

## Quality of Life of Children age from (8- less than 13) years with Acute Lymphocytic Leukemia Undergoing Chemotherapy

جودة حياة الأطفال الذين تتراوح أعمارهم بين (8 - أقل من 13) سنة المصابين بابيضاض الدم الليمفاوي الحاد الخاضعين للعلاج الكيميائي

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### المستخلص

**الاهداف:** لتقييم جودة حياة الأطفال الذين تتراوح أعمارهم بين (8 - أقل من 13 سنة) المصابين بابيضاض الدم الليمفاوي الحاد الخاضعين للعلاج الكيميائي ومعرفة العلاقة بين جودة حياة الأطفال المصابين بابيضاض الدم الليمفاوي الحاد وتاريخهم المرضي.

**منهجية البحث:** دراسة وصفية شملت (40) من الأطفال المصابين بابيضاض الدم الليمفاوي الحاد الذين تتراوح أعمارهم بين (8 - أقل من 13 سنة) في مركز امراض الدم في مدينة الطب من المدة 4 اذار 2021 إلى 1 ايلول 2021. استخدمت الدراسة عينة غير احتمالية (غرضية) من الاطفال (الذكور والاناث). استعملت استبانة مصممة من جزئين رئيسيين. اهتم الجزء الاول بالمعلومات الاجتماعية والديموغرافية للاطفال. الجزء الثاني والذي تكون من اربعة محاور اهتم بجودة حياة الاطفال المصابين بابيضاض الدم الليمفاوي الحاد. تم تحليل البيانات من خلال تطبيق الاساليب الاحصائية (الوصفية والاستدلالية) باستخدام الحزمة الاحصائية للعلوم الاجتماعية الاصدار 20.

**النتائج:** ان الأطفال الذين تتراوح أعمارهم بين 8 إلى أقل من 13 سنة تأثرت نوعية جودة حياتهم بصورة متوسطة في جميع محاور حيث يظهر 90% منهم مستوى متوسط في مجال الأداء البدني، و 70% يظهر مستوى متوسط في الأداء العاطفي فيما يتعلق بمجال الأداء الاجتماعي، أظهر 52.5% مستوى متوسطا و 67.5% أظهروا مستوى متوسط في مجال أداء المدرسة.

**الاستنتاجات:** استنتج الدراسة أن جميع مجالات جودة الحياة ومنها (مجال الاداء البدني - مجال الاداء العاطفي - مجال الاداء الاجتماعي - مجال الاداء المدرسي) تتأثر بشكل متوسط لدى الأطفال الذين تتراوح أعمارهم بين 8 إلى أقل من 13 سنة.

**التوصيات:** أوصت الدراسة بأهمية تحديد الأطفال ذو جودة حياة المنخفضة وتشجيعهم في الإشتراك في الرعاية الداعمة للعلاج والتي تعزز صحتهم من خلال تقييم جودة حياتهم بشكل منتظم.

**الكلمات المفتاحية:** جودة حياة ، الاطفال المصابين بابيضاض الدم الليمفاوي الحاد ، الخاضعون للعلاج الكيميائي

### Abstract

**Objective (s):** To assess the quality of life of children age from (8- less than 13) years with acute lymphocytic leukemia undergoing chemotherapy and to find out the relationship between the quality of life of children with acute lymphocytic leukemia and their illness history.

**Methodology:** A descriptive study included (40) children with acute lymphocytic leukemia with age ranged between (8 - less than 13 years) at the Hematology Center in the Medical City for the period from 4<sup>th</sup> March 2021 to 1<sup>st</sup> September 2021. A non-probability (purposive) sample of children (male and female) was used. A questionnaire designed with 2 main parts was utilized. The first part focused on sociodemographic characteristic for children. The second part consisted of four domains, focused on the quality of children with acute lymphocytic leukemia. The data were analyzed by applying statistical methods (descriptive and inferential) that were applied by using SPSS version 20.

**Results:** The quality of life of children aged from 8 to less than 13 years have affected moderately on all domains, in which 90% of them are showing a moderate level in the physical functioning domain, 70% are showing a moderate level in the emotional functioning domain, in regard to the social functioning domain 52.5% are showing a moderate level and 67.5% of them are showing a moderate level in school functioning domain.

**Conclusion:** The study concludes that all domains of quality of life, including (physical functioning, emotional functioning, social functioning, and school functioning) are moderately affected in children aged 8 to less than 13 years.

**Recommendations:** It is important to identify children with a lower quality of life and encourage them to participate in supportive care treatments that enhance their health by assessing their quality of life on a regular basis.

**Keyword:** Quality of Life, Children with acute lymphocytic leukemia, Chemotherapy

## Introduction

Quality of life (QoL) is a comprehensive concept that relates to a person's awareness of the influence of disease and treatment on his /her health, well-being, or functioning in physical, psychological, and social areas of life <sup>(1)</sup>.

Acute lymphocytic leukemia (ALL) is a kind of B or T lymphoblastic malignancy characterized by uncontrolled proliferation of aberrant, immature cells and their progenitors, that eventually leads to bone marrow and other lymphoid organs being replaced <sup>(2)</sup>. In the US, it is estimated that 10,270 children aged (0-14) years were diagnosed with cancer in 2017, and 1,190 of them died due to the disease, according to a recent study. The most prevalent types of cancer in children include leukemia, brain tumors, CNS tumors, lymphomas, soft tissue sarcomas, Neuroblastomas, and Wilms tumors <sup>(3)</sup>.

The mortality rate of children with cancer has dropped by over half. Over the same period, the survival rate (5year) for ALL children younger than 15 years has climbed from 60% to almost 90%, and for adolescents aged 15 to 19, it has increased from 28% to more than 75%. Chemotherapy side effects can last months or years after treatment, thus survivors of childhood and adolescent cancer need to be closely monitored <sup>(4)</sup>.

Chemotherapy induction treatment necessitates long-term hospitalization since hospitalization has a negative effect on children and their caregivers. A new environment, altered routines, discomfort due to the treatment process or the consequences of care, separation from family members, and classmates are among the stressors that children encounter during a protracted hospitalization. ALL patients' quality of life needs special care. It is vital to

evaluate the QoL of ALL patients, with the goal of allowing ALL patients and their parents to predict the events that will occur throughout therapy <sup>(5)</sup>. The QoL assessment is largely affected by the side effects of chemotherapy <sup>(6)</sup>.

Leukemic patients, like children with chronic illnesses, encounter several hurdles that obstruct their academic success and social activities. This is due in part to frequent school absences, feelings of loneliness, and school personnel's concern about dealing with them <sup>(7)</sup>. The researcher opted to conduct this study because QoL assessment is an important predictor of the results of the treatment process as viewed by the patient in terms of their physical, psychological, emotional, school, and social functioning. In order to take steps to change QoL, assessment QoL of children and young adults may be useful.

## Methodology

A descriptive (analytical) study included (40) children with acute lymphocytic leukemia who ranged between (8 - less than 13 years) at the Hematology Center in Medical City which includes two hospitals children (welfare teaching hospital and Baghdad teaching hospital). For the period from March 4<sup>th</sup> 2021 to September 1<sup>st</sup> 2021. The sample was a non-probability (purposive) sample of children were chosen based on a variety of criteria.

## Ethical Considerations

Scientific Research Ethical Committee at the University of Baghdad, College of Nursing has approved the study to be conducted. All children with acute lymphocytic leukemia undergoing chemotherapy participants in the study

completed a permission form for the rights of human subjects.

### **The Study Instrument**

The study questionnaire was consisted of 2 major parts to meet the purposes of study. The first part is related to children sociodemographic variables such as gender, residence, level of education, and family income). The second part focused on the domains quality of life of children aged from (8- less than 13years) with acute lymphocytic leukemia undergoing chemotherapy. There are a total of (8) items in the physical functioning domain, (5) items in the emotional functioning domain, (5) items in the social functioning domain, and (5) items in the school functioning domain. Domains of quality of life of children from (8-less than 13years) with acute lymphocytic leukemia have been scored according to the following patterns: the questions are rated on 5-point Likert scales as (Never=0, Almost Never=1, Sometimes =2, Often=3, Almost always=4). The mean of the scores (Low = 0-10, Moderate=11-21, High= 22-32) was used to evaluate the level of quality of life (physical functioning domain). However, the score (Low = 0-6, Moderate=7-13, High=14-20) was used to calculate the level of quality of life (emotional functioning, social functioning, and school functioning domains).

### **Validity of the Study Instrument**

The questionnaire's reliability was evaluated by a panel of (18) experts from various medical and nursing field. A few minor adjustments were made in response to the experts' suggestions, recommendations, and insightful remarks. The mean of experience years was (26.56) years with a standard deviation (10.159).

### **Reliability of the Study Instrument**

The reliability for constructed questionnaire was determined by pilot study. A pilot study was done on (6) children with acute lymphocytic leukemia who were recruited from the hematology centers in medical city between the 4<sup>th</sup> and 28<sup>th</sup> of February 2021. The pilot study was excluded from the original sample of the study. The reliability of the questionnaire was determined by Cronbach's alpha coefficient, and it revealed that the  $r= 0.778$ .

### **Data Collection**

Data were gathered from a hematology center (Baghdad teaching hospital and children welfare teaching hospital). The researchers used a semi-structured interview method to acquire the data with (closed-ended questions). For the period from the 4<sup>th</sup> of March 2021 to the 1<sup>st</sup> of September 2021.

### **Data Analysis**

The data were analyzed using descriptive statistics (Frequency, Percentage, Mean, and Standard deviation) as well as inferential statistics (Chi-square) and p. value, all of which were done in SPSS, version 20.

### **Limitations of the Study**

During the data gathering process, this study encountered certain limitations: During the presentation of the questionnaire to the Manager of the Hematology Center (Children Welfare Teaching Hospital) for the purpose of evaluation, the use of the WHOQoL (1995) scale was refused for children aged from 8 - less than 13 years and as a result was used (Peds QL TM version 4.0) for children aged from 8 to less than 13 years.

## Results

**Table (1): Distribution of Children Age from 8 to Less than 13 Years with Acute Lymphocytic Leukemia According to their Socio-demographic Characteristics**

No.	Characteristics	F	%	
1.	Gender	Male	<b>24</b>	<b>60.0</b>
		Female	16	40.0
2.	Residency	Rural	8	20.0
		Urban	<b>32</b>	<b>80.0</b>
3.	Level of education	Read & write	<b>24</b>	<b>60.0</b>
		Primary School graduated	16	40.0
5.	Family monthly income	Less than 300.000 ID	9	22.5
		From 300.000-600.000 ID	6	15.0
		From 601.000-900.000 ID	10	25.0
		More than 900.000 ID	<b>15</b>	<b>37.5</b>

F: Frequency, %: Percentage

Table (1) offers the demographic characteristic of the study sample that are 60% males. More of the children are residents in urban are 80%, followed by only 20% of them being residents in rural. According to education level; the highest percentage of the children refers that 60% of them do not read and write, followed by those who are graduated from primary school 40%. Around 37.5% of the monthly income of the family is more than 900.000ID.

**Table (2): Distribution of Children Age from 8 to less than 13 Years with Acute Lymphocytic Leukemia Undergoing Chemotherapy According to Illness History**

No.	Characteristics	F	%	
1.	Age at the onset of illness	7- less than 10 years	<b>32</b>	<b>80.0</b>
		10- less than 12 years	7	17.5
		12 years or more	1	2.5
2.	Duration of chemotherapy treatment (months)	1- less than 7	17	42.5
		7- less than 13	<b>21</b>	<b>52.5</b>
		13 and more	2	5.0

F: Frequency, %: Percentage

Table (2) reveals that the majority of the children 80% are diagnosed with acute lymphocytic leukemia at age 7- less than 10 years and 17.5% of them are diagnosed at age 10 - less than 12 years. 52.5 % most of the children who received chemotherapy are within (7- less than 13) months.

**Table (3): Assessment of the Levels of Domains (Quality of Life) of Children Age from (8 to less than 13) Years with Acute Lymphocytic Leukemia Undergoing Chemotherapy**

<b>1.Level (Physical Functioning Domain)</b>	<b>F</b>	<b>%</b>	<b>M.S</b>	<b>SD</b>
<b>Low</b>	4	10.0	1.90	0.304
<b>Moderate</b>	<b>36</b>	<b>90.0</b>		
<b>High</b>	0	0.0		
<b>2.Level (Emotional Functioning Domain)</b>	<b>F</b>	<b>%</b>	<b>M.S</b>	<b>SD</b>
<b>Low</b>	9	22.5	1.85	0.533
<b>Moderate</b>	<b>28</b>	<b>70.0</b>		
<b>High</b>	3	7.5		
<b>3. Level (Social Functioning Domain)</b>	<b>F</b>	<b>%</b>	<b>M.S</b>	<b>SD</b>
<b>Low</b>	13	32.5	1.83	0.675
<b>Moderate</b>	<b>21</b>	<b>52.5</b>		
<b>High</b>	6	15.0		
<b>4. Level (School Functioning Domain)</b>	<b>F</b>	<b>%</b>	<b>M.S</b>	<b>SD</b>
<b>Low</b>	13	32.5	1.68	0.474
<b>Moderate</b>	<b>27</b>	<b>67.5</b>		
<b>High</b>	0	0.0		

**F: Frequency, %: Percentage, M.S: Mean of score, SD: Standard deviation: Physical functioning level (low=0-10, Moderate=11-21, High=22-32), emotional, social, and school functioning levels (low=0-6, Moderate=7-13, High=14-20)**

Table (3) offers that children age from 8 to less than 13 years have moderate to low effects on all domains of the quality of life in which 90% of them are showing a moderate level in the physical functioning domain, 70% are showing a moderate level in the emotional functioning domain, in regard to the social functioning domain 52.5% are showing a moderate level and 67.5% of them are showing a moderate level in school functioning domain.

**Table (4): The Statistical Relationship between Quality of Life Domains of Children Age from 8 to less than 13 Years and their Illness History**

Variables	Domains (Quality of Life)															
	'Physical Functioning' Domain				'Emotional Functioning' Domain				'Social Functioning' Domain				'School Functioning' Domain			
	Chi-square	d.f	p-value	Sig.	Chi-square	d.f	p-value	Sig.	Chi-square	d.f	p-value	Sig.	Chi-square	d.f	p-value	Sig.
<b>1. Age at the onset of illness</b>	0.173	1	0.677	N. S	1.190	2	0.552	N. S	2.514	2	0.285	N. S	1.283	1	0.257	N.S
<b>2. Duration of chemotherapy treatment (months)</b>	4.021	2	0.134	N.S	10.190	4	<b>0.037</b>	<b>S</b>	2.911	4	0.573	N.S	3.654	2	0.161	N.S

df: degree of freedom, p: probability  $\leq 0.05$  level, N.S: Not significant, S: significant

Table (4) illustrates that there are not significant relationships between quality of life domains of children with acute lymphocytic leukemia and their illness history except, duration of chemotherapy there is a significant relationship only with the emotional functioning domain of quality of life at p. value  $\leq 0.05$ .

## Discussion

### Part I: Discussion of Socio-Demographic variables of Children Aged from 8 to Less than 13 years with Acute Lymphocytic Leukemia

Table (1) provides the socio-demographic variables of the participants that the majority of the study samples are 60% males. This result is consistent with a study in Iraq, who stated 8,570 incidences between 2000 and 2019; there was a 1.32 to 1 ratio of boys to girls diagnosed with leukemia among children<sup>(8)</sup>. This result is consistent with a study in Egypt, who stated 60 were boys (57.1 %) that out of 155 patients studied<sup>(9)</sup>.

Concerning the residency, more of the children are residents in urban are 80%, followed by only 20% of them being residents in rural. This result is consistent with a study in Turkey, who stated 35.7 % (n = 107) of respondents lived in a town<sup>(10)</sup>. Also, this result is consistent with a study in Iran, who stated more than half of the sample lived in urban regions (61.5%), with the other living in rural areas (38.5 %) <sup>(11)</sup>.

According to education level, the highest percentage of the children refers that 60% of them can read and write, followed by those who are graduated from primary school 40%. This result is consistent with a study in Iraq, who stated the majority of the samples (23.9 %) were primary school graduates. From the researcher's point of view, this represents the finding provides a fact that this level of education is best suited for children aged 8 to less than 13 years<sup>(12)</sup>.

According to family income, around 37.5% of the monthly income of the family is more than 900.000 ID. This result is contradicting with a study in the USA, who stated a link between lower family income and poorer child quality of life. The proportion of participants who

income less than 25,000 \$ per year was 39.1%<sup>(13)</sup>.

### Part II: Discussion of Distribution of Children Aged from 8 to less than 13 years with Acute Lymphocytic Leukemia Undergoing Chemotherapy according to their Illness History

Table (2) reveals that the majority of the children 80% are diagnosed with acute lymphocytic leukemia at age 7- less than 10 years and 17.5% of them are diagnosed at age 10- less than 12 years. This result is contradicting with a study in Swiss, who stated the majority of the participants had a disease between the ages of 0 and 4 and that this reflects (41.2%)<sup>(14)</sup>.

Concerning the duration of chemotherapy treatment, that 52.5 % of the most children who received chemotherapy are within 7- less than 13 months. This result is contradicting with a study in Iran, who stated majority of participant in the experiment group (41.7%) were at the 3<sup>rd</sup> phase of treatment<sup>(15)</sup>.

### Part III: Discussion the Levels of Quality of Life Domains of Children Age from 8 to less than 13 years with Acute Lymphocytic Leukemia Undergoing Chemotherapy

Table (3) offers that children age from 8 to less than 13 years have moderate to low effects on all domains of the quality of life in which 90% of them are showing a moderate level in the physical functioning domain, 70% are showing a moderate level in the emotional functioning domain. This result is contradicting with a study in Iraq, who stated the physical domain's overall responses are low<sup>(16)</sup>. This result is contradicting with a study in Singapore, who stated the children had worse quality of life emotional sub domain scores. Cancer in children has the greatest impact

on this sub domain. From the researcher's point of view, the reason for this could be that children are being exposed to new situations such as hospitals, diseases, doctors, and nurses for the first time, on a regular schedule, and for an extended period of time, as well as the negative emotions brought on by the complications and treatment of the disease. Cancer and its treatment, as well as its side effects and long-term effects, can affect a child physically and emotionally, causing stress, worry, fear, and anger, as well as socially, by forcing the child to leave his or her family, friends, and social context. Cancer's long and difficult treatment, as well as its effects, might make it hard for children to begin or continue attending school<sup>(17)</sup>.

That in regard to the social functioning domain 52.5% are showing a moderate level and 67.5% of them are showing a moderate level in the school functioning domain. This result is consistent with a study in the USA, who stated after cancer treatment (chemotherapy, radiation), the children's neutrophil count drops, making them more susceptible to infections and isolating them from their peer. From the researcher's point of view, this forced social isolation negatively impacts children's quality of life by isolating them from their families, schools, and play surroundings, as well as their friends, during a time when they are most in need<sup>(18)</sup>. This result is consistent with a study in the USA, who remarked that cancer and its treatment are difficult for patients to understand and require a long time; children with cancer should spend a lot of their time in the hospital, interrupting or eliminating school life<sup>(19)</sup>.

#### **Part IV: Discussion the Statistical Relationship between Quality of Life Domains of Children Age from 8 to less than 13 years and their Illness History**

Table (4) illustrates that there are no significant relationships between domains of QoL of children with acute lymphocytic leukemia and their illness history except, duration of chemotherapy treatment there is a significant relationship only with the emotional functioning domain of quality of life at  $p$  value  $\leq 0.05$ . This finding contradicts with a study in Iraq, who stated a significant association between age at onset of thalassemia and quality of life (physical, and independent domains), except social and psychological domains of the quality of life no significant relationship with age at onset of thalassemia<sup>(20)</sup>.

#### **Conclusions**

The researchers conclude that acute lymphocytic leukemia is more common in males than females, and it is more common in patients living in urban than in rural areas. Children aged from 8 to less than 13 years are moderately affected in all domains of quality of life.

#### **Recommendations**

The researchers recommend the following based on the findings and conclusions of this study:

1. Identifying children with a lower quality of life to engage them in supportive care treatments that enhance their health by assessing their quality of life on a regular basis.
2. All children with Acute Lymphocytic Leukemia and their parents get counseling and education programs about leukemia, medical care, efforts to overcome side effects, and nutrition, all of which help to improve the children's quality of life.
3. To foster a normal and productive life, the children should be encouraged to attend school, seek work when he or she is old enough, and engage with peer groups that appropriate for this age.



4. Incorporating exercise into one's daily routine is one of the most effective strategies to combat fatigue, but it must be done under the supervision of a doctor who can establish the types and amounts of exercises and activities that are permissible, as this differs from one patient to another.

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