Effectiveness of Video Assisted Teaching Program for Caregivers regarding Caring of Children with Cerebral Palsy Undergoing Hyperbaric Oxygen Therapy

Rania Ebrahim Abd-Elzaher[1], Ebtisam Mohamed Abd-El-Aal [2], Amina Abd-Elrazek mahmoud [3], and Basma Mohamed Abd-Elrahman [4]

(1) Assistant lecturer of Community Health Nursing, (2,3) Professor of Community Health Nursing, and (4) Assistant Professor of Community Health Nursing, Faculty of Nursing, Benha University, Egypt.

Abstract

Background: Caregivers play a vital role in providing comprehensive care for children with cerebral palsy, as they practices greatly enhance effectiveness of hyperbaric oxygen therapy and prevent its complications. **Aim of study:** This study aimed to evaluate the effectiveness of a video-assisted teaching program for caregivers regarding caring of children with cerebral palsy. **Research design:** This study used a quasi-experimental research design. **Setting:** This study was carried out at the Hyperbaric Oxygen Therapy Unit in the Nasser Institute for Research and Treatment, Cairo, Egypt. **Sample:** 76 caregivers and their children (divided into study and control groups) were taken by a purposive sample. **Tools of data collection**: Five tools were used. **1):** A structured interviewing questionnaire sheet, which consisted of three parts **A)** Socio-demographic traits of caregivers under the study and personal data of children with cerebral palsy. **B)** Medical data of the children with cerebral palsy. **C)** Knowledge of the studied caregivers regarding cerebral palsy and hyperbaric oxygen therapy. **II)** The FLACC pain scale. **III)** Checklist to assess caregivers practices. **IV)** Communication function classification system scale **V)** Communication and symbolic behavior scales **Results:** The findings revealed that the mean ages of caregivers under the study were 33.03±4.750 and 32.42±5.006 years, respectively. 18.4% and 15.8% of the study and control groups of caregivers had good total knowledge level pre-program implementation, improved to 81.6% and 28.9% post program implementation, respectively. Also, a highly statistically significant positive correlation between total practices of studied caregivers and communication abilities of their children with cerebral palsy was present then control group. **Conclusion:** The video-assisted teaching program greatly improve the knowledge, practices of study group of caregivers, and communication abilities among the study group of the children then the control group. **Recommendation:** Dissemination of educational booklet and video about CP to all HBOT units to be available for all newly caregivers of children with CP.

Key words: Video Assisted Teaching Program, Caregivers, Children, Cerebral Palsy, Hyperbaric Oxygen Therapy.

Introduction Cerebral palsy (CP) describes a group of lifelong, neurological conditions caused by nonprogressive injury or maldevelopment in the developing brain that affects movement and posture, thus causing limitations in activity. Motor disorders in CP are often accompanied by sensory, perceptual, cognitive, communication, behavioral, epilepsy and secondary musculoskeletal issues. CP is the most common physical disability in children, often associated with lifelong multiple disabilities, rendering it a

significant psychological and economic burden for families and societies worldwide **(Finch-Edmondson et al., 2025; Hoang et al., 2025).**

Classification of CP is based on clinical manifestations and the location of brain lesions, including spastic, dyskinetic, ataxic, rigid, and mixed types. Pyramidal system damage, leading spastic CP which characterized by abnormal motor development, increased muscle tone, hyperreflexia, weakness, and balance issues, which can significantly affect independence, social participation, and quality of life. CP is caused by congenital abnormalities of the brain, and less than 10% are caused by factors such as intrauterine asphyxia, uterine and placental infections, amniotic fluid problems, and maternal fever during childbirth. Children with CP often present with intellectual disabilities, speech disorders, and various other symptoms **(Haramshahi et al., 2024; Lin, & Wang, 2025).**

Diagnosis of CP usually based on a combination of clinical and neurological signs, typically identified between age 12 and 24 months. Diagnosis made through careful taking medical history and use standardized tools to confirm the child injured. CP cannot be cured but early treatment can help to achieve functional abilities that facilitate independence and improve quality of life. There is a variety of treatment options to reduce spasticity and related symptoms. These options include botulinum toxin (BTX), orthoses, exercise therapy, surgery and Hyperbaric Oxygen Therapy (HBOT) **(de Roo et al., 2025).**

Hyperbaric Oxygen Therapy (HBOT) means breathing 100% pure oxygen with pressure higher than sea level >1.0 Atmosphere Absolute (ATA) within a treatment chamber. HBOT enhance many of biological responses through increase tissue oxygenation even in areas with compromised blood flow. Children with CP may have complications like spasticity, contractures, scoliosis, joint dislocations, skin breakdown, aspiration pneumonia, malnutrition, dental problems, low bone mass, epilepsy, psychological problems, and bowel and bladder complications. This, in turn, affects their activities of daily living and mobility, and it can limit their social integration. Not only are the children is affected, but also impact on families and caregivers **(Hájek et al., 2024; Marois et al., 2024).**

Community health nurses plays extremely important role in providing a variety of child- and family-directed services which include healthcare, education and social care and other services. On the other hand, providing the services must also related to the children and caregivers needs. CHNs must be vigilant for medical and developmental problems, as well as assist caregivers of children primarily diagnosed with CP in managing health conditions and correcting poor health practices of them, CHNs must be aware of the deviant development. Also, interprofessional collaboration is vital in delivery well-functioning healthcare for children with physical disabilities. **(Styczen et al., 2024; Međaković et al., 2024)**.

Video teaching method understandably presents complicated concepts and concerns through sight, voice, and motion, it improves caregivers learning. Video is innovative way to attract caregivers and their children to intervention and consider a crucial component of education program since it connects theory to practice. CHNs play vital role in improve

caregivers knowledge and practice, though a variety of teaching techniques, including lectures supported with video, demonstrations, discussions, self-education, and teaching program. Video-based teaching would be advantageous for caregivers since it would enable them to enhance and perfect their current abilities and expertise, leading to improved care **(Suthasini et al., 2024).**

Significance of the study:

The global prevalence of CP can range from 2 to 3.5 per 1,000 livebirths, and estimated that 30-40% of the disabilities in children are attributed to CP. This prevalence is inversely related to gestational age and birthweight, with a prevalence ranging from 90 cases per 1,000 neonatal survivors weighing less than 1 kg to 1.5 cases per 1,000 for those born weighing 2.5 kg or more. Education of caregivers is vital for enhancing caregiver knowledge, skills, and confidence in delivering evidence-based care. Such programs equip caregivers with practical strategies for safe feeding, hygiene, communication, and home-based exercises, thereby preventing secondary complications and promoting optimal functional outcomes. caregiver education contributes to improved quality of life for both the child and family, while reducing long-term healthcare demands **(Alruwaished et al., 2020).**

Aim of study

The aim of this study was to evaluate the effectiveness of video assisted teaching program for caregivers regarding caring of children with cerebral palsy undergoing hyperbaric oxygen therapy

Research hypothesis:

1- Knowledge and practices of caregivers regarding care of children with cerebral palsy undergoing hyperbaric oxygen therapy who will participate in the video assisted teaching program will be improved than those not receive the program.

2- Communication abilities of children with cerebral palsy who will participate in the video assisted teaching program will be able to do better than those do not receive the program.

Subjects and Method

Research design

A quasi experimental research design was utilized to conduct this study

Setting

The study was conducted at Hyperbaric Oxygen Therapy Unit in Nasser Institute for Research and Treatment in Cairo Governorate. Egypt. This sitting the only governmental unit affiliated to Ministry of Health and Population which provide this treatment.

Sample

A purposive sample was used in this study it was included 76 caregiver and their children diagnosed with CP, (study and control group, pre& post test was conducted for both group). Caregivers for children with CP attending to the previously mentioned setting through six months from the beginning of the study according the inclusion criteria: Children with mild and moderate disability, children recently receiving the hyperbaric oxygen therapy treatment sessions, child aged from 3:<12year. Exclusion criteria include: Children doesn't have any comorbidities as pulmonary dysfunction, cardiac diseases, epilepsy, mental retardation.

Tool development:

In order to achieve the research aim, the researcher firstly reviewed the current and past national and international literature

regarding the several aspects of the research problem which helped the researcher to be acquainted with all dimensions of the problem and HBOT treatment which guide the researcher to develop tools of data collection.

Tools for data collection

Five tools were utilized for data collection.

Tool I: An interviewing questionnaire sheet: It was designed, adjusted and developed in Arabic language and divided into three parts to evaluate the following:

Part I: **A-**Sociodemographic trait of the studied caregivers of children with CP as: Caregiver of the child, gender, marital status, age, educational level, occupation, place of residence, monthly income.

B-Personal data of children with CP as: Child age, gender, birth order

Part II: It was concerned **A-** Medical data of children with CP as follow: Age of the child when diagnosed, child health problem, type of CP the child has, treatment regimen for the child, severity of disability.

B- Data of treatment with hyperbaric oxygen therapy, as follow: Number of treatment session, duration of treatment session, oxygen pressure during session, child improvement as result of hyperbaric oxygen therapy sessions.

Part III: It was concerned with knowledge of the studied caregivers regarding CP, and HBOT, it includes eighteen closed ended questions as:

A: Caregivers knowledge regarding CP, which included nine closed ended questions (multiple choice type) covered main 9 items as (meaning, types, risk factors, causes, signs and symptoms, diagnosis, treatment, prevention, and complications).

B- Caregivers knowledge regarding HBOT, which included nine closed ended questions (multiple choice type) covered main 9 items as (meaning, indications, types of HBOT chamber, methods, benefits, contraindications, complications, substances should be avoided on the child body before HBOT session, items prohibited from entering chamber of HBOT).

Scoring system of caregivers knowledge:

Knowledge scoring was calculated as follows: (2) score for complete and correct answer, (1) score for incomplete and correct answer, and (0) for don't know. The total knowledge score =36 point and classified the total knowledge into three level as following: Good level when score ≥75% (≥27 score), average when equal 50- <75% = (18-<27 score), and poor when < 50% (<18 score).

Tool II: Face, Legs, Activity, Cry, Consolability scale or FLACC behavioral pain scale was adopted from **Voepel-Lewis et al., (2010).** To assess pain intensity in children with CP during HBOT session. The scale composed of five categories (Face, Legs, Activity, Cry, Consolability).

Scoring system:

The total scores of pain intensity scale ranged from "0-10", the scores categorized as the follows: "0 score" for relaxed and no pain, "1-3score" for mild pain, "4-6 score" for moderate pain, "7-10 score" for severe pain.

Tool III: Checklist to evaluate caregivers practices **(Narayanan et al., 2007 & Mahmood et al., 2024),** and modified by researcher to evaluate the caregivers reported practices regarding care of children with CP which included: Nutritional practices (7 steps), hygienic practices (6 steps), range of motion exercise (5 steps), stretching exercise

(4 steps). Used pre and post for both groups of caregivers.

Scoring system

All responses were given a score of '1' for "done" and '0' for "not done." There were 22 points in all throughout the practices. The overall practices score was divided into two categories: Adequate level if it was at least 60% (≥13 points) and an unadequate level if it was less than 60% (>13 points).

Tool IV: Communication Function Classification System (CFCS) was adopted from **Hidecker et al., (2011).** This tool consisted of five-levels (CFCS I, II, III, IV, V) that classifies children with CP by their social communication abilities: Level I means (highest communication ability) and level V means (lowest communication ability).

Scoring system:

The total score is obtained by averaging the percentage scores across the five levels. Percentage score across the five levels the child was categorized in which level of CFCS as level I (80%- 100%), level II (60%- 80), level III (40%- 60%), level IV (20%- 40%), level V (0%- 20%).

Tool V: Communication and Symbolic Behavior Scales Developmental Profile (CSBS DP) Infant-Toddler was adopted from **Coleman et al., (2013),** and modified by the researcher. Is a reported screening checklist for CFCS include 7 subdomains as following (Eye gaze, Communication, Gesture, sounds, words, understanding, and object use).

Scoring system

A three-point Likert scale was used for rating communication ability of children with CP. Each response was given a score between 0-2, where never = 0 score, sometimes= 1 score, and always = 2 score. The domain score is calculated by summation of items score of each domain. The total score of CSBS = 46 score which is sum of scores across seven domains items. The total communication function score was classified into three categories: High communication ability when score ≥ 75% (≥ 34 score), moderate when score 50-75% (23-34 score), and low when score < 50% (< 24 score).

Administrative process:

An official letter was sent to the director of Nasser Institute for Research and Treatment from the dean of Benha University's Faculty of Nursing, requesting advance permission from the hospital to carry out the study. The study goals and title were described in the letter.

Ethical consideration:

The Scientific Research Ethical Committee at Faculty of Nursing, Benha University approved the study. The code of the study is R.E.C. C.H.N-P.121. at July 2025. Before beginning the study, the researcher informed each caregiver of the study purpose and obtained their informed consent; both study participants are free to leave the study at any time. Furthermore, the researcher made sure the caregivers were informed that the information was used only for research.

Pilot Study:

The pilot study was carried out on 10% of the studied caregivers (8 caregivers).The pilot study aimed to assess the tool clarity, applicability and time needed to fill each sheet. Furthermore, to discover any obstacles and problems that the researcher might find while gathering data. The pilot study sample was excluded from the total sample as modifications on the tool was done as adding Communication Function Classification System (CFCS) scale to evaluate improvement

in children after video assisting teaching program.

Tools validity:

A group composed of three specialists in Community Health Nursing, Benha University examined the tools to confirm the accuracy of the information and make sure it was suitable, applicable and comprehensiveness.

Tools reliability:

Reliability of the tools was applied by researcher for testing internal consistency of the tools using the Cronbach's Alpha coefficient test. The statistics reliability for knowledge was 0.890, for practices' was 0.789

Data collection:

The study was conducted in four main phases: assessment, planning, implementation, and evaluation, which spanned a period of six months. The researcher attended the previous setting three times a week for about three hours each time, from 9 AM to 12 PM, because the caregivers of children with CP were available at the Hyperbaric Oxygen Therapy Unit on those days.

The study was conducted through:

A-Assessment phase:

To gather baseline data, interviews were conducted with caregivers in the study and control groups during the assessment phase. After welcoming each caregiver, the researcher went explained the goals, schedule, and activities of the study. The researchers were available from 9:00 am to 12:00 pm on Saturdays, Sundays, and Wednesdays. The caregivers and their children were greeted by the researcher at the Hyperbaric Oxygen Therapy Unit's waiting room. During this stage (pretest), the data collection instruments were filled out. To evaluate their knowledge and practices, the caregivers under study were asked to fill out a questionnaire sheet. The researcher assess knowledge regarding CP and HBOT it took 5–10 min. Each caregiver was asked individually about their care practice without to evaluate their practice using a practices checklist. Practices checklist for each caregiver filled by the researcher. The average number of caregivers interviewed per day was 2–3 caregiver per day. The time needed for filling out all data collection tools was 45–60 min. The assessment phase took nearly 2 months. Depending on the admitted caregivers who agreed to participate in the study, the number of caregivers who were interviewed was identified.

B-Planning phase:

Based on information gathered from the assessment phase and the pertinent literature, the researcher created a video-assisted teaching program in Arabic. Based on caregivers' knowledge levels, the researcher created the video, brochure, booklet, contents, and verified the number of sessions, different teaching techniques, and media to be utilized in the program. The researcher coordinated the session's timing and location with the unit head nurse and caregivers. The following are the program objectives that were developed.

General objectives:

The overall goal of the video-assisted teaching program was to increase the knowledge and practices of the caregivers who were being studied regarding the care of their children with cerebral palsy who were having HBOT and communication abilities of their children.

Specific objectives:

After the completion of the video assisted teaching program, the studied caregivers should be able to:

A-Acquire knowledge as:

Define cerebral palsy and its types, mention the risk factors & causes which contributing to

the occurrence of CP, describe clinical manifestations of CP and methods used for diagnosis of CP, discuss different types of treatment of CP, enumerate complication of CP. Define HBOT and its indication, differentiate between methods of treatment with HBOT, discuss benefits of treatment with HBOT, determine contraindication and complications of treatment with HBOT and Mention material restricted to enter pressure room.

B- Apply the following practical skills:

- Demonstrate steps of proper nutrition
- Apply hygienic related practices for the child
- Implement steps of range of motion exercise.
- Perform stretching exercise for the child.

C- Implementation phase:

During the implementation phase, the video-assisted teaching program was put into place. Six scheduled sessions were included. The small group of caregivers, consisting of two to three caregivers, had 45 to 60 minute sessions. The same sessions are given to each group of caregivers under study. Over the period of two months (July 2024 to the end of August 2024), a total of six sessions, each lasting 45 to 60 minutes, were held. Additionally, a variety of instructional techniques were used, such as group discussions, demonstration, re-demonstration, lectures supported by videos. The program sessions were conducted in a waiting room, allowing the researcher to apply various teaching techniques and show a video presentation. A brief introduction to the video-assisted teaching program and its purpose was given at the opening of the first session. Additionally, the researcher provided the study group with an informative brochure and booklet. Each session began with a quick introduction, followed by a summary of the previous one and the goals of the current one. The program was implemented through the program sessions. Total number of sessions for the study caregivers was 6 sessions, 2 sessions for theoretical part include (explanation about meaning, causes, types, manifestations, and treatment, complications and prevention of CP. And Meaning of HBOT, indication, benefits, types of HBOT chamber, contraindication, and complication. 4 sessions for practical skills include (nutritional practices, hygienic practices, range of motion and stretching exercise).

At the conclusion of every session, the researcher facilitates an interactive discussion, allowing caregivers to seek clarification and obtain guidance tailored to their individual needs and concerns.

D- Evaluation phase:

Immediately after the program, a posttest was administered to both the study and control groups using the same pretest tools to determine the effectiveness of the video-assisted teaching program. The research hypotheses were validated, and the evaluation phase was completed within approximately 2 months.

Statistical analysis:

All data collected were organized, tabulated and analyzed by using the Statistical Package for Social Science (SPSS version 22), which was used frequencies and percentages for qualitative descriptive data, and chi-square coefficient x^2 was used for relation tests, and mean and standard deviation was used for quantitative data, spearman analysis was used for correlation coefficient (r) analysis and degree of significance was identified.

Results

Table (1): Displays that 71.1% and 65.8% of the study and control groups were mothers, respectively, and 60.4% and 57.9% of both groups aged from 30 years to less than 35 years, with mean ages of 33.03±4.750 and 32.42±5.006 years, respectively. While 71.1% of the study group and 52.6% of the control group had secondary education, and 71.1%

and 65.8% of the two groups were not working. Regarding residence, 71.1% and 63.2% of the study and control groups were from rural areas, respectively, and 76.3% and 84.2% of both groups had inadequate income.

Table (2): Indicates that 57.9% and 47.4% of the study and control groups aged from 5 years to less than 7 years, with mean ages of 6.32±1.23 and 6.37±1.36 years, respectively. Also, 84.2% of the study group and 71.1% of the control group were males, and 60.5% and 57.9% of the two groups were the second in ranking among siblings, respectively.

Table (3): 65.8% and 63.2% of the two groups were diagnosed at age less than 1year respectively. While 78.9% and 73.7% of study group and 76.3% and 68.4% of control group were suffering from communication problems and movement problems respectively. Regarding treatment regimen all of study group and control group were treated with medication and HBOT respectively. Furthermore, 60.5 % of study group and 71.1% of control group had moderate disability respectively.

Table (4): Reveals that 71.1% and 60.5% of the study group and control group received 40 HBOT sessions, respectively; 78.9% and 73.7% of the study group and control group received HBOT sessions for 60 min., respectively; and 65.7% and 71% of both groups received HBOT sessions at 1.5 ATA, respectively. While 78.9% of the study group and 68.4% of the control group were suffering from severe ear pain during the HBOT session, respectively, 89.5% and 81.6% of the study group and control group were suffering from fatigue after the HBOT session, respectively. Regarding child improvement, 81.6% and 68.4% of the study group and 78.9% and 68.4% of the control group had improvement in cognitive function and communication skills, respectively.

Figure (1): Portrays that the good total knowledge level of the study group improved from 18.4% pre video assisted teaching program implementation to 81.6 % post video assisted teaching program implementation respectively, while the good total knowledge level of control group improved from 15.8 % pre video assisted teaching program implementation to 28.9 % post video assisted teaching program implementation respectively.

Figure (2): Portrays that 63.2% of the study group and the control group had severe pain levels pre-video-assisted teaching program implementation, and 68.4% and 23.7% of the study group and the control group had relaxation and comfort post-video-assisted teaching program implementation, respectively.

Table (5) Shows that there was a statistically significant difference between both groups of caregivers regarding reported hygienic practices post video-assisted teaching program implementation ($P > 0.05$). While there was a highly statistically significant difference between the study and control groups regarding total reported practices of nutrition and stretching exercises post video-assisted teaching program ($P > 0.001$).

Figure (3): Illustrates that the adequate total reported practices score of the study group increased from 26.3% pre-video-assisted teaching program to 81.6% post-video-assisted teaching program, respectively. While 23.7% of the control group had adequate total reported practice score pre-video-assisted teaching program, it increased to 31.6% post-video-assisted teaching program.

Figure (4): Illustrates that the total communication function level I and level II of the study group increased from 0.0% and 15.8% pre-video-assisted teaching program to 21.1% and 44.7% post-video-assisted teaching program, respectively, and 13.2% of the control group had total communication function classification system level II pre-teaching program elevated to 21.1% post-teaching program, respectively. While 34.2% and 42.1% of both groups had level III of the total communication function levels, pre-video-assisted teaching program decreased to

21.1% and 39.5% post-video-assisted teaching program, respectively.

Table (6): Illustrates that there was a highly significant positive correlation between total knowledge and total practice of the study and control groups pre and post video assisted teaching program implementation ($p \leq 0.001$) respectively.

Table (7): Displays that; there was a significant positive correlation between total communication of both groups of children and total practices of the study and control groups of caregivers pre and post video assisted teaching program implementation ($P \leq 0.001$) respectively.

Results

Table (1): Distribution of both studied caregivers (study and control groups) regarding their sociodemographic characteristics (n=76)

Caregivers sociodemographic characteristics	Variable	Study group n= (38)		Control group n= (38)		X^2	p-value
		No.	%	No.	%		
Caregiver	Father	8	21.1	6	15.8	1.963	.375 n.s
	Mother	27	**71.1**	25	**65.8**		
	Sister/brother	3	7.9	7	18.4		
Age /(years)	20 <30	4	10.5	7	18.4	1.247	.742 n.s
	30 <35	23	**60.4**	22	**57.9**		
	35<40	8	21.1	6	15.8		
	45> 40	3	8	3	7.9		
	Min -Max	**20-42**		**20-42**			
	Mean ±SD	**33.03±4.750**		**32.42±5.006**			
Gender	Male	8	21.1	6	15.8	.350	.554 n.s
	Female	30	**78.9**	32	**84.2**		
Education	Basic education	2	5.3	5	13.2	3.056	.217 n.s
	Secondary education	27	**71.1**	20	**52.6**		
	University education and more	9	23.6	13	34.2		
Marital status	Single	4	10.5	10	26.3	3.152	.076 n.s
	Married	34	**89.5**	28	**73.7**		
Occupation	Working	11	28.9	13	34.2	.244	.622 n.s
	Not working	27	**71.1**	25	**65.8**		
Residence place	Rural	27	**71.1**	24	**63.2**	.536	.464 n.s
	Urban	11	28.9	14	36.8		
Monthly income	Adequate	9	23.7	6	15.8	.748	.387 n.s
	In adequate	29	**76.3**	32	**84.2**		

(n.s) Not Significant (P>0.05)

Table (2): Distribution of both studied children (study and control groups) regarding their personal characteristics (n=76)

Children personal characteristics	Variable	Study group (n=38)		Control group (n=38)		X^2	p-value
		No.	%	No.	%		
Age /years	5<5	2	5.3	4	10.5	.221	748 n.s
	7<7	22	**57.9**	18	**47.4**		
	9<9	12	31.5	14	36.8		
	12<12	2	5.3	2	5.3		
	Min – Max	**4-10**		**4-10**			
	Mean ±SD	**6.32±1.23**		**6.37±1.36**			
Gender	Male	32	**84.2**	27	**71.1**	1.894	.169 n.s
	Female	6	15.8	11	28.9		
Child birth order among siblings	First	2	5.3	10	26.3	11.733	.003*
	Second	23	**60.5**	22	**57.9**		
	Third	13	47.4	6	15.8		

(n.s) Not Significant (P>0.05) *** Statistically significant (P < 0.05)**

Table (3): Distribution of both studied children (study and control groups) regarding their medical history(n=76)

Children medical history	Variable	Study group (n=38)		Control group (n=38)		X^2	p-value
		No	%	No	%		
Child age at diagnosis	Less than1 year	27	**71**	30	**79**	.078	.867 n.s
	1<3	11	29	8	21		
Children health problems	Movement problems	25	**65.7**	20	52.6	617	984 n.s
	Swallowing difficulty	10	26.3	11	28.9		
	Communication problems	23	**60.5**	25	**65.7**		
	Tooth problem	30	79	22	57.8		
	Incontinence	25	65.7	23	60.5		
	Hearing problems	10	26.3	11	28.9		
	Vision problem	7	18.4	12	31.5		
Type of CP	Spastic CP	25	**65.7**	24	**63.1**	2.820	420 n.s
	Ataxic CP	7	18.5	4	10.5		
	Athetosis CP	3	7.9	5	13.2		
	Mixed CP	3	7.9	5	13.2		
Treatment regimen	Medication	38	**100.0**	38	**100.0**	.353	994 n.s
	Physiotherapy	20	52.6	25	65.7		
	Surgery	24	63.1	27	71.0		
	Occupational therapy	15	39.5	17	44.7		
	Speech therapy	25	65.7	29	76.3		
	HBOT	38	**100.0**	38	**100.0**		
Severity of children disability	Mild	15	39.5	11	28.9	.935	.333 n.s
	Moderate	23	**60.5**	27	**71.1**		

(n.s) Not Significant (P>0.05) *** These answers were not mutually exclusive**

Table (4): Distribution of studied children (study and control groups) according to their history of treatment with HBOT (n=76).

Data of treatment with HBOT	Variable	Study group (n=38)		Control group (n=38)		X^2	p-value
		No.	%	No.	%		
No. of treatment sessions	40 session	29	**76.3**	28	**73.6**	4.752	.191 n.s
	60 session	4	10.5	8	21.1		
	80 session	5	13.2	7	18.4		
Duration of treatment sessions	45 min	6	15.8	6	15. 8	.736	.692 n.s
	60 min	31	**82.2**	29	**77.7**		
	90 min	2	5.3	4	10.5		
Atmosphere pressure of oxygen during session	1.4 ATA	5	13.1	5	13.1		
	1.5 ATA	28	**73.6**	29	**76.3**		
	1.7 ATA	8	21.2	6	15.7		
Child improvement	Improvement of motor skills	12	31.5	7	18.4	5.999	.587 n.s
	Improvement of cognitive function	35	**92.1**	32	**84.2**		
	Improvement of communication skills	30	**78.9**	28	**73.6**		
	Stimulate neuroplasticity	10	26.3	11	28.9		
	Increase physical flexibility	7	18.4	4	10.5		
	Stop drooling	15	39.5	14	36.8		
	Swallowing improvement	12	31.6	12	31.6		

(n.s) Not Significant (P>0.05) *** These answers were not mutually exclusive**

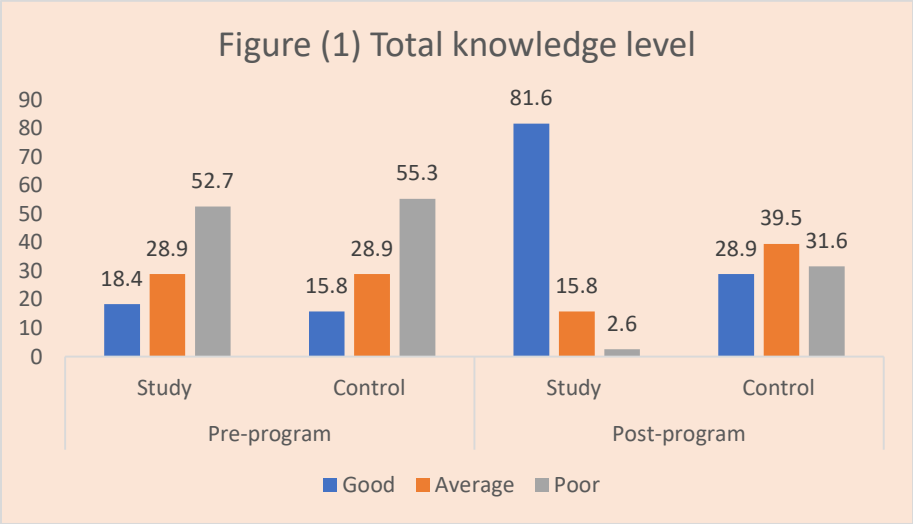

Figure (1): Percentage distribution of both studied caregivers (study and control groups) regarding their total knowledge (n=76)

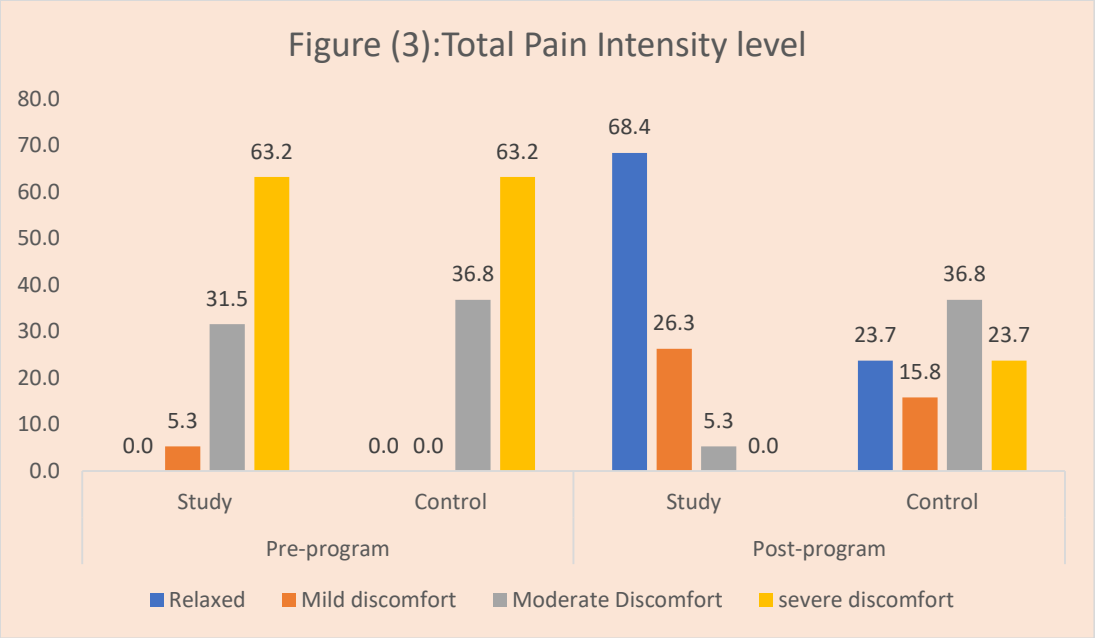

Figure (3):): Percentage distribution of both groups of children regarding their total pain intensity level pre and post program, (study and control groups) (n=76)

Table (5): Comparison of both studied groups of caregivers (study and control groups) regarding their total reported practices items pre and post program, (n=76).

Total reported practice items	Response	Pre implementation of video assisted teaching program						Post implementation of video assisted teaching program					
		Study group (n=38)		Control group (n=38)		X^2	p-value	Study group (n=38)		Control group (n=38)		X^2	p-value
		No.	%	No.	%			No.	%	No.	%		
Nutritional Practices	Satisfactory	8	21.1	9	23.7	.076	.783 n.s	32	84.2	16	42.1	14.47	.000**
	Unsatisfactory	30	78.9	29	76.3			6	15.8	22	57.9		
Hygienic Practices	Satisfactory	11	28.9	12	31.6	.062	.803 n.s	32	84.2	19	50.0	10.07	.002**
	Unsatisfactory	27	71.1	26	68.4			6	15.8	19	50.0		
ROM exercise	Satisfactory	10	26.3	12	31.6	.256	.613 n.s	31	81.6	17	44.7	11.08	.001**
	Unsatisfactory	28	73.7	26	68.4			7	18.4	21	55.3		
Stretching exercise	Satisfactory	7	18.4	4	10.5	.957	.328 n.s	32	84.2	9	23.7	28.01	.000**
	Unsatisfactory	31	81.6	34	89.5			6	15.8	29	76.3		

(n.s) Not significant (p > 0.05) ****Highly statistically significant (P < 0.001)**

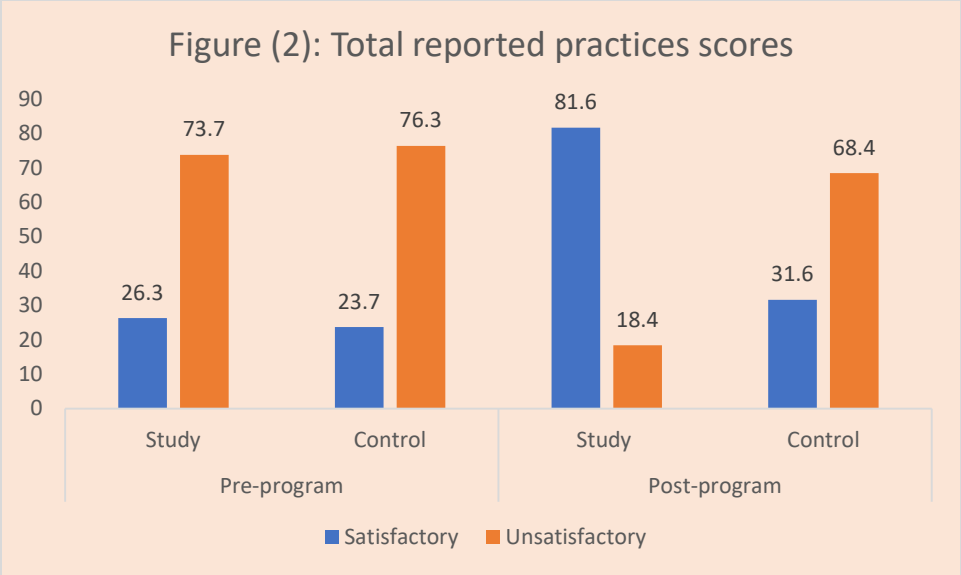

Figure (2): Percentage distribution of both studied caregivers (study and control groups) regarding their total reported practices score pre and post program (n=76).

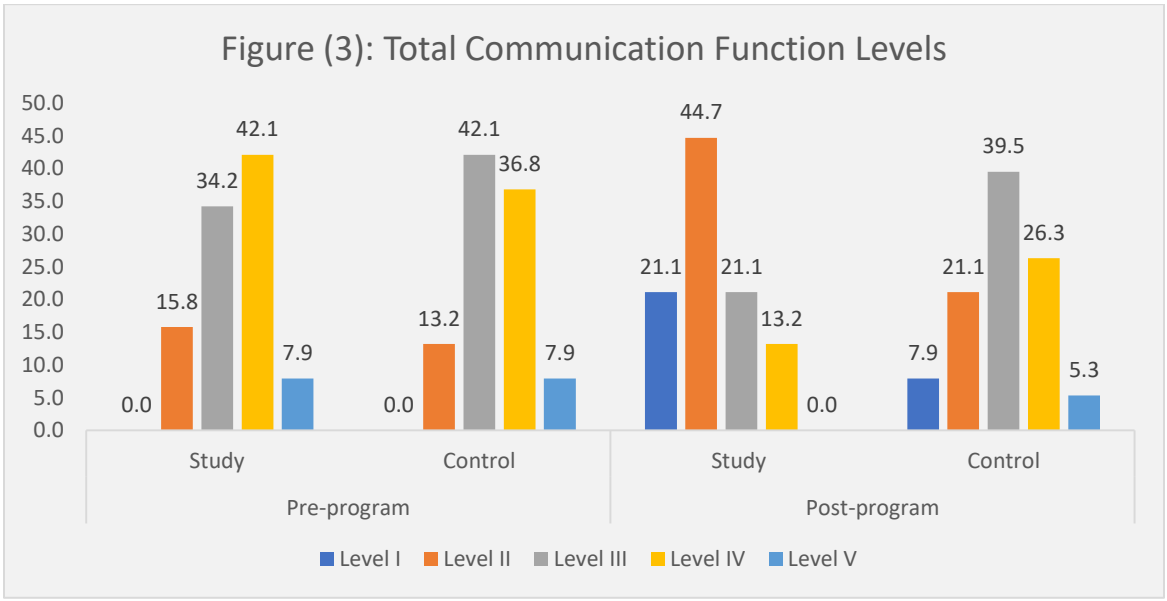

Figure (3): Percentage distribution of the studied children(study and control groups) regarding their total communication function levels pre and post program, (n=76).

Table (6): Correlation between total knowledge score and total practices score among both studied caregivers pre and post program, (study and control groups) (n=76).

Total knowledge	Total practices			
	Pre implementation of video assisted teaching program		Post implementation of video assisted teaching program	
	r	p-value	r	p-value
tudy	.720	.000**	.230	.165
Control	.670	.000**	.907	.000**

*Statistically significant (P ≤ 0.05) **Highly statistically significant (P ≤ 0.001)

Table (7): Correlation between total communication of both studied children and total practices of both groups of caregivers pre and post program, (study and control groups) (n=76).

Total communication of children	Total practices of caregivers			
	Pre implementation of video assisted teaching program		Post implementation of video assisted teaching program	
	r	p-value	r	p-value
Study	.483	.000**	.902	.000**
Control	.491	.000**	.669	.000**

**Highly statistically significant (P ≤ 0.001)

Discussion

Children hurting with CP experience abnormalities in muscle tone and motor function. Furthermore, they can suffer from difficulties with walking, balance, and fine motor abilities due to compromised muscle control and coordination. Speech, deglutition, intellect, vision, and hearing can also be impacted. Currently, braces, rehabilitation therapy, and assistive technologies are the mainstays of treatments for children with CP to enhance overall function. Among those therapies, Hyperbaric Oxygen Therapy (HBOT) **Marois et al. (2024)**.

Regarding sociodemographic traits of studied caregivers, the present study displayed that less than three-quarters (71.1%) of the study group and almost two-thirds (65.8%) of the control group were mothers, respectively, and nearly three-fifths (60.4%) and slightly less than three-fifths (57.9%) of the study and control groups were aged from 30 to less than 35 years, with mean ages of 33.03±4.750 and 32.42±5.006 years, respectively. While less than three-quarters (71.1%) of the study group and more than half (52.6%) of the control group had secondary education. Also, less than three-quarters (71.1%) and less than two-thirds (65.8%) of the study and control groups were not working. Regarding residence, less than three-quarters (71.1%) and more than three-fifths (63.2%) of the study and control groups were from rural areas, respectively, and more than three-quarters (76.3%) and the majority (84.2%) of both groups didn't have adequate income (table 1).

Corresponding to personal data of the studied children, the present study indicated that more than half (57.9%) and approximately less than half (47.4%) of the study and control groups were aged from 5 years to less than 7 years, with mean ages of 6.32±1.23 and 6.37±1.36 years, respectively. Also, the majority (84.2%) of the study group and less than three-quarters (71.1%) of the control group were males. Also, three-fifths (60.5%) and more than half (57.9%) of the study and control groups were the second in ranking among siblings, respectively (table 2).

Regarding the history of treatment with HBOT of the studied children, the current study revealed that less than three-quarters (71.1%) and three-fifths (60.5%) of the study group and control groups received 40 HBOT sessions, respectively (table 4). These findings were parallel with **Khalil et al. (2023)**, who studied "Long-term effect of hyperbaric oxygen therapy on gait and functional balance skills in cerebral palsy children" in Egypt (n=39) and reported that the studied children were treated with HBO2 therapy for a total of 40 treatment sessions. This might be due to 40 sessions allowing for achieving the full range of physiological benefits associated with HBOT. Also, this benefit can be observed in phases as initial sessions improve cellular energy and tissue function, while later sessions promote the formation of new blood vessels and tissue regeneration.

Additionally, more than three-quarters (78.9%) of the study group and more than two-thirds (68.4%) of the control group were suffering from severe ear pain during the HBOT session, and the majority (89.5% & 81.6%) of the study group and control groups were suffering from fatigue after the HBOT session, respectively (table 4). These findings were congruent with **Harch et al. (2020)**, who studied "hyperbaric oxygen therapy for mild traumatic brain injury persistent post-concussion syndrome" (n=50) and reported that study subjects experienced fatigue symptoms and ear pain late in the HBOT session. From a researcher's point of view, this might be attributed to high pressure and the inability of the child to equalize pressure inside the ear.

Concerning the total knowledge level figure (1); this study declared that less than one fifth of the study group had good total knowledge level pre video assisted teaching

program, while post video assisted teaching program improved to majority and slightly less than one third of both group had good total knowledge level respectively. These findings were congruent **Gad & Khalil, (2023)**, who studied "Effect of an Educational Program about Cerebral Palsy Management on Mothers' Performance" in Egypt (n=50), and reported that only 12% of mothers in the study sample had total satisfactory knowledge before the intervention, this increased to 94.0% in the post intervention. Also supported with **Abolwafa et al. (2022),** who studied a "Impact of Educational Empowerment Program on knowledge, Aggression, loneliness, and Anxiety of Mothers having Children with Cerebral Palsy" in Egypt (n=100), and found that majority of mothers' total score of knowledge were satisfactory after implementation of the empowerment program with statistically significant differences (P. 0.01). From researcher point of view, this might be related to the effective program that used video, simple language, pictures and use of straightforward communication techniques, and preparation of educational program materials based on pretest assessment and in turn the knowledge level is elevated. This finding support hypothesis No1.

Concerning the total pain level, this study declared that more than three-fifths (63.2%) of the study group and the control groups had severe pain levels pre-video-assisted teaching program implementation, while more than two-thirds (68.4%) and more than one-fifth (23.7%) of the study and control groups had relaxation and comfort post-video-assisted teaching program implementation (figure 3). These findings disagreed with by **Bambi et al. (2021)**, who studied "Chronic pain among children with cerebral palsy attending a Ugandan tertiary hospital" (n=224) and reported that more than three-quarters (77.8%) of studied children with spastic bilateral CP had moderate pain. From a researcher point of view, this might be due to effective caregiver practices during the session as a result of the teaching program, which in turn promote comfort and relaxation among children.

Concerning caregivers total reported practice items, the current study explained there was a statistically significant difference between both groups regarding the reported hygienic practices domain post-video-assisted teaching program implementation ($p \leq 0.05$). While there was a highly statistically significant difference between the study and control groups regarding total reported practices of nutritional and stretching exercises, respectively, post video-assisted teaching program implementation ($p \leq 0.001$) (table 5). These findings were consistent with **Draz & Elsharkawy (2021)**, who found that there was a highly statistically significant improvement in the total reported practice of studied mothers at pre- and post-intervention. This might be due to using a simple Arabic language during the teaching program and using illustrative methods such as videos and photos, which enable caregivers to overcome their challenges and enhance child care practices.

The existing study showed that slightly more than one quarter (26.3%) of the study group had adequate total reported practices level pre-teaching program, while post-teaching program, the majority of them (81.6%) had a adequate total reported practices level (figure 2). These findings agreed with **Hassan & Sabea (2020)**, who presented "Dietary counseling program for mothers of children with cerebral palsy" in Egypt (n=70) and reported that less than half of mothers had adequate total score practices before programs reported by them, while the majority of them had adequate practices post the dietary counseling program. This might be due to the effectiveness of the teaching program and ongoing interaction between researcher and caregivers. This finding support hypothesis No1.

Regarding total communication function levels of both groups of studied children, the present study illustrated that the total

communication function classification system level I and level II of the study group increased from zero percent and less than one-fifth (15.8%) pre-teaching program to one-fifth (21.1%) and more than two-fifths (44.7%) post-teaching program, respectively (figure 8). This finding was incongruent with **Karim et al. (2021)**, who reported that communication function level I increased from 25.5% to 26.5% after intervention. This might be related to the effectiveness of caregivers practices that support the communication needs of children, which result in improvement in the communication ability of children with CP. Also, teaching programs boost caregivers confidence in their ability to help, making children more proactive and engaged in supporting the children to progress at all levels. This finding support hypothesis No2.

Concerning correlation between caregivers knowledge and practices the present study illustrated that illustrated that there was a moderate, significant positive correlation between total knowledge and total practice of the study and control groups pre- and post-video-assisted teaching program implementation ($P > 0.001$, $r = 0.720$). While there was a strong, significant positive correlation between total knowledge and total practices of the study groups of caregivers post video-assisted teaching program implementation ($P > 0.001$, $r = 0.907$) (table 6). These findings were congruent with **Mostafa et al. (2024)**, who studied "Mothers' knowledge, attitudes, and practices towards their children with cerebral palsy" in Egypt (n=210) and reported that there was a positive correlation between knowledge and reported practice scores with a highly statistically significant difference. ($P = 0.000$, $r=0.613$). From the researcher point of view, this might be relevant to increased caregivers ability to manage the condition of their children after increasing their knowledge and acquiring healthy behaviors. Also, caregivers who engage in frequent practices often provide more opportunities for children to express themselves, feel more confident, and enhance their communication abilities over time.

The results of the current study indicated that there was a statistically strong positive correlation between total communication of study groups of children and total practices of the study groups of caregivers post video-assisted teaching program implementation ($P > 0.001$ & $r = 0.907$) (table 7). This finding agreed with **Alibakhshi et al. (2023)**, who reported that there were interactions between effective communication skills in mothers and changes in children with CP that could lead to a potential reduction of behavioral problems as a result of irregular communication. This might be due to the teaching program enhancing caregivers communication by equipping them to pay attention to their children, engage in meaningful constructive communication, and help children to increase self-confidence and improve social communication. **Conclusion**

The video assisted teaching program significantly enhanced the caregivers knowledge and practices regarding care of children with CP. Also has positive impact on gross motor skills and communication abilities among CP children.

Recommendations

Based on finding of present study the following recommendations are suggested:

1- Dissemination of educational booklet and video about CP to all HBOT units to be available for all newly caregivers of children with CP.
2- Further research needed to be carried out about HBOT as a new modality of treatment of CP in various settings on large sample of caregivers to achieve more generalization.

References:

Abolwafa N, Zaki S, Ali H.(2022). Impact of Educational Empowerment Program on knowledge, Aggression, loneliness, and

Anxiety of Mothers having Children with Cerebral Palsy. EJHC Vol. 13. No.3.

Alibakhshi, H., Simin Ghalamaval, M., Ayoubi Avaz, K., Salmani, M., Pahlavanian, A., Motaharinezhad, F., and Kanani, Z. (2023). The impact of teaching communication skills to mothers on reducing behavioral problems in children with cerebral palsy: A quasi-experimental study. Journal of rehabilitation sciences & research, 10(4), 222-227.

Almosallam, A., Qureshi, A. Z., Alzahrani, B., AlSultan, S., Alzubaidi, W., and Alsanad, A. (2024). Caregiver knowledge, attitude, and behavior toward care of children with cerebral palsy: A Saudi Arabian perspective. In healthcare 12(10) p. 982). MDPI.

Alruwaished, A., Ali, B., Alhowaimil, L., Alhowaimil, A., Alhowaimil, N., and Alessa, A. (2020). Knowledge and attitudes of caregivers of cerebral palsy children in Riyadh city. International journal of medicine in developing countries, 4(11), 12–17. https://doi.org/10.24911/ijmdc.51-1547833051

Amin Sayed M, Hamdy Abdelmonem H, Ali Ahmed F.(2021). Effect of Empowerment program for caregivers on Quality life of children with Cerebral palsy. Egyptian Journal of Health Care. 11;12(1):140-55.

Bakar MR, Talib SS, Baharudin NS, Shamsudin NB, Ismail WI, Zin MF. (2024). Supporting children with cerebral palsy with a caregiver training program in a northern 20alaysian hospital.

Chagas P, Lemos A, Ayupe K, Toledo A, Camargos A, Longo E, Morais R, Leite H, Palisano R, Rosenbaum P, Romeros A. (2024). Functioning profile and related impairments of children and adolescents with cerebral palsy-PartiCipa Brazil preliminary results. BMC pediatrics. 11;24(1):719. https://doi.org/10.1186/s12887-024-05210-2.

Chaudhary, S., Bhatta, N.K., Poudel, P. et al. (2022). Profile of children with cerebral palsy at a tertiary hospital in eastern Nepal. BMC Pediatr 22, 415. https://doi.org/10.1186/s12887-022-03477-x

Coleman, A., Weir, K., Ware, R., & Boyd, R. (2013). Relationship between communication skills and gross motor function in preschool-aged children with cerebral palsy. Archives of physical medicine and rehabilitation, 94(11), 2210-2217.

De Roo, E., Koopman, S., Janssen, T., and Aertssen, W. (2025). The effects of extracorporeal shock wave therapy in children with cerebral palsy: a systematic review. International journal of surgery, 111(4), 2773-2790.

El Zahra Kamal F, Ibrahim Abdalla Ibrahim A, Abd Elsalam Amin M, Said Gouda Ahmed S. (2021). Effect of video-assisted teaching on mothers' knowledge and practices regarding preserved food and their children health. Egyptian journal of health care. 1;12(4):150-62.

Ezat Mohamed A, Salah Eldin Ibrahim Al-Rafay S, Tantawi R. (2020). Needs assessment of children with cerebral palsy undergoing hyperbaric oxygen therapy. Egyptian journal of health care. 1;11(4):1294-305.

Finch-Edmondson, M., Paton, M., Webb, A., Reza Ashrafi, M., Blatch-Williams, R. K., Cox Jr, C. S., and Novak, I. (2025). Cord blood treatment for children with cerebral palsy: Individual participant data meta-analysis. Pediatrics, 155(5), e2024068999.

Gad Ahmed S, Khalil A.(2023). Effect of an Educational Program about Cerebral Palsy Management on Mothers' Performance. Port Said Scientific Journal of Nursing. 2023 Mar 30;10(1):59-79.

Haramshahi, M., Toopchizadeh, V., Pourzeinali, S., Nikkhesal, N., Heris, T., Farshbaf-Khalili, A., and Osouli-Tabrizi, S. (2024). Cerebral palsy: potential risk factors and functional status among children under

three years, a case-control study in northwest Iran. BMC pediatrics, 24(1), 695.

Hidecker, M., Paneth, N., Rosenbaum, P., Kent, R., Lillie, J., Eulenberg, J., & Taylor, K. (2011). Developing and validating the Communication Function Classification System for individuals with cerebral palsy. Developmental Medicine & Child Neurology, 53(8), 704-710.

Hoang, K., and Pham, V. (2025). Efficacy of the comprehensive intervention model for children< 6 years of age with spastic cerebral palsy. World academy of sciences journal, 7(3), 48.

Khalil M, Abdel Ghafar M, Abdelraouf O, Mohamed M, Harraz E, Dawood R, Abouelkheir R.(2023). Long-term effect of hyperbaric oxygen therapy on gait and functional balance skills in cerebral palsy children—a randomized clinical trial. Children. 17;10(2):394. Linical. https://doi.org/10.3390/ children10020394

Kibrom, Y., Tekeste, E., Tesfamariam, S. et al. (2024). Clinical profile and associated comorbidities of cerebral palsy in children visiting Orotta National Referral Hospital, Eritrea: a cross-sectional study. BMC Pediatr 24, 458. https://doi.org/10.1186/s12887-024-049381

Lin, X., Wang, Z., Zhang, Z., Cai, Z., Xie, G., Peyrodie, L., and Chu, J. (2025). The application of music therapy in the rehabilitation education of children with cerebral palsy. JOURNAL of investigative medicine, 73(11).

Mahanna A, El-Toukhy N, Mousa A, Megahed K, Ashamallah G.(2021). Does motor deficit in children with cerebral palsy correlate with diffusion tensor metrics abnormalities in thalamocortical pathways?. Egyptian Journal of Radiology and Nuclear Medicine. Dec;52:1-0. 52:82. https://doi.org/10.1186/s43055-021-00463-8

Mahmood Q, Habibullah S, Aurakzai HU.(2024). Effectiveness of simple and basic home-based exercise programs including pediatric massage executed by caregivers at their homes in the management of children with spastic cerebral palsy: A randomized controlled trial. J Pediatr Rehabil Med.;17(1):97-106. Doi: 10.3233/PRM-220135. PMID: 38427509; PMCID: PMC10977413.

Marois P, Letellier G, Marois M, and Ballaz L. (2024). Using the gross motor function measure evolution ratio to compare different dosage of hyperbaric treatment with conventional therapies in children with cerebral palsy–could it end the controversy?. Frontiers in Neurology. 8;15:1347361. https://doi.org/10.3389/fneur.2024.1347361.

Međaković J, Čivljak A, Zorčec T, Vučić V, Ristić-Medić D, Veselinović A, Čivljak M, Puljak L. (2024). Perceptions on support, challenges and needs among parents and caregivers of children with developmental disabilities in Croatia, North Macedonia and Serbia: A cross-sectional study. BMC pediatrics. 3;24(1):297. https://doi.org/10.1186/s12887-024-04770-7

Mohamed Abdelrahman B, NabawyElaasar H, Rady El Said R. (2021). Effect of Family Empowerment Program on Parents' Performance regarding Care of Their Children with Cerebral Palsy. Egyptian Journal of Health Care. Sep 1;12(3):2072-93.

Mostafa S, Hammad E, Sharkawy S, Abdalfata W.(2024). Mothers' knowledge, Attitudes, and Practices towards their Children with Cerebral Palsy at Assiut City, Egypt. Assiut Scientific Nursing Journal.

1;12(45):169-83.DOI: 10.21608/asnj.2024.296815.1841

Narayanan UG, Fehlings D, Weir S, Knights S, Kiran S, Campbell K. (2006). Initial development and validation of the Caregiver Priorities and Child Health Index of Life with Disabilities (CPCHILD). Developmental medicine and child neurology. 48(10):804-12.

Nurfatimah, N., Saadong, D., Subriah, S., & Ramadhan, K. (2022). The Relationship of Mother's Role in Stimulation with Motor Development in Toddler, 20(1), 20-28. Vol20Iss1.6 18 https://doi.org/10.31965/infokes.

Ramadan Mohamed Ebeed S, El-Sayed Isamail Omar T, El-Sayed Youssef M, Ibrahim Mohamed Hamad N. (2024). Quality of life of mothers having children with cerebral palsy. Alexandria scientific nursing journal. 1;26(1):15-27.

Russell DJ, Avery LM, Rosenbaum PL, Raina PS, Walter SD, Palisano RJ. (2000). Improved scaling of the gross motor function measure for children with cerebral palsy: evidence of reliability and validity. Physical therapy.1;80(9):873-85. https://doi.org/10.1093/ptj/80.9.873.

Voepel-Lewis T, Zanotti J, Dammeyer J, Merkel S. (2010). "Reliability and validity of the face, legs, activity, cry, consolability behavioral tool in assessing acute pain in critically ill patients". Am. J. Crit. Care;19 (1).

Yeo H, Han J, Kim J. (2023). Characteristics of Epilepsy in Children with Cerebral Palsy: A Single Tertiary Center Study. Ann Child Neurol.;31(4):257-27.https://doi.org/10.26815/acn.2023.00220