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Effectiveness of Healthy Nutritional Educational Program on Clinical Outcomes for Non-Hodgkin Lymphoma Patients at Baghdad Teaching Hospital

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Abstract: ***Objective: The main objective of the present study is to evaluate the Effectiveness of healthy nutritional educational program (HNEP) on clinical outcomes for non-Hodgkin lymphoma (NHL) patients at Baghdad Teaching Hospital. Methodology: A quasi-experimental design was carried out at Baghdad Teaching Hospital for period nine August 2016 to the nine August 2017. The program and instruments were constructed and developed by the researcher to measure the purpose of the study. The study sample consisted of (60) patients with NHL. Exposed to the HNEP. The measurement of effectiveness of HNEP on nutritional knowledge for NHL patients through the researcher use of knowledge test; Dietary assessment; anthropometric; blood test; Social habits test. Reliability of instrument was determined by test and retest and the instrument validity was determined through a panel of experts. The analysis of data was performed through the application of description statistic (frequency, percentage and cumulative percent, arithmetic mean and standard deviations) and Inferential statistical (Fisher Exact Probability test (F.E.P.T.), Chi-Square test, Student t-test for and ANOVA to present the differences between the pretest; posttest 1and posttest2. The results of the study showed that the effectiveness of HNEP on clinical outcomes for NHL patients is a positive. The study concluded that the HNEP are effective in enhancing dietary habits and improving of side effects of treatment of NHL patients. The study recommended that an HNEP can be designed and constructed for blood disease patients through the program, an emphasis can be directed and oriented healthy nutritional. The patients can be encouraged for being participated in a special training programs designed and constructed to fulfill the patients' needs concerning defects and limitation in their practices and collaborative work can be issued between the ministry of health and higher education to provide such program.***

Keywords: Healthy Nutritional Educational Program, Non-Hodgkin Lymphoma

1. Introduction

Non-Hodgkin lymphoma (NHL), a heterogeneous group of malignancies, is the greatest common hematologic malignancy [(1)]. In the Unit States American, 72,580 new cases of NHL and 20,150 deaths are anticipated to happen in 2016 [(1)]. A number of risk factors, for instance cigarette smoking, alcohol consumption, obesity, and family history of NHL, have been associated with an increase of NHL incidence [(2–5)]. Dietary factors have also been documented to perform a role in the development of NHL[6].

In keeping with overview of (Chen and coworker[7] in 2016; Cainia and coworker[8] in 2016; and Leo and coworker[9], 2016) stated that healthy diets rich in fruits, vegetables, whole grains, beans, fish, nuts and olive can reduce the risk of NHL while also providing essential vitamins, minerals, and other substances [like phytochemicals] necessary for good health.

As stated by Nursing Midwife Council (2007)[10] and Florence Nightingale (1820-1910) that the manipulation of patient environment is important concerning eating and drinking. In this study, the manipulation of patients' environment by their educating and their restricting to healthy nutrition. In addition, the manipulation was in keeping with Mediterranean diet pattern.

This current study will evaluate if the healthy nutritional educational program increased enhancing nutrition knowledge and following implementation of adherence to healthy nutrition, whether the frequency of fruit, vegetables, whole grains, beans, fish, nuts and olive oil served increased and meat proceeding, poultry and dairy products served restricted.

Meanwhile, this program may be happened improving of clinical outcomes such as (body weight, nutrition impact symptoms). In addition, this study will assess if NHL patients can apply their knowledge of foods that are beneficial to health.

2. Methodology

The Implementation was carried out in hematology outpatient for the period from 9 August 2016 to 9 August 2017. The implementation of the healthy nutritional educational program, which was introduced to the research sample, comprised the following:

The selection of present sample based on special criteria which includes patients (male & female) who are attending of hematology outpatient of Baghdad Teaching Hospital at Medical City. In addition, patients undergoing first line chemotherapy only rituximab, cyclophosphamide, doxorubicin, vincristine, and prednisone (R-CHOP), patient

age 18 and above, no have renal failure, no have advanced stage, no have other cancer and no have psychiatric problems. The educational program was design to provide patient's knowledge toward healthy and unhealthy diet for Non-Hodgkin lymphoma. The study's instrument was developed by the researcher and checked by a panel of experts and for the purposive of the study, it was consent of three parts. To evaluate the effectiveness of healthy nutritional educational program on knowledge and clinical outcomes for Non-Hodgkin's Lymphoma patients at Baghdad Teaching Hospital, a self-administered questionnaire is developed by the researcher for the purpose of this study. The questionnaire consists of (3) parts. The first part (Socio demographic Characteristics Data), this part is focused on the collection of basic socio-demographic data gained from the NHL patients by observation and interview, the data Included age, gender, socioeconomic status, marital status, level of education, occupation, smoking and alcohol drinking. The Second Part (Clinical Characteristics Data), this part is focused on the collection of clinical data gained from the NHL patients by observation and interview. The data included medical history of NHL patients such as hypertension; diabetic; lymphoma type as WHO classification and body mass index (obese and not obese). Third Part the questionnaire was concerned with data to evaluate the effectiveness of the dietary program. Fifth major instruments were used to evaluate the effect of healthy nutritional educational program on nutritional knowledge for non-Hodgkin lymphoma patients. Through the researcher use of dietary assessment includes (11) items; body mass index measurement which included (height and weight); blood test which included white blood cell (WBC), hemoglobin (HB), & platelet) clinical assessment of the Side effects related to the treatment & their impact on drinking and eating. Reliability of instrument was determined by test and retest and the instrument validity was determined through a panel of experts. The testing of study group (pre, post 1 and post2) was as follow up in table I

Table I: the course of the study plan, including the intervals of data acquisition is shown in this table

Enrollment	*Implementation of the Program and Follow up*	*End of the Study*
Patient briefing handout of -information brochures - Control sticks and documentation sheets for patients' information.	The program sessions manage by three methods, booklets, lectures and group discussion, and through cell phone communication for any question or comments from the patients to the researcher after the implementation of the program.	Final consultation after 12 weeks of diet or if patient dropped out early
Pre-test 1.Nutrition knowledge test. 2.Dietary assessment 3.Anthropometric 4.Biochemical Test 5.Clinical assessment of side effects treatment	***Every six weeks:*** **Post-test 1** 1.Nutrition knowledge test. 2.Dietary assessment 3.Anthropometric 4.Biochemical Test 5.Clinical assessment of side effects treatment	***Every six weeks:*** **Post-test 2** 1.Nutrition knowledge test. 2.Dietary assessment 3.Anthropometric 4.Biochemical Test 5.Clinical assessment of side effects treatment
-1	**6**	**12**

3. Results

Table 1: Socio demographic Characteristics of the study sample of for NHL Patients.

Variables	Groups	Experimental group	
		Frequency	Percent
Age Group	23- 34	12	20
	35 - 44	12	20
	45 - 54	18	30
	55 - 64	9	15
	65-74	9	15
	Total	60	100
Mean (SD)	47.6667 (13.65764)		
Gender	Male	35	58.33
	Female	25	41.67
	Total	60	100
Socioeconomic status	Low level	6	10.0
	Middle level	40	66.67
	High level	14	23.33
	Total	60	100
Marital Status	Single	7	11.67
	Married	49	81.67
	Widowed	4	6.66
	Total	65	100
Level of education	No read or Write	5	8.33
	Read & Write	3	5.0
	Primary School	16	26.66
	Intermediate School	3	5.0
	Secondary School	16	26.66
	Institute or College/above	17	28.33
	Total	60	100
Occupation	Employee	9	15.0
	Worker	28	46.67
	Unemployed	17	28.33

The table shows that the majority of the study sample were (**30%)** in range (45 - 54) years and more than half of study sample were (**58.33%**) male. Most of the study population were (28.33%) Institute, College, or more of education level, (**81.67%**) married, (**46.67%**) worker of occupation, (**66.67%**) middle level of economic situation, (**95.0**%) not drinking, (**71.67**) not smoking.

Table 2: Clinical Characteristics for Non-Hodgkin's Lymphoma Patients.

Groups			Frequency	Percentage
Medical history	Hypertension	No	48	80
		Yes	12	20
		Total	60	100
	Diabetic	No	52	86.7
		Yes	8	13.3
		Total	60	100
Types of lymphoma	diffuse large B-cell lymphoma (DLBCL)		43	71.67

	marginal zone lymphoma (MZL)	12	20.0
	follicular (FL)	5	8.33
	Total	60	100
BMI	Not obese (< 25 kg/m^2)	34	56.66
	Obese (> 25.1 kg/m^2)	26	43.34
	Total	60	100

BMI = Body Mass Index, less than = <, more than = >

The table showed that the most of sample were (80%) patients non-hypertensive, (86.7) non-diabetics. Where DLBCL type was the big amount of lymphoma type (71.67), and more than half of sample was obese patients.

Table 3: Distribution of SD, mean of score, minimum, and maximum of patients' adherence to healthy nutrition among study group

Different period	Patients' adherence to healthy nutrition				
	NO.	Mean	SD	Minimum	Maximum
Pre	60	18.4333	4.62626	11.00	30.00
Post 1	60	32.2500	4.82797	20.00	42.00
Post 2	60	37.1500	8.05242	20.00	50.00
Total	180	29.2778	9.96309	11.00	50.00
One-way ANOVA; F = 154.781(P=0.000), df = (2, 177) 179					

ANOVA = Analysis of variance, Significant level at p value ≤ 0.05, No. = number, SD= standard deviation df = degree of freedom, p= probability.

This table shows the high difference in mean, for patients' adherence to healthy nutrition among study group; the mean of study groups showed high statistical significance (P=0.001).

Table 4: Distribution of body weight change for non-Hodgkin's lymphoma patients among different periods of the tests

Different period	Body weight change				Total (%)
	Weight losing [A]		Weight stable [B]		
	Frequency	Percent	Frequency	Percent	
Pre	5	8.3	55	91.7	60 (100)
Post1	2	8.3	58	96.7	60 (100)
Post 2	0	0.0	60	100	60 (100)
Total	7	3.9	173	96.6	180 (100)
χ^2 = 5.648 (P = 0.05) df = 2					

χ^2 = Chi square, Significant level at p value ≤ 0.05, SD= standard deviation df = degree of freedom p= probability, (A Weight losing = weight loss of > 1 kg, (B) Weight stable = weight gain or weight loss < 1 kg.

This table shows there is significant association between the changing of body weight and study groups (pretest, post 1and post 2), where P value was (< 0.05). This mean that the healthy nutritional educational program affected the weight.

Table 5: Distribution Treatment side effects of *NHL Patients* for Study Groups

Variable	Pre				Post 1				Post 2				χ^2 (P value) d.f = 2
	Yes		No		Yes		No		Yes		No		
	NO.	%	NO.	%	NO.	%	NO.	%	NO.	%	NO.	%	
Fatigue	22	36.7	38	63.3	12	20	48	80	6	10	54	90	12.600 (P=0.002)
Nausea	27	45	33	55	12	20	48	80	5	8.3	55	91.7	22.801(P=0.000)
Vomiting	18	30	42	70	11	18.3	49	81.7	9	15	51	85	4.470 (P=0.107)
Appetite loss	16	26.7	44	73.3	11	18.3	49	81.7	7	11.7	53	88.3	4.424 (P=0.109)
Persistent taste	22	36.7	38	63.3	12	20	48	80	6	10	54	90	12.600 (P=0.002)
Dry mouth	16	26.7	44	73.3	11	18.3	49	81.7	7	11.7	53	88.3	4.424 (P=0.000)
Food aversion	27	45	33	55	13	21.7	47	78.3	14	23.3	46	76.7	9.683 (P=0.008)
Hypersensitivity to odor	27	45	33	55	13	21.7	47	78.3	14	23.3	46	76.7	9.683 (P=0.008)
Satiety	18	30	42	18	14	23.3	46	76.7	10	16.7	50	83.3	2.981 (P=0.225)
Abdominal problems (pain discomfort)	17	28.3	43	71.7	16	26.7	44	73.3	13	21.7	47	78.3	0.759 (P=0.684)
Constipation	16	26.7	44	73.3	13		47	78.3	12	20	48	80	0.821 (P=0.663)
Diarrhea	21	35	39	65	19	31.7	41	68.3	16	26.7	44	73.3	0.985 (P=0.611)

χ^2 = Chi square, % = percentage, Significant level at p value ≤ 0.05, No. = number, SD= standard deviation d.f. = degree of freedom p= probability.

Table-12- shows there is highly significant difference among different period of test concerning; Fatigue; Nausea; Dry mouth; ; Persistent taste Hypersensitivity to odors.

4. Discussion

Analysis of patient's demographic characteristics of group study. The study reveals that the patients in the study (n=60) were allocated to a group study. The study shows that the majority of the study sample were (30%) in range (45 - 54) years and more than half of study sample were (58.33%) male. Most of the study population were (28.33%) Institute, College, or more of education level, (81.67%) married, (46.67%) worker of occupation, (66.67%) middle level of economic situation, (95.0%) not drinking, (71.67) not smoking. (Table 1).

Our finding showed gradually development increase of percentage of patients to adherence to healthy nutrition among different periods of the testes; that was mean very high statistical significance (P=0.001). (Table 3). This study sported by Kyle and Webber[11] stated that the nutrition care, the mean serving of fruits ate a day was 1.48 ± 1.56 servings. After the nutrition care, the mean serving of fruits ate a day was 1.52 ± 1.89 servings. A paired sample T-test was accomplished to assess the effect of the nutritional educational program on fruit eating. Mean fruit eating enhanced 0.04 servings a day after the nutritional educational program. This was not a statistically important change (p – value = 0.96). Before the nutrition care, the mean serving of vegetables ate a day was 0.94 ± 0.55 servings. After the nutrition care, the mean serving of vegetables ate a day was 2.02 servings. A paired sample T-test was accompanied to assess effectiveness of the nutritional educational program at enhancing vegetable eating. Mean vegetable eating enhanced by 1.08 servings a

day after the nutritional educational program which was statistically important (p – value = 0.02).

This study shows there is significant association between the changing of body weight and study groups (pretest, post 1and post 2), where P value was (< 0.05). This mean that the healthy nutritional educational program affected the weight (Table 4). This study supported by Percival and colleague[12] Body weight was stable in 27%, increased in 42% and decreased in 31% of enrolled patients post intervention. Two third of patients' body weight stabilized or increased after one month.

The study showed that majorly of patients in the study group suffered from fatigue (36.7%, 12% and 10%) (Pre, post1 and post2) respectively, Nausea (45%, 20 % and 8.3%) (Pre, post1 and post2) respectively; dry mouth (26.7%, 18.3% and 11.7%) (Pre, post1 and post2) respectively; Hypersensitivity to odors (45%, 21.7% and 23.3%) (Pre, post1 and post2) respectively; Persistent taste (36.7%, 20% and 10%) (Pre, post1 and post2) respectively; swallowing difficulties (36.7%, 12% and 10%) (Pre, post1 and post2) respectively, this improving of symptoms is denoting significant statistical at P value for dry mouth, fatigue, Nausea, hypersensitivity to odor, persistent taste and swallowing difficulties respectively, that affected nutritional intake (Table 5).

As previous researches Coa and collaborators [13] in 2015; Senesse collaborators[14] in 2014; Zabernigg collaborators[15] in 2010 stated that most patients treated with anticancer. Certainly, the principal treatment induced side effects included nausea, fatigue, dry mouth, changed sensations to odor and digestive transit complaints.

Kisha and coworkers[16] in 2015 reported that hematologic-oncologic patients were fewer to be expected to state a number of nutrition related issues. They were fewer to be expected to state a reduced appetite (29.7% vs. 42.8%; P < 0.01), and fewer to be expected to state eating fewer often (20.9% vs. 33.8%; P < 0.01). Patients with hematologic-oncologic (12.6% vs. 20.8%; P < 0.01) were fewer to be expected than other-patients to have an increased sensitivity to metallic-taste, and fewer sensitive to the odor of diet cooking than other-patients (8.0% vs. 13.6%; P = 0.02).

5. Conclusion

The effectiveness of Healthy Nutritional Educational Program on clinical outcomes for NHL patients is a good outcome. The study concluded that the HNEP are effective in enhancing dietary habits and improving of side effects of treatment of NHL patients.

6. Recommendations

Creating newly registered graduate nurse to assist cancer patients to choose a healthy diet that provides an adequate nutritional and fluid intake.

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