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Research Article

Knowledge of Adolescent Girls Regarding Management of Selected Nutritional Deficiencies: Impact of Awareness Programme (J&K, India)

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I N F O

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A B S T R A C T

Background: Adolescent has been defined by World Health Organization as the period of life spanning between the age of 10 to 19 years.[1]This is the growing period of life when the maximum amount of physical, psychological and behavioral changes take place. This is vulnerable period in life cycle for the development of nutritional deficiencies. The common nutritional deficiencies found in adolescents of age group 10 to 19 years includes iron deficiency, vitamin B12 deficiency, folate deficiency, vitamin D deficiency, vitamin A deficiency and zinc deficiency[2].The study was aimed to assess the effectiveness of awareness programme on knowledge of adolescent girls regarding management of selected nutritional deficiencies.

Methodology: A Pre-experimental one group pre-test post-test design was used to assess the effectiveness of Awareness programme on knowledge among 100 adolescent girls regarding management of selected nutritional deficiencies at government girls higher secondary school Soura, Srinagar, Kashmir. The study subjects were selected by using convenient sampling technique. A self-structured Questionnaire was used to assess the pre-test and post-test knowledge of study subjects.

Results: On pre-test, maximum of the study subjects (72%) had inadequate knowledge whereas 27% had moderately adequate knowledge and only 1% of the study subject had adequate knowledge regarding management of selected nutritional deficiencies. On post-test majority of the study subjects (84%), had adequate knowledge, 16% had moderately adequate knowledge and none of the study subject had inadequate knowledge regarding management of selected nutritional deficiencies.

Conclusion: The study concluded that the knowledge level of adolescent girls regarding management of selected nutritional deficiencies improved after the administration of awareness programme.

Keywords: Awareness programme, knowledge, Adolescent girls, iron deficiency anemia, vitamin D deficiency, zinc deficiency

Introduction

Anemia is one of the public health problems, affecting both developed and developing countries. Anemia is defined as the reduction in the volume of red blood cells or in the concentration of haemoglobin below the normal range I;e 12 -14gm/dl in female adolescent and 13-15gm/dl in male adolescents. According to WHO anemia is classified on the basis of haemoglobin level as: mild(Hb:11-11.9gm/dl in female adolescents), moderate(Hb:8-10.9gm/dl) and severe (Hb< 8gm/dl).[3] Causes of anemia includes inadequate iron in diet, excess blood loss due to road traffic accidents, hookworm infestation, excess bleeding during menstruation, and autoimmune conditions like crohns disease, ulcerative colitis and rheumatoid arthritis.[4]The early signs and symptoms of anemia are fatigue, restlessness, and loss of appetite. Late signs and symptoms includes pallor skin, nail beds and mucous membrane, weakness, loss of balance, headache and drowsiness. Other features are sore tongue, increased respiratory rate, shortness of breath on exertion, increased heart rate, abnormal beating of heart (palpitations). Chronic iron deficiency anemia causes epithelial changes in some patients like Koilonychias, Glossitis , angular stomatitis and heart failure.[4]

Anemia can be diagnosed by signs and symptoms, physical examination and blood tests like complete blood count, serum iron levels, serum ferritin levels and Total iron binding capacity.[4] Anemia can be managed by taking iron rich diet such as animal sources like liver, red meat, fish are and plant source includes beans, spinach, lentils, dried fruit, jaggery. Vitamin C rich foods like lemon, oranges enhances iron absorption in the gut.[4] Other preventive measures includes deworming, regular hand washing to avoid infection and avoid taking excess amount of coffee or tea as it hinders iron absorption.[5] Severe anemia can be treated by medication of like iron and folic acid supplements and iron sucrose. Sometimes blood transfusion and ferric carboxymaltose injection may be required in severe anemia.[2]

Vitamin D Deficiency is common nutritional disorder that has assumed epidemic proportion worldwide with an estimated one billion people having vitamin D deficiency.[7]

Vitamin D (also referred as "calciferol") is fat soluble vitamin. It promotes calcium absorption in the gut and maintains adequate serum calcium and phosphate concentrations to enable normal bone mineralization to prevent hypocalcemic tetany. It helps in bone growth and bone remodeling by osteoblasts and osteoclasts. It reduces inflammation, promotes neuromuscular and immune function and helps in glucose metabolism.[6]

The main causes of vitamin D deficiency includes inadequate vitamin D diet, lack of sun light exposure, certain condition such as cystic fibrosis, crohns disease, certain biological factors like obesity, and less amount of melanin pigment in skin. Deficiency of vitamin D causes rickets in children, symptoms of rickets include: bowed or bent bones, muscle weakness, bone pain, deformities in joints. In adolescents and adults its deficiency causes osteomalacia and the signs and symptoms include, fatigue, bone pain, muscle weakness, muscle aches, or muscle cramps, mood changes like depression.[7] The vitamin D deficiency can be diagnosed by assessment, physical examination and Serum vitamin D (25-hydroxy vitamin D) levels.[8] vitamin D deficiency can be prevented by taking vitamin D rich foods like fish(salmon, tuna, sardines, rainbow trout), beef liver, mushroom, egg yolk, cod liver oil and sun light exposure for 30 to 60 minutes from 4pm onwards and avoid sun light exposure for too long time as it may cause skin problems like burn, skin cancer.[9]

Zinc is a micronutrient and an important mineral required for a wide range of reactions and functions in the body including healthy growth, immune function, DNA synthesis and cell division.[10].Causes of zinc deficiency includes inadequate zinc in diet, and less protein diet as proteins helps the body to absorb zinc. Zinc deficiency can result in skin changes that look like eczema (it is a condition in which skin becomes inflamed, itchy, cracked and rough). There may be cracks and a glazed appearance on the skin, often found around the mouth, and hands.[11] The people with zinc deficiency may also experience hair loss, changes in their nails, diarrhea, irritability, loss of appetite, impaired wound healing and lack of taste and smell. The zinc deficiency can be diagnosed by signs and symptoms, physical examination and serum zinc levels. Zinc deficiency can be prevented by taking zinc rich diet, includes meat, fish , cereals, legumes, beans, plain oat meals, yogurt, dairy foods and seeds. Severe Zinc deficiency can be managed by zinc supplements and medication that contains zinc.[10]

Need for the study

According to Comprehensive National Nutritional Survey 2019, in India the prevalence of iron deficiency anemia in girls during early adolescence period (10 to 14 years) and late adolescence period (15-19 years) were 24% and 31% respectively. In Jammu and Kashmir the prevalence of iron deficiency anemia in adolescent girls of age group 10-14 years and 15-19 years were 30.7% and 42.2% respectively. [2]

In India the prevalence of Vitamin D deficiency in adolescent girls of age group 10 to 14 years and 15-19 years were 35% and 34% respectively while as in Jammu and Kashmir prevalence of vitamin D deficiency were 23.9% and 80.5% in adolescent girls of age group 10-14 years and 15-19 years respectively.[2] Prevalence of zinc deficiency in adolescent girls of age group 10-14 years and 15-19 years were 27% and 28% whiles as in Jammu and Kashmir its prevalence were 45.3% and 33.9% respectively.[2]

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Deepika and Anuradha[12] (2019), conducted a cross sectional study to assess the prevalence of anemia among adolescent girls at 10 different schools of puttaparthi mandal, Andra Pradesh on 1300 adolescent girls from the age group of 13-17 years. Random sampling technique was used to select the study subjects. Self-structured questionnaire was used to collect the data regarding anthropometric and haemoglobin profile of the selected study subjects. The findings of the study revealed that about 40% (519) had anemia among them 77.46% (402) of adolescent had mild anemia, 15% (78) had moderate anemia and 7.51% (39) had severe anemia. There was positive co-relation of haemoglobin with BMI at (p<0.01%).

Priyalatha[13] (2020) conducted a pre-experimental study to assess the effectiveness of awareness program on knowledge regarding anemia at selected schools of Ras Al Khaimah, UAE on 100 adolescent students of class 8th and 9th by using consecutive sampling technique. The findings of the study revealed that on pre-test, 89.5% had moderate knowledge, 9.8% had Poor while as 0.8% had good knowledge regarding anemia while on post-test , there was an increase in the knowledge level among 70.7% had good knowledge and the rest 29.3% had an average level of knowledge. Pretest knowledge mean score was 5.94 and posttest mean score was 9.66, showing a significant improvement of knowledge regarding anemia at 0.001 level of significance.

Keeping in view the findings of the above research studies regarding prevalence of nutritional deficiencies, it has been observed that the nutritional deficiencies are more prevalent in adolescent girls and moreover Investigator worked at different health care settings where adolescent girls were admitted with nutritional deficiencies and they were having inadequate knowledge regarding prevention and management of nutritional deficiencies, so investigator felt that planning and implementation of awareness program regarding management of nutritional deficiencies will be effective in preventing nutritional deficiencies and will improve their physical, mental and emotional health .

Methodology

A Pre experimental One Group Pre-test, Post-test research design was used to assess the knowledge of 100 adolescent girls using convenient sampling technique at Government Girls Higher Secondary School, Soura by using self-structured questionnaire. After establishing validity and reliability (r=0.90) of the tool, pre-test was conducted on day 1st and on the same day, intervention was given in the form of awareness programme was given. Post-test was conducted on 7thday. Assessment of knowledge score was categorized into 03 levels based on the criteria developed by Gopal and Chand[14]

Table 1.Scoring Criteria for Knowledge regarding management of selected nutritional deficiencies

Knowledge score	Score percentage (% age)	Knowledge Level
0-21	≤50	Inadequate knowledge
22-31	51-75	Moderately Adequate knowledge
32-42	>75	Adequate knowledge

Maximum score = 42, Minimum score = 0

Results And Discussion

Out of 100 study subjects, maximum number of study subjects (55%) belonged to age group of 14-15 years, 35% belonged to 16-17 years of age group and only 10% belonged to age group of 18-19 years. Majority of the study subjects (86%) were from urban areas and only 14% were from rural areas. Highest number of study subject's father 32% were illiterate, 28% were graduates and above, 22% were having higher secondary education and 18% were having primary to middle education. Almost equal percentage 35% and 31% of study subject's father were doing other job and government employee respectively, (19%) were businessmen and (15%) were private employee. Maximum number of the study subjects (43%) had illiterate mothers , Almost equal percentage 22% and 20% were having higher secondary education and primary/middle education respectively and only 15% were having graduate and above education. Maximum number of mothers of the study subjects (51%) were home makers, 19% were private employee, 17% were doing other work and only 13% were government employee. Highest number of the study subjects (38%) had above Rs 40000 total monthly income of family, 26% had Rs 310000-40000, 24% had Rs 21000-Rs30000, and only 12% had below Rs 20000 of total monthly income of family. Almost equal percentage of study subjects 31% and 30% spent time less than 15 minutes and 16-30 minutes to sunlight exposure respectively, 20% spend more than 60 minutes and 19% spend 31-60 minutes to sunlight exposure.(Table 02)

These findings were similar to the results of the studies conducted by Pandey[15] (2022), Saeed, Anaam, Saud, Alshammari, Almunef, Almogbel et al[16] (2022), Kameshwary, Thakur, Abha, Vaghela, Banerjee, Gupta[17] (2020).

On pre-test, maximum of the study subjects (72%) had inadequate knowledge, 27% had moderately adequate knowledge and only 1% had adequate knowledge regarding management of selected nutritional deficiencies. On post-

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test, majority of the study subjects (84%) had adequate knowledge, and only 16% had moderately adequate knowledge and none of the study subjects had inadequate knowledge regarding management of selected nutritional deficiencies (Table 3, Figure 1).

The findings of present study were consistent with a pre-experimental study conducted by Deepti, Chaudhary, Kaur, Chitra [18] (2022)

The mean post-test knowledge scores of the study subjects regarding management of selected nutritional deficiencies was significantly higher (33.89±3.78) than that of the mean pre-test knowledge scores (19.87±5.42) and the t-test value (30.5) was significantly higher than that of tabulated value at 0.05 level of significance which indicated that the awareness program was effective in increasing the knowledge of study subjects regarding management of selected nutritional deficiencies (Table 4).

The findings were supported by a study conducted by Lungaraju, Munirathna, Mamatha[19](2018)

There was non significant association of the pre-test knowledge scores of study subjects regarding management of selected nutritional deficiencies with their selected demographic variables at p-value≤0.05 except with the demographic variable, educational status of father and total monthly income of family (p-value≤0.05) (Table 5).

The findings of the present study were supported by a study conducted by Yadav , Singh, Verma[20] (2022), Kumari and Pooja[21](2021).

Table 2.Frequency and percentage distribution of study subjects according to Demographic Variables

N=100

Variables	Catagories	Frequency(n)	Percentage(%)
Age	14-15 years	55	55
	16-17 years	35	35
	18-19 years	10	10
Residence	Rural	14	14
	Urban	86	86
Educational status of Father	Illiterate	32	32
	Primary/middle education	18	18
	Higher secondary education	22	22
	Graduate and above	28	28
Occupation of Father	Government employee	31	31
	private employee	15	15
	Buisnessman	19	19
	any other	35	35
Educational status of Mother	Illiterate	43	43
	Primary/middle education	20	20
	Higher secondary education	22	22
	Graduate and above	15	15
Occupation of Mother	Government employee	13	13
	private employee	19	19
	Home maker	51	51
	any other	17	17
Total monthly income of family	Below Rs 20000	12	12
	Rs 21000 to 30000	24	24
	Rs 31000 to 40000	26	26
	Above Rs 40000	38	38

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Time spent on exposure to sunlight	less than 15 minutes	31	31
	16-30 minutes	30	30
	31-60 minutes	19	19
	More than 60 minutes	20	20

Table 3.Frequency and percentage distribution of the study subjects according to the pre-test and post- test knowledge score

N=100

Levels of knowledge	Knowledge Scores of Study subjects	Pre-Test		Post-Test	
		Frequency (n)	Percentage (%)	Frequency (n)	Percentage (%)
Inadequate	0-21	72	72	0	0
Moderately adequate	22-31	27	27	16	16
Adequate	32-42	1	1	84	84

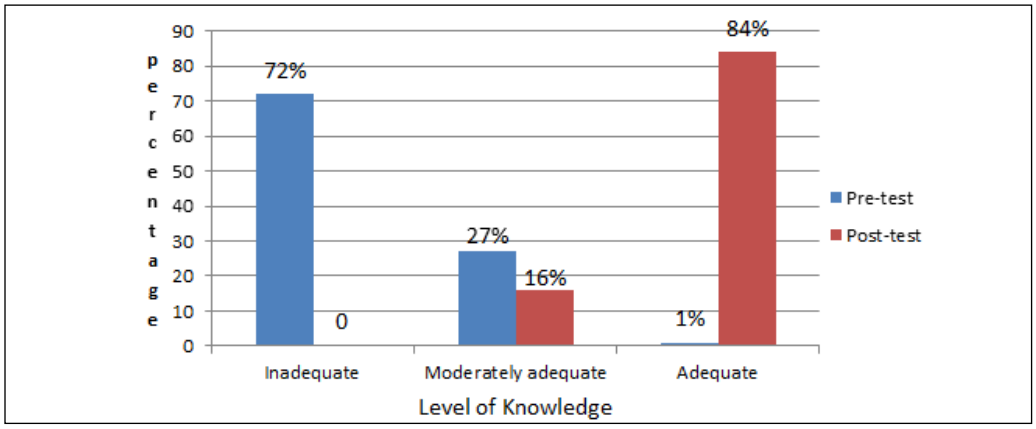

Figure 1.Bar diagram showing percentage distribution of the study subject according to their pretest and post-test Knowledge scores

Table 4.Comparison of pretest and post-test knowledge scores of study subjects regarding management of selected nutritional deficiencies

N=100

Knowledge score	Mean	SD	df	t-test	P value
Pre- test	19.87	5.42	99	30.05	0.001^{***S}
Post –test	33.89	3.78			

S=significant at 0.001 level

Table 5.Association between pre-test knowledge scores of study subjects regarding management of selected nutritional deficiencies with their selected demographic variables.

Variables	Categories	level of knowledge						Chi square	p-value
		Inadequate knowledge		Moderately Adequate knowledge		Adequate knowledge			
		n	%	n	%	n	%		
Age in years	14-15	38	69.1	17	30.9	0	.0	2.75	0.600 NS
	16-17	26	74.2	8	22.9	1	2.9		
	18-19	8	80.0	2	20.0	0	.0		
Residence	Rural	10	71.4	4	28.6	0	.0	0.178	0.915 NS
	Urban	62	72.1	23	26.7	1	1.2		

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Educational status of Father	Illiterate	26	81.2	6	18.8	0	.0	21.60	0.001*** S
	Primary/middle education	16	88.9	2	11.1	0	.0		
	Higher secondary education	18	81.8	3	13.7	1	4.5		
	Graduate and above	12	42.9	16	57.1	0	.0		
Occupation of Father	Government employee	17	54.8	14	45.2	0	.0	10.98	0.089 NS
	Private employee	11	73.3	4	26.7	0	.0		
	Businessman	14	73.7	5	26.3	0	.0		
	Any other	30	85.7	4	11.4	1	2.9		
Educational status of Mother	Illiterate	34	79.1	8	18.6	1	2.3	7.25	0.296 NS
	Primary/middle education	16	80.0	4	20.0	0	.0		
	Higher secondary education	12	54.5	10	45.5	0	.0		
	Graduate and above	10	66.7	5	33.3	0	.0		
occupation of Mother	Government employee	6	46.2	7	53.8	0	.0	11.06	0.086 NS
	Private employee	11	57.9	8	42.1	0	.0		
	Home Maker	42	82.4	8	15.7	1	2.0		
	Any other	13	76.5	4	23.5	0	.0		
Total monthly income	Below Rs 20000	12	100.0	0	.0	0	.0	27.49	0.001*** S
	Rs 21000 to 30000	22	91.7	1	4.2	1	4.2		
	Rs 31000 to 40000	20	76.9	6	23.1	0	.0		
	Above Rs 40000	18	48.6	20	51.4	0	.0		
Time spend on exposure to sunlight	less than 15 minutes	25	80.6	6	19.4	0	.0	6.80	0.339 NS
	16-30 minutes	20	66.7	10	33.3	0	.0		
	31-60 minutes	15	78.9	4	21.1	0	.0		
	more than 60 minutes	12	60.0	7	35.0	1	5.0		

NS = Non-significant, S = Significant

Conclusion

On pre-test, maximum of the study subjects (72%) had inadequate knowledge, only 1% had adequate knowledge regarding management of selected nutritional deficiencies whereas on post-test, majority of the study subjects (84%) had adequate knowledge regarding management of selected nutritional deficiencies which showed that administration of awareness programme was effective.

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Conflicts of Interest: None

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