

# Psychological Impact of various Therapeutic Modalities in Childhood Malignancy

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**Background:** The purpose of the study is to evaluate and compare the psychological impact of various therapeutic modalities in pediatric cancer by comparing them to healthy children across age groups.

**Methods:** The semi-structured and the Mini International Neuropsychiatric interview (M.I.N.I Kids Test) were administered to 80 children including 40 cancer patients and 40 healthy children.

**Results:** CNS tumors were the most common tumor 47.5% followed by hematological malignancies 35% and Non CNS solid tumors 17.5%. About two thirds of the sample reported social problems followed by school problems in 57.5% of cases. By analyzing the mood changes, there was significant depression, anxiety disorders, panic attacks and separation anxiety between the patients and the control ( $p = <0.001$ ). The patients had also significant lack of attention and stubbornness ( $p = <0.001$ ). These problems did not show any difference between sex except for depression and social worries which were more in girls. These symptoms did not show any difference as regard receiving or not chemotherapy, radiotherapy or combination.

**Conclusion:** The psychological problems were more evident in cancer patients compared to healthy children and was higher than developing countries. The present study highlighted the need of a health care team and integration of a comprehensive psychological support in the treatment plan in Egypt. This will improve quality of life and reduce the burden of treatment.

## Introduction

The overall survival of all childhood cancers have increased dramatically from the mid-1970s to reach 83% and even exceeding 90% in certain diseases. Reducing the burden of cancer and its treatment for these children, parents, health care provider and adult survivors has become the centre of research with improvement of treatment outcome [1].

A child with cancer is exposed to a range of short and long term social, emotional and behavioral difficulties. There is a negative impact on children's social and psychological adjustment with exposure to chronic strains such as treatment related pain and visible side effects including hair loss, weight gain or loss, physical disfigurement and repeated absence from school and peers [2].

Our primary goal is to cure childhood malignancies as we are located in a developing country with limited resources. This is the first study in Egypt to consider quality of life by studying the psychological impact of various therapeutic modalities in childhood cancer in an attempt to improve the outcome and limit the burden of treatment for those vulnerable patients.

## Materials and Methods

The study included 80 children. They were 40 cancer patients and 40 siblings who attended the pediatric oncology unit in the Kasr Al Ainy Center of Clinical Oncology and Nuclear Medicine at Cairo University from June 2012 to February 2013. The eligibility criteria included patients of both sex, age of 3-16 years with histopathological confirmation of malignancy and treated with chemotherapy, radiotherapy or a combination of these modalities. The control group consisted of 40 sibling children of the study group in the same age group with no medical or mental illness. Children with history of any psychological disease before having cancer were excluded from the study. The study is a case control cross section study to evaluate the psychological impact of various therapeutic modalities in childhood malignancies.

## Methodology

Analysis of the following data was done: age, sex, type of malignancy, type of treatment received (radiotherapy, chemotherapy, combined and surgery) and psychological assessment. The later was done by two interviews: The semi-structured interview and the Mini-International Neuropsychiatric Interview (M.I.N.I-Kids Test). The control group was analyzed for age and sex and underwent the same psychological assessment interviews.

### The semi-structured interview

This sheet starts by covering all the basic demographic data including name, age, sex, address, telephone number, scholar year (if present). It also includes the clinical data about the experience of having cancer from the start of the complaining symptoms, the investigations done, the impact of the diagnosis on the child and his family as well as on their social environment and the school.

### The Mini-International Neuropsychiatric Interview (M.I.N.I-Kids Test)

It is a short structured diagnostic interview. It is developed jointly by psychiatrists and clinicians to meet the need for a short but accurate structured psychiatric interview for multicenter clinical trial, epidemiological studies and to be used as a first step in outcome tracing in clinical settings. It generates reliable and valid psychiatric diagnosis for children and adolescents [3]. The translated Arabic copy in January, 2000 done by the psychiatric department in the faculty of medicine, Ain Shams University was used in this study. It measures the mood disorders, social worries and stubbornness. The mood disorders included depression, anxiety disorders, separation, phobia, panic attacks, hallucinations, obsession and suicidal attempts.

## Ethical considerations

The research protocol was accepted by both the ethical and the scientific research committees of the oncology department, Faculty of Medicine, Cairo University. The aim of the study was clarified to all the caregivers of the participants with full explanation to the method of psychometric tests applied. Participation was a free choice which did not affect the treatment plan of the patient by any means.

## Statistical analysis

All the data were evaluated statistically by the statistical package for the social sciences (SPSS) version 16. The T-test was used to compare the numerical data in two different groups. Pearson correlation test was used to find correlations between numerical data of the same patient to determine the direction and significance of any correlation.

## Results

A total of 40 patients were included in the study and were compared to 40 control child from the same socioeconomic environment. The mean age of the patients was 10.6 years  $\pm$  3.4. The boys constituted the majority (62.5%). Most of the studied group had CNS tumors (47%) followed by hematological malignancy (35%) and Non-CNS solid tumors (17%). **Table 1 and 2.**

	Patients N=40		Control N=40		P value
	Number	%	Number	%	
Sex					
Boys	25	62.5	28	70.0	0.2
Girls	15	37.5	12	30.0	
Mean age	10.6±3.4		9.7+3.0		0.2

**Table 1. Characteristics of the study and the control group.**

<b>Diagnosis</b>	<b>Frequency</b>	<b>Percentage</b>
CNS tumors	19	47.5
Hematological malignancy	14	35.0
Non-CNS Solid Tumors	7	17.5
<b>Therapy</b>		
Surgery	39	97.5
Chemotherapy	38	95.0
Radiotherapy	29	72.5
Combined chemo -radiotherapy	27	67.5

**Table 2. Characteristics of the 40 patients.**

The majority of the sample had significant social and school problems between the case and the control (65%, 57.5%,  $p=0.001$  in both) with no economic problem difference. **Table 3.** The child with cancer was subjected to rejection from some of the surrounding people thinking that cancer is a contagious disease. He also had bad reaction from the school mates as regard alopecia and was embarrassed from the announcement of his diagnosis in the school with his disruption in school attendance because of the treatment and its complications.

<b>Interview</b>	<b>Case</b>		<b>Control</b>		<b>P value</b>
	<b>No</b>	<b>%</b>	<b>No</b>	<b>%</b>	
<b>1) Semi-structured Interview</b>					
<b>Social problems</b>					
Yes	23	57.5	0	0	<0.001
No	17	42.5	40	100	
Economic					

problems					
Yes	11	27.5	11	27.5	1
No	29	72.5	29	72.5	
<b>School Problems</b>					
Yes	26	65	0	0	<0.001
No	14	35	40	100	
<b>2-Mini-international Neuropsychiatric Interview</b>					
<b>i) Mood changes</b>					
<b>Depression</b>					
Yes	16	40	0	0	<0.001
No	24	60	40	100	
<b>Suicidal attempts</b>					
Yes	0	0	0	0	
No	40	100	40	100	
<b>Anxiety</b>					
Yes	19	47.5	0	0	<0.001
No	21	52.2	40	100	
<b>Hallucination</b>					
Yes	0	0	0	0	
No	40	100	40	100	
<b>Panic attacks</b>					
Yes	13	32.5	0	0	<0.001
No	27	67.5	40	100	
<b>Separation anxiety</b>					
Yes	23	57.5	0	0	<0.001
No	17	42.5	40	100	
<b>Special phobia</b>					
Yes	1	2.5	0	0	1
No	39	97.5	40	100	
<b>Obsession</b>					
Yes	0	0	0	0	
No	40	100	40	100	
<b>ii) Social worries</b>					
Yes	23	57.5	0	0	<0.001
No	17	42.5	40	100	
<b>Hi-Lack of attention</b>					
Yes	12	30	0	0	<0.001
No	28	70	40	100	
<b>iv) Stubbornness</b>					
Yes	18	45	0	0	<0.001
No	22	55	40	100	

Table 3. Comparative data of the psychological assessment.

As for the mood changes reported by Analysing the Mini-International Neuropsychiatric Interview (M.i.n.i- kids) the cancer child suffered from mood changes elicited by significant depression, anxiety disorders, panic attacks and separation anxiety than the control group. ( $p = < 0.001$  in all). These patients had also lack of attention with stubbornness ( $p = < 0.001$ ). **Table 5.** These problems did not differ between both sexes except for social worries which were more in girls (80% vs 44% for boys,  $p = 0.046$ ). These symptoms also did not show any statistical difference as regard receiving or not chemo or radiotherapy. **Table 4.**

Symptom	Sex		p	Radiotherapy		P	Chemo-Radiotherapy		P
	Boys N=25	Girls N=15		Yes N=29	No N=11		Both N=27	One N=13	
	N, %	N %		N %	N %		N %	N, %	
<b>Depression</b>									
Yes	6 (24%)	10 (66.7)	0.02	12 (41.4%)	4 (36.4%)	1.0	11 (40.7%)	5 (38.5%)	1
No	19 (76%)	5 (33.3)		17 (58.6%)	7 (63.6%)		16 (59.3%)	8 (61.5%)	
<b>Suicidal attempts</b>									
Yes	0 (0%)	0 (0%)		0 (0%)	0 (0%)		0 (0%)	0 (0%)	
No	25 (100%)	15 (100%)		29 (100%)	11 (100%)		27 (100%)	13 (100%)	
<b>Mood changes</b>									
Yes	14 (56%)	5 (33.3%)	0.2	15 (51.7%)	4 (36.4%)	0.5	13 (48.1%)	6 (46.2%)	1
No	11 (44%)	10 (66.7%)		14 (48.3%)	7 (63.6%)		14 (51.9%)	7 (53.8%)	
<b>Hallucination</b>									
Yes	0 (0%)	0 (0%)		0 (0%)	0 (0%)		0 (0%)	0 (0%)	
No	25 (100%)	15 (100%)		29 (100%)	11 (100%)		27 (100%)	13 (100%)	
<b>Panic attacks</b>									
Yes	6 (24%)	7 (46.7%)	0.2	9 (31%)	4 (36.4%)	1	8 (29.6%)	5 (38.5%)	0.7
No	19 (76%)	8 (53.3%)		20 (69%)	7 (63.6%)		19 (70.4%)	8 (61.5%)	
<b>Separation anxiety</b>									
Yes	12 (48%)	11 (73.3%)	0.2	18 (62.1%)	5 (45.5%)	0.5	17 (63%)	6 (46.2%)	0.5
No	13 (52%)	4 (26.7%)		11 (37.9%)	6 (54.5%)		10 (37%)	7 (53.8%)	
<b>Social worries</b>									
Yes	11 (44%)	12 (80%)	0.046	17 (58.6%)	6 (54.5%)	1	16 (59.3%)	7 (53.8%)	1
No	14 (56%)	3 (20%)		11 (41.4%)	5 (45.5%)		11 (40.7%)	6 (46.2%)	
<b>Special phobia</b>									
Yes	1 (4%)	0 (0%)		1 (3.4%)	0 (0%)	1	1 (3.7%)	0 (0%)	1
No	24 (96%)	15 (100%)		28 (96.6%)	11 (100%)		26 (96.3%)	13 (100%)	
<b>Obsession</b>									
Yes	0 (0%)	0 (0%)		0 (0%)	0 (0%)		0 (0%)	0 (0%)	
No	25 (100%)	15 (100%)		29 (100%)	11 (100%)		27 (100%)	13 (100%)	

Lack of attention									
Yes	5 (20%)	7 (46.7 %)	0.09	10 (34.5%)	2 (18.2%)	0.5	9 (33.3%)	3 (23.1%)	0.7
No	20 (80%)	8 (53.3%)		19 (65.5%)	9 (81.8%)		18 (66.7%)	10(76.9%)	
Stubborn									
Yes	10 (40%)	8 (53.3%)	0.5	14 (48.3%)	4 (36.4%)	0.7	13 (48.1%)	5 (38.5%)	0.7
No	15 (60%)	7 (46.7%)		15 (51.7%)	7 (63.6%)		14 (51.9%)	8 (61.5%)	

**Table 4. Factors affecting psi-Kchological disorders.**

## Discussion

The study is a case control cross section study aiming to evaluate psychological impact of various therapeutic options in childhood Egyptian cancer patient using the semi-structured interview and the Mini-International Neuropsychiatric Interview (M.I.N.I-Kids Test). The translated Arabic copy (Jan. 2000) done by the psychiatric department in the faculty of medicine, Ain Shams University was used. The results of the present study revealed that the therapeutic modality including chemotherapy or chemo-radiotherapy in childhood malignancy did not have a significant psychological impact on the patient.

The patients in the study suffered from statistical significant social and school problems ( $p$  value  $<0.001$ ) which was higher than reported in other studies [4]. This is due to the lack of a psychiatric in the multidisciplinary team and lack of school re entry programs as compared to other studies done in more developed countries [5][6]. This was comparable to another study done in Pakistan as a developing country showing marked difference between cancer patients and healthy children [7]. The patients were treated in a governmental hospital so the economic problems were not evident between the 2 groups. This is was consistent with multiple studies suggesting that youngsters with cancer under chemotherapy were at risk of two psychological difficulties mainly social adjustment and emotional well being [8][9]. Most of the patients in the present study were under 12 years and so age analysis was hard to be analysed.

These findings were due rejection from the surrounding thinking it is a contagious disease and the bad reaction from school mates as regard alopecia. The child is usually embarrassed from the announcement of his diagnosis in school and is disrupted in school attendance because of cancer therapy and related complications. Also, in Egypt there is no educational service provided to the children during their stay at home or in the hospital. This makes the school return more difficult.

The children in the studied group also showed mood disorders including depression, anxiety disorder, panic attacks, separation anxiety, lack of concentration and stubbornness with statistical significance from the control group, ( $p$  value  $<0.001$ ). This was higher than other studies [10]. This may be due to the high incidence of brain tumors in the study (47%) which is considered more vulnerable to adverse psychological outcomes [11] and were usually excluded from many studies. However, other studies showed evident difference between patients and the healthy population [7] [12].

Anxiety was because of frequent procedures and treatments (e.g. blood draws and intravenous [IV] placements, as well as chemotherapy). The child usually presents with anticipatory anxiety and/or nausea and vomiting. For preschool children, the worry may be about separation from a caregiver. They may demonstrate a greater resistance to being separated from parents or become more fearful of new people. They wanted to know exactly where their parents will be before, during or after treatment. Worries about pain were foremost in a child mind. Pain was controlled or eliminated whenever possible, even when this may mean a delay in a procedure.

Also in the present study, girls were affected more then boys by depression and social worries ( $p=$

0.02 and 0.046). This may be due to high vulnerability of girls to the quality of life problems [13] [14]. children undergoing surgery were of better QOL than those receiving chemotherapy or radiotherapy. This could be explained by the fact that both chemotherapy and radiotherapy have many side effects that might deteriorate the children's QOL. Surgery gives the patient and his relatives the perception of nearly final cure, as compared to other treatments such as chemotherapy and radiotherapy with their long duration as well as the possible side effects [15]. In the present study this was not obvious as all patients received post operative radiotherapy, chemotherapy or both.

Our study was limited by the small number of patients from a single center. However it is one of the pilot studies in Egypt evaluating the quality of life by studying the psychological impact of various therapeutic modalities in childhood cancer in an attempt to improve the outcome and limit the burden of treatment for those vulnerable patients.

In conclusion, comprehensive psychological support should be integrated in the treatment plan. Emphasis on the healthcare team should be done to improve the patient's quality of > life and reduce the burden of treatment while respecting the cultural difference of the family. They should maintain open communication with them across the trajectory of illness whether the outcome is cure or end of life care.

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