NUTRITIONAL STATUS AND NUTRITIONAL BEHAVIOUR OF   CANCER SURVIVORS

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Abstract

Introduction: Cancer is a leading cause of death worldwide, accounting for nearly 10 million deaths in 2020, or nearly one in six deaths. One defining feature of cancer is the rapid creation of abnormal cells that grow beyond their usual boundaries, and which can then invade adjoining parts of the body and spread to other organs; the latter process is referred to as metastasis. Widespread metastases are the primary cause of death from cancer (WHO, 2022). The aim of the study is to assess the nutritional status and nutritional behaviour of cancer survivors attending medical, surgical and radiation oncology OPD's of a cancer hospital.

Materials and Methods: This is a   cross sectional hospital based study carried out on 290 cancer survivors among which 118 men and 172 women suffering with various cancer diseases and attending medical, surgical and radiation oncology OPD's of a cancer hospital, after obtaining institutional ethical clearance from SPMVV, Tirupati (AP).Nutritional status was assessed using anthropometric, dietary assessment methods and nutritional behaviour was assessed by food habits, frequency of food intake, dietary diversity score (DDS), food likes and dislikes.

Results: Among 290 cancer survivors, majority (45.9%) were above 51 years of age, the mean dietary nutrient intake of the men (n=118) and women (n=172) were below normal when compared to their Recommended Dietary Allowance (RDA) for their age (ICMR, 2021). There was no significant association found between independent variables and DDS (Dietary Diversity scores) of cancer survivors.

Conclusion: The Cancer survivors need nutrition educational intervention to improve their nutritional behaviour and nutritional status.

Introduction:

The concept of survivorship related to cancer patients was introduced into the Western world, early on, between the sixth and seventh decades of the 20th century, when the development of effective treatments led to improved survival from a hitherto deadly disease (NCI, 2021). A cancer patient is a survivor, from the day of diagnosis of a potentially fatal illness, through the myriad of treatments, many of which are as toxic as the disease itself; and after treatment is complete, going on to live as normal life as possible. Nourishment is an imperative perspective of care within the administration of cancer at all stages, from determination to survivorship [Ravasco, 2019; Barrera and Wahnefried, 2009). An individual's move from a cancer understanding to a cancer survivor is challenging and frequently related with way of life and behavioral changes, counting those of a wholesome nature. Regularly side impacts of treatment can continue, such as weariness, taste, and scent changes. This may adversely affect the capacity or want to devour nourishment and share in physical action [Gegechkori etal., 2017).The part of sustenance as a basic portion of a solid way of life for cancer survivors is well acknowledged (Chapman et al., 2011). Cancer modifies metabolic and physiological perspectives of patients' dietary needs for carbohydrate, protein, fat, vitamins and minerals (Vanderbroek and Schrijvers, 2008).There is an increasing body of evidence that lifestyle interventions including a healthy diet, weight management and increased physical activity can influence the rate of cancer progression and improve overall survival (Davies et al. 2011, Pekmezi & Demark-Wahnefried 2011).The aim of the study is to assess the nutritional status and nutritional behaviour of cancer survivors attending medical, surgical and radiation oncology OPD's of a cancer hospital.

Materials and methods:

This is a cross sectional hospital based study carried out on 290 cancer survivors among which 118 men and 172 women suffering with various cancer diseases and attending medical, surgical and radiation oncology OPD's of a cancer hospital, after obtaining institutional ethical clearance from SPMVV, Tirupati (AP). The male and female cancer survivors aged between 25 to 65 years with any of the organ cancer were considered for inclusion in the study. The patients with third and fourth stage of cancer and those with co-morbid complications were excluded from the study. A structured questionnaire developed for the purpose was used to collect demographic information, nutritional status was assessed using anthropometric, dietary assessment methods and nutritional behaviour was assessed by food habits, frequency of food intake, dietary diversity score (DDS), food likes and dislikes.

Results and discussion: The data collected from 290 cancer survivors were tabulated and analyzed and presented as follows;

Body Mass Index (BMI): The data collected on height (cm)and weight (kg)of each respondent was used to calculate the Body Mass Index and the sample were categorized based on their BMI as shown table 1

Table 1: Distribution of the Respondents by their BMI

BMI of the Respondents	Per cent	Frequency
BMI (3 Categories)		
Underweight (≤ 18.5)	14.8	43
Normal (18.5 – 24.9)	52.1	151
Obese (>25)	33.1	96
Total	100.0	290

The BMI of the sample reflects that a 14.8 percent were under weight, a 52.1percent were normal and 33.1 percent were obese. Which indicates that majority of the sample had normal BMI, a notable percent were obese and a considerable percent were underweight. The BMI of cancer also depends on the diet, medication and other health issues. The impact of body composition on breast cancer chance and results for breast cancer survivors is well recorded (McDonald et al., 2011).

Dietary Nutrient Intake:

The researcher made an effort to assess the dietary intake of the respondents by collecting their previous day's menu and intake of all the food items using 24 hour recall method and set of standardized vessels (for volume) and translated into their raw equivalents and calculated the nutritive values of each respondent's diet for selected nutrients; Energy, Protein, Vitamin A, Vitamin C, Iron and Folic Acid using Nutritive Value of Indian Foods (ICMR,2021).The mean dietary nutrient intake of men and women were presented in Table 2

Table 2: Distribution of cancer survivors by Selected Dietary Nutrient Intake Indicators

Selected Dietary Nutrient Intake Indicators	Minimum	Maximum	Mean	Standard Deviation
Men (n = 118)				
Energy (kcals)	1168	1927	1559	139.1
Protein (g)	15	65.5	52	6.4
Vitamin A(µg)	153	826	564.7	173.3
Vitamin C (mg)	3.7	27	18.3	4.1
Iron (mg)	11	20.5	15.7	1.8
Folic Acid ((µg))	36.8	178	132.5	29.3
Women (n = 172)				
Energy (kcals)	1011	1846	1402	165.9
Protein (g)	30.4	94	47.9	7.9
Vitamin A(µg)	59	1158	467.8	184.1
Vitamin C (mg)	5	31	17.7	4.6
Iron (mg)	7.3	22	15.1	2.4
Folic Acid ((µg))	13.8	197	120	33.3

The mean dietary nutrient intakes of the men (n=118) and women (n=172) presented in table 2, indicates that they were below normal when compared to their recommended dietary Allowance (RDA) for their age (ICMR, 2021).

Nutritional behaviour:

The cancer survivors nutritional behaviour, food habits, frequency of meals consumed and water consumption per day in litres was recorded and presented in Table 3, which reflects that majority (62.1%) took more than two litres of water per day, around 55.5% were non vegetarians and 70% had meals less than or equal to three times a day.

Table 3: Distribution of the Respondents by Selected Indicators of

Nutritional Behaviour

Selected Indicators of Nutritional behaviour	Per cent	Frequency
1. Intake of Water (in Litres)		
≤ 1-2	37.9	**110**
>2	62.1	**180**
2. Food Habits		
Vegetarian / Ovo-Vegetarian	44.5	**129**
Non-Vegetarian	55.5	**161**
No. of Meals (Per Day)		
≤ 3	**70.0**	203
>4	**30.0**	87
Total	**100.0**	**290**

Likes and dislikes towards certain foods are frequently thought to play a colossal part in eating behaviors. The joy we infer from nourishment may be one of the foremost in the event that not the foremost critical variables contributing to nourishment admissions (Eertmans, et al., 2001; Rozin & Zellner, 1985; Rozin, 1990). It was found that among the men and women majority have expressed liking for cereals (men=99.2% and women =100%), pulses (men=78% and women =83.1%), vegetables (men=81.4% and women =80.2%), fruits (men=66.9% and women =75%), milk and milk products (men=73.7% and women =83.7%), eggs (men=88.1% and women =76.7%) and beverages (men=77.1% and women =75%). In contrast to these preferences less than 20 percent of sample liked millets, nuts and oil seeds. Moreover around 45 to 55 percent of men and women liked poultry, meat and sea foods, the women (72.7%) preferred junk foods than their male (54.2%) counter parts.

Table 4: Distribution of the respondents by selected foods likes and dislikes across Gender

Selected Oral Supplements Intake	Men	Women	Total	χ2	df	p-value	χ2	df	p-value
	%	No.	%	No.	%	No.			
1. Cereals									
Dislike	0.8	1	0.0	0	0.3	1			

	Men	Women	Total	χ2	df	p-value	χ2	df	p-value
Like	99.2	117	100.0	172	99.7	289	1.463	1	0.407
2. Pulses							1.219	1	0.288
Dislike	22.0	26	16.9	29	19.0	55			
Like	78.0	92	83.1	143	81.0	235			
3. Millets							0.063	1	0.863
Dislike	85.6	101	86.6	149	86.2	250			
Like	14.4	17	13.4	23	13.8	40			
4. Nuts & Oil Seeds							2.487	1	0.077
Dislike	87.3	103	80.2	138	83.1	241			
Like	12.7	15	19.8	24	16.9	49			
5.Vegetables							0.057	1	0.880
Dislike	18.6	22	19.8	34	19.3	56			
Like	81.4	96	80.2	138	80.8	234			
6. Fruits							2.237	1	0.087
Dislike	33.1	39	25.0	43	28.3	82			
Like	66.9	79	75.0	129	71.7	208			
Selected Oral Supplements Intake	**Men**	**Women**	**Total**	χ2	df	p-value	χ2	df	p-value
7.Milk Products							4.312	1	0.05*
Dislike	26.3	31	16.3	28	20.3	59			
Like	73.7	87	83.7	144	79.7	231			
8. Eggs							5.993	1	0.01**
Dislike	11.9	14	23.3	40	18.6	54			
Like	88.1	104	76.7	132	81.4	236			
9. Poultry							0.769	1	0.403
Dislike	50.0	59	55.2	95	53.1	154			
Like	50.0	59	44.8	97	46.9	136			
10. Meat							2.188	1	0.087
Dislike	44.1	52	52.9	91	49.3	143			
Like	55.9	66	47.1	81	50.7	147			
11.Sea Foods							0.478	1	0.549
Dislike	51.7	61	55.8	96	54.1	157			
Like	48.3	57	44.2	78	45.9	133			
12. Beverages							0.172	1	0.780
Dislike	22.9	27	25.0	43	24.1	70			
Like	77.1	91	75.0	129	75.9	220			
13. Junk Foods							10.481	1	0.001***
Dislike	45.8	54	27.3	47	34.8	101			
Like	54.2	64	72.7	125	65.2	189			
Total	**100**	**118**	**100**	**172**	**100**	**290**			

The results of chi square test reveals that there was no significant association found between the food likes and dislikes of men and women for; cereals, pulses, millets, nuts and oil seeds, vegetables, fruits, poultry, meat, sea foods and beverages as p value is greater than 0.05. In contrast, there was significant association

found between gender and food likes and dislikes for milk and milk products (p=0.05*), eggs (p=0.01**) and junk foods (p=0.001***). In the event that eating behaviour isn't seen as engaging in terms of appearance, scent, taste, and surface it likely will not be eaten (Hetherington & Rolls, 1996). Although interest in eating inclinations do not imply that it has impact on eating behaviour, likes and dislikes, provided they have a knowledge on healthy food choices.

Dietary Diversity Score (DDS):

DDS provides a simple score which reflects a number of different food groups consumed over a given period (Hoddinott et al., 2002). There are various DDSs developed and used for different purposes. In the present study the Dietary Diversity Score card was prepared by Sarada (2014) as part of UGC funded major research project on Family nutritional behavioural risk factors surveillance was used to examine the frequency of food intake of cancer survivors and to identify the quality of food consumed. The DDS card consisted of 21 food items with their quantity of consumption per day and score assigned to per portion, the total positive score was 28 and negative score was -4 per day. Thus, the total score for each respondent per week was calculated and the negative score was deducted (196-28=168), thus the ideal score was 168 for a person consuming a diet drawn from all the 17 groups and excluding foods from four groups. The maximum score as 168 per week, 28 per day and the minimum score as 104 per week and 16 per day. The mean DDS per week was 113.5 and per day was 16.5. The standard deviation was larger indicating that the sample were varied in their DDS

Table 5: Distribution of the Respondents by their DDS per Week and Per Day (N=290)

Total DDS	Minimum	Maximum	Mean	Standard Deviation
Total DDS/ Week	104	168	113.5	52.24
Total DDS/ Day	16	28	16.5	7.46

It was found that there was no significant association between seven independent variables and cancer survivors' DDS per week and per day. There was significant association found between the predictor variables namely: education (p=0.05*), marital Status (p=0.01**), monthly income (0.01**) and relationship of caretaker (p=0.01**) at 0.05 and 0.01 level respectively.

Table 6: Association between independent variables and their DDS

S.No	Independent variables	DDS per Week		DDS per Day	
		χ^2 -Value	p-value	χ^2 -Value	p-value
1	Age	1.817	0.164	1.775	0.171
2	Gender	16.803	0.001	18.913	0.001
3	Domicile	1.719	0.087	1.740	0.083
4	Religion	0.199	0.820	0.176	0.839
5	Marital Status	5.008	0.01**	5.041	0.01**

6	Education	2.937	0.05*	2.971	0.05*
7	Occupation	1.824	0.163	1.762	0.176
8	Monthly Income	4.582	0.01**	4.695	0.01**
9	Type of Family	0.387	0.699	0.401	0.689
10	Family Size	0.046	0.955	0.050	0.095
11	Relationship of Caretaker	5.216	0.01**	5.003	0.01**

*Significant @ 0.05 level and ** very significant @0.01 level

Conclusion:

From this study we have drawn the conclusion that among the sample majority were under the age of ≥ 50 years, The mean dietary nutrient intakes of the men (n=118) and women (n=172) were below normal. There was no significant association found between seven independent variables and cancer survivors' DDS per week and per day, there was significant association found between the four predictor variables; marital status, monthly income, relationship of care taker and education at 0.001 and 0.05 level of significance. These findings indicate that these four variables may influence the nutritional status and nutritional behaviour of the cancer survivors. There is every need to address the dietary diversity , dietary intake and nutritional behaviour of cancer survivors to improve their nutritional status and nutritional behaviour

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