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Children and Parents' Characteristics as Factors causes Depression, Anxiety and Stress among Parents with Children receiving Chemotherapy

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Abstract: **Parents of children with cancer have high levels of psychological distress. High levels of depression and anxiety after diagnosis reveal many aspects of parents' health.** ***Aim:*** **This study aimed to identify Children and Parents' Characteristics as Factors causes Depression, Anxiety and Stress among Parents with Children receiving Chemotherapy.** ***Methods:*** **Descriptive design was used to accomplish this study. The subjects consisted of a convenience sample of 100 parents of cancer children. Tools of data collection included, a socio- demographic and clinical data structured interview schedule and the Arabic short version of the standardized depression- anxiety, stress scale-21 items.** ***Results:*** **The majority of the studied parents suffer an extremely severe level of depression, anxiety and stress.** ***Conclusion:*** **The results revealed that psychological distress increased among parents with low family income, had not safe sewage disposal, not covered by health insurance, had children in the first stage of cancer, who took many hours to arrive to the hospital, waiting time more than two hours and alopecia as a side effect of the treatment.**

Keywords: **child cancer, psychological distress, socio-demographic, clinical characteristics.**

1. INTRODUCTION

Pediatric cancer is a rising, serious and common type of chronic illness around the world [(1)], it comprises 0.5% of all cancers and its incidence rate is between 50 and 200 cases/1,000,000 all over the world. About 80%–85% of such cases occur in developing and less developed countries due to their large youth population [(2, 3)].

The psychological effects of childhood cancer on parents revealed that they experience significantly more distress compared to a normative group of parents [(4, 5)]. People suffer stress or perceive things as threatening when they do not believe that their resources to overcome obstacles (situations, stimuli, people, etc.) are sufficient for what the situation demand. When people believe that the demands imposed on them go beyond their capability to manage, then, they perceive stress [(6)].

Psychological distress is defined as "a multi-factorial unpleasant emotional experience of a psychological (i.e., cognitive, behavioral, emotional, social, and/or spiritual) nature that may interfere with the ability to cope effectively with stresses." This Psychological distress among parents is incorporating anxiety, stress, and depression [(7)].

Anxiety is "a psychological and physiological state characterized by cognitive, somatic, emotional, and behavioral components, these components combine to create an unpleasant feeling that is typically associated with uneasiness, fear, or worries" [(8)]. However, symptoms of depression include, persistent sad, anxious or ''empty" feelings, feelings of

hopelessness, feelings of guilt, worthlessness and/or helplessness, irritability, restlessness, and loss of interest in activities or hobbies once pleasurable [4,9,10].

Parents are the most significant sources of emotional support for children with cancer and are in contact with health-care professionals at all stages of the disease [11]. Childhood cancer disrupts the family function [12] and is the most severe stresses parents can get [13]. Psychological distress among those parents has been linked with increased symptoms reporting, increased health care utilization, decreased the quality of life, cutting family and social relations due to the child's treatment constraints, frequent admissions to hospital, many economic problems, cutting prior enjoyable experiences, poorer long-term health outcomes and affects parents' relationship which is another reason for elevated anxiety and depression among parents [14], and all these symptoms may have adverse effects on overall children outcomes [15].

Socio-demographic and treatment-related factors have a potentially significant effect in the process of psychological adjustment among parents with pediatric cancer [16]. While parents are coping with illness, many are also affected by major challenges related to lower socioeconomic status [17,18]. It is well recognized that poverty and other factors related to low socioeconomic are concerned with poorer mental and physical health among parents and children [19]. Caring for the sick child and other children in the family are hard and time consuming and mothers in particular account, it is difficult to care for a child with cancer while also providing care for the rest of the family [20, 21, 22]. Other demographic factors may also contribute to psychological distress among parents such as employment and distance traveled for treatment, and household income, and another factor related to cancer treatment such as, recurrent medical visits, invasive procedures, hard side effects, and financial expenses [23,24,25].

Significance of the study

Despite medical progress in pediatric oncology, there is a clear gap between the psychological and medical fields, particularly for a developing country such as Egypt, the largest country in terms of population in the Arab world and third in terms of population density in Africa. The highest incidence and prevalence of childhood cancer in Egypt is alarming and the survival rate is between 20% and 25% [26], which is very low compared to the United States and Sweden where rates range from 85% to 95% depending on the specified tumor. However, this can be due to some factors, such as late diagnosis, lack of access to health-care facilities, limited financial resources, population increase, and poverty [27].

The medical efforts are evident, however, little is thought of the psychosocial experiences of the parents who carry an unusual burden and play a major role in the child care. Pediatrics and psychiatric nurses are in a strategic position to assess the level of distress in cancer children and their families and be able to interfere to give symptom relief and guidance to improve the quality of comprehensive life [28, 29]. Therefore, this study aimed to identify factors associated with a higher risk of psychological distress among parents of children receiving chemotherapy.

Study aim: This study aimed to identify Children and Parents' Characteristics as Factors causes Depression, Anxiety and Stress among Parents with Children receiving Chemotherapy.

Research questions:

What are the levels of psychological distress (depression, anxiety and stress) among the study subjects?

What are children and parents' characteristics that increase depression, anxiety and stress among parents with children receiving chemotherapy?

2. SUBJECTS AND METHODS

Research Design: A descriptive design was used to accomplish this study.

Settings:-

The study was carried out in the Pediatric Outpatient Clinic at Mansoura Oncology Center. The Pediatric Outpatient Clinic consists of three small rooms used for child's examination, and two large rooms with 30 beds; in which children receive chemotherapy (15 in each room). The Clinic also consists of large reception with chairs used for children and parents during their waiting either for examination or receiving chemotherapy.

Study Subjects:

A convenience sampling of 100 parents of children with cancer who fulfilling the following criteria constituted the subjects: Both sexes, receiving chemotherapy in outpatient clinics and who had received chemotherapy at least once previously in their current regimen regardless of their age.

Tools of the Study:

Tool I: Socio- Demographic and Clinical Data Structured Interview Schedule: It was developed by the researchers after thorough review of the related literature to assess factors associated with psychological distress amongst parents of outpatient chemotherapy children. It includes two parts:-

Part 1: Characteristics of the studied parents and their children

A. Characteristics of the studied parents; as age, level of education, occupation, residence, and type of health insurance.

B. Characteristics of children, such as, age, sex, and birth order.

Part II: Child Clinical Data Sheet such as, the aim of treatment, side effect of chemotherapy and number of chemotherapy sessions per week.

Tool II: Depression- Anxiety, Stress scale-21 items (DASS-21): Arabic shorted version of the standardized Depression, Anxiety, Stress Scale adopted from Mukhtar, 2013. It is a valid and reliable scale. The reliability of the tool was done by measuring the internal consistency of its items using the Cronbach's alpha coefficient. The tool was reliable as r = 0.86. The DASS-21 is divided into 3 subsections of 7 questions, pertaining to depression (DASS-D), anxiety (DASS-A) and stress (DASS-S). The DASS-D measures hopelessness, low self-esteem and low positive affect, DASS-A measures autonomic arousal, physiological hyper-arousal and the subjective feeling of fear and DASS-S measures stress through reported frequency of symptoms relating to tension, agitation and negative affect. Its scoring system is as follows: Depression was considered normal if it ranges from 0-4, mild 5-6, moderate 7-10, severe 11-13 and extremely severe depression 14+. While anxiety was considered normal if it ranges from 0-3, mild 4-5, moderate 6-7, severe 8-9 and extremely severe 10+. As regards stress it was considered normal if it ranges from 0-7, mild 8-9, moderate 10-12, severe 13-16 and extremely severe 17+. (30)

Method of Data Collection:

Official permission was obtained from the director of the Pediatric Oncology Outpatient Clinic and head nurse of the Outpatient Clinic to carry out the study after explaining the aim of the study. Study tool (1) was developed by the researchers, after reviewing of the related literatures. A pilot study was conducted on 10 parents of children with cancer to test the clarity and applicability of the study tools, also to determine the time needed for data collection. Subjects who participated in the pilot study were excluded from the study sample. Informed consent was obtained from each parent for his / her participation in the study after explaining the aim of the study and confidentiality was assured. Each parent was interviewed individually at the pediatric outpatient Clinic at Mansoura Oncology Center. The duration of each interview lasted from 15-20 minutes while they were waiting for their children to receive chemotherapy at the reception of the clinic. Data collection was done over 3 month period extending from September to November 2018.

3. DATA ANALYSIS

Collected data were coded, computed and statistically analyzed using SPSS (statistical package of social sciences), version 16. Data were presented as frequency and percentages (qualitative variables). Chi-square test was used to test the associations among the under studied qualitative variables. Statistical significance was considered at P-value < 0.05.

4. RESULTS

Characteristics of the studied parents are presented in Table (I). It is revealed from the table that the majority of the parents were mothers, 74%, while, only 26% were fathers. More than half of the studied parents were in the age group 30 to less than 40 years (54%). Forty two percent of the studied parents had completed secondary education. The majority of them were married 93% and only 7% were divorced and widow.

Table (2) portrays Socio- economic status of the studied families. It was clear from the table that the majority of the studied family had ≤ 2 / room, well ventilated house, safe drinking water, and electricity supply (82%, 83%, 93% and 96% respectively). The same table also represented that only 41% of the families were covered by health insurance and the majority of these health insurance were private (68.3%)

Table (3) illustrates the clinical Characteristics of the studied children. It revealed from the table that slightly more than one third 34.0% of the studied children were in the age group 10 to less than 15 years old, while 18% of them were at age 1 to less than 5 years of age with a mean age of 9.59 ± 4.82. 45% of the children were the first child, while 34% was the second child in the family. Leukemia was the most common type of cancer among the studied children (62%). More than two thirds of the studied children were at the first stage of the disease (69%). The majority of the children consumed 2 – 3 hour to arrive to the hospital with waiting time > 60 min (69% and 83% respectively). Alopecia was the most common side effect of chemotherapy (42 %) followed by Nausea & vomiting that was found in 27% in the studied children.

Level of depression, anxiety, and stress among the studied parents are presented in table (4). It is revealed from the table that the majority of the studied parents were suffering from severe to extremely severe depression, anxiety, and stress (93%, 98% and 80% respectively).

Table (5) shows that the majority of the studied mothers had severe to extremely severe depression, anxiety and stress (100%, 98% and 95%, respectively) compared to 73.1%, 96.2% and 34.6%, respectively for fathers). All the studied parents who were in the age group 50 years old and those who were illiterate, had severe to extremely severe depression and anxiety (100% for each). Regarding current marital status the same table also represents that all divorced parents had severe to extremely severe depression, anxiety and stress (100% for each).

Table (6) demonstrates that all parents who lived in crowded housing had severe to extremely severe depression and anxiety (100% for each) and the majority of them had severe to extremely severe stress (88.9%). Regarding family income the table illustrates that the majority of parents who had not enough income had severe to extremely severe depression and stress (95.7% and 91.3%, respectively), and all of them had severe to extremely severe anxiety (100%) with statistically significant difference. In relation to safe sewage disposal the table shows that the majority of parents who had no safe sewage disposal had severe to extremely severe levels of depression, anxiety and stress (93.3% for each) with statistically significant difference.

Regarding family covering by health insurance it was found that 96.9%, 100% and 86.4% of family who did not cover by health insurance had severe to extremely severe depression, anxiety and stress respectively, compared to 87.8%, 95.1% and 70.7% respectively for those who covered by health insurance. There were no statistically significant differences.

Table (7) illustrates that 100%, 100% and 82.4% of parents with children at age groups 15 to 18 years old had severe to extremely severe depression, anxiety and stress respectively. In relation to child's order it was found that 100%, 100% and 97.8% of parents with first child had severe to extremely severe depression, anxiety and stress respectively. Alopecia as a side effect of chemotherapy for children were responsible for severe to extremely severe depression, anxiety and stress in 97.6%, 100% and 90.5% of the studied parents respectively.

In relation to the stage of cancer the table shows that the highest percentages of parents who had children in the first stage of cancer had severe to extremely severe levels of depression, anxiety and stress (98.6%, 98.6% and 94.2% respectively) with statistically significant difference.

Regarding waiting time the same table also shows that the majority of the studied parents who had waiting time more than 60 minutes had severe to extremely severe depression, anxiety and stress (96.4%, 98.8% and 81.9%, respectively) compared to 76.5%, 94.1% and 70.6% for those who had waiting time less than 60 minutes respectively.

Table (1): Socio-demographic Characteristics of the studied parents

Characters	Items	No (n=100)	%
Parents	- Fathers - Mothers	26 74	26.0 74.0
Parents' age	- 20- - 30- 	43 54 3	43.0 54.0 3.0

	- 40-50		
Residence	- Rural	78	78.0
	- Urban	22	22.0
Parents' Education	- Illiterate	24	24.0
	- Read& write	19	19.0
	- Secondary	34	34.0
	- University	23	23.0
Marital status	- Married	93	93.0
	- Divorced	4	4.0
	- Widow	3	3.0
Number of children	- One	10	10.0
	- Two	34	34.0
	- Three	40	40.0
	- Four	16	16.0

Table (2): Socio- economic characteristics of the studied parents

Characters	Items	No (n=100)	%
Crowding index	- > 2 / room	18	18.0
	- ≤ 2 / room	82	82.0
Family month income	- Enough	77	77.0
	- Not enough	23	23.0
Ventilation	- well	83	83.0
	- Bad	17	17.0
Safety insect fighting	- Yes	71	71.0
	- No	29	29.0
Safe drinking water	- Available	93	93.0
	- Not available	7	7.0
Electricity supply	- Available	96	96.0
	- Not available	4	4.0
Safe sewage disposal	- Available	85	85.0
	- Not available	15	15.0
Covering by health insurance	- Yes	41	41.0
	- No	59	59.0
Type of health insurance (n= 41)	- Governmental	13	31.7
	- Private	28	68.3

Table (3): Characteristics and clinical data of the studied children

Characters	Items	No (n= 100)	%
Gender	- Males	45	45.0
	- Females	55	55.0
Child's age (years)	- 1-	18	18.0
	- 5-	31	31.0
	- 10-	34	34.0
	- 15-18	17	17.0
	Range: 1.0 – 18.0 ys, Mean ± SD= 9.59 ± 4.82, Median = 10.0 ys		
Child's order	- First	45	45.0
	- Second	34	34.0
	- Third	16	16.0
	- Fourth	5	5.0
Type of Cancer	- Leukemia	62	62.0
	- Lymphoma	26	26.0

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	- Neuroblasoma - Ewing sarcoma - Hepatoblastoma	8 1 3	8.0 1.0 3.0
Stage of cancer	- First stage - Second stage - Third stage	69 29 2	69.0 29.0 2.0
Aim of treatment	- Auxiliary - Final	8 92	8.0 92.0
Side Effects of chemotherapy	- Nausea & vomiting - Fatigue - Alopecia - Stomatitis	27 15 42 16	27.0 15.0 42.0 16.0
Time consumed to arrive the hospital	- 1 - hours - 2 – hours - 3+ hours	26 69 5	26.0 69.0 5.0
Waiting time	- ≤ 60 min - > 60 min	17 83	17.0 83.0
Number of sessions	- One / month - Two / month - Three / month	25 28 47	25.0 28.0 47.0

Table (4): Level of depression, anxiety and stress among the studied parents

Level	Depression (n=100)		Anxiety (n=100)		Stress(n=100)	
	No	%	No	%	N0	%
Normal	0	0.0	0	0.0	0	0.0
Mild to moderate	7	7	2	2	20	20
Severe to extremely severe	93	93	98	98	80	80

Table (5): Parents Characteristics as factors causes depression, Anxiety and Stress

	Level of depression (n= 100)					Levels of Anxiety (n=100)					Levels of stress (n=100)				
	Mild to moderate		Severe to extremely severe		Chi-square	Mild to moderate		Severe to extremely severe		Chi- square	Mild to moderate		Severe to extremely severe		Chi-square
sex of parent	No.	%	No.	%		No.	%	No.	%		No.	%	No.	%	
Father	7	26.9	19	73.1	χ^2=2.645 P=1.85	1	3.8	25	96.2	χ^2= .611 P=. 434	17	65.4	9	34.6	χ^2=1.972 P= .157
Mother	0	0.0	74	100		1	1.4	73	98.6		3	4.1	71	95.9	
Age															
20 to > 30	1	2.3	42	97.7	χ^2=3.071 P=.215	1	2.3	42	97.7	χ^2= .091 P=.956	6	13.9	37	86.1	χ^2=5.233 P= .199
30 to > 40	6	11.1	48	88.9		1	1.9	53	98.1		12	22.2	42	77.8	
40 to 50	0	0.0	3	100		0	0.0	3	100		2	66.7	1	33.3	
Parents' education															
Illiterate	0	0.0	24	100	χ^2= 4.228 P=.238	0	0.0	24	100	χ^2= 2.145 P=.543	4	16.7	20	83.3	χ^2= .801 P= .849
Read and write	3	15.8	16	84.2		1	5.3	18	94.7		5	26.3	14	73.7	
Diplom	2	5.9	32	94.1		1	2.9	33	97.1		6	17.6	28	82.4	
Bachelors degree	2	8.7	21	91.3		0	0.0	23	100		5	21.7	18	78.3	
Current marital status															
Married	6	6.5	87	93.5	χ^2=3.540 P=1.70	2	2.2	91	97.8	χ^2= .154 P=.926	20	21.5	73	78.5	χ^2= 1.882 P= .390
Divorced	0	0.00	4	100		0	0.0	4	100		0	0.0	4	100	
Widowed	1	33.3	2	66.7		0	0.0	3	100		0	0.0	3	100	

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Table (6): Relationship between level of anxiety, depression and stress and the socioeconomic characteristics of the studied parents

	Levels of depression (n=100)					Levels of Anxiety (n=100)					Levels of stress (n=100)				
	Mild to moderate		Severe to extremely severe		Chi-square	Mild to moderate		Severe to extremely severe		Chi-square	Mild to moderate		Severe to extremely severe		Chi- square
Crowding index	No.	%	No.	%		No.	%	No.	%		No.	%	No.	%	
Crowded	0	0.0	18	100	χ^2=.346 P= .625	0	0.0	18	100	χ^2=.510 P=.475	2	11.1	16	88.9	χ^2=1.563 P= .211
Not crowded	7	8.5	75	91.5		2	2.4	80	97.6		18	21.9	64	78.1	
Family month income															
Enough	6	7.8	71	92.2	χ^2=.824 P= .396	2	2.6	75	97.4	χ^2=.794 P=.373	18	23.4	59	53.6	χ^2=4.018 P= .045
Not enough	1	4.3	22	95.7		0	0.0	23	100		2	8.7	21	91.3	
Ventilation															
Good	6	7.2	77	92.8	χ^2=.346 P= .625	2	2.4	81	97.6	χ^2=.510 P= .475	17	20.5	66	62.5	χ^2=.391 P= .532
Bad	1	5.9	16	94.1		0	0.0	17	100		3	17.6	14	82.4	
Safety insect fighting															
Yes	7	9.9	64	90.1	χ^2=2.784 P= .185	2	2.9	68	97.1	χ^2=.755 P=.385	15	21.1	56	78.9	χ^2=.114 P= .735
No	0	0.0	29	100		0	0.0	29	100		5	17.2	24	82.8	
Safe drinking water															
Available	6	6.5	87	93.5	χ^2=1.366 P=.242	2	2.1	91	97.8	χ^2=.107 P= .743	18	19.4	75	73.6	χ^2=1.316 P= .251
Not available	1	14.3	6	85.7		0	0.0	7	100		2	28.6	4	57.1	
Electricity supply															
Available	7	7.3	89	92.7	χ^2=.233 P= 1.000	2	2.1	94	97.9	χ^2=.063 P= .802	19	20.4	74	79.6	χ^2=.344 P= .558
Not available	0	0.0	4	100		0	0.0	4	100		1	25	3	75	
Safe sewage disposal															
Available	6	7.1	79	77.9	χ^2=3.567 P= 059	1	1.1	84	98.8	χ^2=1.575 P=.209	19	22.4	66	77.6	χ^2=2.551 P= .110
Not available	1	6.7	14	93.3		1	6.7	14	93.3		1	6.7	14	93.3	
Covering by health insurance															
Yes	5	12.2	36	87.8	χ^2=.410 P= .522	2	4.9	39	95.1	χ^2=.085 P= .771	12	29.3	29	70.7	χ^2=.000 p= 1.000
No	2	3.4	57	96.6		0	0.0	59	100		8	13.6	51	86.4	

Table (7): Relationship between children's characteristics and level of anxiety, stress and depression among their parents

	Levels of depression (n=100)					Levels of Anxiety (n=100)					Levels of stress (n=100)				
	Mild to moderate		Severe to extremely severe		Chi-square	Mild to moderate		Severe to extremely severe		Chi-square	Mild to moderate		Severe to extremely severe		Chi-square
Gender	No.	%	No.	%		No.	%	No.	%		No.	%	No.	%	
Male	4	8.9	41	91.1	χ^2=.252 P=.707	1	2.2	44	97.8	χ^2=.003 P=.954	10	22.2	35	77.8	χ^2=.040 P= 841
Female	3	5.5	52	94.5		1	1.8	54	98.2		10	18.2	45	81.8	
Child's age (years)															
1-	2	11.1	16	88.9	χ^2=3.044 P=.170	2	11.1	16	88.9	χ^2=22.25 P=.564	3	16.7	15	83.3	χ^2=26.695 P=.319
5-	3	9.6	28	90.3		0	0.0	31	100		8	25.8	21	67.7	
10-	2	6.9	27	93.1		0	0.0	34	100		6	17.6	28	82.4	
15-18	0	0.0	17	100		0	0.0	17	100		3	17.6	14	82.4	
Residence															
Rural	5	6.4	73	93.6	χ^2=6.313 P=.097	2	2.6	76	97.4	χ^2=.644 P=.886	14	17.9	64	82.1	χ^2=2.737 P=.434
Urban	2	9.1	20	90.9		0	0.0	22	100		6	27.3	16	72.7	
Child's order															
First	0	0.0	45	100	χ^2=5.046 P=.168	0	0.0	45	100	χ^2=.632 P=.959	1	2.2	44	97.8	χ^2=3.179 P=.528
Second	5	14.7	29	85.3		1	2.9	33	97.1		4	11.8	30	91.2	
Third	1	6.3	15	93.7		0	0.0	16	100		10	62.5	6	37.5	
Fourth	1	20	4	80		1	20	4	80		4	80	1	20	
Type of Cancer															
Leukemia	1	1.6	61	98.4	χ^2=.861 P=.930	2	3.2	60	96.8	χ^2=1.251 P=.870	10	16.1	52	83.9	χ^2=2.815 P=.589
Lymphoma	4	15.4	22	84.6		0	0.0	26	100		8	30.8	18	69.2	
Neuroblastomas	2	25	6	75		0	0.0	8	100		1	12.5	7	87.5	
Ewing sarcoma	0	0.0	1	100		0	0.0	1	100		0	0.0	1	100	
Hepatoblastoma	0	0.0	3	100		0	0.0	3	100		1	33.3	2	66.7	

Table (7) cont.

Stage of Cancer															
First	1	1.4	68	98.6	χ^2=5.834 P= .054	1	1.4	68	98.6	χ^2=.917 P=.632	4	5.8	65	94.2	χ^2=1.267 P=.531
Second	5	17.2	24	82.8		1	3.4	28	96.6		15	51.7	14	48.3	
Third	1	50	1	50		0	0.0	2	100		1	50	1	50	
Side Effects of chemotherapy															
nausea and vomiting	1	3.7	26	96.3	χ^2=4.568 P=.206	0	0.0	27	100	χ^2=2.205 P=.531	7	25.9	20	74.1	χ^2=4.659 P=.199
Fatigue	3	20	12	80		1	6.7	14	93.3		5	33.3	10	66.7	
Alopecia	1	2.4	41	97.6		0	0.0	42	100		4	9.5	38	90.5	
Stomatitis	2	12.5	14	87.5		1	6.3	15	93.7		4	25	12	75	
Time consumed to arrive the hospital															
1 to less than 2 hours	6	23.1	20	76.9	χ^2=.885 P=.829	2	7.7	24	92.3	χ^2=.794 P=.851	9	34.6	17	65.4	χ^2=1.277 P=.735
2 to 3 hours	1	1.4	68	98.6		0	0.0	69	100		10	14.5	59	85.5	
more than 3 hours	0	0.0	5	100		0	0.0	5	100		1	20	4	80	
Waiting time															
less than 60 min	4	23.5	13	76.5	χ^2=.003 P=.956	1	5.9	16	94.1	χ^2=1.961 P=.161	5	29.4	12	70.6	χ^2=.000 P=1.000
more than 60 min	3	3.6	80	96.4		1	1.2	82	98.8		15	18.1	68	81.9	
Number of sessions															
one / month	2	8	23		χ^2=.702 P=.704	0	0.0	25	100	χ^2=2.211 P=.331	5	20	20	8	χ^2=.122 P=.946
two / month	1	3.6	27			0	0.0	28	100		5	17.9	23	82.1	
three/ month	4	8.5	43			2	4.3	45	95.4		10	21.3	37	78.7	

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5. DISCUSSION

Recently, considerable development has been made in the diagnosis and treatment of childhood cancer. For some cancer types, the chance of a 5 year survival rate is more than 90% [31]. Thus, because of the increased survival rate of many childhood cancers, the role of parental care is very essential [14]. Parents experience increased levels of distress when having a child with cancer diagnosis [23, 24], and socio-demographic factors may be supported in identifying the most risk families [23, 27]. Parents who are stressed tend to exhibit more negative interactions with their children [32], and it may alter parents' decision making, which may influence several aspects of the child's life, including the medical care they receive [24, 33].

The current study revealed that, the majority of the studied parents have an extremely severe level of depression, anxiety and stress, the findings of previous studies also showed that parents of children with cancer had higher levels of psychological distress [4, 9, 34, 35, 36]. According to **Vrijmoet-Wiersma et al, (2010)** most of the parents reported intense levels of stress, including intrusive thoughts, treatment avoidance, physiological responses, and psychological agitation [37].

The results of the present study revealed that, mothers have high levels of anxiety, depression and stress than fathers, and this may be due to, mothers tend to express their emotions more than fathers and the primary parent role is usually attributed to mothers, however fathers become less involved and spend their time providing family financially, this result comes in the same line with **Rahmani et al., (2018)** who cited that most of the parents were females [24]. Other previous researches revealed that gender plays roles in the psychological response to diseases and the way parental caregiver's spilt responsibilities [26, 29]. However, these results are Incongruence with **Valizadeh *et al*. (2014)** who showed that caring responsibility of fathers was prominent in emotional dimension and mothers burden more demands of physical care [32].

The economic factors would put parents and children at higher risk for psychological distress. In the present study, the results indicated that in the face of a child's cancer, the underlying influence of economic factors creates a greater risk for psychological distress among parents with low family income, more crowding index, no covering by governmental health insurance and who takes more than two hours to arrive at the hospital. This may be due to low monthly income increase parent's distress due to the unexpected expense of a prolonged treatment plan, especially 90% of the studied subjects have more than one child at home and most of them live in rural areas. Also, some couldn't afford to acquire transportation to the hospital because it might take many hours and need many varieties of transportations that value an oversized quantity of cash that a lot of families struggle to earn. According to **Bemis etal, (2015)** socio-demographic status appeared to significantly increase the experience of distress for parents and children. Parents who were vulnerable and reported more psychological difficulties compared to others had lower levels of education, income and more children at home [15]. This result is consistent with **El Malla et al., (2017)** who reported that the consequences of the tough socioeconomic status and the very few resources provided to parents of children with cancer result in severe psychological distress [38].

In the current study, psychological distress was higher among parents during the first stage of the disease than the second and the third stage with significant difference between the level of anxiety and stage of cancer, the possible explanation of this result could be due to parents are anxious due to the child's physical condition, procedures and side effect of the treatment. Also, many parents feel sad and depressed when they hear the name of cancer and concern of losing of their kids because death is a major concern for many parents and this is related to the high mortality rate in this area. These results are consistent with **Chen et al., (2011)** who cited that, parents experience considerable stressful events and are troubled by doubt, emotional distress (e.g., anxiety and depression), when their child is diagnosed with cancer and shock throughout the cancer treatment [39]. However, **Jones (2006)** showed that parents of children with cancer practice high levels of illness ambiguity, mainly during the first three months of the cancer treatment [40].

Leukemia is the most common malignancy in children accounting for almost one third a newly diagnosed pediatric cancer cases [41]. This comes in the same line with the current study which shows that leukemia was the most common type of cancer among the studied children**.** Also **Gelesson, et al., (2014**) cited that childhood cancer is an increasing and prevalent type of chronic disease worldwide. Leukemia is one of the most common cancers in children under 15 years of age and represents 25% of all cancers in children [42]. Also the results of the current study showed that psychological distress was moderate to severe among parents of children with leukemia with statistically significant difference between type of

cancer and level of anxiety among parents and this may be due to parents concern about the severity of the disease regardless of its type, this is consistent with previous research that, parents suffering from severe level of anxiety and depression whether the disease was leukemia or a CNS tumor [43].

The present study showed that psychological distress was severe among parents of children with alopecia than other side effects of the treatment, this may be due to, Hair loss is a problem for the parent, not only because of the changing appearance that the child might face, which can be very difficult however in several cases, it seems to be more of a problem for the parent of the child. Hair loss brings many questions in school and in the neighborhood, and it can be a problem if caregivers decide not to disclose the child's illness to their community. Also, for girls, in particular, losing one's hair is similar to the loss of a person's sexual identity which is important in the eyes of society for how girls should look. As addressed by El **Malla et al., (2017)**, additionally as another study conducted in Egypt by **Fawzi et al., (2013)** who cited that, physical appearance was addressed as an associated obstacle and correlated with lower quality of life for the children [38,45,46].

6. CONCLUSION AND RECOMMENDATION

The results of the present study concluded that all parents of children with cancer suffer an extremely severe level of depression anxiety and stress regardless of their socioeconomic circumstances. Also the results revealed that psychological distress increased among parents with low family income, had no safe sewage disposal, not covered by health insurance, had children in the first stage of cancer, who took many hours to arrive to the hospital, waiting time more than two hours and alopecia as a side effect of the treatment. These factors with the additional stresses resulted from having a child with cancer may strengthen the negative impact on parent's adjustment.

On that base, the current findings recommended that socio-demographic factors need to be taken into account in the implementation of screening procedures for psychological distress and parents who are most in need of direct psychological interventions include those from low SES backgrounds and report high levels of general stress and stress related cancer. Establish a counseling clinic for parents of children with cancer to reduce stress and improves the overall health.

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