubMed ID: 34312210]. [PubMed Central ID: PMC8314749]. <https://doi.org/10.1136/bmjopen-2021-051957>
- Brown T, Lynch H. Children's Play-Work Occupation Continuum: Play-Based Occupational Therapy, Play Therapy and Playwork. *Can J Occup Ther.* 2023 Sep;**90**(3):249-256. Epub 2022 Oct 11. [PubMed ID: 36221893]. <https://doi.org/10.1177/00084174221130165>
- Li WHC, Chung JOK, Ho KY, Kwok BMC. Play interventions to reduce anxiety and negative emotions in hospitalized children. *BMC Pediatr.* 2016;**16**:36. [PubMed ID: 26969158]. [PubMed Central ID: PMC4787017]. <https://doi.org/10.1186/s12887-016-0570-5>
- Regalado Chamorro M, Medina Gámero A. Terapia lúdica: una alternativa en la rehabilitación de pacientes [Play therapy: an alternative in patient rehabilitation]. *Rehabilitacion (Madr).* 2024;**58**(3):100853. Spanish. [PubMed ID: 38761564]. <https://doi.org/10.1016/j.rh.2024.100853>
- Elbeltagi R, Al-Beltagi M, Saeed NK, Alhawamdeh R. Play therapy in children with autism: Its role, implications, and limitations. *World J Clin Pediatr.* 2023;**12**(1):1-22. [PubMed ID: 36685315]. [PubMed Central ID: PMC9850869]. <https://doi.org/10.5409/wjcp.v12.i1>
- Zengin M, Yayan EH, Diken ME. The Effects of a Therapeutic Play/Play Therapy Program on the Fear and Anxiety Levels of Hospitalized Children After Liver Transplantation. *J Perianesth Nurs.* 2021;**36**(1):81-85. [PubMed ID: 33158746]. <https://doi.org/10.1016/j.jopan.2020.07.006>
- Sezici E, Ocakci AF, Kadioglu H. Use of Play Therapy in Nursing Process: A Prospective Randomized Controlled Study. *J Nurs Scholarsh.* 2017;**49**(2):162-169. [PubMed ID: 28098954]. <https://doi.org/10.1111/jnu.12277>
- Thomas S, White V, Ryan N, Byrne L. Effectiveness of play therapy in enhancing psychosocial outcomes in children with chronic illness: A systematic review. *J Pediatr Nurs.* 2022;**63**:e72-e81. [PubMed ID: 34776315]. <https://doi.org/10.1016/j.pedn.2021.10.009>
- Ramdaniati S, Lismidiati W, Haryanti F, Sitaresmi MN. The effectiveness of play therapy in children with leukemia: A systematic review. *J Pediatr Nurs.* 2023;**73**:7-21. [PubMed ID: 37597401]. <https://doi.org/10.1016/j.pedn.2023.08.003>
- Karbasi Amel A, Rahnamaei H, Hashemi Z. Play therapy and storytelling intervention on children's social skills with attention deficit-hyperactivity disorder. *J Educ Health Promot.* 2023;**12**:317. [PubMed ID: 38023093]. [PubMed Central ID: PMC10670883]. https://doi.org/10.4103/jehp.jehp_1104_22
- Budiyarti L, Agustini N, Hayati H, Panjaitan RU, Hakim N. Effectiveness of web-based play therapy intervention in supporting the development of children with attention deficit/hyperactivity disorder. *Pediatr Med Chir.* 2023;**45**(5). [PubMed ID: 36974914]. <https://doi.org/10.4081/pmc.2023.316>
- Halfon S, Doyran M, Türkmen B, Oktay EA, Salah AA. Multimodal affect analysis of psychodynamic play therapy. *Psychother Res.* 2021;**31**(3):402-417. [PubMed ID: 33148118]. <https://doi.org/10.1080/10503307.2020.1839141>
- Harsa P, Breňová M, Bezdíček O, Kališová L, Heidingrová J, Schöňová K, Michalec J. Tower of London test - short version. *Neurol Neurochir Pol.* 2022;**56**(4):365-370. [PubMed ID: 35607867]. <https://doi.org/10.5603/pjnns.a2022.0037>
- Resch ZJ, Cerny BM, Ovsiew GP, Jennette KJ, Bing-Canar H, Rhoads T, Soble JR. A Direct Comparison of 10 WAIS-IV Digit Span Embedded Validity Indicators among a Mixed Neuropsychiatric Sample with Varying Degrees of Cognitive Impairment. *Arch Clin Neuropsychol.* 2023;**38**(4):619-632. [PubMed ID: 36244241]. <https://doi.org/10.1093/acclin/acac082>
- Axboe MK, Christensen KS, Kofoed PE, Ammentorp J. Development and validation of a self-efficacy questionnaire (SE-12) measuring the clinical communication skills of health care professionals. *BMC Med Educ.* 2016;**16**(1):272. [PubMed ID: 27756291]. [PubMed Central ID: PMC5069791]. <https://doi.org/10.1186/s12909-016-0798-7>
- Wong TY, Chang YT, Wang MY, Chang YH. The effectiveness of child-centered play therapy for executive functions in children with attention-deficit/hyperactivity disorder. *Clin Child Psychol Psychiatry.* 2023;**28**(3):877-894. [PubMed ID: 36125333]. <https://doi.org/10.1177/13591045221128399>
- Shaheen S. How child's play impacts executive function-related behaviors. *Appl Neuropsychol Child.* 2014;**3**(3):182-7. [PubMed ID: 25010084]. <https://doi.org/10.1080/21622965.2013.839612>
- Rice T. Commentary: How Child's Play Impacts Executive Function-Related Behaviors. *Front Psychol.* 2016;**7**:968. [PubMed ID: 27444811]. [PubMed Central ID: PMC4918261]. <https://doi.org/10.3389/fpsyg.2016.00968>
- Cardoso CO, Dias N, Senger J, Colling APC, Seabra AG, Fonseca RP. Neuropsychological stimulation of executive functions in children with typical development: A systematic review. *Appl Neuropsychol Child.* 2018;**7**(1):61-81. [PubMed ID: 27779428]. <https://doi.org/10.1080/21622965.2016.1241950>
- Roording-Ragetli SL, Pieters S, Wennekers E, Klip H, Buitelaar J, Slaats-Willems D. Working memory training in children with neurodevelopmental disorders and intellectual disabilities, the role of coaching: A double-blind randomised controlled trial. *J Intellect Disabil Res.* 2023;**67**(9):842-859. [PubMed ID: 37313626]. <https://doi.org/10.1111/jir.13047>
- Acosta V, Hernandez S, Ramirez G. Effectiveness of a working memory intervention program in children with language disorders. *Appl Neuropsychol Child.* 2019;**8**(1):15-23. [PubMed ID: 28956632]. <https://doi.org/10.1080/21622965.2017.1374866>
- Beck SJ, Hanson CA, Puffenberger SS, Benninger KL, Benninger WB. A controlled trial of working memory training for children and adolescents with ADHD. *J Clin Child Adolesc Psychol.* 2010;**39**(6):825-36. [PubMed ID: 21058129]. <https://doi.org/10.1080/15374416.2010.517162>
- Kerns KA, Macoun S, MacSween J, Pei J, Hutchison M. Attention and working memory training: A feasibility study in children with neurodevelopmental disorders. *Appl Neuropsychol Child.* 2017;**6**(2):120-137. [PubMed ID: 27049769]. <https://doi.org/10.1080/21622965.2015.1109513>
- Danesh F, Mohammadi M, Naziri G, Fath N. Investigating the Effectiveness of Modifying the Parent-Child Interaction Pattern Based on Filial Play Therapy on Internet Addiction, Sleep Quality, and Self-efficacy in 9-12-Year-Old Children. *Addict Health.*

- 2023;**15**(4):281-288. [PubMed ID: [38322483](#)]. [PubMed Central ID: [PMC10843351](#)]. <https://doi.org/10.34172/ahj.2023.1398>
38. Warren JS, Brown CR, Layne CM, Nelson PL. Parenting self-efficacy as a predictor of child psychotherapy outcomes in usual care: a multi-dimensional approach. *Psychother Res.* 2011;**21**(1):112-23. [PubMed ID: [21331978](#)]. <https://doi.org/10.1080/10503307.2010.531405>
39. Gupta N, Chaudhary R, Gupta M, Ikehara LH, Zubiar F, Madabushi JS. Play Therapy As Effective Options for School-Age Children With Emotional and Behavioral Problems: A Case Series. *Cureus.* 2023;**15**(6):e40093. [PubMed ID: [37425518](#)]. [PubMed Central ID: [PMC10328142](#)]. <https://doi.org/10.7759/cureus.40093>