



The Effect of Self-Learning Module on the Burden of Care for Children with Cerebral Palsy

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Article History	Abstract
<p>Received: 06 June 2023 Revised: 05 Sept. 2023 Accepted: 11 Sept. 2023</p> <p>CC License CC-BY-NC-SA 4.0</p>	<p><i>Cerebral Palsy is one of the most complex of the common permanent disabling conditions and disorder of movement, muscle tone and posture that is caused by damage that occurs most often before birth and during developing brain. Aim: the current study aimed to evaluate the effect of self-learning module on the burden of care for children with cerebral palsy. Design: A quasi-experimental research design (pre-posttest) was used. Setting: The study was carried out at Sett Khadra Child Health Center in Helwan referred from Helwan general hospital affiliated to Ministry of Health and Physiotherapy Unit in Mustafa Hassan Pediatric Hospital affiliated to Fyoun University Hospital. Sample consisted of 70 children and their accompanying caregivers suffering from cerebral palsy disease. Tool: consists of three tools to assess: I: Structured interview questionnaire sheet to assess caregivers' knowledge regarding cerebral palsy and daily living activity II: Observational checklist to assess caregivers' reported practices regarding care of their children with cerebral palsy) pre/post test) III: Caregiver's attitude scale sheet to assess caregivers' attitude regarding cerebral palsy. Results: there were statistical significance difference between caregivers' characteristic and their total knowledge and total practices regarding cerebral palsy pre and post module. Also, there were statistically significant positive correlation between caregivers' total attitude and their total practice and total knowledge in pre and post self-learning module. Conclusion: Based upon the results of the current study, it can be concluded that self-learning module had appositive effect on caregivers' knowledge, practices and attitude regarding care of their children with cerebral palsy which led to decrease burden of care for children with cerebral palsy. Recommendation: Continuous health education program to mothers regarding cerebral palsy, complications, different aspects of care and management plan.</i></p> <p>Keywords: Self-learning module, Children, Cerebral palsy.</p>

1. Introduction

The term of cerebral refers to the brain and palsy refers to the loss or impairment of motor function. (CP) affects the motor area of the brain's outer layer (called the cerebral cortex), the part of the brain that directs muscle movement. In some cases, the cerebral motor cortex hasn't developed normally during fetal growth. In others, the damage is a result of injury to the brain either before, during, or after birth. In either case, the damage is not repairable and the disabilities that result are permanent (National Institute of Neurological Disorders and Stroke, 2020).

Cerebral palsy refers to a group of neurological disorders that appear in infancy or early childhood and permanently affect body movement and muscle coordination (CP) is caused by damage to or abnormalities inside the developing brain that disrupt the brain's ability to control movement and maintain posture and balance (Cans et al., 2020).

Cerebral Palsy has emerged as the most common physical disability in infancy and a threat to the quality of life of children. Children with CP have a greater rate of mortality and morbidity (Stavsky et al., 2017). Several causes are identified ranging from teratogenicity exposure in pregnancy, traumatic birth injury resulting in severe asphyxia, premature delivery, and metabolic factors amongst other prenatal infections (Burton, 2015).

The average frequency of CP in the world is 2.08 per 1000 live births, but in the group of children born with a body weight below 1500 g, the frequency is 70 times higher when compared with the group of children with a body weight over 2500 g at birth. The risk factors for CP can be divided into pre-conception, prenatal, perinatal and postnatal ones. CP commonly co-exists with epilepsy, in particular drug-resistant epilepsy, but also with mental retardation, visual and hearing impairment, as well as feeding and behavioral disorders. The degree of motor problem varies from mild to very severe making the child totally dependent on caregivers (Ahlin, Himmelmann & Hagberg, 2018).

Cerebral palsy is caused by abnormal development of part of the brain or by damage to parts of the brain that control movement. This damage can occur before, during, or shortly after birth. The majority of children have congenital cerebral palsy CP (that is, they were born with it), although it may not be detected until months or years later (Bainbridge & Haan, 2022).

Children with CP present with three types of motor problems the primary impairments of muscle tone, balance, strength and selectivity are directly related to damage in the CNS. Secondary impairments of muscle contractures and deformities develop over time in response to the primary problems and musculoskeletal growth. Tertiary impairments are adaptive mechanisms and coping responses that the child develops to adapt to the primary and secondary problems. One typical example is gastrocnemius spasticity as a primary impairment leading to secondary ankle plantar flexion contracture and knee hyperextension in stance as an adaptive mechanism (Russman et al., 2018)

Cerebral palsy classified or divided into spastic, dyskinetic and ataxic forms Approximately 70% to 80% of children with CP are spastic Spasticity is defined as an increase in the physiological resistance of muscle to passive motion. It is part of the upper motor neuron syndrome characterized by hyperreflexia, clonus, extensor plantar responses and primitive reflexes. SCP is the most common form of CP. Spastic CP is anatomically distributed into three types Žarković et al., 2021; Kruse et al., 2018).

Self-learning module for caregivers developing their learning skills that contains necessary information that allows caregivers to learn a particular topic and provide new knowledge and technical skills to a large number of caregivers in a cost-effective, consistent manner. Use of self-learning module in teaching is another form of individual used instructions. This is called modular approach of teaching and learning, if self-learning modules are available on some topics they can be given to the caregiver as assignments for self-learning (Khalil et al., 2017).

Role of nurse in self-learning, facilitator, manager, consultant and promoting dialogue with learners, securing resource (prepare learning aids), evaluating outcomes, and promoting critical thinking. Nurse as an educator consider a facilitator for education process. So, caregivers can return to the teacher (nurse as educator) to ask about what are not understandable in SLM. nurse introduce information about disease such as care for children with cerebral palsy, treatment, nutrition. improve communication and prevent infection this information for the family and caregiver has child with cerebral palsy (Nuangpirom et al., 2020).

Aim Of the Study:

The aim of this study was to evaluate the effect of self-learning module on the burden of care for children with cerebral palsy. This aim achieved through:

- Assessing the caregivers' knowledge, practices and attitude regarding care of their children with cerebral palsy.
- Developing and implementing self-learning module for caregivers regarding care of their children with cerebral palsy.
- Evaluating the effect of self-learning module on improving knowledge, practices and attitude of caregiver of children with cerebral palsy.

Research Hypothesis

Self-learning module will have appositive effect on Caregivers' knowledge, practice and attitude regarding care of their children with cerebral palsy.

2. Materials And Methods

I-Technical design

The technical design for this study were included research design, setting, subjects of the study and tools of data collection

Research design

A quasi-experimental research design was utilized to achieve the aim of this study.

Research settings

The study was carried out at Sett Khadra child health center in Helwan refered from Helwan general hospital affiliated to ministry of health and physiotherapy Unit in Mustafa Hassan Pediatric Hospital affiliated to El-Fyoum University Hospital. These settings have high flow rate from children with cerebral palsy.

Sampling

A convenient sample consisted of 70 children suffering from cerebral palsy and their accompanying caregivers who attended in the previously mentioned settings over one year period under the following inclusion criteria:

- Both genders.
- Children confirmed diagnosis with cerebral palsy.
- Children free from any other physical or mental disease.

Tools of data collection

Three tools were used to collect the data, were designed by the researcher in an Arabic language after reviewing the related literature and after reviewing from the researcher' supervisors, they were consisted of the following:

Tool (I) Structured interview questionnaire sheet (pre/post module) it was consisted of three parts:

Part 1: It concerned with characteristics of the children included age, gender, weight, height, ranking and education. Characteristics of the caregivers concerned with; age, level of education, job, social status and residence.

Part 2: Past medical history for mother (**3 Question**) included complications during pregnancy, complication during delivery, RH compatibility. Child medical history (**9 Question**) included relation between father and mother, family history of the cerebral palsy, condition of the child after delivery, age at diagnosis, program practice by child, child suffering any disease, problem associated with cerebral palsy, degree of cerebral palsy and use the any splint to help the movement.

Part 3: Caregivers' knowledge about cerebral palsy that consisted of the following (pre & post module): It concerned with caregivers' knowledge regarding cerebral palsy and daily living activity Caregivers' knowledge regarding cerebral palsy (**13 Question**) which consisted of 12 multiple choice and one open end question about meaning , causes ,types , signs and symptom , learning difficulties ,Warning signs , diagnoses , motor skills problem, relationship between brain infections and cerebral palsy , Physical therapy, treatment , protect child from falling and difficult speaking and language. Caregivers 'knowledge about daily activity delt with caregiver ' knowledge regarding daily activity (**8 Question**) which consisted of 6 multiple choice and 2 open end question that included Importance of general hygiene , important of position of the child while feeding ,Importance of pressure on the jaw during food , important of participation in activities, Importance of exercise , important of

changing the child's position regularly during sleep, important of dental care and appropriate time for toilet training

Scoring system

The caregivers' complete correct answer was scored "two" & those incomplete correct answers was scored "one" and unknown or incoherent answer was scored "zero". Total score was 42 then converted in to percentage. The total caregivers' knowledge was categorized into unsatisfactory → less than 60% and satisfactory → 60% and more.

Tool (II) Observation checklist

This tool was adapted from **Maggioni and Araújo (2020), Ahmed et al. (2015)**, to assess caregivers' reported practice regarding care of their children with cerebral palsy. It was modified and translated into Arabic form by researcher to suit the nature of study. It included ten procedures divided into; Feeding (10 steps), Prevent suffocation (7 steps), Bathing (6 steps), Mouth and teeth care (9steps), Hand washing (11 steps), Toilet training (7 steps), Sleep (5steps), coughing and deep breathing exercise (5 steps), Exercises for range of child's body motion (14 steps).

Scoring system

Each practice item done correctly was scored "one" and not done or done incorrectly was scored "zero". The total numbers of steps in the observational checklist were 74 steps. Total score was 74 then converted in to percentage. The total caregiver' reported practice was categorized into inadequately → less than 60% and adequately → 60% and more.

Tool (III) Caregiver's attitude scale sheet

This tool was adopted from **Amiri et al., (2019) and Al-Dababneh& Al-Zboon (2018)**, to assess caregivers' attitude regarding cerebral palsy.

Scoring system

This scale used three points likerts scale ranged from "zero to2" for rarely to usually for each item (rarely=0, sometimes=1, usually=2) Total score was 36 then converted in to percentage. The total caregiver's attitude questionnaire sheet was classified into negative → less than 70% and positive → 70% and more.

Validity:

The content validity of the tool reviewed by 3 experts in field in pediatric nursing to test the content of validity. The tool was examined for content coverage, clarity, relevance and applicability. Minor modification of the tool was done according to expert's comments on clarity of sentences, appropriateness of content and sequence of item.

Reliability:

Reliability of the tools tested by using Cronbach Alpha for testing internal consistency of the tool was performed the result were 0.845 for structured interview questionnaire, and 0.813 for attitude.

Ethical consideration

An official permission to conduct the proposed study was obtained from the Scientific Research Ethical Committee of Faculty of Nursing Helwan University. The researcher was clarifying objective of the study to children and their accompanying mothers included in the study. The study sample was informed about expected outcomes of the study and information obtained was confidential and used only for the purpose of the study. The study sample was assured also that anonymity and confidentiality was guaranteed. The children and their accompanying mothers have the right to withdraw from the study at any time without any rational.

II-Operational design:

The operational design Includes preparatory phase, pilot study and field work.

The preparatory phase:

It was including review of past, current, national and international related literature and theoretical knowledge of various aspects of the study using books, articles, internet, periodicals and magazines to develop tools for data collection.

Pilot study:

The pilot study was done on 10% of the study subject which consisted of 7 children and their accompanying caregivers it was conducted to evaluate to the clarity of questions and time needed to complete the study tools. Based on the results, modification was done (if necessary). Subjects included in the pilot study was excluded from the study if major modifications are required.

Field work:

The actual field work of the study started from the beginning of November 2021 to the end of October 2022 it was done during the morning shifts. The researcher was available two days per week from 8 a.m. to 12 p.m. in the previously mentioned settings for clarification any difficult. The researcher was start by introducing herself to the caregivers and their children with cerebral palsy and giving them a brief idea about the aim of the study and expected outcomes. The actual field work was divided into four phases:

Assessment phase: (2 months)

In this phase, the researcher used the constructed tools for collecting data related to knowledge of caregivers about cerebral palsy (pre-test). The purpose of the study and its expectations were explained by the researcher to the caregivers' and studied children before starting data gathering. The structured questionnaire forms were filled in by each caregiver. With assistance for caregiver' who were having any difficulty. Time needed to fill the questionnaire was different accordingly to the knowledge of each caregiver. The average time ranged between 20-30 minutes for collecting data about their knowledge and 10-20 minutes for Observation checklist practices regarding cerebral palsy was filled in by the caregiver. While the time needed to fill the attitude scale sheet 10 minutes.

Planning phase: (2 months)

Directions of use SLM in present study instruct the caregivers how to use SLM as the following:

—The caregivers should answer the pretest about caring of children with Cerebral Palsy before use SLM.

- Each chapter should be read carefully, and did not cancel any page in the package.
- The questions after each chapter should be answered
- Did not move to another chapter unless achieve the required score
- If the caregivers did not achieve the required score, they return again to the same chapter
- Caregivers can return to the facilitator (the researcher) in order to clarify the vague points.
- After completion all chapters, the caregivers can take posttest Review of Literature

Self-learning Module:**General objectives:**

Evaluating the effect of the self-learning module on the burden of care for children with cerebral palsy, providing and adding information that meets their needs

Intermediate objectives:

By the end of the self-learning module for the caregivers for children with cerebral palsy they would be able to:

- Describe definition, ethology and types of cerebral palsy.
- List clinical manifestation, diagnosis, complications, preventions and treatment of cerebral palsy.
- Apply self-care for children with cerebral palsy.
- Interpret caregivers of children with cerebral palsy adherence to feeding regimen to prevent suffocation or food entering the lungs.
- Predict caregivers of children with cerebral palsy adherence to physical activity regimen.
- Discuss important of adherence to treatment, importance, the mothers' role towards the correct adherence to treatment, the role of the child towards the correct adherence to treatment.
- Identify caregivers and children important of follow up.

The self-learning module was designed included 5 units, which covered knowledge needed for children with β -cerebral palsy as follows:

Unit one: included; overview about cerebral palsy definition, causes and risk factor of cerebral palsy.

Unit two: included; knowledge about clinical manifestations, types and danger signs for cerebral

palsy **Unit three:** included; diagnosis and complication. **Unit four:** included; prevention, early detection and treatment (physical thereby). **Unit five:** included; important of medication, follow-up and daily care for children with cerebral palsy. For each unit, there was pre/post-test as well as for the module itself. Each test had a written score and defined time answered upon it.

Implementing phase: (4 months)

At the beginning, the researcher disseminated the self-learning module and explained to the caregivers and children how to use the module. The researcher was available 2 days per week, 4 hours a day from previous settings. The studied children were divided into **14 groups**; each group involved 5 children, the researcher dealing with 4 groups in first three months and two groups in fourth month according to their time allowed for clarifying any misunderstanding in the module or answering any question. The total time was **56 hours for all groups**.

Teaching methods:

- Illustrated lecture.
- Group discussions.
- Panel discussion.
- Real objects & dolls.

Teaching materials: Modules.

Evaluating phase: (2 months)

The same tools were used after the implementation phase of self-learning module an indicator to determine the level of caregivers' knowledge and adherence. After finishing of self-learning module, the researcher was assessing caregivers' knowledge, practice and attitude.

Administrative design

After explanation of the study aim and objectives, an official permission was obtained from the Dean of faculty of nursing to the director of the above-mentioned study setting asking for cooperation and permission to conduct the study

Statistical design

Upon completion of data collection, data was organized, categorized, tabulated, entered, computed and analyzed using Statistical Package for the Social Science (SPSS), version 20.0 for analysis. Descriptive statistics tests as numbers, percentage, mean ± standard deviation (± SD), was used to describe the results. Appropriate inferential statistics such as “F” test or “t” test was used as well. The P-value to detect the relations between the variables of the study.

3. Results and Discussion

Table (1): Distribution of studied children according to their characteristics (n=70).

Item	N	%
Age/years		
1 < 5	49	70
5 < 10	11	15.7
10 < 15	6	8.6
≥15	4	5.7
Mean ±SD	6.28±4.09	
Sex		
Male	42	60
Female	28	40
Weight / Kg		
5<15	20	28.6
15< 25	25	35.7
25<35	18	25.7
≥35kg	7	10

Length /Cm		
70 < 90	24	34.3
90<110	29	41.4
110 <130	13	18.6
≥130cm	4	5.7
Ranking		
first	30	42.9
second	21	30
third	17	24.3
Fourth	2	2.8
Level of education		
nursery	12	17.2
primary	14	20
preparatory stage	0	0
special school need	44	62.8

Table (1) Showed that 70% & 60% of studied children were aged from 1< 5 years with mean age 6.28±4.09 and were males respectively. The same table clarified that more than two thirds (35.7%) of studied children weighty 15< 25 Kg while 41.4 % & 62.8% of them had lengthen ranged from 90 to 110 cm and had special school need respectively

Table (2): Distribution of studied caregiver's according to their characteristics (n=70).

Item	N	%
Mother	64	91.4
Fathers	3	4.3
Grandmother	3	4.3
Age /years		
25 < 35	57	81.4
35 <45	6	8.6
45 <55	4	5.7
55years and more	3	4.3
Mean ±SD	32.46±4.15	
Education		
Illiterate	8	11.4
Primary	12	17.2
Preparatory	29	41.4
Secondary	14	20
University	7	10
Job		
Not working	57	81.4
Working	13	18.6
Social Status		
Married	63	90
Divorced	4	5.7
Widow	3	4.3

Table (2): clarified that the majority (91.4 %) of studied caregiver were mother and the same percent (81.4%) of them were aged from 25 < 35 with mean age 32.46±4.15 years and not working respectively. The same table illustrated that the most (90%, & 92.9%) of studied caregiver were married and from rural area respectively.

Table (3): Distribution of studied children according to their child medical history of cerebral palsy (n=70).

Item	N	%
The consanguinity		
Yes	32	45.7
No	38	54.3
Family history of cerebral palsy		
Yes	17	24.3
No	53	75.7
Condition at birth		
Natural	9	12.4
prematurity	26	37.5
Under weight	27	38.6
face and Skin blue	8	11.5
Age at diagnosis		
Less than 3 years	51	72.7
From 3 < 6 years	14	20
6 to <9 years	5	7.3
≥ 9 years	0	0
Training program for cerebral palsy		
Yes	56	80
No	9	12.7
Associated diseases		
Meningitis	11	15.7
Stroke	3	4.3
Jaundice	40	57.1
another mentions	16	22.9
Associated problems		
difficulty speaking	45	64.3
Difficulty swallowing	21	30
Enuresis	4	5.7
Degree of cerebral palsy		
Mild	23	32.6
Moderate	31	44.4
Severe	12	17.2
I do not know	4	5.8
Use any splints or braces to help the movement		
Yes	54	85.7
No	16	22.9

Table (3) Revealed that 54.3% & 75.7 of studied children haven't relation between the father and the mother and haven't family history respectively, while more than two thirds (72.7%) of them were diagnosed of cerebral palsy at less than 3 years. The same table showed that 64.3%, 44.4% & 85.7 of studied children had difficulty speaking, had moderate degree of cerebral palsy and use any splints or braces to help the movement respectively.

Table (4): Distribution of the studied caregiver's according to their total level of knowledge regarding cerebral palsy and daily living activity (N=70)

Total knowledge	Pre		Post		Chi-square	
	N	%	N	%	X ²	P-value
Satisfactory	23	32.9	62	88.6		
Unsatisfactory	47	67.1	8	11.4	45.549	<0.001*
Total	70	100	70	100		

Figure (1): Percentage distribution of the studied caregiver's according to their total level of knowledge regarding cerebral palsy

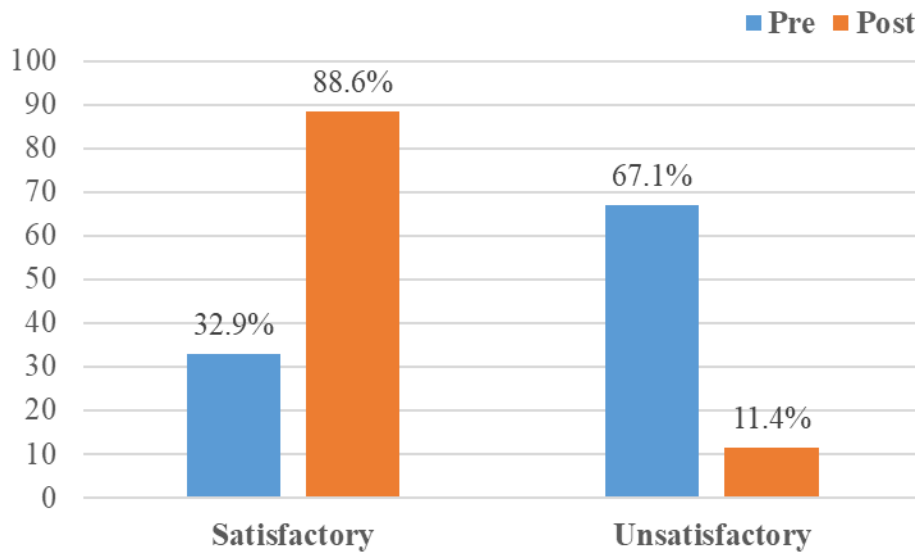


Table (4) and Fig (1) Revealed that more than two thirds (67.1%) of studied caregivers had unsatisfactory total level of knowledge regarding cerebral palsy in pre SLM compared to the majority (88.6%) of them had satisfactory total knowledge post SLM with statistically significant difference as revealed by $P=0.001$ for all items .

Table (5): Distribution of studied caregiver's according to their total reported practice of their children suffering from cerebral palsy (n=70)

Total practice	Pre		Post		Chi-square	
	N	%	N	%	X ²	P-value
Adequate	24	34.3	63	90.0	46.181	<0.001*
Inadequate	46	65.7	7	10.0		
Total	70	100	70	100		

Figure (2): Percentage distribution of the studied caregiver's according to their total reported practices regarding cerebral palsy

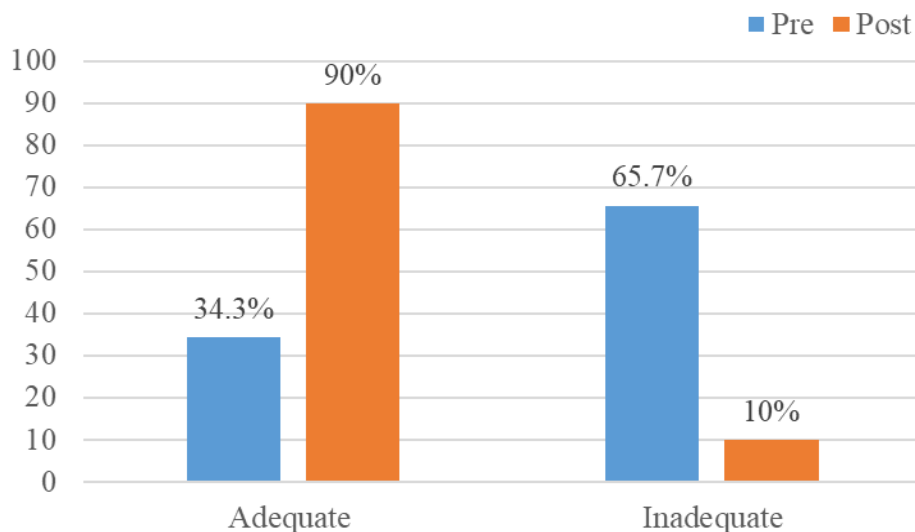


Table (5) and fig (2): Illustrated that less than two thirds (65.7 %) of studied caregivers had inadequate reported practice in pre self-learning module, Compared to the most (90.0%) of them had Adequate reported practice post self-learning module with a highly statistical significant different as revealed P= 0.001for all items.

Table (6): Distribution of studied caregiver’s according to their total attitudes of caregivers of their children suffering from cerebral palsy (n=70)

The attitude	Pre		Post		Chi-square	
	N	%	N	%	X ²	P-value
Positive	33	47.1	54	77.1	13.390	<0.001*
Negative	37	52.9	16	22.9		
Total	70	100	70	100		

Figure (3): Percentage distribution of the studied caregiver’s according to their total attitude regarding cerebral palsy

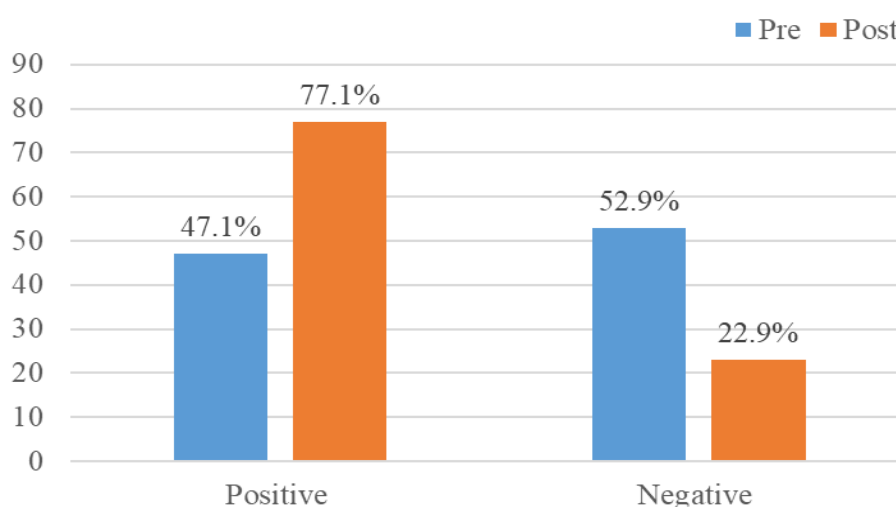


Table (6) and fig (3): clarified that 52.9% of studied caregiver had negative attitude in pre SLM ,while 77.1% of them had positive attitude in post self-learning module with a highly statistical significant difference pre/post, self-learning module where p= 0.001.

Table (7) Relation between studied caregiver’s characteristics and their total level of knowledge post SLM (n=70)

Items	Total knowledge				Chi-square	
	Post					
	Satisfactory	Unsatisfactory			X ²	P-value
	N	%	N	%		
Mother	58	90.6	6	9.4	9.697	0.008*
Fathers	3	100.0	0	0.0		
Grandmother	1	33.3	2	66.7		
Age/year					44.349	<0.001*
25 < 35	55	96.5	2	3.5		
35 <45	6	100.0	0	0.0		
45 <55	0	0.0	4	100.0		
≥55years	1	33.3	2	66.7		
Level of education						

Illiterate	1	12.5	7	87.5		
Primary	11	91.7	1	8.3		
Preparatory	29	100.0	0	0.0	52.300	<0.001*
Secondary	14	100.0	0	0.0		
University	7	100.0	0	0.0		
Job						
Not working	50	87.7	7	12.3	0.220	0.639
Working	12	92.3	1	7.7		
Social Status						
Married	60	95.2	3	4.8		
Divorced	0	0.0	4	100.0	35.188	<0.001*
Widow	2	66.7	1	33.3		
Environment						
Rural	57	87.7	8	12.3	0.695	0.405
Urban	5	100.0	0	0.0		

Table (7): Illustrated that there was statistical significance difference between caregivers' characteristic namely age, education and social statuses and their total level of knowledge in post self-learning module when p-value was <0.00.

Table (8): Correlation matrix between the total level of attitude, total practices and their total level of knowledge pre, post of SLM (n=70)

	Total knowledge		Total practice	
	Pre	Post	pre	post
Total practice	r= 0.541 p=<0.001*	r=0.705 p =< 0.001*		
Total attitude	r= 0.632 P = <0.001*	r= 0.356 p=<0.001*	r= 0.418 p= <0.001*	r=0.732 p=<0.001*

Table (8): Revealed that there was statistically significant positive correlation between their total level of knowledge, total practices and their total attitude respectively pre and post self-learning module when p-value was <0.00. Also, there were statistically significant positive correlation between their total reported practices and their total attitude respectively pre and post self-learning module when p-value was <0.00.

As regard characteristics of studied children, the finding of present study showed that more than two thirds of studied children were aged from 1 < 5 years with Mean age 6.28±4.09. These findings were supported by **Sogbossi et al (2022)** who carried out a study entitled "Mothers' perception of cerebral palsy in a low-income country of West Africa" who reported that less than two thirds of the studied children were between 1-4 years.

Regarding gender of studied children, the finding of present study showed that less than two thirds of studied children were male. This finding is contrasting with that of **Gad et al (2023)**, who found in a study entitled "effect of an Educational Program about Cerebral Palsy Management on Mothers' Performance" and showed that less than two thirds of the studied children were male. From the investigator point of view this result might be due to (CP) is typically diagnosed during the first or second year after birth and male children are at higher risk of cerebral palsy, also this could be due to the greater biological vulnerability of male infants compared to females or might be due to genetic factors as males were at greater risk of prematurity which is the main leading cause of cerebral palsy

In relation to educational level of the studied children, the finding of current study revealed that less than two thirds of them in special school. This finding is corresponding with those finding of **Ahmed,**

et al (2015), Who carry study of “Home care offered by family caregivers to preschool children, suffering from hemiplegic cerebral palsy” who found that more than half of them attended to special school.

Considering characteristics of the caregivers, the finding of present study clarified that the majority of studied caregiver were mother and aged $25 < 35$ with mean age 32.46 ± 4.15 , This finding is consistent with those finding of **Horber et al (2020)**, who found in a study about " Severity of cerebral palsy—the impact of associated impairments" and clarified that less than half of studied sample were between 25- 35 years. On the other hand, this result was disagreed with that of **Perveen et al (2023)**, who studied of "knowledge and care among mothers having children with cerebral Palsy" and mentioned that more than three quarters the studied mothers their age between 30-40year.

Concerning the occupation of caregivers, the present study revealed that the majority of studied caregivers not working, this finding is contrasting with those finding of **Nobakht et al (2020)**, who conducted a study about "A web-based daily care training to improve the quality of life of mothers of children with cerebral palsy: A randomized controlled trial" who clarified that the majority of studied caregivers were housewife. From the investigator point of view this result might be due to that the Egyptian mother preferred to stay at home to provide care for their husband and children especially if they had chronic ill child.

Regarding social statues of studied caregivers, the present study illustrated that the most of studied caregivers were married This finding is congruent with, **Perveen et al (2023)**, who demonstrated that all of studied mothers were married.

Considering the place of residence of studied caregiver, the study finding illustrated that the majority of them from Rural area. The finding is similar to this finding of **Hayles et al (2018)**, who carry out study entitled " Parents’ experiences of health care for their children with cerebral palsy" who reported that more than two third of mother from rural area. From the researcher point of view this might be related to Helwan general hospital and fayoum university hospital serve all cases all over Egypt especially rural areas. On the other hand, this finding was disagreed with the study carried out by **Haberfehlner et al (2020)**, in a study entitled " Instrumented assessment of motor function in dyskinetic cerebral palsy: a systematic review" who found that the most of them from urban area.

As regards child medical history, the result of the of current study revealed that more than half of studied children haven’t relation between the father and the mother, this finding was in accordance and agreement with this finding of **Perveen et al (2023)**, who revealed that less than two fifths of studied children had non-consanguineous marriage.

In relation to the diagnosis disease, the finding of current study illustrated that, more than two thirds of studied children had diagnosed before three years. This study disagreement with **Fouad et al (2022)**, who noted that more than two fifths of them disease onset since birth. This result may be due to maternal complication during pregnancy and labour. And maybe due to low of awareness related to rehabilitation with CP.

Regarding difficulty speaking, the present study illustrated that less than two thirds of them had difficulty speaking. The finding is matched with that finding of **Gillani et al (2021)**, in a study entitled "Effectiveness of treatment in children with cerebral palsy" who found that the majority of the studied children had difficulty speaking.

According to degree of cerebral, the finding of current study explained that almost less than half of studied children had moderate degree of cerebral palsy These results are supported with **Ozkan, (2018)**, who found in a study entitled "Child’s quality of life and mother’s burden in spastic cerebral palsy" and reported that less than two thirds studied children had moderate degree of CP.

As regard to total knowledge about cerebral palsy and daily activity, the current study revealed that more than two thirds of studied caregivers had unsatisfactory total knowledge regarding cerebral palsy in pre SLM compared to the majority of them had satisfactory total knowledge post SLM. In the same line with **Alruwaished, et al (2020)**, in a study entitled "Knowledge and attitude of caregivers of cerebral palsy children in Riyadh city" that showed that parental knowledge of CP is substantially

lacking. This reflects poor educational activities to improve the parental knowledge. On the other hand, this finding was in agreement with that of **Sultana et al., (2022)** in a study entitled "Early Intervention and Parent Counseling Give Positive Impact in Cerebral Palsy Child" who mentioned that parental total knowledge about cerebral palsy and daily living activity is poor.

Concerning total reported practice of the studied caregivers regarding to care of their children with cerebral palsy, the result of current study clarified that less than two thirds of studied caregivers had inadequate reported practice in pre SLM, compared to the most of them had Adequate reported practice post SLM. This finding was similar to **Allah et al (2017)**, studied entitled "Improving the care provided to Hemiplegics Cerebral Palsy Children by Their family caregivers" who found that there was improvement of studied mothers practice after program implementation. This result was supported by **Hashem & Abd El Aziz (2018)** who found that more than half of the studied mothers had unsatisfactory reported practices before the educational program while, more than two thirds had satisfactory reported practices regarding daily care of their children with cerebral palsy after 6 months of the educational program. Also, this result was in the same line with **Rashad et al (2021)**, who carried out a study entitled " Effectiveness of Maternal Training Program on Improvement of Care Provided to Their Children with Cerebral Palsy " who found that nearly one quarter of studied mothers had satisfactory reported practices score of the studied mothers regard care of their CP children before implementation of educational modules. This percentage increased to half after implementation of educational module. Also contrasted with **Namanja & Phiri, (2022)** in a study entitled "Quality of life of primary caregivers of children living with cerebral palsy at two clinics in Blantyre, Malawi" who showed that more than half of the studied for primary caregivers had adequate practices related to cerebral palsy.

Conceding caregivers' total attitude the current study clarified that more than half of studied caregiver had negative attitude in pre SLM ,while more than three quarters of them had positive attitude in post SLM , These findings was similar to **Amiri et al ., 2019**,who study entitled "Effect of Child Factors on Parental Attitude Toward Children and Adolescents With Cerebral Palsy" who revealed that more than one third of studied caregiver were negative attitude in pre SLM compared to the Two third had positive attitude after implementation of module. This result may be due to level of knowledge and practices which effect on level of attitude. On the other hand, **Onwuakagba et al., (2023)** in a study entitled "Burden, needs, and attitudes of parents of children with cerebral palsy in a middle-income country" who found that more than one quarter of the studied parents had negative attitudes.

Regarding relation between studied caregiver's characteristics and their total knowledge. The result of present study revealed that that there were significance statistical difference between caregivers' characteristic namely Caregiver, age ,education and social statues and their total knowledge in post SLM This result was supported by **Hashem & Abd El Aziz (2018)** who found that there was statistical significant differences between mothers' age and educational level and their total level of knowledge about the cerebral palsy and care of associated problems and daily care of their CP children pre- program implementation and also, their total level of knowledge immediate the program implementation. These findings may explain that, better education is necessary to explain and understand the disease process and care required for children while, mothers may benefit more and had higher satisfaction in practical part of the study.

Considering Correlation between studied caregiver's according to their Total attitude and their total practice and their total knowledge pre, post of SLM, the current study result revealed there were statistically significant positive correlation between their total knowledge, total practice and total attitude respectively pre and post SLM when p-value was <0.00. Also, there were statistically significant positive correlation between their total reported practice and their total attitude respectively pre and post SLM. In the same line with **Gamal et al. (2021)**, in a study entitled" Quality of Life and Its effect on Mothers who Providing Care for Their Children with Cerebral Palsy" who revealed that there was a highly statistically significant relations between total mothers' knowledge and practices.

4. Conclusion

Based upon the results of the current study, it can be concluded that Self-Learning Module had a positive effect on caregivers' knowledge, practice and attitude regarding care of their children with cerebral palsy, which lead to decrease burden of care for children with cerebral palsy.

Based on the results of the present study the following recommendation is suggested: Continuous health education for caregivers regarding cerebral palsy, complications, different aspects of care and management plan. Development of training program should be conducted periodically for caregivers to update their knowledge and improve their practices. Increase the public awareness toward care of child and available specialty center that provide care for these children through mass media such as television, booklets and posters. Raising awareness would help caregivers to make better decisions about their children and alleviate the stress that arises from ignorance and uncertainty.

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