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The Effect of Nursing Intervention on Stress and Coping Strategies among Mothers of Children with Cerebral Palsy

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Abstract: Cerebral palsy is one of the most common pediatric neurological disorders which encompasses a negative psychological, emotional, social and physical consequences of providing care. Providing a high level of care for children with cerebral palsy may affect both the physical, social, and psychological health of the mothers who take care for those children. Mothers experience many stressors which affect their daily lives. So, nursing intervention is a key element of managing cerebral palsy children, support their parents and enhance their coping strategies to reduce their tension and stress and adapt to their new situation. **Aim:** Evaluate the effect of nursing intervention on stress and coping strategies among mothers of their children with cerebral palsy. **Method:** A quasi-experimental design was used for this study, including 65 mothers caring of children with cerebral palsy. The tools of data collection were as: a structured questionnaire sheet, Parenting Stress Index-Short Form, Coping Health Inventory for parents and Gross Motor Function Classification System before and after six months of nursing intervention. **Results:** The study revealed that, the total mean score of mothers' stress was high before nursing intervention while, this score was low after nursing intervention. Also, the total mean score of mothers' coping strategies was low before nursing intervention while, this score was high after nursing intervention. In addition to, there was a statistical significance difference between mothers' level of stress and their coping strategies applied to decrease their stress before and after the nursing intervention. **Conclusion:** Nursing intervention was effective in reduction of mothers' stress and raising the coping strategies of mothers of children with cerebral palsy. **Recommendations:** Various parenting approaches and coping strategies need to be recommended and taught to mothers to decrease their stress. Also, nurses should play a key role in health teaching and counseling the mothers about all aspects of care of their children with Cerebral palsy and ways to overcome the stress associated with this care.

Key words: Cerebral Palsy, Children, Coping Strategies, Mothers, Nursing Intervention, Stress, Stressors.

INTRODUCTION

Cerebral palsy (CP) a neuro-developmental disorder in children, and can be associated with life-long disability. Sensory, motor, speech and other cognitive impairments are also experienced by children with CP(1). Recent survey indicated that, approximately 0.2 percent children world wide suffer from cerebral palsy(2).

Having a child with CP involves numerous problems of daily management and changes in family life (3). The daily lives of mothers are often more affected because, they are usually the primary caregivers for their children with CP, and experience many stressors. Broadly, the stressors include psychological ones owing to caregiver demands and uncertainties (4), and physical stressors that result from excessive stress and through continuously assisting their children in activities of daily living (5). In addition, the mothers experience socio-economic stressors due to lack of employment opportunities as well as marital problems which leading to misunderstanding and conflict with their spouses (6 & 7). Therefore, it is evident that, the quality of life of these mothers is negatively affected as a result of caring for their children with CP (8) and looking after a child with disability as CP affects not only the parents specially the mothers, but also the siblings and the relationships among the family members (9).

Stress is a natural phenomenon that, every one experiences in his or her life time. It is a disruptive emotional condition

occurring in response to adverse external influences and capable of affecting physical health. Also, parenting stress is a negative psychological feeling associated with anxiety, frustration and self-blame that can affect parenting behaviors and functions (10) while, coping is a constantly changing cognitive and behavioral efforts to manage specific external and/or internal demands that are appraised as exceeding the resources of the person (11). Mothers coping with the psychological effects of cerebral palsy could be very difficult because, children with CP need long-term care (12). The impact of cerebral palsy on parents' stress is usually influenced by some factors as: the severity of the illness, increased care-giving demands, low maternal education and ethnic background. So, coping strategies should be directed at easing the burden of daily care, decreasing hospital re-admission and targeting appropriate psychological support at specific groups to change parental perception and reduce parents stress and tension (13&14).

Nursing care for children with CP includes providing adequate nutrition, maintaining skin integrity and safety, providing emotional support for children and their parents, promoting growth and development and teaching parents how to care for the child (15). Health education for mothers who are responsible for monitoring the child's treatment regimen should focus not only on health and disease management but should include coping skills training as well. These skills are designed to promote approach-oriented coping techniques for managing the daily issues, and stressors created by the child's disease and improve

parental quality of life (16). Using healthy ways or strategies to cope and manage stress such as practicing different techniques to relax the body and the mind and getting the right care and support can put the problems in perspective and help stressful feelings subside (17).

Aim of the study:

The study aimed to evaluate the effect of nursing intervention on stress and coping strategies among mothers of Children with cerebral palsy.

Research hypothesis:

The study was hypothesized that, mothers' stress will be significantly decreased and coping strategies will be applied after implementation of the nursing intervention.

SUBJECTS AND METHODS

Design: Quasi- experimental design (one group pre and post test design) was utilized in this study.

Setting: The study was conducted out in the in – patient and out – patient departments of Neurology at Mansoura University children's Hospital (MUCH) and the physiotherapy clinic at the General University Hospital .

Subjects: A convenience sample was used in this study. It consisted of 65 mothers who were attending to the previous mentioned settings regardless their characteristics and having children with cerebral palsy only and aged from 1 to 18 years.

Tools of Data Collection: The following four tools were used to collect the data as:

Tool I: Structured questionnaire sheet: it was designed by the researchers based on review of literature and consisted of two parts:

Part (1): it included three items as:

- a) **Characteristics of mothers of children with cerebral palsy as :** Age, educational level, occupation, marital status, mother's work ,number of children, family income ,type of the family.
- b) **Medical history of mothers of children with cerebral palsy as:** Mothers health problems, chronic diseases or CP in the family, having another siblings with CP.
- c) **Characteristics of children with cerebral palsy as:** Age, gender, birth order, , education, duration of illness, type of CP, health problems or difficulties associated with CP, type of feeding, type of treatment, frequency of physiotherapy per week.

Part (2): it included the problems facing the mothers in the care of their children *with CP as:* Problems related to feeding, elimination, movement, walking, speaking, vision, hearing, communication with others, , treatment, follow up.

Tool II: Parenting Stress Index Short Form (PSI- SF):

Parenting Stress Index Short Form was created by (18) as a screening and diagnostic assessment tool, designed to measure stress in the parent –child system. It included (120) items, likert type parent self report questionnaire and comprised (54) parent-focused items, (47) child-focused items and items dealing with general life stressors. This tool

consisted of (36) items divided into three subscales as: *parental distress, parent – child dysfunctional interaction and difficult child .*

- a. **Parental distress(PD):** it included a variety of component stressors such as impaired sense of parenting competence, stresses caused by restrictions placed on other life roles, lack of social support , conflicts with the child' s other parent.
- b. **Parent –child dysfunctional interaction (PCDI):** it indicated the extent to which the parent feels alienated from the child and gives an idea of the strength of the parent – child bond.
- c. **Difficult child (DC):** it focused on the basic behavioral characteristics of the child that makes him either difficult or easy to manage and how these impact on the parents.

The reliability and validity of this research tool were established by the author. Cronbach's alpha for the three subscales ranges from 0.80 to 0.87.

Scoring system:

Each subscale included 12 items which used a 5- point likert scale, rated from (1) strongly disagree to (5) strongly agree which can range from (36 to 180) points .Parents who obtained a raw score of 90 or above the (90 th percentile) experienced a significant levels of stress. The sum of the points attributed to each item defines the total score

Tool III: The coping Health Inventory for Parents (CHIP):

This scale was developed by(19) to assess parental coping styles and perceptions of the helpfulness of certain strategies with the serious or chronic illness of a child . This scale included (45) items which were divided into three subscales :

- a. **Family:** Maintaining family integration, cooperation and optimistic definition of the situation.
- b. **Support:** Maintaining social support, self esteem and psychological stability.
- c. **Medical condition:** Understanding the medical situation through communication with other parents and professionals.

Alphas reliabilities for the previous three subscales were 0.97, 0.79, & 0.71 respectively.

Scoring system:

The scale used a four –points likert – type scale, ranging from (zero) not helpful to (3) extremely helpful .The total score for each subscale was obtained and added together to provide the total score for the coping style for parent.

Tool IV: Gross Motor Functional Classification System (GMFCS):

This tool was a standardized system of classification of severity of motor disability which was developed by (20) who provided a new classification system for gross motor function that classified children with cerebral palsy on the basis of their abilities and limitations. The authors proposed five dimensions of the GMFCS as: lying and rolling, sitting, crawling and kneeling , standing and walking and running and jumping. This system was suitable for using in children

between the ages of 2 and 12 years. It allowed children to be classified into one of five levels based on self initiated movement. The updated version of this scale is expanded and revised by (21) to include children up to 18 years of age which recognized that child's environment and other factors may affect gross motor performance. This scale based on the use of mobility aids, performance in sitting, standing and walking activities.

Scoring system:

The score of each item of the five dimensions of the GMFCS was scored from (0 to 3). The total score was calculated from zero (minimal physical ability) and 100 (normal physical ability).

An administrative Design:

An official approvals to conduct the study were obtained through letters directed from the Faculty of Nursing to the director of Mansoura University Children's Hospital (MUCH), the General University Hospital and the heads of pediatric neurology departments (in -patient & out-patient), and physiotherapy department explaining the study aim and procedures along with its potential benefits.

An ethical Considerations:

The researchers obtained an approval oral consent from each mother for her participation after explaining the aim of the study and securing confidentiality of data. The studied

The study was done during the period from January 2015 to the end of June 2015.

Data collection was carried out for six months and the purpose of the study was explained by the researchers to each mother.

b) Planning phase:

The researchers developed the teaching program based on the collected data and the related literatures, The interviewing time with the studied mothers was 45 minutes to assess the effect of nursing intervention on stress and coping strategies of mothers caring of their children with CP. The researchers was available in the morning and afternoon shifts for data collection (two days /week).

The participant mothers in the study completed the Parenting Stress Index Short Form (PSI- SF) and The coping Health Inventory for Parents (CHIP) under supervision of the researchers. These tools were initially administered on (75) mothers but the full responses were obtained from (65) of them only.

c) The implementation phase:

The program was designed by the researchers according to the needs of the studied mothers and was given for them in two sessions (two theoretical sessions) to cover the content of the program and the duration of each session was 45 minutes. Various teaching methods were used in these sessions in the form of lectures, group discussion, demonstration, re-demonstration and role playing. In addition to, various teaching media were used such as: data show, handout guideline regarding the stress and stressors facing the mothers of cerebral palsy children and the coping strategies used to minimize this stress and improve their

mothers were able to withdraw or refuse at any time from the study without any responsibilities.

An operational Design:

a) Preparatory phase :

The researchers reviewed the related literature covering the all aspects of stress and stressors associated with CP and its management and its effect on the parents specially the mothers of children with cerebral palsy. Also, the coping strategies which are used by these mothers to decrease their stress. This was done by using available text books, articles, journals, and internet search to be acquainted with previous and current literature and to develop the relevant tools for collection of data.

- The study tools were tested for its content validity by a panel of five experts in the field of the study and translated into simple Arabic language before using it.

Pilot study:

A pilot study was carried out to test the study tools .It was conducted on 10% of the total sample size in order to evaluate the research plan ,practicability and feasibility of the tool. Mothers who participated in the pilot study were excluded from the study.

Field work: d) Evaluation phase:

quality of life. This guideline was prepared by the researchers. The program was conducted in both out- patient and in -patient and physiotherapy departments.

After completion of the program sessions, the same research tools were used after 6 months of the program implementation to assess the effect of nursing intervention on stress and coping strategies among mothers of children with cerebral palsy.

Limitations of the study:

A small sample size in the present study was inadequate to generalized the results of the study.

Statistical Analysis:

Version 21 was used to analyze the data, and normality of data was first tested with one sample kolmogrove - smirnov test. Qualitative data were described using number and percent. Association between categorical variables was tested using chi-square test. Continuous variables were presented as mean & standard deviation.

Association between the continuous variables by using paired t- test. For all above mentioned statistical tests done, the threshold of significance is fixed at (p-value < 0.05).

RESULTS

Table (1) describes characteristics of the studied mothers participating in this study. The mean age of the studied mothers was 30.4± 7.5 years, and more than three fourths (78.5%) of them were belonging to rural areas. Also, more than a quarter of them had two or more than three children in the family as revealed by (36.9% and 26.2%) respectively. In addition, more than half (53.8%) of them had not enough family income, more than two thirds (67.7%) of them had a nuclear family type and more than

three fourths of them (78.5%) were house wives. In relation to mothers health problems, more than a quarter (26.2%) of them had health problems, (33.8%) of them had family history of chronic illness or cerebral palsy while, (16.2%) of them had siblings with cerebral palsy and more than half (57.1%) of them had family members with diabetes and heart disease.

Figures (1&2) showed other characteristics of the studied mothers, less than half (46.2%) of the studied mothers had secondary or diploma level of education and the most majority (92.3%) of the studied mothers were married.

The characteristics of the studied children with cerebral palsy are presented in **table (2)**. This table shows that, the mean age of children was 6.19 ± 4.60 years, more than two thirds (67.8%) of them were males, and more than half (53.8%) of them were the first children in their family . Also, less than a quarter of the studied children had the third or the second level of motor disability as revealed by (20% & 18.5%) of them respectively while, less than half (33.8%) of them had the fifth level of motor disability and more than three fourths (78.5%) of them were taking physical therapy for treatment of CP.

Figure (3) pointed that, more than half (63.1%) of children with CP had dyskinetic cerebral palsy.

Table (3) illustrates the associated difficulties of children with cerebral palsy. It is observed from this table that, the majority of children with CP had movement problems and difficulty in feeding their selves as revealed by (90.8% & 81.5%) of them respectively while, three fourths of them had difficulty in speech& language ,constipation and spastic muscles in their legs as revealed by (78.5%, 73.8% & 72.3%) of them respectively.

The mean scores of mothers' stress by parents stress index – short form is showed in **table (4)**.It is observed that, the mean score of mothers' stress due to difficult child was (46.78 ± 8.94) which was the first cause of mothers' stress in the study while, the second cause of stress was parental distress in which the mean score was (41.12 ± 9.40) and the third cause of stress was parent-child dysfunctional interaction by the mean score of them (40.43 ± 7.85). These previous scores of mothers' stress decreased after nursing intervention. Also, the total mean score of mothers stress in all subscales was high as 128.34 ± 21.16 before nursing intervention while, this mean score decreased to (103.74 ± 13.46) after nursing intervention. In addition to, There were a significance statistical differences between mothers' stress due to parental distress, parent- child dysfunctional interaction and difficult child before and after nursing intervention.

Table (5) illustrates the mean scores of coping patterns by the studied mothers according to the coping health inventory for parents. The mean scores of mothers' coping patterns were mainly including maintaining social support ,self esteem, and psychological stability were (24.20 ± 8.64) before nursing intervention while, these scores increased to (34.02 ± 3.62) after nursing intervention. Also, the total mean scores and SD of mothers' coping in all

domains were (57.97 ± 24.93) before nursing intervention while, these scores increased to (84.77 ± 8.62) after nursing intervention.

There were a significance statistical differences between mothers' coping by maintaining family integration, co-operation and an optimistic definition of the situation, maintaining social support, self esteem and psychological stability and understanding the medical situation through communication with other parents and consultation with medical staff before and after the nursing intervention.

Regarding the relationships between mothers' stress and their characteristics, **table(6)** reveals that, the mean scores and SD of mothers' stress was high in those who were aged <30 years ,were divorced, were living in rural areas and their educational level was secondary & diploma before nursing intervention while, these scores were low after nursing intervention. Also, the mean scores and SD of mothers' stress was high in those who were working, had two children, their family income was not enough and had nuclear family before nursing intervention while, these scores were low after nursing intervention. There was a statistically significant difference between mothers' stress and their characteristics before and after nursing intervention.

Table (7) clarifies the relationship between mothers stress and characteristics of their children with CP. It is observed from this table that, the mean scores and SD of mothers' stress was high in those who had children aged ≤ 6 years ,were males ,those took feeding by NGT, in the third birth order , had children with the first level of motor disability before nursing intervention while, these scores were low after nursing intervention. In addition, there was a statistically significant difference between mothers' stress and characteristics of their children as their age, gender, the birth order, spastic and dyskinetic types of CP and the level of motor disability before and after nursing intervention (p -value < 0.05 & < 0.001).

Regarding to the relationship between mothers' coping strategies and their characteristics, it is showed from **table (8)** that, the mean scores and SD of mothers' coping strategies was low in those who were widowed ,had university education, were house wives before nursing intervention while, these scores increased after nursing intervention. Also, the mean scores and SD of mothers' coping strategies was low in those who had aged < 30 years, one child ,had enough family income , had extended family type, had health problems, and had not family history of CP or chronic illness before nursing intervention while, these scores increased after nursing intervention. In addition, there was a significance statistical difference between mothers coping strategies and their characteristics before and after the nursing intervention (p -value < 0.001).

The relationship between mothers' coping strategies and characteristics of their children with CP is observed in **table (9)**. This table clarifies that, the mean scores and SD of mothers' coping strategies was low in those who had children aged ≤ 6 years , were females ,their birth order more than the third, had dyskinetic CP and had the second

level of motor disability, before nursing intervention. while, these scores increased after nursing intervention. In addition, there was a significance statistical difference between mothers' coping strategies and characteristics of their children with CP before and after the nursing intervention (p- value < 0.001

Figures (4&5) clarify the correlation between the total mothers' stress and their coping strategies. It is observed that, there was a significant statistical difference between mothers' stress and their coping before and after the nursing intervention. P-value is (0.008) & r (-0.325) before the nursing intervention while, p-value is (0.003) & r (-0.365) after the nursing intervention.

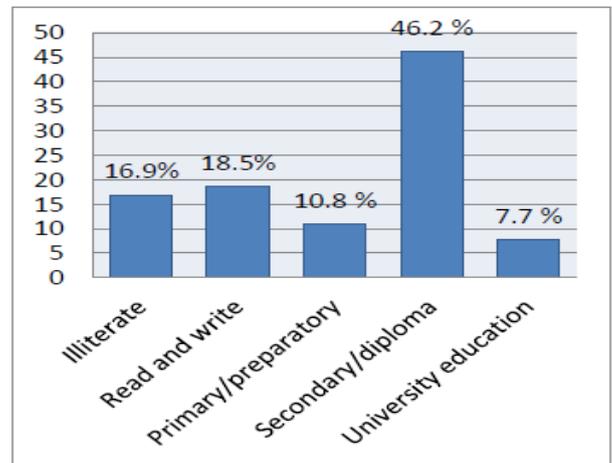


Figure (1) Mothers' educational level

Table (1): Characteristics of the studied mothers

Characteristics	The studied mothers (n=65)	
	No.	%
Age of mother in years:		
Mean (□SD)	30.4 □ 7.51	
Residence:		
• Urban	14	21.5
• Rural	51	78.5
Mothers' work:		
• Housewife	51	78.5
• Working	14	21.5
Duration time of worked mothers is :		
• Part time	6	42.9
• Full time	8	57.1
Number of children:		
• One child	11	16.9
• Two	24	36.9
• Three	13	20.0
• > three	17	26.2
Family income:		
• Not enough	35	53.8
• Enough	30	46.2
Family type:		
• Extended	21	32.3
• Nuclear	44	67.7
Mothers' health problems:		
• Yes	17	26.2
<i>Hypertension and other heart diseases</i>	3	17.6
<i>Diabetes mellitus</i>	4	23.5
<i>Others</i>	10	58.8
Family history of chronic illness or CP:		
• No	44	33.8
• Yes	21	16.2
<i>Siblings with CP</i>	5	23.8
<i>Siblings with DM</i>	4	19.0
<i>Others with cardiac disease and DM</i>	12	57.1

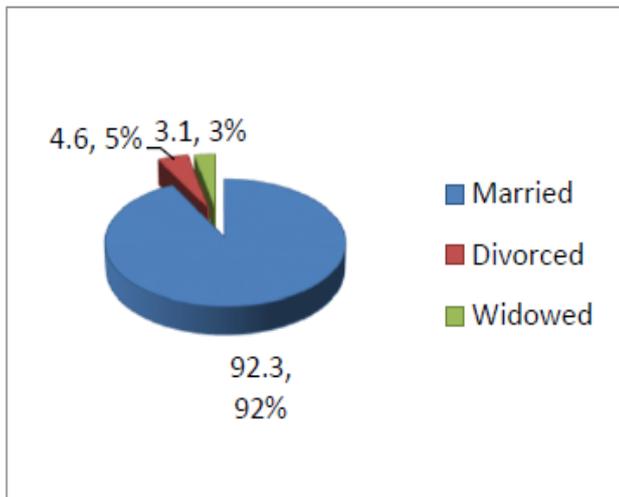


Figure (2) Marital status of the mothers

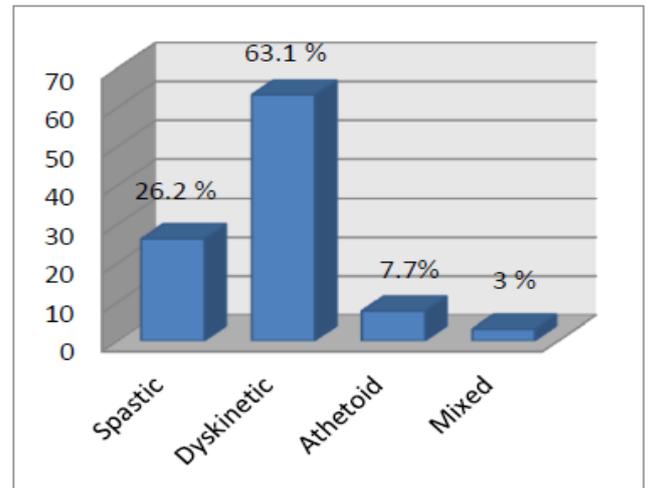


Figure (3) Types of cerebral palsy in children

Table (2): Characteristics of children with cerebral palsy

Characteristics	Children with CP (n=65)	
Age:		
Mean (□ SD)	6.19 □ 4.60	
	No.	%
Gender:		
• Male	44	67.7
• Female	21	32.3
Birth order:		
• The first	35	53.8
• The second	12	18.5
• The third	10	15.4
• Other	8	12.3
Duration of illness:		
• < 4 months	20	30.8
• 4months - < 8 months	18	27.7
• 8months - < 1year	14	21.5
• ≥ 1years	13	20.0
Education:		
• Didn't join the school	59	90.8
• Join the school	6	9.2
Levels of motor disability:		
The first	12	18.5
• The second	11	16.9
• The third	13	20
• The fourth	7	10.8
• The fifth	22	33.8
Type of treatment:		
• Physical therapy	51	78.5
• Speech and conductive therapy	1	1.5
• Occupational therapy	1	1.5
• Medications	12	18.5

Table (3) :Distribution of associated Difficulties of children with CP

Difficulties	Children with CP (n=65)	
	No.	%
Movement problems: -Walking difficulties	59	90.8
-Difficulty in control movement of his head	26	40.0
Difficulty in speech/language	51	78.5
Feeding problems: -Chewing difficulty	34	52.3
-Swallowing difficulty	24	36.9
-Difficulty in feeding their selves	53	81.5
Drooling:	38	58.5
Bowel elimination problems: -Difficulty to control urination	18	27.7
-Difficulty to control bowel	20	30.8
-Constipation	48	73.8
Hearing problems	18	27.7
Vision problems	19	29.2
CNS problems: -Distraction and lack of concentration	39	60.0
-Spastic muscles in their legs	47	72.3
-Seizures attack	38	58.5

Table (4): Mean scores of mothers' stress by Parents Stress Index-Short Form (PSI-SF)

PSI-SF	Pre (n=65)		Post 6 months (n=65)		Paired t- test	P value
	mean	□ SD	mean	□ SD		
Parental Distress	41.12	9.40	31.31	5.23	8.41	≤ 0.001*
Parent- Child Dysfunctional Interaction	40.43	7.85	33.15	4.55	7.61	≤ 0.001*
Difficult Child	46.78	8.94	39.28	6.32	6.31	≤ 0.001*
Total stress score	128.34	21.16	103.74	13.46	8.76	≤ 0.001*

* indicates (≤ 0.001) denotes a highly statistically significant difference

Table (5): Mean scores of mothers' coping by Coping Health Inventory for Parents (CHIP)

CHIP	Pre (n=65)		Post 6 months (n=65)		Paired t- test	P value
	mean	□ SD	mean	□ SD		
Maintaining family integration, cooperation, and an optimistic definition of the situation	23.83	13.29	35.94	4.56	9.15	≤ 0.001*
Maintaining social support, self-esteem, and psychological stability	24.20	8.64	34.02	3.62	10.12	≤ 0.001*
Understanding the medical situation through communication with other parents and consultation with medical staff	9.94	4.08	14.82	2.00	9.22	≤ 0.001*
Total coping score	57.97	24.93	84.77	8.62	10.06	≤ 0.001*

* indicates (≤ 0.001) denotes a highly statistically significant difference

Table (6): Relationship between mothers' stress and their characteristics

Mothers' Characteristics	No.	Mothers' Stress				Paired t test	P value
		Pre (n=65)		Post 6 months (n=65)			
		mean	□ SD	mean	□ SD		
Age in years:							
• <30 years	34	135.0	18.3	104.2	11.9	9.9	< 0.001*
• 30 - <40years	21	126.6	18.3	105.4	10.2	4.8	<0.001*
• ≥40years	10	109.4	25.3	98.5	22.4	1.01	0.34
Marital status:							
• Married	60	128.6	21.2	103.0	12.9	9.1	< 0.001*
• Divorced	3	139.0	11.5	111.7	5.7	8.1	0.01*
• Widowed	2	104.5	16.3	112.5	34.6	0.2	0.9
Residence:							
• Urban	14	127.1	19.4	104.3	14.8	3.3	0.006*
• Rural	51	128.7	21.8	103.6	13.2	8.2	< 0.001*
Educational level:							
• Illiterate	11	124.2	23.6	92.5	12.1	6.3	< 0.001*
• Read and write	12	126.4	21.2	108.2	12.8	2.5	0.03*
• Primary & preparatory	7	123.0	27.0	104.4	11.7	2.8	0.03*
• Secondary/diploma	30	132.2	19.8	106.4	13.1	5.5	< 0.001*
• University educations	5	126.4	18.9	100.8	12.6	3.7	0.02*
Mothers' work:							
• Housewife	51	125.4	20.1	103.8	14.1	6.7	< 0.001*
• Working	14	139.2	21.9	103.4	11.1	7.4	< 0.001*
Number of Children:							
• One	11	121.6	26.3	101.1	21.6	2.9	0.02*
• Two	24	132.4	14.9	103.1	8.8	8.9	< 0.001*
• Three	13	123.2	16.1	107.8	14.8	2.3	0.04*
• > 3	17	130.8	27.5	103.3	11.8	4.0	0.001*
Family income:							
• Not enough	35	130.1	21.6	104.2	13.3	7.2	< 0.001*
• Enough	30	126.3	20.7	103.2	13.9	5.2	< 0.001*
Family type:							
• Extended	21	120.5	18.3	106.9	16.4	2.2	0.04*
• Nuclear	44	132.1	21.6	102.2	11.7	11.2	< 0.001*
Mother health problems:							
• No	48	129.6	21.2	103.7	11.3	8.6	< 0.001*
• Yes	17	124.7	21.3	103.9	18.6	3.2	0.006*
Family history of CP or chronic disease:							
• No	44	128.6	15.2	104.5	11.5	11.1	< 0.001*
• Yes	21	127.8	30.6	102.2	17.1	3.4	0.003*

Statistical significant at $p < 0.001$ & $p < 0.05$

Table (7): Relationship between the mothers' stress and characteristics of their children with CP

Children's characteristics	No.	Mothers' Stress				Paired t test	P value
		Pre (n=65)		Post 6 months (n=65)			
		mean	□ SD	Mean	□ SD		
Age:							
• ≤6years	39	130.3	20.7	101.9	12.0	10.8	< 0.001*
• >6years	26	125.4	21.9	106.5	15.2	3.3	0.003*
Gender:							
• Male	44	129.0	17.2	103.0	13.4	9.3	< 0.001*
• Female	21	126.9	28.1	105.2	13.9	3.3	0.003*
Birth order:							
• The first	35	123.7	16.8	104.2	14.4	4.8	< 0.001*
• The second	12	132.7	26.9	105.6	10.8	4.2	0.001*
• The third	10	137.2	28.9	102.4	15.3	5.0	0.001*
• Other	8	131.0	15.5	100.5	11.9	7.1	< 0.001*
Type of CP:							
• Spastic	17	138.3	29.9	102.4	12.9	6.2	< 0.001*
• Dyskinetic	41	125.0	14.8	104.1	14.1	6.2	< 0.001*
• Athetoid	5	122.0	22.2	105.6	10.2	1.9	0.14
• Mixed	2	126.5	36.1	103.0	21.2	2.2	0.27
Level of motor disability:							
• The first	12	135.3	13.9	107.7	9.4	6.3	0.001*
• The second	11	126.9	24.0	106.9	11.9	2.4	0.03*
• The third	13	125.8	20.9	101.3	14.2	3.2	0.007*
• The fourth	7	122.6	27.6	97.0	6.6	2.9	0.03*
• The Fifth	22	128.6	21.8	103.5	16.7	5.3	0.001*

Statistical significant at $p < 0.001$ & $p < 0.05$

Table (8): Relationship between the mothers' coping strategies and their characteristics

Mothers' characteristics	No.	Mothers' Coping				Paired t test	P value
		Pre (n=65)		Post 6 months (n=65)			
		mean	□ SD	mean	□ SD		
Age of mother in years:							
• <30 years	34	61.3	24.4	85.3	9.1	-6.1	< 0.001*
• 30 - <40years	21	51.1	23.7	83.1	7.4	-7.7	< 0.001*
• ≥40years	10	61.0	28.5	86.6	9.7	-3.7	0.005*
Marital status:							
• Married	60	57.6	25.3	85.3	8.4	-10.0	< 0.001*
• Divorced	3	55.7	28.4	73.00	1.7	-1.0	0.42
• Widowed	2	72.5	4.9	87.5	12.0	-1.2	0.43
Residence:							
• Urban	14	63.7	27.7	88.4	8.4	-4.1	0.001*
• Rural	51	56.4	24.2	83.8	8.5	-9.1	< 0.001*
Educational level:							
• Illiterate	11	49.2	25.1	82.9	10.3	-5.2	< 0.001*
• Read and write	12	45.0	21.8	78.3	5.4	-5.9	< 0.001*
• Primary/preparatory	7	65.9	25.9	88.1	6.6	-2.6	0.04*
• Secondary/diploma	30	62.4	21.6	86.5	8.1	-6.5	< 0.001*
• University education	5	70.8	38.8	89.4	10.1	-1.3	0.26

Mothers' work:							
• Housewife	51	59.1	24.6	84.2	7.6	-8.1	< 0.001*
• Working	6	53.9	26.7	86.8	11.7	-6.5	< 0.001*
Number of Children:							
• One child	11	63.6	31.2	85.2	9.7	-2.8	0.02*
• Two children	24	55.9	25.8	84.3	9.4	-5.8	< 0.001*
• Three children	13	62.9	20.0	86.4	8.4	-5.0	< 0.001*
• > three children	17	53.4	23.3	83.9	7.4	-6.8	< 0.001*
Family income:							
• Not enough	35	48.6	22.9	81.8	7.3	-8.9	< 0.001*
• Enough	30	68.9	22.9	88.2	8.9	-5.7	< 0.001*
Family type:							
• Extended	21	76.1	16.4	87.3	8.4	-3.6	0.002*
• Nuclear	44	49.3	23.7	83.6	8.6	-11.1	< 0.001*
Mother health problems:							
• No	48	57.2	25.4	84.7	8.7	-8.7	< 0.001*
• Yes	17	60.2	24.0	84.9	8.6	-4.9	< 0.001*
Family history of CP or chronic disease:							
• No	44	59.9	24.4	85.4	8.7	-7.8	<0.001*
• Yes	21	53.9	26.2	83.4	8.5	-6.3	<0.001*

Statistical significant at $p < 0.001$ & $p < 0.05$

Table (9) : Relationship between mothers' coping strategies and characteristics of their children with CP

Children characteristics	No.	Mothers' Coping				Paired t test	P value
		Pre (n=65)		Post 6 months (n=65)			
		mean	□ SD	Mean	□ SD		
Age:							
• ≤6years	39	60.5	25.2	85.5	8.6	6.8	< 0.001*
• >6years	26	54.1	24.5	83.6	8.7	7.9	< 0.001*
Gender :							
• Male	44	57.8	23.8	85.0	8.5	8.8	< 0.001*
• Female	21	58.4	27.8	84.2	9.1	5.0	< 0.001*
Birth order:							
• The first	35	67.1	21.8	86.2	7.7	5.7	< 0.001*
• The second	12	42.2	21.7	83.0	10.4	9.7	< 0.001*
• The third	10	34.5	14.8	80.0	7.1	10.4	< 0.001*
• Other	8	70.9	23.1	87.0	9.8	2.2	0.07
Type of CP:							
• Spastic	17	41.5	20.6	79.5	6.6	8.2	< 0.001*
• Dyskinetic	41	64.1	23.1	86.8	8.0	6.7	< 0.001*
• Athetoid	5	60.6	22.7	84.2	9.0	3.1	0.03*
• Mixed	2	65.0	56.6	89.5	21.9	1.0	0.5
Level of motor disability:							
• The first	12	58.2	19.2	82.9	7.0	4.0	0.002*
• The second	11	72.4	23.2	85.5	7.9	2.2	0.05*
• The third	13	56.1	19.7	84.7	8.3	7.1	< 0.001*
• The fourth	7	56.4	30.0	88.7	8.5	3.9	0.008*
• The Fifth	22	52.2	28.5	84.2	10.1	6.2	<0.001*

Statistical significant at $p < 0.001$ & $p < 0.05$

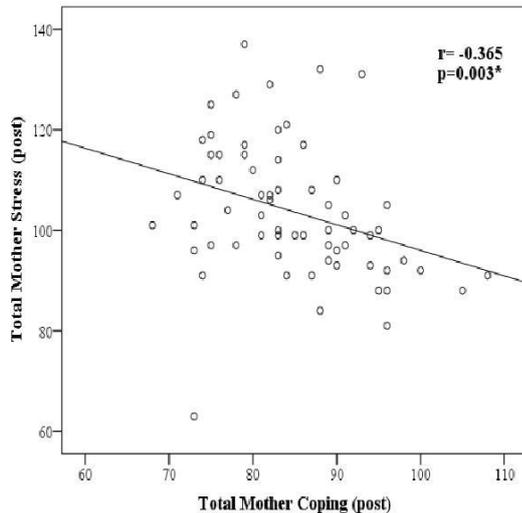


Figure (5): Simple Scatter diagram illustrates correlation between mothers' stress and their coping strategies (Post nursing intervention)

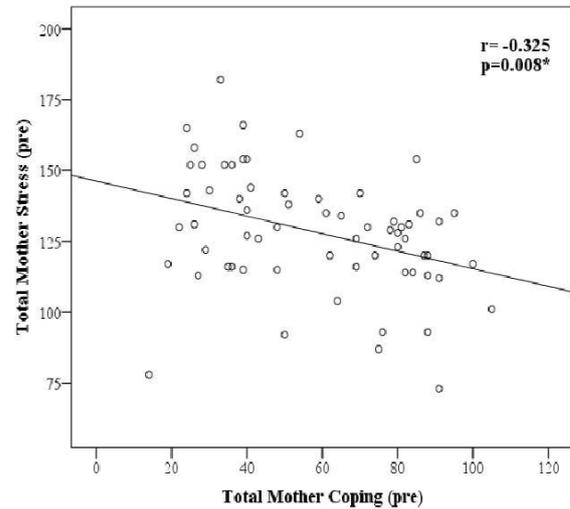


Figure (4): Simple Scatter diagram illustrates correlation between mothers' stress and their coping strategies (before nursing intervention)

DISCUSSION

Caring for a children with cerebral palsy can be a challenging experience for parents and usually requires a high level of care over a long period of time (22). Mothers generally assume the main responsibility for looking after their cerebral palsy children and are most exposed to the high levels of demands and stress (23). There is a considerable variation in how the mothers cope with the diagnosis and care of their children with cerebral palsy (24). Hence, coping strategies should be educated to the mothers and directed at easing the burden of daily care, and referral to appropriate support groups to decrease mothers stress and increase psychosocial wellbeing in mothers of cerebral palsy children (15 & 25).

The findings of the current study clarified the characteristics of the studied mothers. It is observed that, the mean age of the studied mothers was 30.4(SD±7.51) and more than half of them aged < 30 years and the minority of them aged ≥40 years. These results approximately agree with (26) who stated in their study that, the mean age of mothers was 32.5 years (SD± 7.97), the youngest mother was 17 years and the oldest mother was 58 years of age while, these results were not similar with the results of (27) who revealed in their study that, all mothers participated in the study had ages between 20 and 40 years. Also, in the present study, more than three fourths of the studied mothers were house wives, less than half of them had secondary or diploma level of education, more than half of them had insufficient family income and the most majority of them were married. These results were in agreement with the results of (28) who revealed in their study that, most mothers of CP children were unemployed , 80% were homemakers, 66% were married, low educational of the studied sample and 41% completed secondary education. Another study by (29) disagree with the previous results who reported that, 52% of the studied mothers had moderate family income and 36% of them had low family income. These results clarified that, the financial difficulties in the family and low educational

level of the mothers with CP children may hinder an effective social integration of the child and his family and restrict access to certain health care services and purchasing of equipment to facilitate accessibility and communication.

Regarding to the residence, number of children and family type of the studied mothers, our present findings revealed that, more than three fourths of them lived in rural areas, more than a quarter of them had two children in the family and more than two thirds had nuclear family. These results were not similar with the results of the study by (30) who stated that, half of the participant mothers of children with CP resided in town and most of mothers had three or more children. Also, a study by (31) approximately agree with one current result which indicated that, 28% of mothers resort to dependence on the extended family system for support. These findings clarified that, most of the studied mothers lived under conditions of social vulnerability and living in rural areas implies the need to travel which consequent financial costs, physical and /or emotional burden experienced.

The results of the present study demonstrated that, more than two thirds of the studied mothers had different health problems such as diabetes, hypertension, heart disease, rheumatoid arthritis. Also, more than a quarter of them had family history of chronic illnesses as siblings had cerebral palsy, siblings had diabetes & other family members had cardiac disease and hypertension. These results indicated that, presence of health problems in the mothers of children with CP affected on their physical and psychological condition and added to their burden of taking care effectively of their children and other family members who had chronic illnesses.

In relation to characteristics of cerebral palsy children, The findings of the current study revealed that, the mean age of children was 6.19 years (SD ± 4.60), and more than two thirds of them were males. A study by (4) disagree with these results which reported that, the mean age of the children with CP was 5.5 years (SD±1.90). Also, these

results contradicted with the view of (3) who mentioned that, cerebral palsy occurs in both sexes equally.

As regards children's birth order, the current study showed that, more than half of CP children in the first birth order. This result disagree with a study by (32) who stated that, about one fourths of children with CP were the first born children in the family. Also, the present findings revealed that, more than half of children had dyskinetic cerebral palsy and more than a quarter of them had spastic cerebral palsy. This result was in agreement with (33) who mentioned in their study that, the number of children with spastic CP were more than those with dyskinetic and ataxic types. This result confirms that, spastic CP is the common type of CP in children.

Another important findings in the present study were that, children with CP demonstrated five levels of motor disability according to (GMFCS). More than a quarter of them were in the fifth level of motor disability while, the minority of them were in the first, second, third and fourth levels of motor disability. These results disagree with the results of (34) who stated that, 47.3% of children with CP had serious impairment or the fourth & fifth levels and 52.7% had mild & moderate motor impairment or the first & second levels, while, a study by (35) supported our findings and reported that, 48% of children in the fifth level of motor disability, 4% in the first level, 16% in the second level, 12% in the third level and 20% in the fourth level of motor disability. These results indicated that, the studied mothers who had CP children with the fourth or the fifth levels of motor disability had difficult challenge in dealing with the frequent health complications and child's dependence on them for mobility and carrying out the basic needs, which becomes more acute as the child grows and becomes heavier.

In the current study, more than three fourths of children used physical therapy as the main treatment of CP beside the other therapeutic measures. these results approximately agree with the view of (36) who reported that, 98.1% of mothers told that, physiotherapy was beneficial and the primary intervention in the management of their CP children. Another study by (37) disagree with our results which found that, 85% of children in their study enrolled in special schools as well as in main stream schools

The studied mothers of children with CP in the present findings indicated that, experienced high levels of parenting stress. The total mean scores of mothers' stress were high before nursing intervention while, these mean scores decreased after nursing intervention. Analysis of PSI-SF domains showed that, the first source of stress for the studied mothers was the difficult child, parental distress was the second source of stress for mothers and finally, parent - child dysfunctional interaction was the third source of stress for the studied mothers. These results were supported by (38) Who stated that, the average stress score of mothers of children with CP was 99.02 (SD±22.1), which showed the high level of parenting stress but, a study by (28) disagree with our results who reported that, parent- child dysfunctional interaction was the main source of stress by 45% of participants, parental distress was the second source of stress by 33% and difficult child domain is the third

source of stress by 22% of mothers of children with CP based on analysis of PSI domains. The present results clarified that, mothers who had high stress before nursing intervention tended to perceive less social support , require clinical evaluation and need therapy assistance for managing of their stress.

Parental distress which was the second source of stress for the studied mothers in our study showed presence of feelings of incompetence in the performance of the parental role, depression and the demands of the child caused stress for her/ his mother and restricted their social participation (39). This result was not similar with the view of (40) who clarified that, a high percentage of clinical stress for mothers was in the parental distress domain.

According to the coping health inventory for parents (CHIP), the current study demonstrated that, the total mean scores of coping strategies used by the studied mothers were decreased before nursing intervention while, these scores improved and increased after nursing intervention. The first coping strategies which was used by these mothers with stress was maintaining social support, self -esteem and psychological stability while, the second coping strategy was maintaining family integration, cooperation and an optimistic definition of the situation but, the least coping strategy used by the mothers in our study was understanding the medical situation through communication with other parents and consultation with medical staff.

The previous findings disagree with a study by (41) who stated that, the mean and SD of CHIP scores were 40.5 (7.6) for maintaining family integration, 40.1 (6.5) for maintaining social support and 14.6 (3.9) for understanding the medical situation. Also, a study by (42) was not consistent with our results which reported that, a significant high percentage of parents / caregivers (76%) responded positively to the importance of having community support workers to conduct treatment sessions in their homes and decrease their physical and financial burden.

A study by (43) supported our findings who found that, social support helps parents with caring for children with different disabilities to cope with their stressful situation. Also, the coping patterns in the current results were congruent with (30) who indicated that, family behavioral intervention may lead to improvements in caregivers' self efficacy, confidence, family adjustment and psychosocial well being. Another study by (25) supported our findings and showed that, a good sense of self- esteem is required to cope effectively and promote good mental health for the parents and care givers.

In the present study, family resources were associated with parental stress and parents who valued social support had lower stress relating to finances.

Our results were supported by a study by (44) who concluded that, health care professionals are the most common source of information for parents and may cause anxiety regarding their child's condition. Parents of younger children found communicating with health care professionals more useful than did those of older children.

These findings indicated that, all parents contributed to obtain information on their children's situation.

Caring for child with a disability as cerebral palsy impacts on many aspects of a parent's life, including physical, social and emotional health and wellbeing, marital relationships, employment and financial status(45).It was stated by (40) in their study that, vulnerability to stress is influenced by the mother's and child's characteristics, by aspects of relationships and by family, economic, social and cultural context.

An association between the total mothers' stress and their characteristics was clarified in the present study. The findings revealed that, mothers who were aged < 30 years had higher mean stress scores than those who were \geq 40 years especially before nursing intervention but, these mean scores decreased after nursing intervention. This finding was not similar with the view of (46) who reported that, there was no significant difference in the severity of stress experienced by the mothers in the younger age or in the middle age groups. Also, (42) concluded in their study that, the age of the caregivers did not affect the levels of stress score.

The results of the current study demonstrated that, more than a quarter of the studied mothers who received secondary or diploma education, and low family income had high mean scores of stress before nursing intervention but these scores decreased after nursing intervention. These findings disagree with (47) who reported in their study that, the educational level of caregivers did not affect the level of stress and was not found to be significant. Another study by (48) was similar with our findings and stated that, families of children with cerebral palsy have lower income than families of children without deficiencies.

Another results in the present study revealed that, mothers who were divorced, lived in rural areas and working had high mean scores of stress before nursing intervention but these scores decreased after nursing intervention. These results were not similar with the findings of (46) who concluded in his study that, the employment status had no influence on the levels of stress and there was no significant difference in the severity of stress experienced by the mothers belonging to rural area. Also, a study by (42) disagree with our results who demonstrated that, the high mean scores represented those who were married parents and the lowest score was for the divorced parents.

The present findings found that, there was a significant relationship between the total mothers' stress and characteristics of their children with CP. These findings were not congruent with the results of (49) who indicated in his study that, child related variables such as age, gender, birth order, type of CP and level of disability are found to be non-significant variables in determining the severity of stress among mothers of these children. But, this study agree with our results which mentioned that, the presence of multiple disability or associated difficulties was a significant variable that decides the level of stress experienced by mothers of children with cerebral palsy. Also, it was reported by (50 & 40) in their studies that, the severity of a child's disability has been linked to self- reported measures

of family functioning including parenting stress, marital quality and social support.

These views may indicate the need for a more comprehensive assessment of children with CP by which the severity of the associated problems as well as the possible impact on mothers' psychological condition could be predicted.

The current study showed that, there were a high scores of stress for mothers whose children with CP aged \leq 6 years, were males ,were the third siblings in their family ,had spastic CP and had the first level of motor disability before nursing intervention but, these mean scores of mothers' stress were decreased after nursing intervention.

According to a study by (51), his results supported our results and suggested that, the impact of having a child with CP may change depending on the child's age but, another study by (52) disagree the previous results and stated that, the fundamental issues related to caring for a child with cerebral palsy remain similar throughout childhood and adolescence, although some parents indicated that the level of impact on these issues may be more pronounced in earlier years. Also, (4) reported in his study that, maternal stress decreased with the increase in the age of children with CP.

A study by (50) was contradicted with our results which demonstrated that, the severity of the child 's disability impacted on family functioning ,including parental stress but, (53)in their study agree with the present results and showed that, the severity of child' s disability did not seem to have a significant impact on parenting stress levels. Another study by (54) proposed that, the level of impairment was statistically significant predictor of maternal stress levels amongst families of child with CP. These results may indicate that, children with severe disability tend to be less independent with activities of daily living and are more likely to exhibit many associated problems such as feeding problems, seizures disorders and communication problems than those children with less severe involvement.

The present results disagree with (55 & 56) who revealed in their studies that, there was no correlation between the number of children in the house hold and parenting stress. Also, the mean scores of stress experienced by mothers of children with mixed type of cerebral palsy was high than in other types of CP and they reported that ,there was no significant difference in the stress experienced by these mothers in their studies. A study by (28) supported our results and reported that, presence of many health problems in children with cerebral palsy influence the occurrence of clinical stress among the caregivers. Our findings supported the view of (34) who clarified that, coping strategies by the mothers Include the daily activities and behaviors which help to adjust to the different conditions and the different demands of caring for their child's disability. Also, (43) reported in their study that, mothers who adapt successfully to the challenges need access to information, to resort to physical, emotional, family, social and financial resource or manage to develop efficient strategies for dealing with the specific demands.

The results of the present study indicated that , the total mean scores of mothers' coping strategies were high after nursing intervention which were demonstrated by mothers who were aged ≥ 40 years, were widowed, lived in urban areas, had a university education, working , had one child in the family , had enough income, had health problems and had an extended family .These results were not similar with the results of (57) who showed that, couples had higher scores on the CHIP sub scales than single parents and relied more on external social resources as compared with single parents as mothers with lower levels of education. but, this study supported the current result as working parents had higher scores on the all levels of coping patterns. The previous result may clarify that, single parents seemed unable to take advantage of social support and activities possibly because of their Isolation and limited social network.

A study by (10) supported the present findings and stated that, a higher level of education amongst the mothers would better equip them to face the challenges with their disabled children. it was confirmed by a study of (24) that, there was a relationship between low education, low family income and using of coping skills.

The current results were supported by (58 & 43) who indicated in their studies that, employment amongst their studied mothers was associated with less depression and independent of their socio- economic status. Also, under stressful circumstances at home, the work environment was providing the women with a break from their domestic routine responsibilities and equipped them to cope with caring for their disabled child. A study by (25) was congruent with our results who showed that, mothers in the African society enjoyed some level of support from members of the extended family in caring for their children .But, our results were not similar to the results of the study by (59) who found that, no significant difference were found between parents' coping strategies in nuclear and extended family. This view may support the idea that, adaptation to major life changes and difficulties are in part influenced by family type and family capabilities.

The relationship between mothers' coping strategies and characteristics of their children was clarified in the current findings which pointed that, there was a high mean scores of coping strategies applied by mothers after nursing intervention than before. This was mentioned by mothers who had children aged ≥ 6 year, had males children, had the first child and more than three children, had dyskinetic and mixed types of CP and had children with the second and the fourth level of motor disability.

The present findings were congruent with the study by (60) who indicated that, mothers of young children reported fewer strategies for dealing with difficulties, and they described a greater, number of stress factors. He described how they began to adopt more coping strategies as their children grow and when their children are in adolescence, the mothers have already acquired more experience and are more secure in carrying out daily care tasks.

Our results disagree with the view of (61) who showed that, mothers whose children have severe impairment face the major difficulties related to coping with health complications and functional limitations but, according to results of the study by (57), they approximately agree with the current result and told that, there was a tendency for those with moderate to severe mobility dysfunction to have higher score on the coping patterns sub scales related to understanding the medical situation.

The present results were supported with a study by (62) who showed that, there was a significant relationship between child's characteristics such as(type of CP, age, gender ,time elapsed since diagnosis) and parent' s adaptive behaviors. These results mean that, dealing with the problem as CP which is a chronic illness would lead to stress and need for more training for adapting to the challenges of this problem.

Finally, the current study indicated that, there was a negative correlation between mothers' stress and their coping strategies before and after nursing intervention. These results were not similar with the view of (63) who reported in his study that, there was a high positive and significant correlation and acceptable predictable relation between levels of stress and dimensions of coping strategies inventory.

All the previous findings in our study clarified that, when mothers' stress increased, their ability to use the coping strategies decreased and this may be due to many demographic factors of the studied mothers, children, experience, knowledge and social factors.

CONCLUSION

The study concluded from the current results and research hypothesis that, recognition of coping strategies of the parents especially the mothers is important to decrease their stress and useful for the development of therapeutic intervention which aimed at facilitating mothers adaptation in families of children with developmental disabilities as CP.

RECOMMENDATIONS

Based on the results of the present study, we recommended that:

1. Community agencies and government should educate the general public about cerebral palsy and raising their awareness about the difficulties associated with cerebral palsy children.
2. Siblings and other family members should be encouraged and equipped to support the mothers and participate in the care of children with cerebral palsy so, this will help the mothers to relax and reduce their stress.
3. Nurses have an important role in creating preventive programs that focus on the parents of CP children which would promote and encourage them towards using a desirable family coping strategies.

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