ASSOCIATION BETWEEN DIETARY HABITS AND DAILY LIVING ACTIVITIES AMONG CHILDREN WITH LEUKEMIA

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Abstract

Objectives: To Assess the Dietary Habits and the Daily Living Activities Regarding Children with Leukemia. To find out the association between Dietary Habits and Daily Living Activities Regarding Children with Leukemia. To find out the association between Dietary Habits and Daily Living Activity Regarding Leukemic Children with their socio-demographic characteristic.

Methodology: A "Descriptive (Cross sectional) study" was conducted in three hospitals Holy Karbala Health Department, Karbala Children's Teaching Hospital and Imam Hassan Al-Mujtaba Teaching Hospital on children with Leukemia in Holy Karbala City between the period of (22 June 2022) to (26 January 2024).

Results: The study revealed a significant positive correlation between the dietary habits of children with leukemia and their daily living activities. Conclusion: The effect of dietary habits can be summarized in that children treated with chemotherapy eat meals of average quality and small quantity. Which negatively affects children's daily life activities. Recommendations: The team of health care providers in hospitals must focus on improving the dietary Habits, its diversity, and the number of main meals that the child eats to provide him with energy and growth, encourage sick children to rely on themselves for their special needs, and provide detailed scientific information about the disease in an appropriate way of explanation to the children's parents.

Keywords: Dietary Habits, Daily Living Activities, Children, Leukemia.

INTRODUCTION

The World Health Organisation (WHO) estimates that cancer ranked as the second most prevalent cause of death on a global scale in 2018. Furthermore, both the incidence and mortality rates of cancer are increasing at an alarming rate. (Bray et al., 2018).

Blood and bone marrow are both affected by the malignancy known as leukaemia. Among children and adolescents, it is the most prevalent form of cancer. There are around 3500–4000 new cases diagnosed annually in the United States. (American Cancer Society ,2018).

A remarkable amount of progress has been made in the treatment of acute lymphoblastic leukaemia (ALL), which accounts for 75–80 percent of childhood acute leukaemia. The five-year overall survival rate has reached 90 percent in high-income countries (HICs). Leukaemia, of which more than 95 percent are acute, is the most common diagnostic group of childhood cancers throughout the world (Pui CH et al., 2015).

Despite the fact that the progress made in acute myeloid leukaemia (AML) has not been particularly remarkable, it has been consistent, with overall survival rates close to 70 percent after five years. There are not many longitudinal studies that have been conducted on the survival rates of childhood cancer in India. In spite of this, there is research that has been published indicating that there has been positive progress in the outcomes of childhood ALL. Even while the amount of development that has been made in India has been far less significant (Gupta A et al., 2015).

Although the overall prevalence of leukaemia is very low, it is the most prevalent kind of cancer that affects children. It is responsible for thirty percent of all malignancies that are detected in children younger than fifteen years old. Within this cohort, acute lymphocytic leukaemia (ALL) is diagnosed roughly approximately five times more commonly than acute myelogenous leukaemia (AML), and it is responsible for around 78% of all leukaemia diagnoses in children. (Oeffinger KC et al., 2016).

In children aged 0 to 14 years old, cancer is the second most prevalent cause of mortality, behind accidents as the leading cause of death. The most prevalent form of cancer in children is leukaemia, which accounts for approximately one-third of all cancers within the paediatric population. The United States of America (U.S.) is home to around 3,800 children who are diagnosed with acute lymphoblastic leukaemia (ALL) or acute myeloblastic leukaemia (AML) per year. (American Cancer Society, 2016).

Malnutrition is a prevalent complication observed in children diagnosed with cancer. Research has established that malnutrition plays a substantial role in treatment resistance, heightened morbidity, unfavourable prognosis, diminished quality of life, and increased healthcare expenditures (Koirala S ,2021).

Consistent physical activity and a nutritious diet are significant contributors to the prevention of chronic diseases and the maintenance of good health across all stages of life. This is also reflected at the national level in many nations, where dietary guidelines advise "regular physical activity and sedentary

behaviour reduction for health promotion. (US Department of Health and Human Services, 2015).

By analysing the intricate relationship between diet, physical activity, and improved cancer outcomes, incidence of the disease was significantly reduced and survival rates were significantly increased (American Cancer Society, 2017).

At present, exercise and nutrition are regarded as integral components of therapy that are critical for alleviating the adverse effects of active cancer treatment, particularly fatigue associated with cancer (Schmitz KH et al., 2019).

Specific guidelines regarding moderate aerobic exercise for the purpose of nutrition and muscle strengthening are recommended by the World Cancer Research Fund (Daudt H et al., 2017).

These guidelines include increasing the consumption of plant-based foods, decreasing the intake of red and processed meat, limiting energy-dense foods, salt, sugary drinks, and alcohol, and refraining from the use of dietary supplements. The existing body of literature provides extensive discussion on the benefits of physical activity, including improved fitness, decreased psychological distress, and enhanced cognitive abilities. In contrast, nutritional consultations may be beneficial in addressing the difficulties associated with cancer-related fatigue, such as anaemia, diarrhoea, nausea, and vomiting (American Institute for Cancer Research, 2017).

The activities of daily living can be further categorised into personal activities of daily living, which pertain to fundamental self-maintenance (e.g., eating, showering, toileting, and dressing), and those activities that are typically employed to evaluate and predict the developmental stages of children. Additional activities that are considered instrumental activities of daily living consist of household chores, such as cooking, cleaning, purchasing, and laundering, which are frequently used to assess the degree of dependence or disability of elderly patients, as well as access tasks, including driving and mobile use. More specifically, health professionals frequently assess the functional status by evaluating the ability to perform Activities of Daily Living (Rhoads et al.,2016).

Additionally, the functioning of daily living activities demonstrates children's capacity to operate objects without external assistance. However, young children frequently require adult assistance to perform the functions of playing, feeding, sleeping, bathing, socialising, and feeding, feeding, sleeping, and playing independently in the home, school, community, or workplace (Bates HH ,2015).

Methodology

Descriptive (Cross sectional) study was conducted on children with Leukemia in Holy Karbala City between the period of (22 June 2022) to (26 January 2024). To assessment the association between dietary Habits and daily living activities among children with leukemia.

The study was carried-out in three hospitals in Holy Karbala, was two in Holy Karbala Health Department, Karbala Children's Teaching Hospital and Imam Hassan Al-Mujtaba Teaching Hospital, and the third hospital was Warith International Cancer Institute. Samples were taken using a convenience sampling method for all children with leukemia who had been admitted to the hospitals or visited a hematology

consultant. The children's ages were from 6 to 16 years. The total number of participants was 170 child with leukemia.

According to the literature review of previous studies related to dietary Habits and activity of daily life, we prepared a questionnaire to measure dietary Habits, which includes dietary Habits, Food Frequency Intake, and the amount of food items intake. And we used a scale to measure activity of daily living. Comparing the relationship between dietary Habits and daily life activity for the sample taken for children with leukemia (Appendix D). A tool in the form of a questionnaire was built for the purpose of the study.

Results

Table 4-1. Distribution of Studied Sample related to their Socio-demographic Data

Socio-demographic data	Classification	No.	%
Age M ± SD= 9.91 ± 3.10 Min.-Mix. = 6-16	6-9 years	**84**	**50.9**
	10-13 years	46	27.9
	>13 years old	35	21.2
Gender	Male	**118**	**71.5**
	Female	47	28.5
Residents	Rural	59	35.8
	Urban	**106**	**64.2**
Is he/she student	Yes	118	71.5
	No	47	28.5
Father Education	Illiterate	9	5.5
	Able to read & write	9	5.5
	Elementary school graduate	22	13.3
	Intermediate school graduate	15	9.1
	Secondary school graduate	22	13.3
	Diploma	**52**	**31.5**
	Bachelor's	36	21.8
Mothers Education	Illiterate	10	6.1
	Able to read & write	24	14.5
	Elementary school graduate	18	10.9
	Intermediate school graduate	19	11.5
	Secondary school graduate	13	7.9
	Diploma	**39**	**23.6**
	Bachelor's	33	20.0
	Post-graduate	9	5.5
Fathers' occupation	Employed	**97**	**58.8**
	Unemployed	68	41.2
Mothers' occupation	Employed	**84**	**50.9**
	Unemployed	81	49.1
Parent relationship	Linked	**123**	**74.5**
	Divorced	22	13.3
	Separated	15	9.1
	Widow	5	3.0
Parents consanguinity	Yes	70	42.4

		No	**95**	**57.6**
History of Leukemia	Yes	59	35.8
	No	**106**	**64.2**
History of Diagnosis	<1 year	71	43.0
	>1 year	**94**	**57.0**
Treatment Modalities	Chemotherapy	**85**	**51.5**
	Radiotherapy	7	4.2
	Both	73	44.2

No. Number; %= Percentage

When examining the demographic characteristics of the 165 children with leukemia who participated in this study, we found that their ages ranged from 6 to 16 years, with 71.5% of participants being male, participants being females 28.5%. Urban dwellers were the majority, making up 64.2%, with 35.8% from rural areas. 71.5% classified as students, as opposed to 28.5% who were not currently in school.

We found that a substantial portion of fathers and mothers had graduated with a diploma, accounting for 31.5% and 23.6%, respectively. Regarding parental occupation, 58.8% of fathers and 50.9% of mothers were gainfully employed. The parents' relationship status, the majority, comprising 74.5%, reported being in a linked or together relationship. When it came to the contingency between parents, 57.6% expressed that there was no contingency between them.

Table 4-2. Dietary Habits among Leukemic Children

ON	Dietary Habits Items	Responses	No.	%	M.s	Ass.
1	Eating breakfast	Never	85	51.5	1.66	Poor
		Sometime	48	29.1		
		Always	32	19.4		
2	Eating three main meals	Never	88	53.3	1.63	Poor
		Sometime	50	30.3		
		Always	27	16.4		
3	Eating a full meal of meat, vegetables, and bread	Never	50	30.3	1.95	Moderate
		Sometime	73	44.2		
		Always	42	25.5		
4	Eating small meals	Never	87	52.7	1.64	Poor
		Sometime	50	30.3		
		Always	28	17.0		
5	Eating nuts	Never	60	36.4	1.80	Moderate
		Sometime	78	47.3		
		Always	27	16.4		
6	Eating salad with every meal	Never	90	54.5	1.64	Poor
		Sometime	46	27.5		

			No.	%	M.s	Ass.
		Always	29	18		
7	Drinking carbonated beverages	Never	55	33.3	1.92	Moderate
		Sometime	69	41.8		
		Always	41	24.8		
8	Eating canned food	Never	82	49.7	1.58	Poor
		Sometime	69	41.8		
		Always	14	8.5		
9	Eating frozen food	Never	84	50.9	1.65	Poor
		Sometime	54	32.7		
		Always	27	16.4		
10	Eating pickles	Never	63	38.2	1.79	Moderate
		Sometime	74	44.8		
		Always	28	17.0		
11	Eating more fatty food	Never	88	53.3	1.63	Poor
		Sometime	50	30.3		
		Always	27	16.4		
12	Eating sweets	Never	64	38.8	1.80	Moderate
		Sometime	70	42.4		
		Always	31	18.8		
13	Adding salt while eating food	Never	60	36.4	1.90	Moderate
		Sometime	62	37.6		
		Always	43	26.1		
14	Eating Food during watching TV or the phone	Never	86	52.1	1.65	Poor
		Sometime	50	30.3		
		Always	29	17.6		
15	Drinking tea immediately after meals	Never	70	42.4	1.78	Moderate
		Sometime	62	37.6		
		Always	33	20.0		
16	Eating fast food	Never	88	33.3	1.63	Poor
		Sometime	50	30.3		
		Always	27	16.4		
17	Eating red meat	Never	90	54.6	1.66	Poor
		Sometime	41	24.8		
		Always	34	20.6		
18	Eating white meat	Never	90	54.6	1.64	Poor
		Sometime	43	26		
		Always	32	19.4		

Level of Assessment (Poor= 1-1.66; Moderate= 1.67-2.33; Good= 2.34-3)

In the context of the statistical mean, the table presented highlights the responses of children with leukemia regarding their dietary habits. This is demonstrated by the continuous overall mean (between 1-1.66) across all items assessed in the scale.

Table 4-3. Overall Dietary Habits among Leukemic Children

Scale	Min.	Max.	M	SD	Score	No.	%
Dietary Habits (18 Q)	21	48	36.95	8.204	Poor (18-30)	128	77.6
					Moderate (30.1-42)	32	19.4
					Good (42.1-54)	5	3.0
					Total	165	100.0

Min.: Minimum; Max.: Maximum, M: Mean for total score, SD=Standard Deviation for total score

The findings highlight the variety of responses of children with leukemia regarding their dietary habits. Their dietary habits scores range from 21 to 48 on the rating scale. The overall mean score was calculated at 36.95, accompanied by a standard

deviation of 8.204. The research indicates that a large majority (77.6%) of children showed Poor eating habits.

In relation to family history, 64.2% of the children indicated that there was no known family history of leukemia. Furthermore, 57.0% had been diagnosed with leukemia for more than one year. Finally, regarding the treatment modalities, the majority, 51.5%, received chemotherapy as a part of their treatment regimen.

Table 4-4. Overall Domain Activities Daily Living among Leukemic Children

Domains	Scores	No.	%	M (±SD)	Ass.
Clothing	Low (5-8.33)	49	29.7	9.41±2.90	Moderate
	Moderate (8.34-11.66)	85	51.5		
	High (11.67-15)	31	18.8		
	Total	165	100.0		
Motor activities	Low (5-8.33)	50	30.3	9.31±2.84	Moderate
	Moderate (8.34-11.66)	81	49.1		
	High (11.67-15)	34	20.6		
	Total	165	100.0		
School activities	Low (6-10)	51	30.9	7.97±3.47	Low
	Moderate (10.1-14)	94	57.0		
	High (14.1-18)	20	12.1		
	Total	165	100.0		
Play and hobbies	Low (4-6.66)	50	30.3	5.89±2.42	Low
	Moderate (6.67-9.33)	78	47.3		
	High (9.34-12)	37	22.4		
	Total	165	100.0		
Personal hygiene	Low (8-13.33)	91	55.2	13.07±3.83	Low
	Moderate (13.34-18.66)	64	38.8		
	High (18.67-24)	10	6.1		
	Total	165	100.0		
Eating and drinking	Low (2-3.33)	37	22.4	3.7±1.07	Moderate
	Moderate (3.34-4.66)	72	43.6		
	High (4.67-6)	56	33.9		
	Total	165	100.0		
Sleeping	Low (3-5)	106	64.2	4.93±1.72	Low
	Moderate (5.1-7)	44	26.7		
	High (7.1-9)	15	9.1		
	Total	165	100.0		

M: Mean for total score, SD=Standard Deviation for total score

The results reveal a wide range of responses among children with leukemia regarding their daily activities. When it came to clothing, approximately 51.5% of children showed a moderate level of activities of daily living, with a mean score of 9.41 ± 2.90. In the field of motor activities, about 49.1% of the children showed an average level of daily life activities, obtaining an average of 9.31±2.84. Regarding school activities, approximately 57% of the children showed a moderate level of activities of daily living, with a mean score of 7.97 ± 3.47. As for play and hobbies, approximately 47.3% of children indicated a moderate level in activities of daily life, obtaining an average of 5.89±2.42.

Regarding personal hygiene, the results indicate that 55.2% of children showed a lower level of activities of daily living, with an average score of 13.07±3.83. When it came to eating and drinking, a similar proportion of 43.6 % of children expressed a moderate level of activities of daily living, with a mean score of 3.7 ± 1.07. Finally, regarding sleep-related activities, the majority, approximately 64.2% of children, showed a lower level of activities of daily living, with a mean score of 4.93±1.72.

Table 4-5. Overall Activities Daily Living among Leukemic Children

Scale	Min.	Max.	M	SD	Score	No.	%
Activities Daily Living (33 Q)	39	94	54.28	16.20	Low (33-55)	43	26.1
					Moderate (55.1-77)	108	65.5
					High (77.1-99)	14	8.5
					Total	165	100.0

Min.: Minimum; Max.: Maximum, M: Mean for total score, SD=Standard Deviation for total score

The findings highlight the variety of responses of children with leukemia regarding their activities daily living. Their activities scores range from 39 to 94 on the rating scale. The overall mean score was calculated at 54.29, accompanied by a standard deviation of 16.20. The results indicates that a large majority (65.5%) of children showed moderate activities of daily living.

Table 4-6. Association between Dietary Habits and Activities Daily Living among Children with Leukemia

Correlation Statistics	1	2	3	4	5	6	7	8	9
1.Dietary Habits	1								
2.Clothing Activities	.675**	1							
3. Motor Activities	.644**	.577**	1						
4. School Activities	.671**	.724**	.614**	1					
5. Play Activities	.659**	.642**	.626**	.729**	1				
6.Personal hygiene	.487**	.494**	.410**	.566**	.518**	1			
7. Eating and Drinking	.425**	.524**	.333**	.540**	.526**	.366**	1		
8. Sleeping	.398**	.485**	.421**	.440**	.382**	.309**	.293**	1	
9. Overall LDA	.760**	.720**	.737**	.835**	.774**	.652**	.544**	.495**	1

**. Correlation is significant at the 0.01 level (2-tailed).

The study revealed a significant positive correlation between the dietary habits of children with leukemia and their daily living activities. This correlation was observed in various aspects of activities daily living, including clothing (r = 0.675; p < 0.001), motor activities (r = 0.644; p < 0.001), school activities (r = 0.671; p < 0.001), play and hobbies (r = 0.659; p < 0.001), personal hygiene (r = 0.487; p < 0.001), eating and drinking (r = 0.425; p < 0.001), sleeping (r = 0.398; p < 0.001), and overall daily living activities (r = 0.760; p < 0.001).

Discussion of the Study Results

5.1. Distribution of Studied Sample related to their Socio-demographic Data

The findings of the study of 165 children with leukemia reveal several noteworthy demographic characteristics that provide valuable insights into the profile of the participants. First of all, the age range of the children participating in the study ranged from 6 to 16 years. The mean age of 9.91 ± 3.10 years indicates a relatively young cohort, highlighting the prevalence of leukemia in early childhood and adolescence.

Gender distribution appears to be an important factor, with a clear predominance of males in the study. 71.5% of the participants were male, while females made up the remaining 28.5%. This gender disparity raises questions about possible biological or environmental factors that contribute to higher leukemia rates in boys. Further exploration of the reasons behind this gender skew may be useful for understanding and treating childhood leukemia. This result agrees with with (Niklas Gunnarsson 2017) who studying (Chronic myeloid leukemia and cancer). their study is mentioned that majority of participating regarding the gender distribution was 60% of the participants were male, while females made up the remaining 40%.

Residence patterns also come out on top, with 64.2% of children residing in urban areas and 35.8% in rural areas. This urban dominance can be linked to factors such as access to health care facilities, environmental exposure, or socioeconomic status, emphasizing the need to consider these variables in the context of leukemia prevalence and outcomes. This result is similar to that (Muntadher Al-Suwaid 2019) who studying (Complications Preventive Strategies of Children with Leukemia from Mothers' Perspectives in Al-Basrah Province) their study is shown that the Majority of the population are living in urban estimating as (72.7%) and rural (27.3).

The educational background of the parents is another important aspect explored in the study. A significant percentage of fathers (31.5%) and mothers (23.6%) graduated with a diploma. This information underscores the need to study the potential impact of parental education on childhood leukemia incidence and management. Understanding the role of education in health-seeking behavior and adherence to treatment regimens can guide interventions to improve outcomes for affected children. This result disagrees with with (Mohammad Kajiyazdi et al 2022) who studying "The Effect of Parents' Education on the Prevalence of Acute Leukemia in Children". According to his research, the educational attainment of parents in the healthy group was as follows: 50.7% held associate or bachelor degrees, 23.5% held master's degrees, and 72.7% held an associate degree or less, with 7.8% holding a master's degree.

Parents' occupation was also highlighted, revealing that 58.8% of fathers and 50.9% of mothers were gainfully employed. This information is essential to understanding the social and economic context in which these families overcome the challenges of childhood leukemia. It urges consideration of potential financial barriers to accessing health care and the impact of parental employment on the ability to support a child through treatment. This result is inconsistent with (Dwi Novrianda 2015) study "The effect of educational intervention on the quality of life of acute lymphocytic leukemia who undergoing chemotherapy" their study finding indicated that the more generally the Parents' did not work with (83.3%).

The study delves into the family dynamics of the participants, indicating that the majority (74.5%) of parents reported being in an attached or together relationship. In addition, 57.6% of parents expressed that they did not have an Parents

consanguinity relationship. Understanding family structures and dynamics is vital, as it can greatly impact the emotional and logistical support available to a child undergoing leukemia treatment. This result disagrees with with (Ali Gholami et al 2017) who studying "Parental Risk Factors of Childhood Acute Leukemia: A Case- Control Study". His findings indicated that the parents relationship (78%) was separated and parents relationship bonded was (22%).

And this result is similar to that (Abdulbari Bener et al 2015) who studying "Consanguinity and family history of cancer in children with leukemia and lymphomas" their study is shown that a proportion of 50.5% of the indigenous population of the United Arab Emirates (UAE) is married consanguineously. The purpose of this research was to ascertain whether there are any differences in the rates of consanguinity and family history of cancer between the families of children with lymphoid malignancy and the general population.

Family history appears to be a relevant factor, with 64.2% of children indicating no known family history of leukaemia. This finding role of the environmental factor predisposition in childhood leukaemia. Further studies and genetic investigations into possible environmental factors could shed light on the etiology of these cases. This result agrees with with (Sahar Mehranfar et al 2017) who studying "History of Leukemia: Diagnosis and Treatment from Beginning to Now". His findings indicated that with 59% of children indicating no known family history of leukaemia.

Regarding the duration of leukemia diagnosis, 57.0% of children were diagnosed for more than 1 year, indicating a large proportion with prolonged exposure to the challenges of disease management, and the possibility of living with this disease. Longitudinal studies that track the outcomes of these conditions over time can provide valuable insights into the trajectories of childhood leukemia and the effectiveness of interventions. This result disagrees with with (Rosnah Sutan et al 2017) who studying "Coping Strategies among Parents of Children with Acute Lymphoblastic Leukemia". His findings indicated that at the time of diagnosis, the average age of the children was 4.5 ±2.9 years.

Finally, the prevalent use of chemotherapy as a treatment modality (51.5%) underscores the importance of understanding the therapeutic landscape in pediatric leukemia. Exploring the reasons behind the choice of specific treatment methods and evaluating their effectiveness and side effects is crucial to improving treatment methods and improving overall outcomes for affected children. This result is consistent with (Ahmed Motohiro Kato 2018) study " Treatment and biology of pediatric acute lymphoblastic leukemia" their study finding indicated that the most of the ideal option for treating children with leukemia was chemotherapy, and the percentage of children receiving this treatment was 60% of the sample taken.

5.2 Dietary Habits among Leukemic Children
Findings on the dietary habits of children with leukemia provide valuable insights into the diverse responses within this population. The use of a rating scale ranging from 21 to 48 allowed for accurate assessment, revealing a wide range of dietary behaviors among participants.

The overall average score of 33.35 provides a central reference point for understanding the average eating habits of the children studied. This average, when viewed alongside the standard deviation of 8.204, shows the degree of variation in the data. A higher standard deviation indicates a greater dispersion in scores, indicating that dietary habits among children are not uniform but show large individual differences. A study conducted by (Dheyaa Aldeen et al., 2022) who studied "Nutritional evaluation of the children and teenagers at the diagnosis time of acute leukemia " the researcher showed that the higher the standard deviation, the greater the degree of numerical dispersion, indicating that children's eating habits are not uniform and individual differences are large.

The fact that the majority of children (77.6%) showed poor dietary habits confirms the prevalence of this category among the population studied. It would be interesting to explore further the factors that contribute to this poor level of eating habits. For example, are there common trends or patterns in the types of foods consumed, not frequency of meals, or dietary preferences among this majority. And this result agrees with (Gagnonet al,.2019) their studying "Food habits during treatment of childhood cancer: a critical review" their study finding indicated that in response to a question regarding their child's food habits, parents stated that their child was consuming an unhealthy diet. The extended reduction in consumption was a source of anxiety for the parents due to the possibility that it would have an adverse effect on the treatment outcome. Some parents found the increased appetite that occurred during steroid treatments to be comforting.

And this study consistent with (Williams L & McCarthy M 2015) who studying " Parent perceptions of managing child behavioural side-effects of cancer treatment: a qualitative study". His findings indicated this finding was supported by an additional study which revealed that a significant proportion of interviewed mothers expressed satisfaction when their child's appetite increased, as it served to offset the periods of insufficient eating.

Understanding the distribution of scores and the prevalence of poor eating habits could have major implications for designing interventions and support systems for children with leukemia. It may be helpful to design dietary guidelines and nutritional programs to meet the specific needs and challenges faced by those with different dietary habits. In addition, identifying factors influencing these habits could inform targeted strategies to promote healthy eating behaviors among children undergoing leukemia treatment. these results supported by a similar study (V. Marcil et al, 2019) their studying " Food habits during treatment of childhood cancer: a critical review" their study finding indicated in the majority of interventional studies on paediatric cancer, the protocols or feasibility analyses of interventions have been presented. Due to the variability of study designs and the paucity of studies that have reported their findings, the effect of these on the formation of healthy eating patterns is therefore unknown. More information into the dietary patterns and consumption of nutrients by children undergoing cancer treatment could provide valuable direction for subsequent nutritional interventions.

Furthermore, the observed range of scores from 21 to 48 prompts further exploration at the extremes of the spectrum. Are there specific characteristics or circumstances associated with children who score at the lower or higher ends of the scale? Investigating these outliers can provide valuable insights

into factors influencing the dietary habits of children with leukemia, which may guide personalized interventions for those at both ends of the spectrum. a study conducted by (Hannah et al., 2019) who studied (160 Parents) their studying about " Prospective, longitudinal assessment of quality of life in children from diagnosis to 3 months off treatment for standard risk acute lymphoblastic leukemia ". their researchers showed that adverse neurological events reported during treatment may be predictive of physical and social functioning impairments three months after treatment. Further investigation is required to establish reliable predictors of health-related quality of life impairment, to elucidate the underlying mechanisms of impairment, and to develop efficacious interventions that enhance health-related quality of life in the months immediately following therapy completion.

In conclusion, the results highlight the complexity and diversity of dietary habits among children with leukemia. Identifying the dominant poor eating habits category, along with the score range and standard deviation, provides a comprehensive picture of the variation within this population. More research could delve into the factors that contribute to these dietary habits, paving the way for more targeted and effective interventions to support the nutritional health of children undergoing leukemia treatment. This result agrees with (philippe et al 2021) their studying " Transcriptional and Mutational Profiling of B-Other Acute Lymphoblastic Leukemia for Improved Diagnostics "their findings indicated the researchers showed the higher the standard deviation, the greater the degree of numerical dispersion, indicating that children's eating habits are not uniform and individual differences are large. signifies the discrepancy between the average scores of the case and control groups as determined by the dietary behaviours assessment. The findings of this research demonstrate that the mean scores for the case and control groups in terms of the evaluation of dietary patterns differed significantly (P. value).

5.3: Overall Domain Activities Daily Living among Leukemic Children

The findings presented in this study provide valuable insights into activities of daily living for children with leukemia. The evaluation included various aspects of their lives, including clothing, motor activities, school activities, toys and hobbies, personal hygiene, eating and drinking, and sleep-related activities. The results show a variety of responses among these children, highlighting the challenges they face and their overall performance in various areas.

One notable observation is that a large proportion of children with leukemia showed a moderate level of activities of daily living across the different groups. This indicates resilience and adaptability among these children, indicating that they actively participate in and manage their daily routines despite the impact of leukemia on their lives. For example, in the context of school activities, more than half of the children showed an average level of performance, with an average of 11.13. This finding suggests that many children with leukemia are still able to participate in educational activities, albeit with some challenges. This result disagrees with (marta et al 2020) their studying " Pediatric Patients Treated for Leukemia Back to School: A Mixed-Method Analysis of Narratives about Daily

Life and Illness Experience" their study finding indicated that data showed leukemia in children can impact their participation in school activities through factors such as social support, treatment-related effects on academic performance, and motor skill delays. Early educational intervention and support are recommended for children affected by leukemia to mitigate these challenges.

On the other hand, the results also point to specific areas where children with leukemia may face greater difficulties. Personal hygiene and sleep-related activities, in particular, emerged as areas in which a large proportion of children showed lower levels of activities of daily living. These findings highlight potential areas for targeted support and intervention, as difficulties with personal hygiene and sleep-related activities could have wider implications for the wellbeing and quality of life of these children. This result consistent with (Dominik Gaser et al 2022) their studying " Effects of strength exercise interventions on activities of daily living, motor performance, and physical activity in children and adolescents with leukemia or non-Hodgkin lymphoma: Results from the randomized controlled Active ADL Study" their study is mentioned the leukemia in children can impact personal hygiene and sleep-related activities. Children may experience difficulties with oral hygiene practices due to the effects of treatment. Sleep disturbances, such as excessive daytime sleepiness and sleep-disordered breathing, are common in children with cancer, particularly those with neoplasms involving the CNS.

The overall mean of 59.40 on the rating scale, with a standard deviation of 16.20, provides a comprehensive summary of children's activities in daily life. The fact that 65.5% of children showed moderate activities in daily life confirms the resilience of this population and the strength of their adaptation to the disease. However, it is important to recognize the diversity within this group as 26.1% had low activities and needed to depend on their family in their daily lives, as evidenced by a wide range of scores (39 to 94). This disparity underscores the need for tailored approaches to support each child based on their unique challenges and strengths. This result Congruent with that (Nuhad Aldoori et al, 2020) their studying " Daily Living Activities of School Age Children with Acute Lymphocytic Leukemia at Welfare Pediatric Teaching Hospital" their study finding indicated A significant proportion of children experience symptoms, clinical signs, and complications associated with acute lymphocytic leukaemia.A significant proportion of children with acute lymphocyte-cytic leukaemia experience a moderate impact on their daily activities. This result disagrees with (Aleksandra Kowaluk et al 2019) their studying " Physical Activity and Quality of Life of Healthy Children and Patients with Hematological Cancers" their study finding indicated that A shortage of physical activity is a critical determinant that adversely impacts the quality of life and fosters a sense of dependence among children diagnosed with cancer. The findings of the research indicated that children who were receiving cancer treatment exhibited diminished physical fitness and a general state of unwell-being. Children whose cancer was successfully treated exhibited marked improvements in their overall health and physical endurance.

In conclusion, the study contributes valuable information to our understanding of how children with leukemia cope in their

daily lives. The findings underscore the importance of considering multiple dimensions of activities of daily living and designing interventions to address the specific challenges faced by these children, with the ultimate goal of enhancing their overall well-being and quality of life.

5.4: Association between Dietary Habits and Activities Daily Living among Children with Leukemia

The study revealed a significant positive correlation between the dietary habits of children with leukemia and their daily living activities. This correlation was observed in various aspects of activities daily living, including clothing ($p < 0.001$), motor activities ($p < 0.001$), school activities ($p < 0.001$), play and hobbies ($p < 0.001$), personal hygiene ($p < 0.001$), eating and drinking ($p < 0.001$), sleeping ($p < 0.001$), and overall daily living activities ($p < 0.001$). This result consistent with (S. Beaulieu-Gagnon et al 2019) who studying " Food habits during treatment of childhood cancer: a critical review" their study are mentioned that showed that nutrition knowledge in children and young adolescents was positively associated with healthier food consumption, including fruits, pasta or grains, fish, and vegetables. Additionally, a decrease in the intake of desserts, snacks, fried foods, and sugary beverages was observed. Higher parental education and occupation were also associated with healthier eating habits in children.

And this result agrees with another study (Cheryl L. et al 2018) their study" Modifying bone mineral density, physical function, and quality of life in children with acute lymphoblastic leukemia". His findings indicated the study found that A heightened intake of added lipids was found to be correlated with an elevated risk of childhood leukaemia, whereas milk and dairy product consumption was associated with a decreased risk. Higher protein intake also showed a borderline trend towards reducing childhood leukemia risk.

Conclusion

The effect of dietary habits can be summarized in that children treated with chemotherapy eat meals of average quality and small quantity. Which negatively affects children's daily life activities.

Recommendations

The team of health care providers in hospitals must focus on improving the dietary Habits, its diversity, and the number of main meals that the child eats to provide him with energy and growth, encourage sick children to rely on themselves for their special needs, and provide detailed scientific information about the disease in an appropriate way of explanation to the children's parents.

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