Effect of Bite-Sized Teaching Sessions about Chest Physiotherapy on the Mothers' Care of Their Children with Cerebral Palsy

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Abstract

Background: Children with cerebral palsy often encounter significant health challenges that can lead to respiratory complications, and it is essential to educate mothers about the importance of providing continuous chest physical therapy to help alleviate these respiratory concerns and improve the well-being of their children. **The study aimed** to evaluate the effectiveness of bite-sized teaching sessions about chest physiotherapy on the mothers' care of their children with cerebral palsy. **Design:** A quasi-experimental research design was used in the study. **Subjects:** A convenience sample of 55 mothers and their cerebral palsy children were involved in the current study. **Setting:** the study was conducted at the University Children's Hospital in the Outpatient Physiotherapy, Pediatric Clinic, pediatric Inpatient, and pediatric intensive care unit at Zagazig University Hospital. **Results**: Before implementation of the program, 41.8% of mothers had inadequate practices, and 74.5% had unsatisfactory knowledge about chest physiotherapy for their children with cerebral palsy. One month later, the Bite-sized Teaching sessions' adequate practices increased to around two-thirds (58.2%), and 61.8% of mothers achieved satisfactory knowledge. **Conclusion**: The mothers` knowledge and Practices regarding Chest Physiotherapy for their Children with Cerebral Palsy were significantly improved after the Bite-sized Teaching Sessions. **Recommendations**: Implement regular Bite-sized Teaching sessions to enhance mothers' knowledge and practices regarding chest physiotherapy for children with cerebral palsy.

Key Words: Bite-Sized Teaching Sessions, Chest Physiotherapy, Mothers' Care, Children, Cerebral Palsy.

Introduction:

Cerebral palsy in children results from brain damage that will likely result in the child being unable to control the muscles of the face, neck, and possibly all muscles in the body. When a child's capacity to swallow, chew, suck, breathe, and feed is compromised, various issues may occur. For proper bodily function, air, food, or liquids must travel through the mouth, enter the pharynx, and proceed into the esophagus. Additionally, during breathing, the pathway should be uncluttered by anything while consuming food or drink, the airway must be closed. Functioning properly requires complex neuromuscular activity **(Sayed et al.,2021).**

Damage to the brain before its complete maturation can lead to cerebral palsy, which is classified as a chronic neurological condition. This condition can arise from brain damage that happens during the prenatal or postnatal phases, as brain development continues to progress for the first two years of life. Research indicates that between 70 to 80 percent of cerebral palsy cases arise during pregnancy, with the exact causes frequently remaining unclear. Notable risk factors associated with neonatal cerebral palsy include intrauterine growth restriction, intracranial hemorrhage, trauma, delivery before 32 weeks of gestation, and a birth weight of less than 2,500 grams (**Rashad et al., 2021**).

The respiratory system has one of the most important vital roles in the human body. This allows an individual to breathe effectively and ingest food and liquids, which is crucial for the organs to carry out their fundamental operations. In the absence of a steady supply of oxygen, these organs will cease to function. It has become clear from the results of some studies by **Scofano et al., 2021** that 86% of children with cerebral palsy complain

of a defect in oral movement, as they are unable to control the muscles of the face and neck and have no coordination between swallowing and breathing. This may cause challenges with eating, breathing, or even speaking. Furthermore, it can increase the child's risk of suffocation, aspiration, repeated chest infections, and pneumonia. **(Moriwaki et al., 2022).**

The term "chest physiotherapy" (CPT) refers to a collection of nursing procedures intended to increase lung capacity, enhance the muscles involved in respiration and eliminate mucus from the respiratory tract. It involves several techniques, including suctioning, vibration, percussion, and postural drainage, which consists of placing the child in positions that enable gravity to help drain secretions from smaller to larger bronchi. Percussion also included clapping or cupping. Vibration is the movement of the hands along the ribs in the direction of the chest's expiratory movement, whereas these terms refer to the physical rhythmic pounding of the thorax. Clearing the airway is typically used in combination with other therapies (**Ahmed et al., 2023 & Afonso et al., 2021**).

Children with cerebral palsy require extensive, long-term care, making them highly dependent on their primary caregivers, mainly their mothers, who must navigate complex healthcare and therapeutic responsibilities **(CDC, 2021)**. Daily challenges such as dysphagia increase the risk of aspiration and respiratory infections, further intensifying caregiving demands **(Smitha & Blamires, 2022)**. Mothers are required to navigate a complex landscape of caregiving that includes the implementation of vital therapeutic interventions such as chest physiotherapy. This is critical for

mitigating the risk of recurrent pulmonary infections and addressing associated morbidity and mortality concerns. The demand for continuous attention to both therapeutic and rehabilitative needs underscores the multifaceted and often overwhelming nature of caregiving in this context (**Singh & Awasthi 2024**). Therefore, this study was carried out to assess how mothers' performance was affected by the implementation of an educational training program regarding chest physiotherapy.

Significance of the study:

In children, cerebral palsy (CP) is a frequent reason for physical disability; in Egypt, the incidence is 2.04 for every 1,000 live births. Caregivers of children diagnosed with cerebral palsy need to be aware of the condition and how to manage it, particularly regarding swallowing, breathing, drooling, and preventing recurrent aspiration. With this information, therapy plans might be more effectively designed to assist children regain their functional abilities, enhance their health, have fewer hospital admissions, and lessen the strain on their families and the community. So, the researchers` focus was on examining the effectiveness of bite-sized teaching sessions in nurturing their kids who have cerebral palsy and performing chest physiotherapy to mitigate the risk of respiratory complications.

Operational definitions:

Bite-sized teaching sessions: Bite-sized learning refers to concise, targeted educational workshops designed to provide practical guidance and assistance for mothers of children with cerebral palsy (CP). This method aids in efficiently managing cognitive load and works well alongside different teaching methods. **(Schwartz, 2019).** Bite-sized teaching (BST) is an instructional method that

effectively incorporates the principles of microlearning. This approach entails dividing educational content into small, manageable segments, with each session typically lasting between 5 to 20 minutes. Designed to accommodate busy schedules, BST focuses on improving information retention while reducing cognitive strain. This approach is especially effective in promoting engaging and efficient learning experiences. **(Manning et.al., 2021).**

Chest physiotherapy (CPT): This type of therapy is a distinct kind of physical therapy designed to assist in the removal of mucus from the lungs and improve breathing ability. It utilizes various external mechanical methods, such as chest percussion, postural drainage, and vibration. These techniques help to move and clear airway secretions, allowing patients to successfully cough up mucus. (**Warnock & Gates 2023)**.

The Study aimed to: evaluate the effectiveness of bite-sized teaching sessions about chest physiotherapy on the mothers' care of their children with cerebral palsy.

Research hypothesis:

H1: The mothers' knowledge will be significantly enhanced through the bite-sized teaching sessions focusing on chest physiotherapy for their children with cerebral palsy.

H2: The mothers` practices will be significantly enhanced through the bite-sized teaching sessions focusing on chest physiotherapy for their children with cerebral palsy.

Subjects and methods:

Research design: a quasi-experimental research design was used.

Setting: The research was conducted at the University Children's Hospital in the Outpatient Physiotherapy,

Pediatric Clinic, pediatric Inpatient, and pediatric intensive care unit at Zagazig University Hospital.

Subjects: -

Sample size (n) = N/1+N*d2 **(Sharma et al., 2020)**

N = Total population = 55

d = Margin of error or precision = 0.05

n = 55/1+55* (0.05)2 = 55 mothers

subjects: a convenience sample of 55 mothers and their cerebral palsy children were involved in the current study.

Inclusion criteria: Mothers who have children with cerebral palsy come for outpatient physiotherapy pediatric clinic, or are admitted to the pediatric inpatient, and pediatric intensive care unit, and do not have any intellectual disabilities or psychiatric disorders in order to follow instructions and get the program benefits.

Data Collection Tools: -

Tool I: A structured interview sheet:

Part I:

- Personal characteristics of the mothers (age, education, work, housing, family income, and parents' consanguinity, positive family history of hereditary disease, other children of cerebral palsy or in the extended family)
- Personal characteristics of the children with cerebral palsy (age, gender, birth ordering, family size) and their medical history; (birth health problems, duration of illness, difficulties related to illness and movement ability, intact swallowing reflex, and recurrence of respiratory infection)

Part II:

The researchers adapted this tool from **Elslemy et al. (2023),** mothers' knowledge about CP, including definition, causes, signs and symptoms, types, investigation, prevention, and management, in addition to related complications, and

their knowledge related to respiratory issues and chest physiotherapy, including its concepts, the importance for CP children, appropriate time, duration, indications, techniques and contraindication.

Scoring system: The researchers used a model response to assess the mother`s knowledge; every question scored 1 for a correct response and zero for an incorrect or don't know the response. Mothers' total knowledge will be divided into the following categories:

- Satisfactory ≥ 60%
- Unsatisfactory < 60% **(Ahmed et al., 2023)**

Tool II: observational checklist

Checklists for observing mothers on how to perform CPT in children with cerebral palsy, the researchers created observational checklists using the most recent, standardized literature about CPT for CP children **(Warnock & Gates 2023; Belli et al., 2021; Kyle & Carman, 2017).** It includes: 8 items for percussion, 7 items for vibration, and 36 items for postural drainage, in addition to drooling and swallowing it includes 4 items, which will be used to achieve the research aim.

Scoring system: Each item was given a score of zero if the action was not done, one score if the action was done inappropriately, and two scores if the mother correctly did the action, and it will follow the category of:

- Less than 60 % will be considered as inadequate practices
- 60 % or more will be considered as adequate practices. **(Hussein et al., 2023)**

Validity & reliability of the tools:

Validity: A panel of seven experts from Cairo and Port Said Universities who specialized in pediatric nursing and medicine evaluated the instruments for content validity. The

required adjustments for making it effective had been done.

Reliability: The reliability of the study instruments was assessed using Cronbach alpha, with results showing that mothers' knowledge interviewing sheet had an alpha of 0.81 and their CPT checklist practice had an alpha of 0.78.

Administrative Design: After explaining the study's aim to the mothers, official approval was obtained from the director of the University Children's Hospital at Zagazig University to conduct the research.

Ethical considerations:

An approval was taken from the research ethics committee of the faculty of Nursing (**ID/ZU.Nur.REC#:254**). Moreover, approval was obtained from the director of the University Children's Hospital at Zagazig University to conduct the research.

Furthermore, the mothers' consent to take part in the study was obtained, and the aim and methods of the research were communicated to them in clear and understandable language. They were also made aware that they could decline participation or withdraw at any point, for any reason, without any impact on their care.

Bite-Sized Teaching Sessions:

Field Work

The actual fieldwork was carried out over 4 months from the beginning of August to the end of November 2024 and then evaluated after one month. The researchers were available in the study settings for 2 days, as the researchers coordinated with the mothers to determine suitable timings for the sessions, ensuring they aligned with their visits at the hospital for regular monitoring of the child's health condition, medication refills, or the need for physiotherapy sessions. If the scheduled time is not entirely suitable

for them, researchers offer alternative timings, reschedule based on the mother's availability, and record materials to ensure the mothers can still access the information, the actual field work was divided into four phases.

Assessment phase:

Before starting the interviews and data collection, the researchers gave the mothers an explanation of the goals of the study and what would be expected of them. Data on the mothers' knowledge about CP, respiratory problems, and CPT for their children with cerebral palsy was utilizing Tool I. The researchers will fill out the interview sheet, the time it took to finish the interview sheet was governed by the mothers' queries and knowledge in addition to learning needs. It took on average fifteen to thirty minutes. Then the session the mothers were asked to perform CPT procedures for their children to be more brief and not heavy sessions as they cared for their children, so they needed to be free for them. Postural drainage will take 10-15 minutes, whereas percussion and vibration take 4-5 minutes. The typical time needed to finish all procedures is 20-30 minutes. The study sample was divided into eleven groups in total, which included 5 mothers for each group. The implementation was performed on only one group weekly through two days for two sessions or according to the mother's availability time.

Planning Phase:

Based on the results of the assessment phase and the objectives of the study, bite-sized teaching sessions were created to address the educational needs of the mothers, as identified in the literature review. The reasoning behind the sessions' implementation was part of the content preparation. Simple Arabic language will be used to

illustrate educational activities. A range of instructional resources, including pamphlets, booklets, images and posters, PowerPoint and video presentations, and the materials required for the CPT, were developed.

Implementation Phase:

A bite-sized teaching session was conducted through multiple sessions, twice a week, throughout two sessions that aligned with the free time for the mothers. Every session lasts for about 15-30 minutes and includes mothers' feedback along with discussions. A variety of teaching techniques were employed, such as group discussions, interactive lectures, question-and-answer sessions, and demonstrations. 11 subgroups were created from the study mothers, with each group consisting of 5 mothers. The educational intervention was carried out as per the mothers` actual needs assessment, with consecutive sessions conducted for each group. Every session began with an overview of the goals, followed by a recap at the end. The sessions addressed the subsequent themes:

- **The first session:** It was centered on the definition, types, investigation, prevention, and management of cerebral palsy in addition to respiratory problems and issues related to cerebral palsy, Instructions for relieving drooling, the relationship between breathing and swallowing, and how to improve swallowing and decrease aspiration, and chest physiotherapy.
- **The second session:** The researchers demonstrated the techniques of vibration, percussion, and postural drainage in front of the mothers. After the demonstration, the mothers practice these techniques themselves. If there are any common errors during their demonstrations, the researcher

provides corrections to ensure they perform the techniques correctly.

Evaluation phase:

The impact of a bite-sized teaching session intervention on mothers' knowledge and practice was evaluated using the same assessment tools, one month after the educational sessions ended

Table 1 indicates that more than half (54.5%) of the mothers were lacked adequate sufficient monthly income. The mean age of the mothers was 25.65 years, with a standard deviation of 5.88 years. In terms of education, 10.9% of the mothers had only completed primary school. Regarding their working conditions, the majority (78.2%) of mothers were employed. Additionally, approximately one-third (32.7%) of the parents were in consanguineous relationships.

When considering the family history of children with cerebral palsy (CP), about two-thirds of mothers (61.8%) reported no history of CP in their families. Furthermore, more than three-quarters (78.2%) of the mothers did not have other children with CP. In terms of the children's ages, roughly two-thirds (60%) were between the ages of 3 and less than 10 years, while the rest of them their ages from 10 to 19 years old.

Additionally, more than half (56.4%) of the children were male. The mothers reported that 67.3% of their children had compromised swallowing reflexes, and the majority (80%) experienced recurrent chest infections, leading to hospitalizations due to this health issue.

Table 2 indicates that the bite-sized sessions implementation conducted for mothers of children with cerebral palsy had a positive impact. There was a significant statistical association between the mothers' knowledge about cerebral palsy, pulmonary function, appropriate position for children,

symptoms of respiratory infections, the relationship between respiration and intactness of swallowing, indications of CPT, its frequency, duration, and finally contraindication to performing CPT for their children, both before the program and one month after its implementation. However, there were still gaps in understanding regarding the prevention of chest infection and aspiration, the concepts of chest physiotherapy, and the importance of demonstrating these techniques to their children.

Table 3 shows that there is a statistically significant positive correlation between mothers' practices related to chest physiotherapy techniques—percussion, vibration, and positioning—and the issues of drooling and swallowing, respectively, before and after one month of implementing the bite sized sessions.

Figure 1: illustrated that only 41.8% of the mothers had inadequate practices related to performance of CPT for their children with cerebral palsy while this percentage was increased to about two thirds (58.2%) after the implementation of the bite sized sessions.

Figure 2 illustrates that the educational program positively impacted the mothers' knowledge. Before the program, 74.5% of the mothers had unsatisfactory knowledge. However, one month after the bite sized sessions implementation, 61.8% of the mothers had achieved satisfactory knowledge regarding chest physiotherapy for their children with cerebral palsy.

Table 4 shows that following the bite sized sessions implementation, a significant negative correlation was observed between the mothers' knowledge before the sessions and their practices one month after the

sessions, with a p-value of ≤ 0.037. Conversely, there was a statistical correlation between mothers' knowledge before and after the implementation of the bite sized sessions, measured one month later, as well as their practices before and after the program's implementation as the correlation coefficients were P ≤ 0.014 and 0.003. Notably, the correlation was negative regarding their practices before the bite sized sessions; however, one month after its implementation, the correlation became positive.

Table 1: Frequency and percentage distribution of studied mothers and their children according to their sociodemographic data (**n= 55)**.

Characteristics of Studied Mothers	Frequency	Distribution
Education:		
Illiterate	8	14.5
Read and write	11	20.0
Primary school	6	10.9
Secondary school	14	25.5
Bachelor	16	29.1
Age: Mean ± SD	25.65 ± 5.88	
Income:		
Enough	14	25.5
Not Enough	30	54.5
Intermediate	11	20.0
Mother Work:		
Working	43	78.2
Not working	12	21.8
Parents consanguinity:		
No	37	67.3
Yes	18	32.7
Positive Family history of CP:		
No	34	61.8
Yes	21	38.2
Other Children with CP:		
No	43	78.2
Yes	12	21.8
Child`s Age:		
3 ≤ 10 yrs	33	60.0
10 -19 yrs	22	40.0
Child Gender		
Male	31	56.4
Female	24	43.6
Insufficient swallowing reflex		
No	18	32.7
Yes	37	67.3
Recurrence of Respiratory infection and hospitalization in the previous 6 months		
No	11	20.0
Yes	44	80.0

Table: 2 Studied Mothers' Knowledge about Cerebral Palsy and Chest Physiotherapy before and after Bite-Sized Sessions implementation (n= 55)

	Mother`s Knowledge before the bite-sized sessions implementation				Mother`s Knowledge 1 month after bite-sized sessions implementation				X^2	P-Value
	Satisfactory		Unsatisfactory		Satisfactory		Unsatisfactory			
Knowledge background of cerebral palsy; causes, signs, and symptoms.	18	32.7	37	67.3	31	56.4	24	43.6	12.88	0.035*
Knowledge about pulmonary functions	16	29.1	39	70.9	31	56.4	24	43.6	12.82	0.000**
Appropriate positions that ease and improve respiration	14	25.5	41	74.5	35	63.6	20	36.4	10.73	0.001**
Symptoms of respiratory infections.	18	32.7	37	67.3	30	54.5	25	45.5	8.94	0.003**
Prevention of chest infection and aspiration	11	20.0	44	80.0	32	58.2	23	41.8	3.15	0.076
Relation between respiration and intactness of swallowing	19	34.5	36	65.5	32	58.2	23	41.8	15.94	0.000**
Concept of Chest Physiotherapy	15	30.0	35	70.0	34	61.8	21	38.2	0.087	0.768
Importance of CPT	32	58.2	23	41.8	39	70.9	16	29.1	0.173	0.248
Indications of CPT	21	38.2	34	61.8	23	41.8	32	58.2	0.845	0.015*
Frequency of CPT	22	40.0	33	60.0	37	67.3	18	32.7	1.67	0.004**
Duration of CPT	17	30.9	38	69.1	35	63.6	20	36.4	0.912	0.012*
Contraindications of CPT	11	20.0	44	80.0	33	60.0	22	40.0	1.212	0.000**

Table: 3 : Studied Mothers' Practices about Chest Physiotherapy techniques before and after Bite-Sized Sessions Implementation. (n= 55).

	Mother`s Practice before the bite-sized sessions implementation				Mother`s Practice 1 month after the bite-sized sessions implementation				McNemar Test	P-Value
	Adequate		Inadequate		Adequate		Inadequate			
	No	**%**	**No**	**%**	**No**	**%**	**No**	**%**		
Percussion:	18	32.7	37	67.3	36	65.5	19	34.5	0.223	0.002**
Mean ± SD	**11.65 ± 1.43**				**14.43 ± 1.34**					
Vibration:	16	29.1	39	70.9	42	76.4	13	23.6	0.879	0.000**
Mean ± SD	**13.32 ± 1.78**				**15.84 ± 1.47**					
Positioning:	23	41.8	32	58.2	39	70.9	16	29.1	1.036	0.002**
Mean ± SD	**49.67 ± 4.87**				**59.27 ± 6.53**					
Drooling & Swallowing:	20	36.4	35	63.6	32	58.2	23	41.8	6.149	0.012*
Mean ± SD	**6.82± 1.12**				**8.14 ± 1.72**					

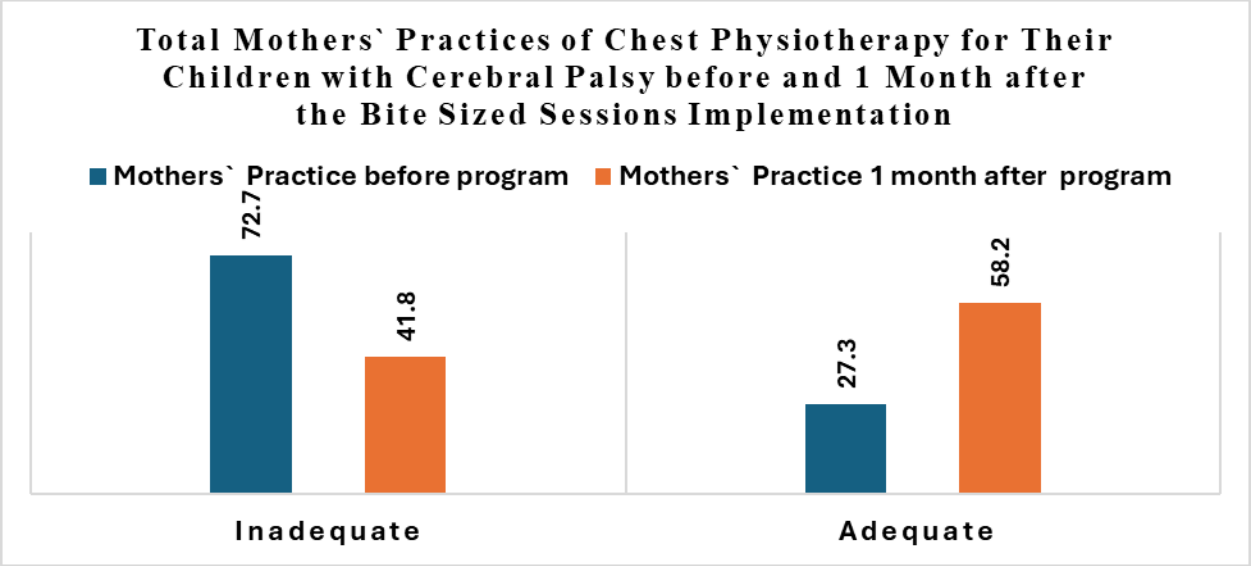

Figure 1: Total mothers` practices related to CPT for their children with cerebral palsy: n=55

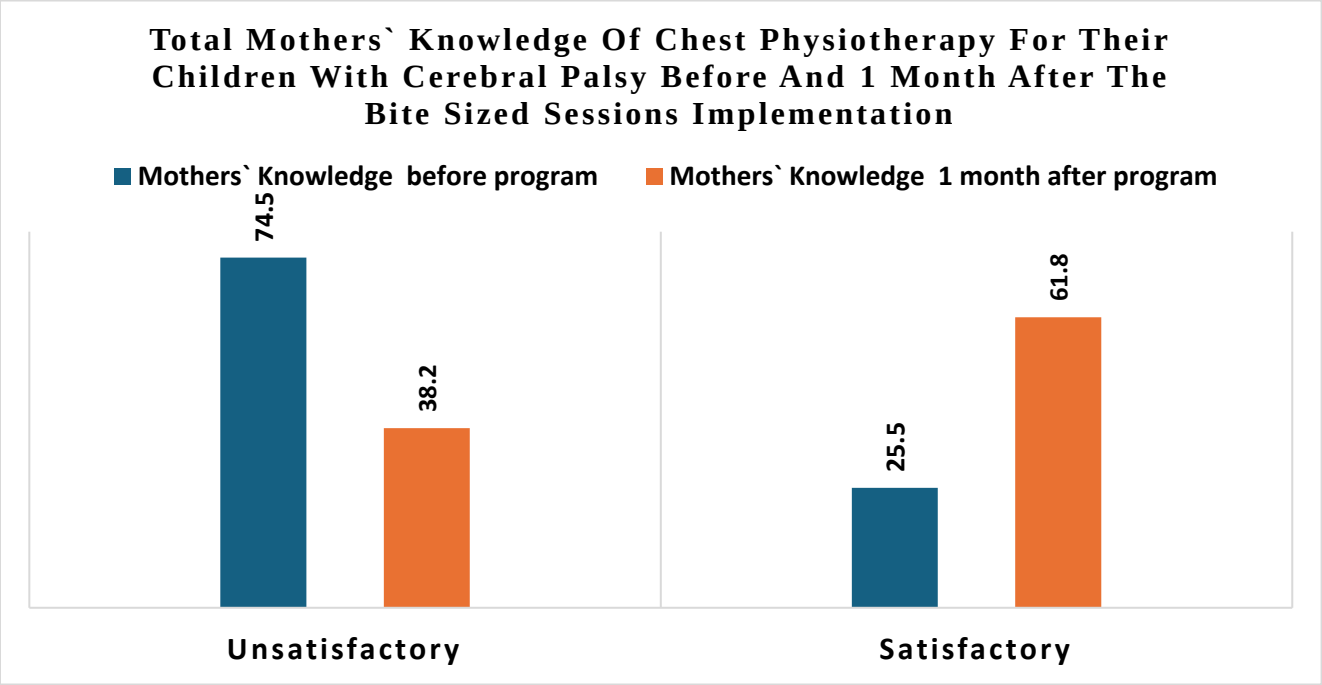

Figure 2: Total mothers` knowledge related to CPT for their children with cerebral palsy: n=55

Table 4: Correlation between total mothers' knowledge and their total practices before and after 1 month of educational program n=55.

	Mother`s Knowledge before the bite sized sessions implementation		Mother`s Knowledge 1 month after the bite sized sessions implementation	
	r	P-Value	r	P-Value
Mother`s Total Practice				
Before the implementation of the Program	0.044	0.750	- 0.197	0.014*
After 1 month of the implementation of the Program	- 0.140	0.037*	0.204	0.003**

Discussion:

CP is a neurodevelopmental disorder that arises from complications during the developmental processes of the brain in fetuses. It is estimated that this condition affects over 17 million children globally. In addition to presenting with motor impairments, children diagnosed with CP often face a variety of medical challenges. These may include difficulties with breathing and swallowing, a weakened cough reflex, as well as recurrent chest infections and pneumonia. Such conditions can significantly affect the overall quality of life for these children (**Belli et al., 2021**)

The current study demonstrated that 67.3% of the studied children had compromised swallowing reflexes, and the majority (80%) experienced recurrent chest infections, leading to hospitalizations. This result is in the same line with **Kürtül Çakar & Cinel (2021)**, about "The respiratory problems of patients diagnosed with cerebral palsy requiring hospitalization: Reasons and solutions" and found that the majority of pediatric patients with cerebral palsy admission were due to pneumonia and they had a swallowing dysfunction, which may lead to recurrent respiratory infections. Moreover, **Gibson et.al.,(2019)** titled "Prevention and Management of Respiratory Disease in Young People with Cerebral Palsy" clarified that many children with cerebral palsy are at risk of developing respiratory problems, such as infections and long-term lung damage. It underscores the importance of early identification and proactive management to prevent hospitalizations. **Royal Children's Hospital. (2025)** reported that chest infections are the most common reason for hospital admission among children with cerebral palsy. Precipitating factors include pseudobulbar palsy

leading to aspiration, increased secretions, poor cough, and gastroesophageal reflux.

The finding of the present study revealed that there was a significant improvement in the mothers' knowledge about cerebral palsy, respiratory function, chest infection, and chest physiotherapy after the Bite-sized Teaching Sessions. The guidelines of the American Academy for Cerebral Palsy and Developmental Medicine **(AACPDM, 2024)** suggest that informed caregivers can effectively implement strategies such as chest physiotherapy to enhance airway clearance and reduce the risk of respiratory infections. These results are consistent with **Roqué-Figuls et al., (2023) mentioned that** educating caregivers about the mechanisms and benefits of chest physiotherapy emphasized confidence and participation in respiratory care, moreover, educational interventions ensure better implementation of care strategies, especially in conditions like CP, where respiratory function is often compromised. From the perspective of the researcher, the results of the current study may be because: The educational sessions provided in-depth information about the nature of cerebral palsy that affects respiratory function, and the increased risk of respiratory infections in children with Cerebral Palsy. This allowed mothers to understand their children's condition, recognize early symptoms of respiratory problems, and act appropriately.

The results of the current study indicated a statistically significant positive correlation between mothers' practices related to chest physiotherapy techniques. These results disagree with **Al-Masry et al., (2018)** about “Practices of Pediatric Nurses Versus Mothers Having Children with Respiratory Problems

regarding Chest Physiotherapy" and clarified that all studied mothers in their study had incompetent practice regarding chest physiotherapy**.** However, the results of the present study agree with **Elslemy et al., (2023).** about "Effect of implementing educational intervention on mothers' knowledge and practices regarding respiratory problems for children with cerebral palsy**,"** Which mentions that there was a statistically significant difference concerning mothers' practices of chest physiotherapy techniques (chest percussion, vibration, and postural drainage). From the researcher's point of view, that may be because of: The educational program included practical demonstrations and training on CPT techniques such as percussion, vibration, proper positioning, and the mothers trained on the timing, frequency, and techniques for applying CPT. This hands-on approach enabled mothers to practice these techniques effectively, making them feel confident and proficient in applying them to their children at home. The practical sessions emphasized the importance of proper positioning to facilitate easier breathing and prevent aspiration, which is needed in caring for children with CP.

The results of the current study demonstrate an increase in total mothers` knowledge and practices regarding chest physiotherapy for their children with cerebral palsy after the program implementation. These results are similar to the findings of the study done by **Elslemy et al., (2023)** showed a significant improvement in mothers' knowledge and performance in caring for their children with CP post-intervention. Study by **Sayed et al., (2021)** about "Effect of an Empowerment program for Caregivers on Quality of life of children with Cerebral Palsy"**,** who discovered that,

the majority of studied caregivers had an inadequate knowledge level before the program, however, most of them showed an improvement in their level of knowledge after the program. **Baraka et al. (2022)** conducted research to determine the effect of an educational intervention program on mothers' knowledge and practice about the quality of life for their children with CP. The results illustrated a significant improvement in mothers' knowledge and reported care post-intervention, highlighting the positive impact of educational programs on caregiving practices. **Draz and Elsharkawy (2021)** have a study on the effect of supportive educational intervention for mothers of female adolescents with CP and demonstrated a positive effect on mothers' knowledge and reported practice regarding the care of their children.

The findings of the present study highlight Interestingly, the correlation between mothers' knowledge before the program and their practices one month after its implementation turned negative, with a statistically significant p-value of 0.037. This finding may appear counterintuitive but can be explained by the concept of 'unlearning and relearning.' As noted by **Kaminski et al.,(2008)**., when caregivers are introduced to new, evidence-based practices, they often discard previously held misconceptions or ineffective techniques.

This period of adjustment may temporarily disrupt their practices as they strive to align their actions with their newly acquired knowledge. The current study’s results support this phenomenon, as mothers may have initially struggled to integrate the new information into their daily caregiving routines. Moreover, the data showed a statistically significant positive correlation between mothers'

knowledge and practices one month after the program, with a p-value of 0.003. This suggests that as mothers became more familiar with the correct chest physiotherapy techniques through continued practice and reinforcement, their confidence and competence improved. These findings align with the research conducted, which found that educational interventions not only increased mothers' knowledge but also significantly enhanced their practical skills over time **Jeihooni, Kashfi, and Harsini (2019).** The study emphasized that hands-on training and continuous support are critical in transforming theoretical knowledge into effective caregiving practices. Furthermore, the negative correlation between mothers' knowledge before the program and their practices after one month ($p = 0.014$) could indicate that pre-existing knowledge may have been outdated or inaccurate. This observation echoes the work highlighted that many caregivers possess fragmented information about cerebral palsy and chest physiotherapy, which can hinder effective care until corrected through structured educational programs **Draz, , and Elsharkawy (2021)** The overall shift from a weak positive correlation before the program to a strong positive correlation after its implementation underscores the program's effectiveness in bridging the gap between knowledge and practice. This progression suggests that educational interventions, particularly those with practical components, are essential for equipping mothers with the skills needed to manage their children's respiratory health effectively.

Conclusion

Based on the results of the present study, it can be concluded that Mothers` knowledge and Practices regarding Chest Physiotherapy for their Children with Cerebral Palsy

were significantly improved after the Bite-sized Teaching Sessions.

Recommendations:

- Mothers of children with cerebral palsy should implement regular, periodic, ongoing educational programs to enhance mothers' knowledge and practices regarding chest physiotherapy for children with cerebral palsy, in all health care settings.
- Continuous follow-up sessions should be provided for mothers to ensure that they are able to consistently apply the learned chest physiotherapy techniques.

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