

Effectiveness of Play-Based Nursing Interventions on Hand Function in Children with Cerebral Palsy: A Quasi-Experimental Study

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ABSTRACT

Background: Traditional nursing interventions for children with Cerebral Palsy (CP) often lack active engagement and show limited improvement in motor function. Play interventions involving manipulative activities may better support motor skill development. **Objectives:** To evaluate the effect of structured play-based nursing interventions on hand motor skills in children with cerebral palsy. **Methods:** A quasi-experimental pre-test/post-test design with a control group was used. The study was conducted at the Paediatric Welfare Hospital in Baghdad from November 25, 2024, to February 13, 2025. A non-probability sample of 79 children was identified based on the study criteria; of these, 64 children met the eligibility criteria and agreed to participate. While all children continued routine care, only intervention groups received play-based therapy using clay, beads, and sand. The Box and Block Test (BBT) was used to assess hand function before and after the intervention. Data were analysed using SPSS (version 0.27) with descriptive and inferential statistics. **Results:** The intervention groups demonstrated significant improvements in hand function compared to the control group (ANOVA: $F = 8.11, p = 0.001, \eta^2 = 0.29$), reflecting a medium-to-large effect size. Analysis across time points showed that at post-test 1, the effect size was medium ($\eta^2 = 0.17$), whereas at post-test 2, it increased to medium-to-large ($\eta^2 = 0.29$). Post-hoc comparisons indicated that the clay intervention produced the largest gains in Box and Block Test scores (Cohen's $d = 0.65$, medium effect), while sand therapy resulted in moderate improvements and bead therapy showed smaller gains. Overall, the percentage improvement in hand function ranged from 18% to 27% across intervention groups. **Conclusion:** Nursing interventions incorporating play activities are effective in improving hand function in children with cerebral palsy. These methods are child-friendly, supporting the development of motor skills and promoting greater independence. However, no follow-up assessments were conducted to evaluate the long-term sustainability of improvements. Future studies should include follow-up evaluations to confirm lasting benefits.

Keywords: Cerebral Palsy; Hand Function; Nursing Programme; Play Therapy

INTRODUCTION

Cerebral Palsy (CP), the term 'cerebral' related to the brain; 'palsy' means the partial and complete loss (Al-Mosawi, 2019). It is non-progressive neurological disorder that affects movement and posture, leading to functional limitations in daily activities (Anjum *et al.*, 2024). It represents one of the most prevalent motor disabilities during childhood (Faccioli *et al.*, 2023). The condition results from brain damage occurring before, during or after birth, causing impairment in motor control (Philip *et al.*, 2020). CP is often associated with additional challenges such as cognitive impairments, behavioural issues and communication difficulties (McIntyre *et al.*, 2022). Children with CP frequently experience delays in reaching gross motor milestones, significantly impacting their quality of life and ability to participate in everyday activities (Hasan *et al.*, 2015; Rajani, 2023).

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In addition to primary motor impairments, children with CP may develop secondary complications, including muscle contractures, joint deformities, scoliosis and hip dislocation (Wray *et al.*, 2025), which further restrict their movement and daily functioning (Sulemi *et al.*, 2023). Hand function plays a crucial role in performing daily tasks, as the hand is a dynamic sensory-motor organ responsible for executing complex movements with controlled force (Moraga-Amaro *et al.*, 2025). Fine motor skills refer to the coordination of small muscles, especially in the hands and fingers, which enable precise and purposeful tasks such as grasping, manipulating small objects, buttoning, and writing. These skills are essential for functional independence in daily life activities (Hervo *et al.*, 2025; Qasim, 2022; Blank *et al.*, 2019). However, children with cerebral palsy often struggle with skilled hand movements (Basit *et al.*, 2022), predominantly independent finger control, which affects their ability to manipulate objects and grasp with precision (El-samad *et al.*, 2021). Due to motor impairments, many children with CP struggle with upper extremity use and fine motor skills (Sulemi *et al.*, 2023), leading to ineffective grasping patterns and excessive force application when handling objects (Yogman *et al.*, 2018). Clay, beads, and sand were chosen as therapeutic play materials due to their varying textures, resistance levels, and ability to stimulate both tactile and proprioceptive feedback. These materials promote bilateral hand use, finger dexterity, and object manipulation skills essential for improving fine motor control in children with CP. Their proven use in paediatric intervention programmes further supports their inclusion in structured play sessions (Maharani & Jannah, 2018).

Nursing plays a crucial role in the treatment and follow-up care of children with cerebral palsy (Sheikhzakaryae, 2024). Nurses are responsible for providing direct care and coordinating with multidisciplinary medical teams (Maharani & Jannah, 2018), while also offering psychological and social support to children and their families and educating caregivers on proper home care strategies (Shawq, 2024). Nurses significantly contribute to reducing the distress experienced by children and their families through extensive patient interaction (Azeez *et al.*, 2023; Woodgate *et al.*, 2024). As the primary caregivers, they provide not only medical but also emotional and spiritual support (Konukbay *et al.*, 2024). Their role is especially significant compared to other healthcare providers, who engage in less direct patient care (Arslan & Akkoyun, 2022). Research highlights the challenges parents face, emphasizing the need for emotional and practical support (Abdi *et al.*, 2025). Alaei *et al.* (2015), reported that parents experience significant hardship and uncertainty, while meta-analysis identified key caregiver needs, including healthcare access, information, financial aid, and recognition of psychological, physical, and social burdens (Talib & Hussein, 2024).

These challenges affect the child's ability to interact effectively with their environment, highlighting the need for supportive therapeutic interventions. While play therapy has been applied in conditions such as autism and behavioural disorders, research on its effectiveness in improving fine motor skills in children with cerebral palsy remains limited, particularly within the Iraqi context. This study aims to address this gap and provide locally relevant evidence to support nursing interventions based on structured play activities. Although the study was guided by a research question rather than a specific theory, it is grounded in principles of sensorimotor learning and developmental psychology. These principles support the idea that active, hands-on play such as using clay, beads, and sand can enhance fine motor skills through sensory stimulation and repetitive practice.

Aims of the Study

The current study aims to improve hand function in children with cerebral palsy by using play therapy methods and to determine the most effective method.

METHODOLOGY

Research Design

A quantitative study with a quasi-experimental design was used to examine the effect of play therapy by applying clay, beads, and sand for improving hand function in children with CP. This method is used to demonstrate the cause-and-effect relationship between the independent variable, play therapy and the dependent variable, hand function (Maciejewski, 2020).

Setting

The study was conducted at the Paediatric Welfare Hospital in Baghdad City, which provides health

services for a large number of children with cerebral palsy. The hospital includes experienced staff, appropriate facilities, and the necessary tools for the study process.

Sample

A non-probability sample of 79 children was identified based on the study criteria; of these, 64 children met the eligibility criteria and agreed to participate. The sample was divided into four groups (clay, beads, sand, and control), each with 16 participants, as determined by the sample-size calculation (Richard Geiger equivalent). The calculation was based on a population proportion of 50%, representing the highest expected variability, with a 5% error probability, a 95% confidence level, and a standard score of 1.96 corresponding to this confidence level. The children were assigned to the four groups by the researcher using a quasi-random method, based on order of arrival and age balance, to maintain clinical feasibility and reduce group bias. The study's sample was chosen based on the following criteria:

Inclusion Criteria

The sample included male and female children aged 3–7 years who were medically diagnosed with right-sided hemiplegic cerebral palsy. All children in the study were conscious and had hand dysfunction.

Exclusion Criteria

Children were excluded if they had undergone recent hand surgery or received other therapeutic interventions targeting hand function within the last six months. Additionally, children under the age of 3 years or older than 7 years, those diagnosed with Erb's palsy, facial palsy, monoplegia, tetraplegia, quadriplegia or the affected left side of the body and participants in the pilot study were excluded.

Study Instruments

The instrument of the study includes a questionnaire format and hand function test. The questionnaire includes children's data (age, sex, current weight, address and city). The Box and Block Test (BBT), developed by Desrosiers *et al.* (1994), was used to assess hand function and is still used by many researchers for the same purpose. The BBT is a wooden box divided by a partition into two sections, containing 150 blocks (Desrosiers *et al.*, 1994) in figure 1.



(Source: Mathiowetz *et al.*, 1985; Desrosiers *et al.*, 1994)

Figure 1: Wooden of Box and Block Test

The child was asked to transfer one block at a time from one compartment to the other; the number of blocks transferred within 60 seconds was recorded. During each trial, individuals get instructions advising them to ensure their fingers cross the partition when transferring the blocks, and they are not required to retrieve any blocks that may fall beyond the box (Harini *et al.*, 2022).

Instrument of the Study

Children's hand functions were measured using the Box and Block Test (BBT), a fast and simple assessment of gross motor abilities; these characteristics make it a useful and appropriate tool for evaluating children (Prochaska & Ammenwerth, 2024). The BBT is valid and reliable for quickly assessing hand function in children aged 3 to 13 years (Rahman *et al.*, 2022). The test involves counting the number of blocks a child can transfer within one minute, with performance varying based on age, sex, and the affected side. The score depends on blocks moved in one minute. Each block successfully placed in the empty box gets one point. Dropped blocks also count as points (Harini *et al.*, 2022).

Blinding

Blinding was not feasible for participants because both the children and their parents were aware of the type of intervention (clay, beads, or sand). However, the possibility of outcome assessor blinding was considered. To reduce measurement bias, the Box and Block Test, a standardised and objective tool, was used; assessments were conducted by an independent evaluator who was not involved in delivering the interventions.

Validity of the Study Instrument

Face validity is defined as the degree to which test respondents view the content of a test and its items as relevant to the context in which the test is being administered (Allen *et al.*, 2023). Face validity was assessed by a panel of 15 experts with over 13 years of professional experience; each expert reviewed the clinical form.

Reliability of Study Instrument

The Box and Block Test (BBT) is widely recognised for its high reliability in assessing gross manual dexterity. Numerous studies have demonstrated its strong psychometric properties across various age groups and clinical populations. Test-retest reliability demonstrated strong consistency with both high inter-rater reliability (agreement between different evaluators) and high intra-rater reliability (consistency of the same evaluator across time), due to its simple and objective scoring system, which involves counting the number of blocks moved within 60 seconds. Among paediatric populations, the BBT has also demonstrated reliable performance. The instrument was confirmed to have normative data and reliability for children aged 3 to 10 years, supporting its use in developmental and neurological assessments (Jongbloed-Pereboom *et al.*, 2013).

Data Collection and Intervention

Prior to starting therapy, each child's hand functions were assessed by BBT to identify areas of difficulty, such as cross motor control (the coordination of muscle groups across different parts of the body) and range of motion (the full movement potential of a joint). Set up the child in a free and comfortable environment that allows free movement of the child's arm and hand that introduces the child to a type of play therapy that uses (clay, beads, and sand). The study period started from 25th November, 2024, to 13th February, 2025. The sample size used in this study (n=64) was determined to ensure sufficient statistical power and precision in measuring the intervention's effects. It was calculated based on population variability and confidence level assumptions.

Before the implementation of the intervention strategies, the study sample were divided into four groups. They are exposed to a pre-test, post -test 1 and post -test 2 and the content is focused on the objectives. The test was conducted for all children before starting the interventions; the BBT was used to measure hands functions. Children were quasi-randomly assigned to four groups (control, clay, beads and sand).

The researcher used three types of play therapy: clay, sand and beads. These types were used previously in some research with adults and children to improve hand functions. All the used materials (clay, beads and sand) were following the safety measures and were approved by the physician and technical therapist at each hospital. In addition parents of children were assisted as supervisors during children's playing to avoid any risk or hazard.

During intervention sessions, each group engaged in tailored, hands-on activities to stimulate hand function: Clay Group, children used both hands to shape clay into simple objects such as squares, small trees, animals, and miniature household items, using plastic knives for cutting and detailing. Sand Group children used their fingers to mix sand, trace shapes or letters, and search for hidden small plastic objects buried in sand. They were instructed to locate specific numbers or shapes to encourage fine motor control. Beads Group children created small necklaces and bracelets using 12 mm colourful beads, practising threading and forming colour patterns with both hands.

The intervention lasted for 12 weeks with assessments conducted at baseline (week 4, week 8 and week 12, the end of the intervention) (Figure 2). Sessions of intervention lasted for three months, with two sessions per week, each lasting one hour. A WhatsApp group was created with parents to follow up on the programme. Measurements were taken at 4, 8 and 12 weeks. The control group did not receive any of the play therapy interventions (clay, beads, or sand). They continued to receive the routine care and therapy provided by the hospital as part of their usual daily treatment.

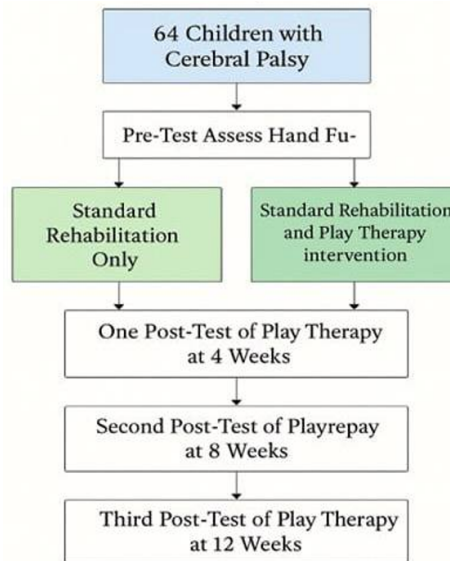


Figure 2: Intervention Process

Standardisation of Intervention

Each therapy session followed a standardised protocol to ensure consistency across participants. The activities were conducted in a fixed sequence, beginning with warm-up exercises, followed by specific play tasks using clay, beads, or sand. The researcher provided clear instructions and demonstrations at each session. Parents were trained to assist as supervisors, encouraging safe and proper handling of materials. This standardised approach ensured uniform delivery and minimised variability in the intervention.

Safety Measures and Monitoring

The intervention materials, including clay, sand, and beads, were selected based on safety standards and approved by the hospital's medical team. Throughout the sessions, trained professionals closely supervised the activities to ensure proper use and prevent any potential hazards. Additionally, parents were involved to support and monitor the children during interventions. No adverse events or safety concerns were observed during the study period.

Data Analysis

A critical step in nursing research is the analysis of data to ensure accuracy and reliability. Descriptive statistics, including frequency, percentage, mean, and standard deviation, were used to summarise the socio-demographic characteristics of the participants (Table 1). Normality distribution was assumed between groups that followed a normal distribution, as for between time periods it was not normally distributed. Therefore, for inferential analysis, one-way ANOVA was applied to compare mean differences across groups, while the Friedman test was used to assess within-group changes across the study periods (Table 2). Post-hoc multiple comparison tests were then performed to identify the specific group differences following significant ANOVA results (Table 3). All statistical analyses were conducted using the Statistical Package for the Social Sciences (SPSS), version 27.0, with a significance level set at $p \leq 0.05$.

Ethical Consideration

The researchers obtained ethical clearance from the Committee of Scientific Research (CSR), the Department of Postgraduate Studies at the College of Nursing, University of Baghdad, Iraq, with reference number 35 on 6th November 2024 (issued an official endorsement facilitating data collection for the research titled "Effect of Play Therapy on Improving Hand Function of Children with Cerebral Palsy").

Additional administrative and ethical approvals were secured from the following authorities:

The researchers obtained ethical clearance from the Republic of Iraq, The Ministry of Planning (Central

Statistical Organization), Iraq, with reference number 747/177 on 12th November 2022 (authorising data collection in compliance with national research regulations).

The researchers obtained ethical clearance from the Al-Rusafa Health Directorate, Ministry of Health, Baghdad, with reference number 4458 on 30th October 2022.

All ethical standards were strictly observed throughout the study. Written informed consent was obtained from the parents of all participating children after they were fully informed about the study's purpose, objectives, procedures, and the potential benefits of play therapy. Participation was entirely voluntary, and all participants were assured of their right to withdraw from the study at any time without any negative consequences.

RESULTS

Table 1: Distributions of Study Sample's Socio – Demographic Data

Socio -Demographic Data		Study Groups									
		Intervention						Control		Total	
		Clay		Beads		Sand					
Sex	Male	F	%	F	%	F	%	F	%	F	%
		9	56.3%	8	50.0%	9	56.3%	9	56.3%	35	54.69%
	Female	7	43.8%	7	43.8%	8	50.0%	7	43.8%	29	45.31%
Weight	Mean± SD	27.28±38.27		16.56±6.29		14.31±3.44		15.22±3.78		18.34±19.80	
Age	Mean± SD	4.00±1.36		4.94±1.73		4.13±1.45		4.25±1.48		4.33±1.52	
Total		16 (100%)		16 (100%)		16 (100%)		16 (100%)		64 (100%)	

F= Frequency; %= Percentage; SD= Standard Deviation

The result in Table 1 shows in term of children age was dominant in (3 years) for all study groups. In term of sex concerning their male percentage was (54.69%) in study sample, while the female percentage was 45.31% in study sample. According to weight predominant in clay group Mean± SD was 27.28±6.35.

Table 2: The Differences among Hand Function of Study Groups at Periods of Study

Period of study		Study Groups Hand function				Statistical Tests		
		Clay	Beads	Sand	Control	F	P-value	Sig
Pre test		19.56±10.04	14.75±7.05	16.94±7.47	14.81±6.73	1.31	0.279	NS
Post test1		23.38±9.86	14.81±7.02	18.38±7.43	14.94±6.89	4.14	0.010	S
Post test2		25.69±9.09	14.94±7.31	23.06±8.09	14.88±6.55	8.11	0.001	HS
Statistical Tests	Friedman Test	30.72	0.75	29.41	0.36			
	P value	0.001	0.687	0.001	0.832			

F (Fisher Test) = calculated using ANOVA; P Value ≤ 0.5; NS = Non- Significance; S= Significance, HS= Highly-Significance

The results in table 2 show that, there was no significant differences regarding the mean of hand function among study groups. In Post -test 1 and 2, the statistics show significant difference among them at *p* value = (0.010). In addition, only clay and sand groups show a difference in their mean score during period of study at *p* value = (0.001).

Table 3: Inter-Group Comparisons for the Effective Play Based Nursing Groups

Study Groups	Post -Test 1		Post -Test 2	
	Mean Difference (I-J)	Sig.	Mean Difference (I-J)	Sig.
Clay Vs. Control	8.438*	0.036	10.813*	0.003
Clay Vs. Beads	8.563*	0.032	10.750*	0.004
Clay Vs. Sand	5.000	0.369	2.625	0.825
Beads Vs. Control	-0.125	1.000	0.063	1.000
Beads Vs. Sand	-3.562	0.655	-8.125*	0.043
Sand VS. Control	3.438	0.680	8.188*	0.041

I= Intervention; J= Control; Sig = Significance; (*) Statistically Significance at *P* value ≤ 0.05

The results in table 3 show that clay group was more significant in Post-test 1 and Post-test 2 compare with other groups at p value ≤ 0.05 . In contrast, sand group was significant only in Post-test 2 at p Value ≤ 0.05 .

DISCUSSION

From a nursing perspective, these findings highlight the essential role of nurses in implementing, guiding, and evaluating play-based therapeutic interventions. Nurses provide hands-on support, family education, and continuous monitoring that ensures child-centred engagement and emotional comfort. This unique position bridges clinical goals with holistic childcare, emphasising the nurse's contribution to sustainable and individualised rehabilitation outcomes (Sheikhzakaryae *et al.*, 2024).

The results showed that the majority of children across all study groups were 3 years old, accounting for 43.75% of the total sample. The mean age was 4.33 ± 1.52 years, indicating that most participants fell within the early childhood range, a period known to be highly receptive to developmental interventions. This finding aligns with previous research emphasizing the critical importance of early intervention during the preschool years. For instance, a study conducted in Denmark demonstrated that children aged 3 to 6 years exhibited significant improvements in motor development after receiving targeted motor skill programmes (Hestbaek *et al.*, 2021). Such improvements during early years may support better motor planning, functional independence, and long-term developmental outcomes. However, differences in CP severity and home environments may have influenced the response to therapy in some cases.

Regarding the sex distribution, males were dominant across all study groups, accounting for 54.69% of the total sample, while females represented 45.31%. This finding is consistent with previous research, including a study conducted in Italy by Romeo *et al.* (2016), which reported that males are more frequently affected by cerebral palsy than females, although the severity of motor impairment does not necessarily differ by sex (Musihb *et al.*, 2024; Romeo *et al.*, 2016). Other studies indicate a difference in prevalence between sexes, with males being more susceptible to CP than females. For example, a study conducted in Sudan found a male-to-female ratio of 1.4:1, suggesting a slightly higher incidence among males (Chounti *et al.*, 2013). This may relate to biological or social factors. Parental support differences could also play a role.

The study revealed that the average weight of children in the four groups was comparatively low. This is consistent with prior findings that children with cerebral palsy often face underweight issues due to nutritional deficiencies and other factors like immobility and spasticity (Şimşek & Tuç, 2014). So, identified a negative relationship between Body Mass Index (BMI) and both functional independence and health-related quality of life, where underweight children demonstrated the least functional independence (Novak *et al.*, 2021). An article in a recent issue of Paediatrics reported that comprehensive early intervention programmes are strongly associated with enhanced motor function in children with cerebral palsy (Novak *et al.*, 2017). Low weight may reduce therapy tolerance and limit gains. Nutritional status is a possible confounder.

A systematic review was conducted in Australia in 2021, and the findings show that early intervention significantly contributes to the improvement of motor function in preschool-age children. These findings support the focus of the current study on 3-years-old children who represent the largest proportion of the sample. As the age is considered a critical development stage where therapeutic interventions are most effective (Cameron *et al.*, 2020; Peripheral *et al.*, 2024). This supports early targeted therapy. Severity differences may have affected response.

The current study highlights the effectiveness of engaging, manipulative activities such as clay and sand play in improving manual skills among children with cerebral palsy. These findings are consistent with Hines *et al.* (2019), who demonstrated that an intensive, play-based intervention known as Hand-Arm Bimanual Intensive Therapy (HABIT), themed around magic play, significantly enhanced upper limb function in children with unilateral cerebral palsy. Their study emphasised the benefits of structured, playful tasks in developing both unimanual and bimanual hand functions, as measured by the Box and Block Test, which supports the present study's conclusion about the value of incorporating creative play into rehabilitation programmes (Abdulzahra & Shawq, 2024; Hines *et al.*, 2019). The involvement of nurses in facilitating these playful activities ensures correct technique, safety, and sustained engagement, contributing to better motor outcomes.

The present findings also align with prior research that demonstrated the benefits of clay modelling in improving hand motor skills (Sundresh, 2017). A study conducted in India on children with mild intellectual disabilities found that a six-week clay modelling intervention led to significant improvements in their manual abilities, highlighting its potential as a therapeutic tool. Similarly, Maharani and Jannah (2018), in their study that used clay media to enhance fine motor skill of children with CP, reported that clay-based activities significantly enhanced fine motor skills. Nurses' supervision during these interventions can adapt tasks to individual hand abilities, maximise participation, and ensure consistent practice, reinforcing the therapy's effectiveness. The physical and tactile nature of clay allows children to engage in various hand movements such as cutting, squeezing, and shaping, which improve dexterity and hand-eye coordination (Maharani & Jannah, 2018). Findings support clay as a low-cost, effective tool. Outcomes may vary by individual hand ability.

The results of the current study showed that the sand group experienced a significant improvement in fine motor skills compared to the control group in post-test 2 ($p = 0.041$). This finding is consistent with the study by Pragistha *et al.* (2022), which demonstrated that sand-based activities are effective in stimulating fine motor development in preschool children. Their findings indicated that children who engaged in sand play exhibited notable improvements in fine motor abilities (Pragistha *et al.*, 2022). It is engaging in sand play activities enhances hand-eye coordination, strengthens muscles, and improves fine motor skills through actions like pouring, digging, and building. Sand tasks stimulate varied hand use and coordination.

The comparative findings among the effective playgroups in the present study are consistent with previous research, which demonstrated that structured, hands-on activities, such as Lego-based interventions, can significantly improve fine motor skills in children with disabilities. These studies highlighted that sensory-rich experiences promote motor development by encouraging dynamic and purposeful interactions. This supports the sensory and manipulative engagement provided by clay play in the current study, further emphasising the role of creative and tactile activities in enhancing fine motor function (Kalel & Shawq, 2024; Maurer & Roebbers, 2020). The nurse's facilitation ensures individualised attention and enhances engagement, reinforcing the effectiveness of tactile and creative play in improving manual function. Play may enhance motivation and neural activation.

Limitations

There were a few difficulties encountered during the implementation of this study due to its innovative nature and being one of the first of its kind. For example, engaging children consistently in structured play activities such as clay, beads, and sand required additional effort and flexibility, as not all children responded equally to each material. The study involved children with varying degrees of motor impairment, which may have influenced their level of participation and outcomes. The duration of the intervention was relatively short, limiting the ability to assess long-term improvements in hand function. The presence of caregivers during sessions, differences in home environments, and individual motivation levels could also play a role in the effectiveness of the intervention. Additionally, the non-random sampling and small sample size may limit generalisability. The absence of blinding may have introduced potential bias in outcome assessment.

CONCLUSION

Children diagnosed with cerebral palsy have a significant position within the field of paediatric nursing, as their condition not only affects motor function but also influences their overall developmental trajectory, independence, and quality of life. It is imperative to assess the extent of their reliance on caregivers for self-care and overall care requirements, since these factors directly impact family well-being and the child's capacity to adapt to daily challenges. Nursing interventions utilising play activities such as activities with clay, beads, and sand proved to be effective in enhancing hand function among children with cerebral palsy. The improvement in fine motor skills observed in this study highlights the therapeutic potential of simple, low-cost, and enjoyable activities that engage children actively in their own care process.

These interventions offer a practical, engaging approach that supports fine motor skill development and promotes greater functional independence. They are not only beneficial in a clinical setting but can also be incorporated into routine home care practices, encouraging families to participate in their child's rehabilitation.

The findings highlight the essential role of nurses in the paediatric field and the value of integrating play methods into therapeutic care, especially given the nurse's position as a primary caregiver who bridges the gap between medical treatment and everyday living. These activities can be incorporated into daily paediatric nursing routines with minimal resources, making them accessible even in resource-limited healthcare settings. Future studies can expand on the current findings by including a larger and more various sample of children with CP to improve the generalisability of results. Longer intervention periods and follow-up assessments are recommended to evaluate the sustained impact of play-based nursing strategies on hand function. Future research should focus on long-term follow-up studies, randomised controlled trials, and inclusion of larger, more diverse samples. Exploring digital or virtual play tools in nursing-led interventions could provide innovative ways to sustain engagement and improve hand function outcomes.

Conflict of Interest

The authors declares that they have no conflict of interest.

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