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Assessment of Nutritional Status of Women with Breast Cancer under Chemotherapy

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THIS research aimed to assess the nutritional status of women with breast cancer under chemotherapy .The study was carried out on a total sample of 57 patients receiving chemotherapy treatment ;a total number of 27 patients were selected from hospital in Cairo. represented as urban patients ,and A number of 30 were selected from Al-Gharbia Governorate, represented as rural patients .Their age ranged 40-50 years .The nutritional status was evaluated by using questionnaires 24 hours recall method ,diet history ,food frequency questionnaire, and subjective global assessment questionnaire .Clinical assessment was tested by Laboratory investigations .Results revealed that the patients from urban area had lower percentage in total caloric intake ,(55%) compared to the patients from rural area .(81%) Fat and protein intake were higher among urban patients than rural patients .While all tested patients had deficiency in protein ,fibers ,vitamin A ,C ,calcium and iron .Data revealed that total patient‘s sample were assessed by) SGA (were nutritionally at risk ,regarding the socioeconomics level Results revealed that urban patients had higher significant value than rural patients .The patients in urban community had 75% of total score ,while the patients live in rural had .59% In conclusion all samples were deficient in macronutrients and micronutrients .While their intake from Macronutrients were within the normal range ,but generally they had a total decrease in their calories intake ,and micronutrients intake .Because of that It is recommended that following the appropriate dietary patterns will lead to improvement in chemotherapy treatment outcomes; improve overall health.

Keywords :*Nutritional status ,Breast Cancer ,Subjective global assessment ,urban Patients, Rural Patients.*

Introduction

Breast cancer is the most frequent malignancy. It is defined a heterogeneous disease multifactorial disease ,remarkably common across the world .In ,2018over 2 million around the world ,and over 23,000women in Egypt specially were diagnosed with invasive breast cancer. (The Global Cancer Observatory, 2020).

An increase in numbers of women with major breast cancer risk factors ,including lower age of menarche ,late age of first pregnancy ,few numbers of pregnancies ,shorter or null periods of breastfeeding ,and a late menopause .Other risk factors which add to the burden of breast cancer are the increase in obesity ,alcohol consumption, inactivity, and hormone replacement therapy (HRT) (Colditz , Bohlke, 2015). Most well-established breast cancer risk factors are not easily modifiable such as family history ,age of menarche or menopause ,and reproductive history ,while diet considered as a modifiable factor ,which has been investigated as a potential means for breast cancer prevention (Xaio, et al., 2018). The nutritional and metabolic status has been related to cancer risk factors as well as to cancer treatments .Thus, The nutritional assessment plays a key role both in risk factors and in anti-cancer treatment because of that important for developing strategies for the promotion ,maintenance and / or recovery of

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nutritional status and cancer outcome (Bering, et al., 2015) Malnutrition is a common problem in cancer patients renowned as an important factor for increased morbidity ,decreased quality of life, decreased survival and high mortality. (Opanga et al., 2017). Increases in cancer prevalence have been leading to the ever-improving treatment modalities ,on top of surgery and radiotherapy, the use of chemotherapy as well as targeted therapy has increased along with the availability of supportive treatment for its side effect management (Dohler et al., 2015). Surgery and irradiation are local treatments that are completed within a couple of weeks ,and usually only the local adverse squeals are significant .In contrast, chemotherapy is scheduled over months or even years in some diseases .It is a systemic therapy often associated with a variety of side effects and can occasionally be life-threatening (Sasaki et al., 2017). Generally, physical side effects caused by chemotherapy have been well-characterized. Among the most common chemotherapy-induced side effects bone marrow ,neuropathies, gastrointestinal disorders, nausea ,and vomiting. Thus, many side effects affect the nutritional status (Chan, and Ismail 2015). Hence, the aim of this study was to assess the nutritional status of women with breast cancer under chemotherapy.

Subjects and Methods

This study was carried out on a total sample of 57women with breast cancer under chemotherapy. A number of 27 women were selected from hospitals Faculty of Medicine ,Ain Shams University ,Department of Oncology ,Cairo ,Egypt. represented as urban residential ,and 30 were selected from Tanta Cancer Center ,represented as rural residential .Their ages were 40-50 years. All women were subjected to dietary assessment that was carried out using-24 Hr Recall Method for the mean of 3 different days ,and each food was computed using the food composition table of National Nutrition institute (Food composition tables for Egypt, 1996). Regarding the nutritive value was compared with the recommended dietary allowance of the national academy of science. (Institute of Medicine. 2006). All patients were asked about all various foods that the women may eat through the month .A food frequency-questionnaire was designed to assess the frequency of some food items consumptions. Anthropometric measurements were measured using height and body weight (kg) to the nearest 0.1 kg, with minimum cloths without shoes (WHO 1983). Height was measured to the nearest millimeter by the use of a stadiometer with the subjects standing without shoes. (Weinbrenner,2006). While body mass index was calculated according to Jelliffe (1966) using the formula:

Body Mass Index) BMI (= Weight (Kg) / Height2 (m).

Socio-economic characteristics were administrated to obtain information about personal data and socioeconomic status questionnaires .The updating indicators for scaling the socioeconomic level of families for health research in Egypt (Fahmy, et al., 2015). The clinical assessment and health status have been assessed by using a questionnaire .Patient-Generated Subjective Global Assessment Short Form) PG-SGA SF (was used to screen the risk of malnutrition of patients (Abbott, et al., 2016). Laboratory Investigations were done using hemoglobin ,TLC ,and platelets concentration in the blood, liver, and Kidney functions (Creatinine and urea), and Serum electrolytes including calcium (Ca), and sodium (Na) concentration in serum were determined.

Statistical Analysis

All obtained data were analyzed using statistical package for the social sciences**) SPSS, (1986**for Windows ,version) 26 SPSS Inc,. Chicago ,IL ,USA). Collected data were presented as mean of results and ± standard deviation (SD).

Results

Results in Table (1) illustrated the distribution of the age and anthropometrics measurements for patients under chemotherapy .Data revealed that the mean value of age for patients from urban area was2.98 ± 44.78 y while it was2.98 ± 46.2 y ,from rural area.

Concerning height parameter ,it is observed that the height for the patients from urban area was significantly) P (0.05 > higher than the patients from rural residential with mean values of5.45 ± 164.1 cm vs5.25 ± 160.5.cm ,respectively .Regarding weight of the patients under chemotherapy ,data in Table (1) revealed that patients from urban area exhibited significant higher values (81.17 ± 10.37 kg.) compared with the patients from rural area (70.37 ± 13.36 kg.) Body Mass Index (BMI) showed the same trend. Body mass index for patients from urban area was 3.53 ± 29.87 Kg/m^2 which is highly significant vs 4.57 ± 26.95 .Kg/m^2 for patients from rural region.

Table (2) showed the distribution of grade of obesity of patients under chemotherapy .Data showed that 3% of total number from both groups urban and rural region ,showed underweight status .While the overweight status represented the highest percentage (45%) from urban area vs .there are 30% overweight patients from rural area .Concerning normal weight ,a total number of 2 patients from urban group had normal, while 10 patients from rural area ,however there was no significant. Regarding obesity (grade 1) the percentage of patients from urban region was higher than the percentage of patients from rural region (38% vs. 30%, respectively.) While Obesity (grade 2), a percentage of 7% of patients from urban residential (n=2) vs. 3% of patients from rural residential (n=1). Also, there was no there was no significant .This finding was close to a study by Befort., et al., (2011) who found that 68% of patients under investigation in their study were overweight and 37% were obese.

Table (3) shows the socioeconomic status of the rural and urban patients under chemotherapy. Concerning patient's education level ,data revealed that 96% of patients from urban region ,compared with (53%) of patients from rural region were graduated from university ,this was significantly)P (0.01=among tested patients .While 4% of patients from urban area had secondary education level ,compared with (20%) of patients from rural area .the patients from urban area was significantly)P (0.01=higher than the patients from rural area. Regarding to the parameter working patients of data revealed the patients from urban area was significantly higher) P (0.001 = than the patients from rural residential with percentage of74% vs ,33% .respectively .Concerning the monthly income ,the highest percentage (44%) was from the urban residential exhibited higher significant value) P ,(0.05 ≥compared with patients from rural residential .(10%) While 5 patients from the urban area had not enough income with a small

TABLE 1. Distribution of Age and Anthropometrics Measurements of Patients under Chemotherapy

Groups / Parameters	Patients (n) = 57. Urban (n) =27 Mean ± SD	Rural (n) = 30 Mean ± SD	P-value
Age (years)	2.98 ± 44.78	46.202.98 ±	0.074
Height (cm)	5.45 ± 164.1	160.55.25 ±	0.016*
Weight (kg.)	10.37 ± 81.1	13.36 ± 70.37	0.001*
BMI (Kg/m2).	29.873.53 ±	26.954.57 ±	0.01*

All data are presented as mean ± standard deviation (SD).
*P-value is significant at level of significance P.0.05 ≥

TABLE2. Distribution of Grade of Obesity of Patients under Chemotherapy

Obesity Grade / Groups	Patients (n) = 57. Urban(n) = 27		Rural(n) = 30		P-value
	No.	(%)	No.	(%)	
Underweight	**1**	**3**	1	3	0.204
Normal	2	7	10	33	
Overweight	12	45	9	30	
Obesity I	**10**	38	9	30	
Obesity II	**2**	7	1	3	

Values are expressed as frequency and percentage for grade of obesity.
*P-value is significant at level of significance P.0.05 ≥

TABLE 3: Distribution of Socioeconomic Status (SES) of Patients under Chemotherapy

Socio-Economic Factors	Patients (n) = 57				P-value
	Urban (n) = 27		Rural (n) = 30		
	No.	(%)	No.	(%)	
Patient's education					
Read and write	0	0	4	13	
Primary	0	0	1	3	
Preparatory	**0**	0	3	10	
Secondary	1	4	6	20	
University	26	96	16	53	*0.01
Patient's work					
Yes	20	74	10	33	0.001*
No	7	26	20	67	0.002*
Patient's computer use					
Never	2	7	14	47	0.001*
Sometimes	14	52	13	43	
Lots of Times	11	41	3	10	0.001*
Monthly income					
Not enough + big loan	0	0	6	20	0.001*
Not enough + small loan	5	19	12	40	0.002*
Enough only	10	37	9	30	0.001*
Enough and saving	12	44	3	10	
Family size (number).					
7<	1	4	1	3	
6	5	19	4	13	0.98
5	5	19	7	23	
4 >	16	58	18	59	
Total Score of SES(48)	36	75	29	59	0.001*

Values are expressed as frequency and percentage for SES.
*P-value is significant at level of significance P.0.05 ≥

loan vs 12 .patients live in the rural area had not enough income with a small loan, (19% vs. 40%, respectively), which is significant.

Generally, as results revealed the socioeconomics level had higher significant value of socioeconomic status (P-value < 0.05). The patients in urban community had 75% of total score ,while the patients live in rural had.59%

Table (4) clarified the mean of medical history factors of patients under chemotherapy. Data showed that all patients live in both residential (urban and rural) area, (100%) of patients had onset of the disease discovery the disease less than 1 year. Family history were found that 47% of urban patients, and 67% of rural patients had a cancer history of his family.

Regarding marital status, percentage of divorced patient among tested patients live in urban region and patients in rural residential was 7%, and 3%, respectively which is not significantly. The higher percentage of married patients was in patients from urban area, compared to the percentage of married patients in rural area (82% vs. 77%, respectively) which is not significant. The single patients represented 7% of patients from urban residential, while it

was 10% of patients from rural residential .While one patient from urban area was a widow ,while it was 4 widow patients from rural area ,which is not significant.

Regarding the age of the1 st porn child 30%of patients who live in urban area ,were significantly higher than patients from rural area patients .(16%) While 26% of the patients from urban area had their1 st child less than 20 years, this was significantly lower than the patients from rural area (67%) at the same category.

As for normal breastfeeding ,the highest percentage of patients under investigations were from both residential urban and rural, 50%)vs 73% .respectively ,(as seen in the same Table.(4)

Regarding the age at menarche ,both groups had a higher percentage at the age of menarche, less than 13 years .Patients from urban area vs. once from rural area represented 67%) vs% 80 . respectively (which is significant.

TABLE 4. Mean of Medical History Factors of Patients under Chemotherapy

Medical history	Response	Patients (n) = 57				P-value
		Urban (n) = 27		Rural (n) = 30		
		No.	(%)		(%)	
Onset of Disease discovery	< 1 year	27	100	30	100	NS**
Family history	No	9	33	16	53	0.13
	Yes	18	67	14	47	
Marital status	Divorced	2	7	1	3	0.81
	Married	22	82	23	77	
	Single	2	7	3	10	
	Widow	1	4	3	10	
Age at first born child	≤ 20	7	26	20	67	0.014*
	≤ 30	8	30	5	16	
	≥ 30	8	30	2	7	
Artificial feeding	Never	4	14	3	10	0.156
Normal breast feeding	No	10	36	6	17	
Never Breastfed.	Yes	13	50	21	73	
	Never	4	14	3	10	
Age at menarche	≤ 13	18	67	24	80	0.25
	≥ 13	9	33	6	20	
Smoking	No	9	33	17	57	0.007*
	Yes	7	26	0	0	
Alcohol	Negative	11	41	13	43	NS
	No	27	100	30	100	
Contraceptive pills	No	12	45	20	67	0.09
	Yes	15	55	10	33	
Analgesics	Yes	27	100	30	100	NS**

Values are expressed as frequency and percentage for SES.
* P-value is significant at level of significance P≤ 0.05.
** Not Significant

Regarding smoking parameter ,although the percentage of patients that negatively smokers is close between patients from both residential urban and rural 41%) vs ,% 43 .respectively.(Smoker patients from urban region were significantly) P (.0.05 ≥higher than patients from rural area ,a number of 7 patients from urban area were smokers ,and the lower percentages from non-smokers patients were from urban group, compared with non-smokers patients from rural region 33%) vs ,% 57 .respectively.(There is no significance in this result.

As for contraceptive pills ;a total number of12 patients from urban residential area and 20 patients from the rural area never took contraceptive pills. On the other hand ,the patients from urban area were higher than the patients from rural area 15)vs ,10 .respectively (have been taken oral contraceptive pills.

Concerning alcohol consumption ,and analgesics ,results showed the same trend .all patients from both urban area and rural area ,were non-alcoholic and depended on analgesics with a percentage of ,(100%) which is not significant.

Results in Table (5) showed the mean values of hemoglobin ,TLC ,and platelets concentration in the blood of patients under chemotherapy .Data illustrated that the mean value of hemoglobin concentration of patients under investigations, was close among patients from urban residential and patients from rural residential1.5 ± 11.3) g/dL 1.5± 11.63 ,g/dL ,respectively .(All mean values showed non-significant differences. Regarding Total Leukocyte Count) TLC ,(and platelets concentrated in the blood ,as shown in Table (5) they had the same trend as hemoglobin. The mean value was close between both groups and there was no significant.

Means value of serum liver ,kidney functions and serum electrolytes levels in the blood of patients under chemotherapy was tabulated in Table .(6) Data showed that non-significant difference regarding Aspartate Aminotransferase)AST (among tested patients .The mean value of AST level in serum ,for patients from urban region was 8.9 ± 34.91) *IU/l ,(*with corresponding mean value for patient ,from rural region11.3± 36.13) IU/l .(Regarding Alanine Transaminase) ALT(patients from urban area exhibited significant) P (0.01=decrease in the level of) ALT (in serum, compared with patients from rural area ,with mean value 14 ± 45.51 vs ,16.5± 55.90 .respectively. Concerning total bilirubin ,the patients from urban area showed significant increase) P,(0.04= compared to the tested patients from rural area. Creatinine and urea concentrations in serum of all patients were in the normal range ,and no significant differences were detected among tested patients from both residential areas.

Results in Table (6) showed that serum calcium) Ca (+and serum sodium) Na (+levels, had close mean values among patients tested from both areas ,concerning serum) Ca (+mean value was 0.95 ± 7.74 vs ,0.98 ± 8.13 .respectively. While mean value of serum Na^+was10.9 ± 128.3 vs ,130.72±10.8 .respectively.

Table (7) illustrated mean value and standard deviation of nutrients intake in relation to Recommended Daily Allowance) RDA (of patients under chemotherapy .Results found that the mean of energy intake was significantly) P≥ (0.05lower in patients from urban residential which was 513.36 ± 1348.72 k.cal ,while it was 432.1 ± 1719.7 K.cal in patients from rural residential .Generally ,both patients from both areas were below the RDA with a percentage of 59%and ,% 76 respectively.

TABLE 5. Mean values of Hemoglobin, Total Leukocyte Count (TLC), and Platelets Concentration in The Blood of Patients under Chemotherapy

Laboratory test.	Patients (n) = 57		P-value
	Urban(n) = 27 Mean ± SD	Rural (n)= 30 Mean ± SD	
Hemoglobin (g/dL)	**11.3 ± 1.5**	**11.63 ±1.5**	0.46
Total Leukocyte Count (103/ml)	**5.54 ± 1.4**	**±2.8 5.25**	0.62
Platelets((109/L)	76.7 **±** 212.**3**	213 ±**76.5**	0.97

All- data are presented as mean ± standard deviation.

* P-value is significant at level of significance P.0.05 ≥

TABLE.6Means Value of Serum Liver ,Kidney Functions and Serum Electrolytes Levels in the Blood of Patients under Chemotherapy

Parameters	Patients	Patients (n) = 57 Urban (n)= 27 Mean ± SD	Rural (n) = 30 Mean ± SD	P-value
Aspartate Aminotransferase (IU/l)		34.91 ± 8.9	36.13 ±11.3	0.37
Alanine Transaminase (IU/l)		45.51 ± 14	55.90 ±16.5	0.01*
Total Bilirubin (mg/dL)		1.09 ± 0.17	1.19 ±0.18	0.04 *
Urea (mg/dl)		34.22 ± 15.1	38.92 ±16.4	0.26
Creatinine (mg/dl)		1.18 ± 0.24	1.23 ±0.22	0.47
Serum Calcium (mg/dl)		7.74 ± 0.95	8.13 ±0.98	0.13
Serum sodium (mEq/l)		128.3 ± 10.9	130.72±10.8	0.40

All data are presented as mean ± standard deviation.
*P = 0.05 ≥significant.

Concerning protein intake ,both patients' groups from urban and rural area had a close percentage ,79%) and ,78% respectively.(

Fat intake in the same Table (7) the highest mean intake was among patients from urban area, 12.70 ± 77g.

While patients from rural area had the lower mean 13.4 ± 67 gm ,.the patients from urban area, which was significantly higher than the other group.

As for carbohydrates intake, it was noticed that the highest percentage (91%) of the patients from urban group, and 84% of the patients from the rural group, with mean values (257 ± 47.19gm, vs. 239 ± 40.3gm respectively, which is not significant.

At the same table, it was noticed that both groups from urban and rural had less fiber intake compared with the RDA. The mean value of fiber intake was 14 ± 5.72g,13 ± 4.4g, respectively.

As regards Vitamin A it is evident that that patients from urban area exhibited significant (P=0.001) lower values than the patients from rural area, which is (394 ± 122.60 IU), and the patient live in rural area had higher intake (544 ± 101.9 IU). They had a percentage in relation to RDA 56% and 78 % respectively. In the present study, a significant reduction in vitamin A.

As the same Table (7) the deficient of Vitamin C was apparent in all patients. In both areas, with a mean value of vitamin A (43 ± 15.48mg, 44 ± 10.6mg., respectively) which represented as 58 % and 59 %, respectively of RDA level.

Concerning calcium intake, patients from urban residential had a significant ($P \leq 0.05$) lower intake than patients from rural residential (527 ± 84.97mg vs. 703 ± 162.1mg, respectively). however, both groups were less than the RDA with a percentage 53% and 70% respectively.

Concerning iron intake, it had the same trend as calcium. Both groups were less than the RDA, patients live in urban area represented 73% of RDA, while patients live in rural area represented 63%. However, patients from urban group were significantly (P=0.031) higher mean than patients from rural group with mean (13 ± 3.45mg vs.11 ± 2.7mg respectively).

Table (8) showed the mean score of Subjective Global Assessment) SGA (of patients under chemotherapy .Data revealed that all patients assessed by) SGA (were nutritionally at risk. Patients from urban area had a higher score than the patients from rural area.

Discussion

Breast cancer is the most frequent malignancy in women ,and one of the most ,one of the most common complications related to the disease ,is malnourishments after treatments and side effects of the chemotherapy.

The goals of nutrition management for this study are to supply adequate intake of macronutrients and micronutrients that also play

TABLE 7. Mean Value of Nutrients intake in Relation to Recommended Daily Allowance) RDA (of Patients under Chemotherapy

Parameters	Mean of RDA	Patients (n) = 57				
		Urban (n) = 27		Rural (n) = 30		P-value
Nutrients intake		Mean ± SD	%	Mean ± SD	%	
Energy (k.cal)	2273	1348 ± 513.36	59	1719 ± 432.1	76	0.005*
Protein (gm)	114	89 ± 15.00	79	89 ± 24.0	78	0.937
Fats (gm)	76	77 ± 12.70	101	**67** ± 13.4	88	0.006*
Carbohydrates (gm)	284	257 ± 47.19	91	239 ± 40.3	84	0.107
Fibers (gm)	25	14 ± 5.72	56	13 ± 4.4	54	0.621
Vitamin A (IU)	700	394 ± 122.60	56	544 ± 101.9	78	0.0**0**1*
Vitamin B1 (mg)	1.1	3 ± 12.33	305	1 ± 0.3	82	0.286
Vitamin C (mg)	75	43 ± 15.48	58	44 ± 10.6	59	0.788
Calcium (mg)	100**0**	527 ± 84.97	53	703 ± 162.1	70	0.001*
Iron (mg)	18	13 ± 3.45	73	11 ± 2.7	63	0.031*****
Phosphorus (mg)	700	563 ± 91.99	81	729 ± 163.0	104	**0.002***

All data are presented as mean ± standard deviation and percentage.
* P = 0.05 ≥significant.

TABLe 8 .Score of Subjective Global Assessment) SGA (of Patients under Chemotherapy

Subjective Global Assessment (SGA)	Patients (n) = 57		P-value
	Urban N = 27	Rural N = 30	
History of) weight ,food intake ,symptoms ,and physical activity.	17	11	0.026*****
Disease and nutritional requirements	1	1	1
Metabolic demand	0	0	0.585
Physical activity	0	1	0.05*****
Total score of SGA.	14	12	0.067

All data are Values are expressed as mean values.
* P = 0.05 ≥significant.

role as an anti-cancer diet ,lower the side effects of chemotherapy ;increase survival ,and improve Quality of Life) QoL .(Also ,it is recommended that this diet should be aiming to weight management that would help influences both the risk of developing BC.

The results of this study revealed that ,the urban women had the lower mean ages value but not significant .Our study agreed with a study by **William ,*et al* (2018) ,.**who presented that the majority of the patients in their study at the age of 49 - 41yrs .while disagreed with **Jarvandi(2016) ,** who mentioned in his study that two thirds of all newly diagnosed female breast cancer patients are in the age 55 years and older and this can be attributed to the postmenopausal period of life. While according to**) Coa ,et al (2015 ,.**younger patients were more likely than older patients to report chemosensory alterations ,which may be attributable to olfactory and gustatory functions diminishing with age which in the same line of our study.

These results regard body mass index for patients from urban was higher than the rural ones and ,these results are in agreement with **Befort ,*et al*** (2011) **,.**who found that the mean BMI of their patients with breast cancer was 29.0 kg/m2.

The education level was higher in urban patients than rural patients **,Preeti , *et al*(2016) ,.** found that maximum patients from rural area had a higher education level (66%) and with no education level (33%) which opposed our findings and this difference could be due to the difference of age of the selected sample .On the other hand, our study agreed with a study by **William ,*et al*,. (2018)**who found that (73.3%) of rural patients were illiterate.

Regarding the monthly income ,urban patients are working and had higher income than the patients live in rural area and ,this result agreed with **William ,*et al* (2018) ,.**who found that 91.7%of patients living in rural area are not working .This also came along with another study by **El-Azayem ,*et al* (2016) ,.**who found that the high socioeconomic status of patients and higher education level are related to the high monthly income of patients in urban region.

As for family history 53% of rural patients had a cancer history in their family ,and 33% of urban patients had family history ,this result was close to study by **Esmail H ,.*et al* (2017) ,.**who found that 30.5% of his patient‘s had family history of breast cancer .Which also is in agreement with a finding of a study by **William ,*et al* (2018) ,.**found that 88.3% of most cancer patients had family history .In our study the majority of patients were married this was in agreement with a study by **Dey ,*et al* (2010) ,**who found that women had their1 st born child at earlier ages than women live in urban region ,due to the early age of marriage. According to**) Texeira & da Graca (2014 ,**in their study" Marital Status and Survival in Patients with Cancer ,"single patients were at significantly higher risk of presentation with metastatic cancer, under treatment ,and death resulting from their cancer .Regarding breastfeeding the highest percentage of patients were from both areas urban and rural ,but the rural patients was higher than the urban ones) .**Dey ,*et al* (2010 ,**in their study, that was in agreement with our findings ,that the urban patients are more educated resulting in bigger chances of work ,higher age of marriage, lesser number of children ,and reduced of normal breastfeeding .The higher numbers of patients who have been taken oral contraceptive pills were from urban area, this result was different than the findings by **Gewaifel ,.*et al* ,(2019) ,.**who found that 24.3% of rural patients have been taken oral contraceptive and 31.3% of the urban had the higher percentage of talking oral contraceptive pills.

Regard smoker patients they were from urbans**)** ,**William ,*et al* (2018 ,.and**) **Al-Naggar, and Chen (2011** found that with nearly all the patients from both regions urban and rural(100%) were not smoking .This was in disagreements with our findings .All tested patients in our study were non-alcoholic .Our findings agreed with **William, *et al* (2018) ,.and Al-Naggar ,and Chen(2011)** who found that nearly all the patients from both regions urban and rural were non-alcoholic.

Regarding hemoglobin ,TLC ,and platelets concentration in the blood ,all tested patients in both groups were at normal range an increased in AST and ALT level in serum for patients, these results were in agreement with a study by **Preeti ,*et al* ,(2016) ,.**who found that all patients were in the normal level of hemoglobin ,TLC, and platelets concentration in the blood .While regarding liver functions the urban showed decreased mean values than rural patients ,Our findings were in agreement with a study by **Preeti, *et al* (2016) ,.**who found that the normal level of)AST and ALT (before starting of chemotherapy treatment session was observed to be less than normal ranges ,and after the sessions it is noted to be increased .Creatinine and urea concentrations in serum of all patients were in the normal range, while regarding serum electrolytes both groups had close mean values among patients and it was less than normal range ,That is agreeing with a study by **Cavusoglu ,*et al* (2010) ,.**who found that hyponatremia and hypocalcemia is the commonest electrolyte abnormality in breast cancer patients.

our finding regard protein intake disagreed with the findings of **Levine ,*et al* (2014) ,.**who found that potentially experiencing benefits from low protein intake ,On the contrary ,**Limon ,.*et al* (2017) ,.**who suggested that ensuring the daily intake of 1.5–1.2 g protein daily for each 1 kg body weight is better for breast cancer patient ,and that meets our findings that increased in protein intake is better for patients ,especially during the chemotherapy intake **.**A study by **mohammed ,*et al* (2013) ,.**who found that the intake of fat and cholesterol were lower than the recommended dietary allowances and that disagreed with our findings that found that both groups had higher fat

intake compared with RDA , another disagreement with our study who found that fat intake was reduced among breast cancer patients undergoing chemotherapy) Brown ,et al ,(2001 .on the other hand ,another study by Bing ,et al(2004),. agreed with our study that patients who received chemotherapy treatment had an increased levels of cholesterol .Concerning carbohydrates intake our findings are not matching with the study by mohammed ,et al (2013) ,.who found that the intake of carbohydrates and protein among the patients in the present study was higher than RDA level. However another study was matching our findings a by Klement ,and Kämmerer(2011) , who noticed a decreased in carbohydrate intake with the increasing of chemotherapy dosage among breast cancer patients .Fibers intake was lower than RDA in both patients 'groups ,this agreed with a study by mohammed ,et al,(2013) ,. who found the lowering of fibers intake less than RDA level .While another study by Farvid ,et al,. (2016)found that women have a higher intake of fibers and that lowered the risk of cancer ,and 5%lower of breast cancer risk was seen for each 10g/day increase of fiber intake .A reduction in vitamin A intake in all patients from both areas, these finding are in line with the observations of Matos ,et al (2014) ,.who reported significant reductions in the levels of intake of vitamins A, in patients with stage III oral cancer who received chemotherapy .Regarding Vitamin C has the same trend as vitamin A ,these findings are in agreement with Matos ,et al (2014) ,.who found a reduction in vitamin C intake ,in patients with breast cancer who received chemotherapy.

Concerning minerals ,it was noted that iron and calcium ,all patients had a deficient intake of iron and calcium ,these results agreed with Cavusoglu ,et al (2010) ,.who found that all patients under chemotherapy suffered from iron deficiency and calcium deficiency ,due to intake reduction of iron and calcium.

Data revealed that total patient's sample were assessed by) SGA (were nutritionally at risk ,this finding agreed with a study by Bering, et al 19.2% 2015 ,.of the patients were classified as suspected or moderately malnourished when assessed by SGA .Vashi et al 2008 ,.found that 29.1%of patients with breast cancer showed malnutrition .And another study by Coa et al,. (2015)in agreement with most patients diagnosed with cancer will receive chemotherapy ,and patients undergoing medication experience and large number of symptoms ,including fatigue, pain ,dyspnea ,nausea ,loss of appetite ,and unintentional weight change .These symptoms can negatively impact one's ability to complete treatment as well as one's quality of life during and after treatment.

Conclusion

All tested patients had deficiency in Energy, protein ,fibers ,vitamin A ,C ,calcium and iron, while their intake were close to the normal range, regarding fats and carbohydrates ,although total patients 'sample who assessed by) SGA (were nutritionally at risk .it is recommended that it would be better to simply suggest a" healthy" dietary pattern during and after treatment, following the appropriate dietary factors that Contain vitamins ,minerals ,fiber ,and various cancer-fighting phytonutrients ,and main source of healthy fats ,complex carbohydrates ,and right quantity and type of protein ,Will lead to improvement in chemotherapy treatment outcomes ;improve overall health ,and prognosis.

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