

Effect of Nursing Intervention on Stressors and Coping Patterns of Children Suffering from Cancer and their Mothers

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Abstract

Background: Children suffering from cancer and their mother are facing many stressors resulting from cancer and its treatment, these stressors are physical, psychological, social and financial. Nurses play a vital role in caring and educating those children and their mothers to improve their knowledge, alleviate their stressors and promote their positive coping patterns toward cancer and its treatment. **Aim:** The aim of the study was to study the effect of nursing intervention on stressors and coping patterns of children suffering from cancer and their mothers. **Subject and methods: Design:** A quasi-experimental design. **Sample:** A purposeful study subject of 150 children suffering from cancer and their accompanying mothers, which divided randomly into two equal matched groups' the study and control groups. **Setting:** The study was conducted at inpatient Pediatrics Medical Departments and Outpatient Oncology Clinics of Children's Hospital affiliated to Ain Shams University Hospitals over 6 months. **Tools for data collection:** The study involved a pre designed interviewing questionnaire to assess characteristics and knowledge of cancer children and their mothers, Stressors' Scale by Miles and Brunser, 1998 to assess stressors of the studied subjects and Coping Patterns Scale by Jalowiec and Powers, 1991 to assess their coping patterns in two phases (pre, post) for both groups. **Results:** of the study revealed that, nursing intervention had a positive impact on the studied subjects' knowledge, decreased levels of stressors and promoted positive coping patterns toward stressors related to cancer. **Conclusion:** Children suffering from cancer and their mother are facing many stressors resulting from cancer and its long lasting consequences and prolonged continuous treatment. These stressors include all aspects of life as physical, psychological, social and financial that increases the burden imposed on the affected children and their mothers. Based on results of the current study, it was concluded that, nursing intervention had a positive impact on the studied subjects' knowledge regarding cancer, stressors and coping, lowered the studied subjects' levels of stressors and promoted their positive coping patterns toward stressors related to cancer. **Recommendations:** The study recommended that, health education programs must be prepared, regularly presented and directed toward children suffering from cancer and their accompanying mothers to teach and help them manage and cope with cancer treatment and its related side effects and stressors..

Key words: cancer, stressors, coping patterns, children, nursing intervention.

Introduction

Childhood cancer has been recognized as one of the major health problems

worldwide, as well as it perceived as a significant serious extensive health issue in the developing countries. It has a tremendous economic and sociologic impact and influences children in every realm of their

life. In addition, the diagnosis of a child with cancer is extremely disruptive to the family and creates a crisis even in the most balanced family. (El Malla,2014). Cancer is the second leading cause of death in the developing countries (World Health Organization, 2012).

Pediatric cancers are relatively common in Egypt contributing about 6.4% of all cancer patients as compared to 1% in USA (Ward et al.,2014).The most common cancer among children in Egypt is leukemia, brain tumors, Neuroblastoma, retinoblastoma (eye), Wilms tumor (kidneys), and hepatoblastoma (liver) are most usually found in infants or young children. Other malignancies found in children and young adults include lymphomas (Hodgkin and non-Hodgkin lymphoma), soft tissue sarcomas (including rhabdomyosarcoma), bone cancer (osteosarcoma and Ewing sarcoma), (National Cancer Institute (USA),2013).

The potential impact of childhood cancer on parents and families has delineated a myriad of stressors including all aspects of life physically, psychologically, socially and financially. Parents specially mothers may experience financial stress, role strains, separations, adjustment to the various components of the medical system, interruptions in daily routines and plans for the future (Klassen et al., 2007&Alderfer and Long, 2010).

Coping is a strategy that refers to the specific efforts, both behavioral and psychological, that people employ to master, tolerate and minimize stressful events (John and Catherine, 2008). Coping strategies used by children with cancer will depend upon their personal characteristics, which include level of confidence, self-esteem, usual coping style, view of the world, past experiences, developmental stage and the cognitive ability (Mu, 2005).

Pediatric oncology nurses play a critical role in the care of children with cancer as new diagnostic techniques become available. They are also leaders in the field of pain management, palliative care, child and family education which help children and their families cope with cancer and its prolonged stressors and treatment (Branowicki et al., 2008).

Significance of the study

Worldwide, it is estimated that childhood cancer has an incidence of more than 175,000 per year, and a mortality rate of approximately 96,000 per year(Ward et al., 2014). In developed countries, childhood cancer has a mortality rate of approximately 20% of cases. In low resource settings mortality rate is approximately 80% or even 90% in the world's poorest countries (International Childhood Cancer Day, 2012).

The Outpatient Oncology Clinics in the Pediatrics Hospital affiliated to Ain Shams University Hospital statistical reports during 2009&2010 that the total number of the admitted children with cancer was 1500.

The diagnosis and treatment of cancer are a stressful and threatening experience, which can be emotionally devastating to children and their families. Despite the improved prognosis, the course of cancer treatment has tremendous impact and stressors on the child and family covering all aspects of life physically, emotionally, socially and financially. Collaborative care and nursing educational interventions will help in alleviating those children and their families' stressors and promote their ability to cope with this chronic illness.

Aim of the study

This study aimed to study the effect of nursing intervention on stressors and coping

patterns of children suffering from cancer and their mothers through: Assessment of stressors and coping patterns of children suffering from cancer and their mothers. Design and implement nursing intervention based upon actual needs assessment of the studied subjects and study the effect of nursing intervention on stressors and coping patterns of the studied subjects pre and post nursing intervention.

Hypothesis of the study

1. There will be relation between the studied children's characteristics and their coping patterns.

2. Implementation of the nursing intervention will be associated with less stressors and better coping patterns of children suffering from cancer and their mothers.

Subjects and methods

Research design

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

Setting:

The study was conducted at inpatient Pediatrics Medical Departments and Outpatient Oncology Clinics of Children's Hospital affiliated to Ain Shams University Hospitals over 6 months.

Type of subjects:

A purposeful study subjects consisting of 150 children suffering from cancer and their accompanying mothers were selected randomly from the previously mentioned settings according to the following inclusion and exclusion criteria.

Inclusion and exclusion criteria: for the studied children

Confirmed diagnosis of cancer, children in the age group of 6-18 years regardless of their gender and duration of illness. Children suffering from both cancer and mental illness will be excluded from the study.

Sample size:

Compose of 150 (10% of the total number of children) suffering from cancer and their accompanying mothers willing to participate in the study, they were randomly assigned into two equal groups (study and control) that entail 75 children and his mother, the studied subjects was interviewed either individually or in groups.

Tools of data collection

Data were collected through using the following tools pre / and post nursing intervention:

I. Interviewing questionnaire: It were designed by the researcher and written in simple Arabic language to gather data in relation to:

Part 1: Characteristics of the studied children including: age, gender, rank and educational level.

Part 2: Characteristics of the studied mothers including: age, level of education, employment, and monthly income and consanguinity between parents.

Part 3: History of illness of the studied children including: family history of illness and causes of hospital admission.

Part 4: Knowledge of the studied subjects about cancer that includes: meaning of cancer its causes, signs and symptoms, treatment of cancer and its complications.

Part 5: Knowledge of the studied subjects about stressors that include: concept of stressors types of stressors , sources of stressors ,

Part 6: Knowledge of the studied subjects about coping that include: concept of coping, factors that affect coping and positive and negative coping patterns.

Questions were in the form of open, closed ended and multiple choice. Time consumed of each form was around 20-30 minutes, the studied sample were interviewed individually or in groups.

Scoring system:

According to the answers obtained from the study subjects, a scoring system was followed to obtain the outcome of the study subjects' knowledge. The studied subjects' answers were categorized into; poor knowledge (scored <50%), average knowledge (scored 50% ≤ 75%) and good knowledge (scored >75%).

II. Stressors' scale by Miles and Brunsser (1998)

Was used to assess the physical, psychological, social and financial stressors experienced by the studied subjects. The studied subjects will be given (2) point for presence of the stressors and (1) point for absence of the stressors. The scales consists of 79 statements divided into 4 kinds of stressors (physical, psychological, social and financial).

Scoring system:

The total level of the studied subject stressors was divided into 3 levels

- Mild stressors(59≤87)
- Moderate stressors(87≤115)
- Severe stressors(115 ≤ 176)

III. Coping patterns scale (Jalowiec and Powers, 1991):

This scale was used to assess children and mothers coping patterns towards cancer. It was modified and translated into simple Arabic language to suit nature of the study. The content validity was assessed and secured by expert consultant before its use.

Scoring system: for mothers

Score ≤ 50 referred to negative coping. While score 50: ≤ 99 referred to positive coping.

Scoring system: for children

Score ≤ 42 referred to negative coping. While score 42: ≤ 84 referred to positive coping.

i. Operational design

1. Preparatory phase

Tools of data collection were designed, developed and adopted by the researcher based on the literature review under supervision of experts in the field of pediatrics nursing. A guiding booklet of nursing intervention was prepared by the researcher. It was specially designed in a simple Arabic language to meet the studied sample educational needs. The study tools and guiding booklet were evaluated for its content validity and clarity by expert consultant.

2. Exploratory phase

Pilot study

A pilot study was carried out from the first of May 2013 to the end of June. Including 10% of the study subjects to evaluate the content validity and feasibility of the implemented designed tools, nursing intervention, its effectiveness and the time required to fill each tool. The necessary modifications were carried out and subjects

included in the pilot study were excluded later from the study sample.

Field work

The actual field work was carried out from the he first of October 2013 to the end March 2014. The researcher was available 3 days /week from 8 o'clock a.m to 1 o'clock p.m. The interviewing questionnaire was presented to gather data about the studied subjects. The total number of session was 9 sessions, each session about 30 to 45 minutes. Methods of teaching were through modified lectures, group discussion, demonstrations and redemonstrations and suitable teaching aids were prepared and used including power point and video films.

Implementation of nursing intervention

Based on needs assessment for the studied subjects, the contents of the guiding booklet was divided into 9 sessions to be implemented within 5 hours per day.

The implementation of the nursing intervention was carried out to the studied subjects (mothers and their children) individually or in groups (from 3 to 4 mothers and their children) . Pre and post test was done to the control groups during the first 3 months of the study while the routine care was given to them. Pre and post test was done to the study group through the second three months. After pre test the studied subjects in the study group was given face to face teaching for approximately 30 to 45 minutes in each session then at the end of the sessions the post test was presented to them. The guided booklet was divided into 4 parts which contain information about cancer, stressors, coping and nursing intervention.

Evaluation: after implementation of nursing intervention, the post test was done for the studied subjects in the study group, to evaluate the outcomes of the implemented nursing intervention, using the same tools pre test and. Children in the control group were

subjected only to a routine hospital care without interference from the researcher. After the post test the guiding booklet distributed to all mothers and children in both study group and control group.

ii. Administrative design

An official permission was obtained by submission of a formal letter issued from the director of Faculty of Nursing, Ain Shams University to the director of the previously mentioned settings to collect the necessary data for the current study.

Statistical design

Data were revised, coded, tabulated and analyzed using the proper statistical tests as: number, Percentage, Mean degree, Standard deviation (Mean \pm SD), F test, Paired T –test and Chi square test (χ^2) and proportion propability of error (P value).

Ethical consideration

A formal letter was obtained from committee of ethics affiliated to faculty of nursing Ain Shams university to conduct the study.

Oral approval was obtained from the mothers of cancer children before inclusion in the study and they are assured that all the data collected will be kept confidential, nursing intervention were allowed to both groups equally.

Limitation of the study

Overcrowded of the outpatient clinics and frequent interruption enforced the researcher to take more time to explain the whole sessions also there was no special place available to introduce the lectures and during periods of severe illness or side effects cancer children were unable to participate in sessions.

Results

Table (1)& Figure (1) shown that, the mean age of the studied children were 10.98+2.87 years for the study group and 10.18+3.06 years for the control group. Whereas more than half (58.7 %) of the studied children were equally females and males in both study and control groups respectively. Regarding to ranking it was found that 56% of the studied children were ranked as first and second child in both study and control group respectively.

As regards child's educational level it was clear that less than two third (60%) of the studied children in both study and control groups were in the stage of basic education.

Table (2) & Figure (2) revealed that, the mean age of the studied mothers in the study group were 39.92+6.53 years and 37.65+7.68 years in the control group. Nearly less than one third (30.7%) of them were primary education in the study group and more than quarter (28.1%) had preparatory education in the control group. As regards employment it was found that, mothers of both the study and control groups were not working as found in (73.3% and 76%) of the studied mothers respectively.

Table (3) clarified that, both study and control groups were live in urban areas as shown in 70.7% and 54.7% of the studied subjects respectively. Meanwhile the majority (98.6% and 92%) of the studied subject's monthly income in both study and control groups were ranged from 600≤ 1200/LE.

Table (4) demonstrated that, the majority (97.3%) of the studied subjects in the study group had good knowledge post intervention regarding total level of knowledge regarding cancer, stressors and coping compared to the minority (13.3%) had average knowledge in the control group.

Table (5) showed that, all (100%) of the studied children had mild physical stressors in the study group post intervention compared to the minority (4%) of the studied children in the control group who had moderate physical stressors.

Table (6) illustrated that, less than three quarters (74.6%) of the studied mothers in the study group had mild physical stressors post intervention compared to more than half(54.7%) of the studied mothers had moderate physical stressors in the control group.

Table (7) demonstrated that, all (100%) of the studied children in the study group had mild psychological stressors post intervention compared to less than two third (64%) of the studied children in the control group had moderate psychological stressors.

Table (8) illustrated that, the majority (90.7%) of the studied mothers in the study group had mild psychological stressors post intervention compared to less than two third (66.3%) of the studied mothers in the control group had severe psychological stressors.

Table (9) clarified that, the majority (92%) of the studied children in the study group had mild social stressors post intervention compared to more than half (57.3%) of the studied children in the control group had moderate social stressors.

Table (10) showed that, the majority (92%) of the studied mothers in the study group had mild social stressors post intervention compared to the minority (11%) of mothers in the control group who had severe social stressors.

Table (11) clarified that, less than two third (64%) of the studied mothers in the control group had severe financial stressors compared to less than three quarters (72%) of the studied mothers in the study group had

moderate financial stressors post intervention.

Table (12) showed that, more than three quarters (82.7%) of the studied children in the study group able to cope positively post intervention compared to more than half (56%) of the studied children in the control group.

Table (13) clarified that, the majority (89.3%) of the studied mothers in the study

group able to cope positively post intervention compared to more than two third (65.3%) of the studied mothers in the control group.

Table(14) showed that, there was a statistical significant difference ($p<0.001^*$) between the studied subjects' total level of knowledge and their total level of stressors and coping patterns in the study group post intervention.

Table (1): Distribution of the studied children according to their characteristics in both study & control groups (n=150).

Characteristics		Study group n=75		Control group n=75		Total n=150		X2	P-value
		N	%	N	%	N	%		
Age (years)	6: < 9	21	28	36	48	57	38	6.879	0.076
	9:<12	29	38.7	18	24	47	31.3		
	12 :< 15	17	22.7	14	18.7	31	20.6		
	15 :≤ 18	8	10.6	7	9.3	15	10		
Mean + SD		10.98+2.87		10.18+3.06					
Gender	Male	31	41.3	44	58.7	75	50	4.507	0.034*
	Female	44	58.7	31	41.3	75	50		
Rank	First	17	22.7	13	17.3	30	20	3.921	0.417
	Second	25	33.3	29	38.7	54	36		
	Third	20	26.6	19	25.3	39	26		
	Fourth	9	12	5	6.7	14	9.3		
	Fifth: ≤ Eighth	4	5.4	9	12	13	8.6		
Child's Educational Level	Primary	26	34.6	45	60	71	47.3	13.746	0.003*
	Preparatory	45	60	26	34.6	71	47.3		
	Secondary	4	5.4	2	2.7	6	4		
	Escaped	0	0	2	2.7	2	1.3		

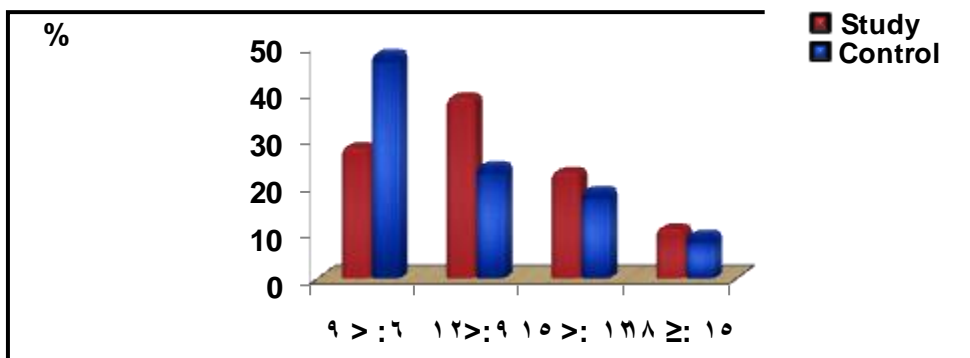


Fig. (1): Distribution of the studied children according to their age in both groups study & control (n=150).

Table (2): Distribution of the studied mothers according to their characteristics in both study & control groups (n=150).

Characteristics		Study group n=75		Control group n=75		Total n=150		X ²	P-value
		N	%	N	%	N	%		
Age (years)	20:< 30	4	5.4	13	17.3	17	11.3	6.408	0.041*
	30 :< 40	27	36	29	38.7	56	37.3		
	40 :≤ 50	44	58.6	33	44	77	51.3		
Mean + SD		39.92+6.53		37.65+7.68					
Educational level	Illiterate	13	17.3	21	28	34	22.6	15.181	0.010*
	Primary	23	30.7	19	25.3	42	28		
	Preparatory	10	13.3	21	28.1	31	20.6		
	Secondary	6	8	3	4	9	6		
	Diplomas	5	6.7	6	8	11	7.3		
	High education	18	24	5	6.6	23	15.3		
Employment	working	20	26.7	18	24	38	25.3	0.141	0.707
	Not working	55	73.3	57	76	112	74.6		

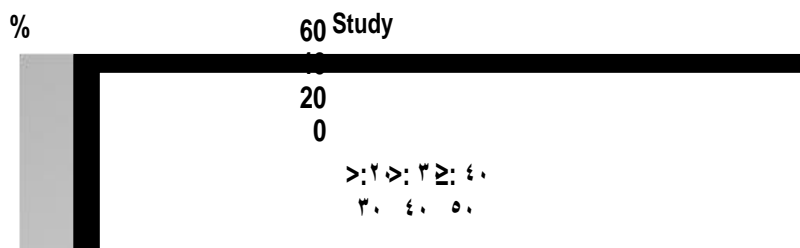


Fig. (2): Distribution of the studied mothers according to their age in years in both study & control groups.

Table (3): Distribution of the studied subjects(mothers and children) according to residence and family monthly income in both study & control groups (n=150).

Items		Study group n=75		Control group n=75		Total n=150		X2	P-value
		N	%	N	%	N	%		
Residence	Rural	22	29.3	34	45.3	56	37.3	4.103	0.043*
	Urban	53	70.7	41	54.7	94	62.6		
Family Monthly Income/LE	200<400	0	0	4	2.7	4	1.3	6.060	0.048*
	400< 600	1	1.3	2	5.3	3	3.3		
	600< 800	10	13.4	15	20	25	16.7		
	800< 1000	36	48	10	13.3	46	30.7		
	1000≤ 1200	28	37.3	44	58.7	72	48		

Table (4): Distribution of the studied subjects(mothers and children) according to their total level of knowledge regarding cancer, stressors and coping in both study & control groups (pre and post nursing intervention) (n=150).

Groups	Level of knowledge	Pre		Post		Total		X2	P-value
		N	%	N	%	N	%		
Study	Poor	19	25.3	0	0	19	12.7	142.276	<0.001*
	Average	56	74.7	2	2.7	58	38.7		
	Good	0	0	73	97.3	73	48.7		
Control	Poor	61	81.3	65	86.7	126	84	0.794	0.373
	Average	14	18.7	10	13.3	24	16		

Table (5): Distribution of the studied children according to their physical stressors in both study & control groups (pre and post nursing intervention) (n=150).

Groups	Physical stressors	Pre		Post		Total		X2	P-value
		N	%	N	%	N	%		
Study	Mild	68	90.7	75	100	143	95.3	10.047	0.002*
	Moderate	7	9.3	0	0	7	4.7		
Control	Mild	72	96	72	96	144	96	0.000	1.000
	Moderate	3	4	3	4	6	4		

Table(6): Distribution of the studied mothers according to their physical stressors in both groups of

Groups	Physical stressors	Pre		Post		Total		X2	P-value
		N	%	N	%	N	%		
Study	Mild	14	18.6	56	74.6	70	46.6	47.685	<0.001*
	Moderate	50	66.7	17	22.7	67	44.7		
	Severe	11	14.7	2	2.7	13	8.7		
Control	Mild	32	42.7	28	37.3	60	40	0.472	0.790
	Moderate	37	49.3	41	54.7	78	52		
	Severe	6	8	6	8	12	8		

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Table (7): Distribution of the studied children according to their psychological stressors in both groups of the study (pre and post nursing intervention) (n=150).

Groups	Psychological stressors	Pre		Post		Total		X2	P-value
		N	%	N	%	N	%		
study	Mild	15	20	75	100	90	60	100.000	<0.001*
	Moderate	49	65.3	0	0	49	32.7		
	Severe	11	14.7	0	0	11	7.33		
Control	Mild	21	28	18	24	39	26	1.059	0.589
	Moderate	42	56	48	64	90	60		
	Severe	12	16	9	12	21	14		

Table (8): Distribution of the studied mothers according to their psychological stressors in both groups of the study (pre and post nursing intervention) (n=150).

Groups	Psychological stressors	Pre		Post		Total		X2	P-value
		N	%	N	%	N	%		
Study	Mild	0	0	68	90.7	68	45.3	127.44	<0.001*
	Moderate	23	38.7	7	9.3	30	20		
	Severe	52	61.3	0	0	52	34.7		
Control	Mild	1	1.3	2	2.7	3	2	0.579	0.749
	Moderate	24	32	23	28	47	31.3		
	Severe	50	66.7	50	66.3	100	66.7		

Table (9): Distribution of the studied children according to their social stressors in both study & control groups (pre and post nursing intervention) (n=150).

Groups	Social stressors	Pre		Post		Total		X2	P-value
		N	%	N	%	N	%		
Study	Mild	11	14.7	69	92	80	53.3	104.870	<0.001*
	Moderate	54	72	6	8	60	40		
	Severe	10	13.3	0	0	10	6.7		
Control	Mild	23	30.7	31	41.3	54	36	2.057	0.358
	Moderate	50	66.7	43	57.3	93	62		
	Severe	2	2.7	1	1.4	3	2		

Table (10): Distribution of the studied mothers according to their social stressors in both study & control groups (pre and post nursing intervention) (n=150).

Groups	Social stressors	Pre		Post		Total		X2	P-value
		N	%	N	%	N	%		
Study	Mild	5	6.7	69	92	74	49.3	110.121	<0.001*
	Moderate	46	61.3	6	8	52	34.7		
	Severe	24	32	0	0	24	16		
Control	Mild	13	17.3	14	18.7	27	18	0.214	0.899
	Moderate	49	65.4	50	66.7	99	66		
	Severe	13	17.3	11	14.7	24	16		

Table (11): Distribution of the studied mothers according to their financial stressors in both study & control groups (pre and post nursing intervention) (n=150).

Groups	Financial stressors	Pre		Post		Total		X2	P-value
		N	%	N	%	N	%		
Study	Mild	4	5.3	16	21.3	20	13.3	13.745	<0.001*
	Moderate	54	72	54	72	108	72		
	Severe	17	22.7	5	6.6	22	14.7		
Control	Mild	1	1.3	2	2.6	3	2	0.359	0.836
	Moderate	26	34.6	25	33.3	52	34		
	Severe	48	64	48	64	96	64		

Table (12): Distribution of the studied children according to their coping patterns in both study and control group (pre and post nursing intervention) (n=150).

Groups	Coping patterns	Pre		Post		Total		X2	P-value
		N	%	N	%	N	%		
Study	Negative	30	40	13	17.3	43	28.7	7.236	0.007*
	Positive	45	60	62	82.7	107	71.3		
Control	Negative	36	48	33	44	69	46	0.107	0.743
	Positive	39	52	42	56	81	54		

Table (13): Distribution of the studied mothers according to their coping patterns in both study and control group (pre and post nursing intervention) (n=150).

Groups	Coping patterns	Pre		Post		Total		X2	P-value
		N	%	N	%	N	%		
Study	Negative	26	34.7	8	10.7	34	23	10.991	<0.001*
	Positive	49	65.3	67	89.3	116	77		
Control	Negative	28	37.3	26	34.7	54	36	0.029	0.865
	Positive	47	62.7	49	65.3	96	64		

Table (14): Relationship between total level of knowledge of the studied subjects and their total level of stressors and coping patterns in the study group post intervention.

Stressors and coping patterns		Total level of Knowledge	
		r	P-value
Physical stressors	mothers	-0.388	<0.001*
	children	-0.199	<0.001*
Psychological stressors	mothers	-0.621	<0.001*
	children	-0.778	<0.001*
Social stressors	mothers	-0.530	<0.001*
	children	-0.597	<0.001*
Financial stressors	mothers	-0.558	<0.001*
Coping patterns	mothers	0.264	<0.001*
	children	0.253	<0.001*

*statistical significant difference

Discussion

CANCER is a life threatening disease and considered the second most common cause of death after accident (**Robinson et al., 2007**). Cancer children and their families face significant physical, emotional, and psychosocial stressors and challenges (**Pai et al., 2007**). Knowing how children and family cope with cancer is a crucial step toward designing appropriate psychological interventions that help them ease the burden of cancer and its related stressors (**Phipps, 2007**).

This study aiming to study the effect of nursing intervention on stressors and coping patterns of children suffering from cancer and their mothers through assessment of stressors and coping patterns of children and their mothers, design, implement, and evaluate the effectiveness of the nursing intervention.

The result of this study revealed that, the mean age of the studied children was (10.98±2.87) years for the study group and (10.18±3.06) years for the control group these are supported by **Mohamed, (2009)** who found in a study titled (Quality of life in the newly diagnosed children suffering from cancer) that, the mean age of the studied children were (11.4 ± 2.9) years. More than half of the studied children were equally females and males in both study and control groups, which is contradict with **Gafer et al., (2013)** who found in a study titled as (Stressors and Coping Strategies of Mothers Having Children with Cancer) that, more than half of the studied children were males, this difference could be attributed to differences in research sample, setting and methodology.

More than half of the studied children in both study and control groups were ranked as first and second. This result is supported by

Hobashy, (2009) in a study titled (stressors and coping patterns of children suffering from chronic diseases and their mothers) and **Gafer et al., (2013)** whose found that more than half of the studied children were ranked as first and second respectively.

The mean age of the studied mothers in the study group were 39.92±6.53 years and 37.65±7.68 years in the control group. Nearly less than one third of them were primary education in the study group and more than quarter were preparatory education in the control group. These findings were supported by **Zeltzer et al., (2009)** in a study titled (A randomized, controlled study of behavioral intervention for chemotherapy distress in children with cancer) who reported that, the mean age of the studied mothers was 38.65± 7.65. While **Hashemi et al.,(2007)** found in a study titled (Coping strategies used by parents of children with cancer) that, more than half of the studied mothers were having primary and preparatory education.

The result of the current study revealed that, less than three quarters and more than three quarters of mothers of both study and control groups were not working. these result which is in accordance with **ElSayed and Mahmoud, (2012)** who found in a study titled (Outcome of enhancement of maternal knowledge and practice on health status of their children with cancer) that, the most of the studied mothers were not working. The researcher found through interview with mothers that, most of mothers who were working had left work to be free to give care to the affected child as cancer as a chronic disease require a great deal of care and follow up especially in the first year of life after diagnosis with cancer.

The majority of the studied subject's monthly income in both study and control groups were ranged from 600≤ 1200/LE which is considered from the researcher point of view low income. This low income is not

sufficient to satisfy and meet the family's ordinary daily needs plus the pressure of meeting the needs of the child's suffering from cancer with all its expenses and consequences, even with the presence of health insurance which is lack and not covering the whole expenses of this chronic disease. This result is supported by **Gafer et al., (2013)** who stated that, most of family's' income was less than 1000 L.E and this was not enough for living costs, costs of treatment, medical follow-up and transportation. This finding was also consistent with **Larsen and Lubkin, (2009)** who stated in a study titled as (Chronic illness; impact and intervention) that, financial stressors can be due low income level, the cost of health care or lack of health insurance, even if the children have health insurance, there were out of pocket expenses that weren't covered by health insurance and families members who also experience less of income, particularly those families members who have to loss the jobs to assist with care giving for sick children.

The majority of the studied subjects in the study group had good knowledge regarding cancer, stressors and coping post intervention compared to the minority in the control group. This result is supported by **ElSayed and Mahmoud, (2012)** in (outcome of enhancement of maternal knowledge and practice on health status of their children with cancer) who found that, more than three quarters of the studied subjects had good knowledge post intervention (cancer, stressors and coping) compared to less than quarter in the control group had average knowledge.

Regarding to the studied children physical stressors the current study revealed that, all of the studied children in the study group had mild physical stressors post intervention compared to the minority of the studied children in the control group who had moderate physical stressors. This result is supported by **Schirm, et al., (2009)** who cleared in similar study titled (Chronic

illness: Impact and intervention) that, more than three quarters of the studied children in the study group had mild physical stressors compared to more than half of the studied children in the control group had moderate physical stressors as a result of cancer and its treatment on the child which may cause varying degree of nausea, vomiting, fatigue, diarrhea, stomatitis and pain. From the researcher point of view giving information regarding nursing care of cancer and its related side effects of treatment as nausea, vomiting, fatigue, diarrhea, stomatitis and pain to the mothers and application of this care leads better understanding and therefore lowering the physical stressors of the child.

Less than three quarters of the studied mothers in the study group had mild physical stressors post intervention compared to more than half of the studied mothers had moderate physical stressors in the control group. This result was in consistent with **Taylor et al., (2008)** (the experience of living with a chronic illness during adolescence) and **Biordi et al., (2009)** (chronic illness: Impact and intervention) who mentioned that, about three quarters of the studied mothers had mild physical stressors post intervention compared to the studied mothers in the control group who were suffering from severe physical stressors due to frequent medical follow up and frequent hospitalization and spending all times in providing care for their the chronically ill children. Teaching encouraging mothers by the researcher to manage times of care and how to encourage the other family members to participate in the child care leads to times free from care and lowering the feeling of physical stress.

All of the studied children in the study group had mild psychological stressors post intervention compared to less than two third of the studied children in the control group had moderate psychological stressors. This result contradict with **Sergin et al., (2007)** who stated in (Independent anxiety and psychological distress in women with cancer

children psychology) that, more than half of the studied children in the study group had severe psychological stressors which is from his point of view related to frequent stressful procedures, frequent hospitalization, physical disfigurement, visible side effects of treatment as hair loss which of a big concern specially to adolescents and weight gain or loss, all these issues specially the negative perception of self-appearance leads to feelings of anxiety, depression, low self-esteem and post traumatic stress disorders. Nursing care and information given to children and mothers regarding visible side effects as wearing wigs, colorful bonnets, caps and using makeup and encouraging the child to participate in social activities help the child overcome psychological stressors.

The majority of the studied mothers in the study group had mild psychological stressors post intervention compared to less than two third of the studied mothers had severe psychological stressors in the control group. This finding was supported by **Sergin et al., (2007)** in (independent anxiety and psychological distress in women with cancer children psychology) and **Alderfer et al., (2009)** in (family functioning and post traumatic stress disorder in adolescent survivor of childhood cancer) who mentioned that, most of the studied mothers in the study group had mild psychological stressors post intervention compared to more than three quarters of the studied mothers in the control group who had moderate psychological stressors as manifested by sadness, anxiety, feeling of hopelessness or pessimism and feeling of guilt as a result of lack of information and guides of care concerning the disease and inability to deal with the child's illness and its consequences. Cancer is an obscure illness and in the Egyptian culture (cancer means death) this concept can be changed through information and care given by the nurse and support groups by families successfully managed and

overcome this illness which leads lowering the psychological stressors.

The majority of the studied subjects in the study group had mild social stressors post intervention compared to more than half and the minority of the studied subjects in the control group who had moderate to severe social stressors respectively. This finding was in agreement with **Rodriguez et al., (2012)** who reported in (cancer-related sources of stress for children with cancer and their parents) that, the majority of the studied subjects had mild social stressors post intervention by encouraging and doing more efforts to maintain the children's involvement in school, engagement of both children and mothers in social activities and interacting with family and friends as much as possible.

As regards mothers financial stressors the present study illustrated that, less than two third of the studied mothers in the control group had severe financial stressors compared to less than three quarters of the studied mothers in the study group had moderate financial stressors post intervention. This finding was consistent with **Warner et al., (2014)** who stated in a study titled (Financial burden of pediatric cancer for patients and their families) that, efforts to reduce unexpected hospitalizations and employment disruptions by providing more comprehensive supportive care for pediatric patients with cancer could help ease families' financial burden. Information given by the researcher about governmental and nongovernmental support organizations as (Friends of Children with Cancer, Care with love, Health & Hope Oasis and Wadi El Natrun) help families manage their financial stressors.

The findings of the current study proved that, more than three quarter and the majority of both children and mothers in the study group were able to cope positively post intervention compared to more than half and

less than two third of the studied subjects in the control group. This result is supported by **Othman et al., (2011)** in a study titles (Psychological Distress and Associated Factors in Parents of Children with Cancer) that, ongoing psychological assessment and educational intervention by nurses in both inpatient and outpatient settings may reduce children and parental stress by promoting positive coping and reducing both mothers and children psychological distress. While **Hildenbrand et al., (2011)** clarified in (Coping with pediatric cancer: strategies employed by children and their parents to manage cancer-related stressors during treatment) that, additional support and educational intervention by medical team help families promote their positive coping patterns for cancer-related stressors.

There was a statistical significant difference ($p < 0.001$) between the studied subjects' total level of knowledge and their total level of stressors and coping patterns in the study group post intervention. These finding was in agreement with **Othman et al., (2011)** in (Psychological Distress and Associated Factors in Parents of Children with Cancer) who found that, studied subjects with higher cancer related knowledge reported reduced stress and positive coping patterns ($p < 0.01$) post implementation of the educational program.

Conclusion

Children suffering from cancer and their mother are facing many stressors resulting from cancer and its long lasting consequences and prolonged continuous treatment. These stressors include all aspects of life as physical, psychological, social and financial that increases the burden imposed on the affected children, their mothers and the community as well. Based on results of the current study, it was concluded that, nursing intervention had a positive impact on the studied subjects' knowledge, lowered their levels of stressors and promoted their

positive coping patterns toward stressors related to children with cancer.

Recommendations

The study recommended that:

- Provide mothers having children with cancer by updated pamphlets, posters and Arabic booklets which contain an action plan suitable for each child's cancer nature to improving their knowledge and alleviate stressors related to side effects of cancer treatment.
- Emphasize the importance of support and education through regular meetings from health team and families had successfully managed cancer and overcome its resulting stressors and families newly diagnosed with cancer.

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