

Nutritional Status of Children with Cancer and Role of Supplements – An observational study

Shweta Rammohan*
Padma Vijaykumar**

Abstract

Article Received: 1st June, 2018
Article Revised: 10th June, 2018
Article Accepted: 25th June, 2018

Keywords:

Nutritional care in cancer;
Role of supplements;
Nutritional status of Children with cancer; Knowledge on cancer diet.

Nutritional status of children with cancer is often compromised during treatment and recovery period. Nutritive care is of key importance. Nutritional status of 100 inpatient children aged 1-14 years was assessed and their BMI were compared with world health organization standards. Below - 2SD of the reference median on these indices were observed, indicating undernourished samples. Records of weight from secondary data were compared and observed, ninety seven percent of total samples had gained weight during hospital stay which was statistically analyzed ($p \leq 0.001$). A 24-hour dietary recall was conducted; protein and calorie intake and adequacy were assessed with respect to recommended dietary intake (RDA). The adequacy of total protein consumption in the diet of the samples with added protein supplements was adequate [Males ($t=3.59^*$, $p<0.05$), Females ($t=2.55^*$, $p<0.05$)]. The adequacy of total calorie consumption in the diet of samples with added calorie supplements was adequate [Males ($t=3.47^*$, $p<0.05$), Females ($t=2.47^*$, $p<0.05$)]. Cumulative findings suggested that the nutritional status of children was compromised however showed signs of improvement with diet provided. Knowledge on cancer diet was assessed; lack of knowledge on the same was noted. An educational program on cancer diet for children and primary care takers was conducted.

Copyright © 2018 International Journals of Multidisciplinary Research Academy. All rights reserved.

Author correspondence:

First Author,

M.Sc. DFSM, IGNOU, Study Center-Mount Carmel College, Autonomous, Bengaluru

Corresponding Author Email Id: shwetarammohan@gmail.com

1. Introduction

Nutrition is an important part of the health of all. Nutrition becomes even more essential when individuals especially the vulnerable groups are diagnosed with cancer. Good nutritive support is beneficial. Both cancer and its treatments may affect a child's appetite, tolerance to foods, and their body's ability to use nutrients. Eating the right kinds of foods before, during, and after treatment can help a child in various ways such as staying closer to the treatment plan schedule, heal and recover faster, have less risk of infection during treatment, have better strength and energy, keep up their weight and their body's store of nutrients, do better at keeping up normal growth and development, feel better and have a better quality of life – they are less irritable, sleep better, and work better with the health care team. India is a developing country with one of the most diverse populations and diets in the world. Change of diet is among the factors that may be responsible for the changing disease rates [19]. Malnutrition is often seen at the point of diagnosis in childhood malignancy or may develop during the course of treatment. Strategies for optimal diagnosis and management of nutritional problems in children with cancer are limited in the published literature. Identification of children who may be malnourished or at nutritional risk can be achieved through improved approaches for risk stratification and classification [5]. A high-energy high-protein diet can provide patients with sufficient energy to meet their nutritional needs and increase their physical performance and may also be used to try to increase their treatment tolerance and decrease therapy-related side-effects [18]. The report is based on the databases of population-based cancer registries. The most frequent single diagnoses are: acute lymphoblastic leukemia, astrocytoma, neuroblastoma, non-Hodgkin lymphoma, and nephroblastoma [10].

Adequate nutrition during cancer plays a decisive role in several clinical outcome measures, such as treatment response, quality of life, and cost of care. However, the importance of nutrition in children and young adults with malignancies is still an underestimated topic within pediatric oncology [2]. Malnutrition is particularly of concern as it has been shown to independently lead to increased hospital readmissions and in-hospital mortality, even after adjusting for disease type and severity [1]. There are very limited studies where nutritional status has been assessed at baseline of cancer children and adolescents [7]. The Indian data which are available are mostly focused on childhood leukemia [11].

2. Research Method

Objectives: a) To assess nutritional status of children 2) To evaluate importance of added protein and calorie supplements to balanced diet 3) To assess the knowledge of primary caretakers/ respondents on cancer nutrition 4) To provide information on cancer diet through nutritional education program.

2.1 Pilot study and data collection

2.1.1 Inclusion criteria: a) Inpatient children of different pediatric wards of the hospital b) Age between 1 -14 years

2.1.2 Exclusion criteria: a) Inpatient children diagnosed with cancer (all types) below 1 year of age and above 14 years of age. 2) Inpatient children diagnosed with cancer that were immobile and in unconscious state.

3) Outpatient children

2.1.3 Research setting and duration of study: Kidwai Memorial Institute of Oncology (KMIO), Bengaluru; 3 months

2.1.4 Study design: Observational qualitative descriptive clinical study.

2.1.5 Type of sampling: a) Simple random sampling b) Sampling size: 100

2.1.6 Research tools used for collection of data: Interview schedule and 24-hour recall

2.1.7 Data analysis & Statistical methods: Descriptive and inferential statistical analysis has been carried out in the study.

2.2 Education program on cancer diet: A knowledge attitude and practice questionnaire were prepared and given to the respondents/primary caretakers. The education program contained a visual presentation using power point along with an interactive session with respondents and primary caretakers.

3. Results and Analysis

3.1 Occupational status of parents

There is significant difference between the occupational status of fathers among male and female respondents ($\chi^2 = 9.03^*$, $p < 0.05$). However, there was no statistical significance among the occupational status of parents among both the genders ($p > 0.05$). Poor nutritional status is associated with socioeconomic variables such as sex of the child and father's occupation [17].

Table 1

3.2 Relationship between Age and Anthropometric Measurements

It is evident from the findings that there exists a positive significant relationship between age with height ($r = +0.914^*$) and weight ($r = +0.883^*$). This signified that as age increased the height increased too and the same was found with respect to weight too. There is significant positive correlation between increase in age and gain in weight and age and gain in height.

Table 2

3.3 Body Mass Index

It is seen that 70 percent of total population, have less than 16.0 BMI. The values indicated difference in BMI values of male and female respondents and is statistically significant ($\chi^2 = 10.89^*$). There is a significant statistical ($\chi^2 = 10.84^*$) difference in BMI between genders where males are found to have higher height, weight ratios indicating that female respondents are more undernourished when compared to their male counter parts.

Table 3

3.4 Type of Cancer

In children, the most commonly encountered type of leukemia is acute lymphoblastic leukemia (ALL) [16].

Table 4

3.5 Alcohol/tobacco/cigarette consumption in household

89.0 percent of the study populations family members did not use alcohol, tobacco or cigarette. The association between tobacco smoke and acute myeloid leukemia (AML) is well established in adults but not in children. Analyses suggest an association between paternal smoking and childhood AML [14]. The study

suggests that maternal alcohol drinking before or during pregnancy may contribute to an increased risk of childhood leukemia [13].

Table 5

3.6 Physical activity and Television viewing

The findings reveal that 55.0 percent of respondents are physically active (Indoor board games, interactive games with volunteers and free play outdoors) whereas only 35.0 percent are moderately active and sedentary (10.0%). The effects of physical exercise training interventions for childhood cancer participants are not yet convincing due to small numbers of participants and insufficient study methodology. Despite that, first results show a trend towards an improved physical fitness in the intervention group compared to the control group [3].

Table 6

3.7 Sleep Pattern

The data reveals that 55.0 percent of respondents slept at least for 1-2 hrs. during the day as compared to only 13.0 percent who did not sleep at all. Slightly higher males (9.8%) compared to females (2.6%) slept for 2-3 hrs. during the day. Recent research conducted in the U.S suggest that sleep disturbance, fatigue, and depressed mood occur in a cascade pattern during chemotherapy, in which increases in sleep disturbance contribute to fatigue, which, in turn, contributes to depressed mood [9].

Table 7

3.8 Present Dietary details

The entire population (100.0%) is on vegetarian food as advised by the doctors and dietician of the hospital. Patients with chemotherapy-induced neutropenia are at increased risk of infection. Historically, dietary restrictions commonly referred to as 'clean', 'low bacteria', 'low-microbial' or 'neutropenic' diets have been prescribed to reduce the risk of food borne infection [14]. Diet is one of the main modifiable risk factors for many degenerative diseases, including cancer [15].

Table 8

3.9 Overall mean on cancer diet Knowledge, Attitude and Practice scores n=100

The mean knowledge on cancer and diet of respondents and their caretakers is 69.5 percent which was lower than the mean attitude (73.1 %) and more than mean percent of practice (61.4 percent). However, the data is subjected for statistical analysis and the F-test reveals that there is significant difference in the knowledge, attitude and practice among them. (F- Test = 14.27*).

Table 9

TOTAL PROTEIN AND ENERGY CONSUMPTION USING 24 HOUR RECALL DIETARY METHOD

3.10 Protein consumption by standard requirements

Total protein consumption levels with and without added protein supplements is recorded. Low and high intake of protein levels in the diet when compared to RDA is also noted. The difference in the protein consumption level between with and without added protein supplements shows statistical significant results among females ($\chi^2 = 3.99^*$, $p < 0.05$). Protein-energy malnutrition is a major health problem contributing to the burden of disease in developing countries [8].

Table 10

3.11 Mean Protein consumption & Adequacy percent by standard requirement

The mean protein consumption and adequacy percent of respondents when compared to standard requirements is recorded. The adequacy with protein supplements is found to be 96.9 percent when compared to RDA and that of without supplements is 63.3 percent indicating the difference found statistically significant ($t = 3.59^*$, $p < 0.05$). The adequacy percent found with protein supplements is 88.7 percent when compared to RDA and that of without protein supplements is 59.1 percent indicating the difference found to be statistically significant ($t = 2.55^*$, $p < 0.05$). Acute and chronic protein-energy malnutrition remains common in hospitalized pediatric patients. Important risk factors may be underlying chronic disease, periods of normally rapid growth, and recognized need for nutrition intervention [6].

Table 11

3.12 Calorie consumption by standard requirement

Total calorie consumption level of the respondents with and without added calorie supplements is noted. It also shows low and high intake of calories in the diet when compared to RDA. Further, the difference in the

calorie consumption levels between with and without added calorie supplements shows statistical non-significant results ($\chi^2 = 0.84^{NS}$, $p > 0.05$).

Table 12

3.13 Mean Calorie consumption & Adequacy percent by standard requirement
The adequacy percent of respondents with calorie supplements is 75.8 percent when compared to RDA and that of without calorie supplements is 55.0 percent indicating the difference statistically significant ($t=3.47^*$, $p < 0.05$). The adequacy percent found with calorie supplements is 72.9 percent when compared to RDA and that of without calorie supplements is 45.2 percent indicating the difference statistically significant ($t=2.47^*$, $p < 0.05$). Males have greater intake of calories than females with respect to with and without calorie supplements.

Table 13

3.14 Hemoglobin, General Random Blood Sugar, total platelet counts
When compared to the standard reference values (11.5-16.5g %) the findings among the population shows that 70 percent of them had low hemoglobin levels. Mildly abnormal CBC values are common in survivors of childhood cancer [12].

Table 14

4. Conclusion

All children with cancer are at risk of malnutrition and deterioration. There is negative impact on their nutritional status due to cancer itself and the treatment process namely chemotherapy and/or radiotherapy as it was observed during the study. It is recommended that they undergo nutritional assessment on a regular basis and receive early and ongoing nutritional intervention to maintain their nutritional status. Added protein and calories are key nutrients and it is suggested to include these supplements along with a balanced diet. The total intake of protein and calories in the diets of the respondents with added protein and calorie supplements was found to be adequate in comparison to RDA, which would help children suffering from protein energy malnutrition and sustain through cancer treatment. Majority of respondents and caretakers did not have enough knowledge on cancer specific diet; therefore, an interactive education program on cancer diet was conducted with the help of visual presentations, there was a positive feedback on the same. Through cumulative findings it was observed that though the nutritional status of the children in the hospital was compromised due to the treatment and the disease itself, they showed gradual improvement with a balanced diet supplemented with protein and calories.

References

- [1] Agarwal E, Ferguson M, Banks M, Batterham M, Bauer J, Capra S, et al, 2012, Nutrition care practices in hospital wards: Results from the Nutrition Care Day Survey 2010, *Clin Nutr*, **31**, pp:995-1001.
- [2] Bauer J, Jürgens H, Frühwald MC, 2011, important aspects of nutrition in children with cancer, *Adv Nutr*, **2**(2), pp: 67-77.
- [3] Braam KI, van der Torre P, Takken T, Veening MA, van Dulmen-den Broeder E, Kaspers GJ, 2013, Physical exercise training interventions for children and young adults during and after treatment for childhood cancer, *Cochrane Database Syst Rev*, **30**(4), pp:CD008796.
- [4] Carr SE, Halliday V, 2015, investigating the use of the neutropenic diet: a survey of U.K. dietitians, *J Hum Nutr Diet*, **28**(5), pp: 510-5.
- [5] Gaynor EP, Sullivan PB, 2015, Nutritional status and nutritional management in children with cancer, *Arch Dis Child*, **100**(12), pp: 1169-72.
- [6] Hendricks KM1, Duggan C, Gallagher L, Carlin AC, Richardson DS, Collier SB, Simpson W, Lo C, 1995, Malnutrition in hospitalized pediatric patients (Current prevalence), *Arch Pediatr Adolesc Med*, **149**(10), pp:1118-22.
- [7] Iniesta RR, Paciarotti I, Brougham MF, McKenzie JM, Wilson DC, 2015, Effects of pediatric cancer and its treatment on nutritional status: A systematic review, *Nutr Rev*, **73**, pp: 276-95.
- [8] Jeyaseelan V, Jeyaseelan L, Yadav B, 2016, incidence of, and risk factors for, malnutrition among children aged 5-7 years in south india, *J Biosoc Sci*, **48**(3), pp: 289-305.
- [9] Jim HS, Jacobsen PB, Phillips KM, Wenham RM, Roberts W, Small BJ, 2013, Lagged relationships among sleep disturbance, fatigue, and depressed mood during chemotherapy, *Health Psychol*, **32**(7), pp:768-74.
- [10] Kaatsch P, 2010, Epidemiology of childhood cancer, *Cancer Treat Rev*, **36**(4), pp: 277-85.
- [11] Kumar R, Marwaha RK, Bhalla AK, Gulati M, 2000, Protein energy malnutrition and skeletal muscle wasting in childhood acute lymphoblastic leukemia, *Indian Pediatr*, **37**, pp: 720-6.

- [12] Long ZB, Oeffinger KC, Brooks SL, Fischbach L, Harris TR, Eshelman DA, Tomlinson GE, Buchanan GR, Incidence and clinical relevance of abnormal complete blood counts in long-term survivors of childhood cancer, 2006, **106**(7), pp:1634-40.
- [13] MacArthur AC, McBride ML, Spinelli JJ, Tamaro S, Gallagher RP, Theriault G, 2008, Risk of childhood leukemia associated with parental smoking and alcohol consumption prior to conception and during pregnancy: the cross-Canada childhood Leukemiastudy, *Cancer Causes Control*, **19**(3), pp:283-95.
- [14] Metayer C, Petridou E, Arangur  JM, Roman E, Sch z J, Magnani C, Mora AM, Mueller BA, de Oliveira MS, Dockerty JD, McCauley K, Lightfoot T, Hatzipantelis E, Rudant J, Flores-Lujano J, Kaatsch P, Miligi L, Wesseling C, Doody DR, Moschovi M; MIGICCL Group, Orsi L, Mattioli S, Selvin S, Kang AY, Clavel J, 2016, Parental Tobacco Smoking and Acute Myeloid Leukemia: The Childhood Leukemia International Consortium, *Am J Epidemiol*, **184**(4), pp:261-73.
- [15] Mosby TT1, Cosgrove M, Sarkardei S, Platt KL, Kaina B, 2012, Nutrition in adult and childhood cancer: role of carcinogens and anti-carcinogens, *Anticancer Res*, **32**(10), pp: 4171-92.
- [16] Moschovi M, Adamaki M, Vlahopoulos SA, 2016, Progress in Treatment of Viral Infections in Children with Acute Lymphoblastic Leukemia, *Oncol Rev*, **10**(1), pp:300.
- [17] Saito K, Korzenik JR, Jekel JF, Bhattacharji S, 1997, A case-control study of maternal knowledge of malnutrition and health-care-seeking attitudes in rural (South India), *Yale J Biol Med*, **70**(2), pp:149-60.
- [18] Schoeman J, Dannhauser A, Kruger M, 2010, Malnutrition in paediatric oncology patients, *Continuing Medical Education*, **28**(8), pp: 385, ISSN2078-5143.
- [19] Sinha R, Anderson DE, McDonald SS, Greenwald P, 2003, Cancer risk and diet in India, *J Postgrad Med*, **49**(3), pp:222-8.

TABLES

Table 1: Occupational status of parents

Sample	Occupational status	Male		Female		Combined		χ^2 Test
		n	%	n	%	n	%	
Father	Unemployed	5	8.2	6	15.4	11	11.0	9.03*
	Farmer	17	27.9	20	51.3	37	37.0	
	Labor	10	16.4	4	10.2	14	14.0	
	Self employed	29	47.5	9	23.1	38	38.0	
Mother	House wife	42	68.8	23	59.0	65	65.0	2.82 ^{NS}
	Farmer	8	13.1	10	25.6	18	18.0	
	Labor	7	11.5	3	7.7	10	10.0	
	Self employed	4	6.6	3	7.7	7	7.0	
Total		61	100.0	39	100.0	100	100.0	

NS: Non-significant χ^2 (0.05, 3df) = 7.815

Table 2: Relationship between Age and Anthropometric measurements

Measurements	Correlation coefficient (r) with Age		
	Males (n=61)	Females (n=39)	Combined (n=100)
Height	+ 0.906*	+0.928*	+0.914*
Weight	+ 0.831*	+0.864*	+0.883*
BMI	+ 0.030 ^{NS}	+0.307*	+0.189 ^{NS}

*Significant at 5% Level NS: Non-significant

Table 3: Body Mass Index

BMI (Kg/m2)	Male (n=61)		Female (n=39)		Combined		χ^2 Test
	n	%	n	%	n	%	
< 16.0	41	67.2	29	74.3	70	70.0	10.89*
16.0-16.9	5	8.2	4	10.3	9	9.0	
17.0-18.4	7	11.5	3	7.7	10	10.0	
18.5-24.9	8	13.1	3	7.7	11	11.0	

* Significant at 5% Level χ^2 (0.05, 3df) = 7.815

Table 4: Type of Cancer

Medical history	Category	Male (n=61)		Female (n=39)		Combined (n=100)		χ^2 Test
		n	%	n	%	n	%	
Type of Cancer	AML	1	1.6	3	7.7	4	4.0	3.17 ^{NS}
	ALL	54	88.5	30	76.9	84	84.0	
	GCT	1	1.6	1	2.6	2	2.0	
	Others	5	8.3	5	12.8	10	10.0	

Table 5: Alcohol/tobacco/cigarette consumption in house hold

Aspects	Category	Male (n=61)		Female (n=39)		Combined (n=100)	
		N	%	n	%	n	%
Smoking/Alcohol/Tobacco Consumer in House Hold	Yes	5	8.2	6	15.4	11	11.0
	No	56	91.8	33	84.6	89	89.0

Table 6: Physical activity and Television viewing

Aspects	Category	Male (n=61)		Female (n=39)		Combined (n=100)	
		n	%	n	%	n	%
General physical activity level	Sedentary	5	8.2	5	12.8	10	10.0
	Moderate	25	41.0	10	25.7	35	35.0
	Active	31	50.8	24	61.5	55	55.0

Table 7: Sleep Pattern

Aspects	Category	Male (n=61)		Female (n=39)		Combined (n=100)	
		n	%	n	%	N	%
Sleeping duration at night	< 5 hrs.	2	3.3	2	5.1	4	4.0
	5-8 hrs.	57	93.4	36	92.3	93	93.0
	> 8 hrs.	2	3.3	1	2.6	3	3.0
Mood on getting up in morning	Happy	46	75.4	30	76.9	76	76.0
	Moody	11	18.0	6	15.4	17	17.0
	Stressed	4	6.6	3	7.7	7	7.0

Table 8: Present Dietary details

Aspects	Category	Male (n=61)		Female (n=39)		Combined (n=100)		χ^2 Test
		n	%	N	%	n	%	
Food habit	Vegetarian	46	75.4	18	46.2	64	64.0	8.84*
	Ovo vegetarian	15	24.6	21	53.8	36	36.0	
Appetite	Good	28	45.9	15	38.5	43	43.0	0.57 ^{NS}
	Average	20	32.8	14	35.9	34	34.0	
	Very poor	8	13.1	6	15.4	14	14.0	
	Fussy	5	8.2	4	10.2	9	9.0	
Appetite during therapy	Good	8	13.1	5	12.8	13	13.0	0.83 ^{NS}
	Average	29	47.6	21	53.8	50	50.0	
	Very poor	16	26.2	10	25.7	26	26.0	
	Fussy	8	13.1	3	7.7	11	11.0	
Recent weight loss	Yes	3	4.9	5	12.8	8	8.0	2.08 ^{NS}
	No	39	64.0	22	56.4	61	61.0	
	Illness	19	31.1	12	30.8	31	31.0	
Recent weight gain	Yes	61	100.0	36	92.3	97	97.0	4.84*
	No	0	0.0	3	7.7	3	3.0	

* Significant at 5% level, NS: Non-significant, χ^2 (0.05, 1df) = 3.841, χ^2 (0.05, 3df) = 7.815

Table 9: Overall mean on cancer diet Knowledge, Attitude and Practice scores n=100

Aspects	Sample (n)	Statements	Max. Score	Scores				'F' Test
				Mean	SD	Mean (%)	SD (%)	
Knowledge	100	10	10	6.95	2.4	69.5	0.1	14.27*
Attitude	100	9	45	32.89	15.9	73.1	1.6	
Practice	100	8	8	4.91	2.3	61.4	0.3	

* Significant at 5% level

TOTAL PROTEIN AND ENERGY CONSUMPTION USING 24 HOUR RECALL DIETARY METHOD**Table 10: Protein consumption by standard requirements**

Protein Consumption level (WHO)	Male (n=61)						Female (n=39)					
	With		Without		Total		With		Without		Total	
	n	%	n	%	n	%	n	%	n	%	n	%
Low	21	48.8	10	55.6	31	50.8	18	52.9	5	100.0	23	59.0
High	22	51.2	8	44.4	30	49.2	16	47.1	0	0.0	16	41.0
Total	43	100	18	100	61	100	34	100	5	100	39	100
χ^2 Test	0.23 NS						3.99*					

* Significant at 5% Level NS: Non-significant χ^2 (0.05, 1df) = 3.8411**Table 11: Mean Protein consumption & Adequacy percent by standard requirement**

Aspects	Protein Consumption (g)					
	Sample (n)	Male (n=61)		Sample (n)	Female (n=39)	
		Mean \pm SD	Adequacy (%)		Mean \pm SD	Adequacy (%)
With Supplements	43	37.8 \pm 11.8	96.9	34	36.2 \pm 4.2	88.7
Without Supplements	18	24.7 \pm 3.9	63.3	5	24.1 \pm 9.1	59.1
t-Test		3.58*			2.55*	
Overall	61	33.7 \pm 13.4	86.4	39	33.5 \pm 5.2	82.1
Standard Requirement WHO		39.0			40.8	

* Significant at 5% level

t (0.05; 59,37df) = 1.96

Table 12: Calorie consumption by standard requirement

Calorie Consumption level (WHO)	Male (n=61)						Female (n=39)					
	With		Without		Total		With		Without		Total	
	n	%	n	%	n	%	n	%	n	%	n	%
Low	35	81.4	16	88.9	51	83.6	29	85.3	5	100.0	34	87.2
High	8	18.6	2	11.1	10	16.4	5	14.7	0	0.0	5	12.9
Total	43	100	18	100	61	100	34	100	5	100	39	100
χ^2 Test	0.52 NS						0.84 NS					

NS: Non-significant

 χ^2 (0.05, 1df) = 3.841,**Table 13: Mean Calorie consumption & Adequacy percent by standard requirement**

Aspects	Calorie Consumption (Kcal)					
	Sample (n=61)	Male		Sample (n=39)	Female	
		Mean \pm SD	Adequacy (%)		Mean \pm SD	Adequacy (%)
With Supplements	43	1095 \pm 291	75.8	34	975 \pm 345	72.9
Without Supplements	18	795 \pm 315	79.0	5	605 \pm 321	45.2
t-Test		3.47*			2.47*	
Overall	61	1006 \pm 326	69.6	39	928 \pm 361	69.4
Standard Requirement		1445			1337	

* Significant at 5% level

t (0.05; 59,37df) = 1.96

Table 14: Hemoglobin, General Random Blood Sugar, total platelet count

Bio-chemical Parameters	Category	Male (n=61)		Female (n=39)		Combined (n=100)		χ^2 Test
		n	%	n	%	n	%	
Hb (11.5-16.5g %)	Below	44	72.1	26	66.7	70	70.0	0.56 NS
	Normal	17	27.9	13	33.3	30	30.0	

NS: Non-significant χ^2 (0.05, 2df) = 5.991

Figures:

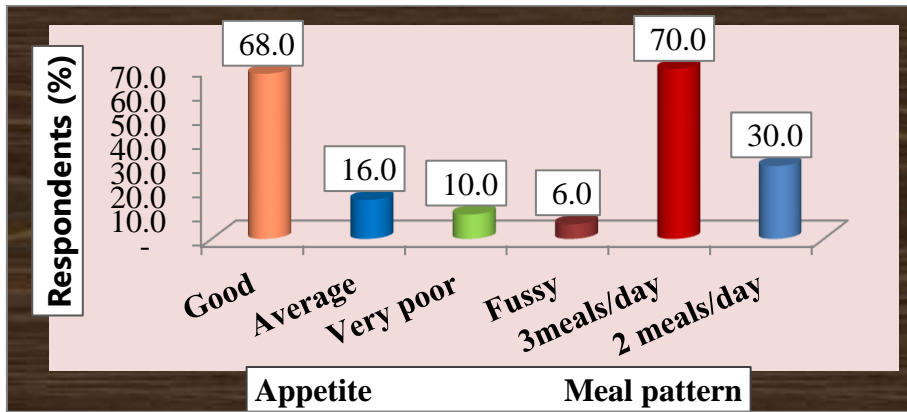


Fig 1 Past Dietary details