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"IMPACT OF HEALTH EDUCATION ON NUTRITIONAL STATUS OF PRIMARY SCHOOL CHILDREN IN URBAN AREA"

Community Medicine

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ABSTRACT

Malnutrition is linked to slow cognitive development, underweight, wasting, impaired resistance to infections , stunting of growth,reduced work capacity , poor mental and social development. Medical health check up of children was conducted at primary school, where dietary history and anthropometric data were collected.According to weight for age (Z score), 8.3% were under weight, 2.2% were severe underweight and 1.7% were overweight.According to height for age (Z score), 9.4% were stunted and 1.7% were severely stunted.According to BMI for age (Z score), 7.7% were under weight, 1.7% were severe underweight and 2.8% were overweight. There was little increase of optimal calorie intake after health education .The health education follow up sessions led to statistically significant improvement in mean weight ,mean height and BMI of subjects. Findings of nutritional status in this study highlights the needs to undertake various initiatives in relation to health promotion and prevention in primary schools.

KEYWORDS

Nutritional status, Health education, Primary school children.

INTRODUCTION

Malnutrition is one of the important public health problems.90% of undernourished people reside in developing countries .

Problem statement

World:

- 2 billion people in the world suffer from various forms of malnutrition.[1]
- Its an underlying cause of death of 2.6 million children each year – which accounts to a third of child deaths globally.[2]
- 1 in 4 of the world's children are stunted [3]; in developing countries this is as high as one in three.[4]
- Paediatric malnutrition is a risk factor for 16% of the global burden of disease.(2005)[2]

India

- One in every 3 malnourished children in the world lives in India.
- Paediatric malnutrition is a risk factor for 22.4% of India's burden of disease.
- India stands 25th on the Global hunger Index with 46 per cent of underweight children below 5 years of age. (State of World Children, 2008).
- National Family Health Survey - 3 reported that both acute and chronic under nutrition was high in many states.
- Prevalence of malnutrition in primary school children was in the range of 50%-60% [5]

Various contributory factors for malnutrition include poverty and lack of resources ,economy of a nation , culture, environment, diseases ,poor sanitation and personal hygiene, socioeconomic status, overcrowding,illiteracy etc.

Children living in rural areas of India suffer more from under nutrition as compared with their urban counterparts [6].United Nations educational scientific and cultural organization (UNESCO) states 6-11 years as primary school age.[7] Malnutrition is an important cause of low school enrolment, high absenteeism, early dropouts and poor classroom performance. WHO developed 10 recommendations for school health, and initiated a global school health initiative in ten countries, of which 8 were developing countries(1997)[2].

Anthropometry is the most useful tool to assess the nutritional status of children.[8] e.g. height-for-age index is an indicator of chronic illness i.e.stunting, weight-for-height index is an indicator of acute illness i.e. wasting and Weight-for-age is a composite index which takes into account both acute and chronic malnutrition With this background the current study had been conducted to assess the impact of health education on existing nutritional status of primary school children in urban area.

OBJECTIVES:

- To study anthropometric measurements and nutritional status of primary school children
- To assess impact of health education on nutitional status of primary School children

METHODS

The study was conducted in a primary school in urban area for duration of one year.The study was initiated after taking permission from school authorities.Written informed consent of parents of school children was obtained.

Dietary history and anthropometric measurements of children were collected .

Sample Size (n) = 4PQ/d2

n= a minimum sample size required.
p = Assumed to be 50% in this study 3
q = 100-50= 50%
d = 15 % of the assumed/expected prevalence of morbidity

Calculated Sample size = 178 (Total= 180 children)

A list of 56 private aided schools of study area (F/N ward) was prepared. Out of these 56 schools, 1 school was selected randomly (lottery method). Sampling units were 6-11 years old primary school children. Simple random sampling was used to select children. Each standard consisted of 60 children. From 1st standard 45, 2nd standard 46, 3rd standard 43 and 4 th standard 46 Children were selected. Some of the children were excluded from study for various reasons eg absenteeism for more than 1 month, chronic/serious illness ,drop outs /shifting of parents within a year etc. Children from 5th standard were excluded from the initial study as they wouldn't be available for follow up. Absent children were examined on the last day of the study.

Ethical clearance:

It was obtained from the Institutional Scientific Review Committee and Ethical Committee.

Inclusion Criteria:

- Children(either sex) of age group of 6- 11 years.
- Children whose parents/guardians gave consent to participate in this study.

Exclusion Criteria:

- Children who are having chronic/serious Illness.
- Children absent for more than 1 month.

Interview of children:

Interviewer collected data using a predesigned, pretested, semi-

structured interview schedule by direct interview method. Interviewer explained the purpose of the study to Parents/teachers by using student information sheet.

Clinical Examination:

General physical examination:

Weight was measured to the nearest 0.1 kg in a standard weighing (bathroom) scale. Height was measured against a non-stretchable tape fixed to a vertical wall, with the participant standing on a firm/level surface and it was measured to the nearest 0.1 cm. Each measurement was taken twice and the mean of the two readings was recorded. **Body mass index (BMI)**= [Weight (kg) / Height (m)**2**].

Systemic Examination

Appropriate treatment was given to children .Children requiring specialist's intervention were referred to higher Centre.

C) Nutritional Assessment

Dietary Assessment: 24 hours recall method was used to obtain data on food consumption.

Nutritional status was assessed by WHO Anthro Plus10 version 1.0.4, 2007 Software using weight for age Z score (WAZ), height for age Z score (HAZ) ,weight for height, Z scores for BMI for age. Using the above criteria,children were classified as normal, stunted, underweight and overweight.

During intervention phase , weekly lectures and demonstrations were conducted in each class regarding dietary habits .Proper training was given to all teachers. An interactive session of about 30 minutes per week was taken. Similar follow up interactive sessions were held by respective teachers in the consecutive week. Nutritional status of the students was again assessed after one year. The health education tools were handed over to the school.

Study tools:

It included consent forms, information sheets,apredesigned, pretested schedule in vernacular language to record the socio-demographic and economic information, weighing machine,measuring tape.

ANALYSIS OF DATA

Data was compiled using Microsoft Excel 2013 and analysed using SPSS 21.0 version, Open Epi Software Version 2.3.

RESULTS

Table-1 Distribution of children according to Dietary habits

Type Of Diet	Frequency	Percent
Mixed	162	90.0
Vegetarian	18	10.0
Meals/Day	**Frequency**	**Percent**
Two	6	3.3
Three (2 major meals+once snack)	10	5.6
Four(2 major meals+twice snacks)	164	91.1
Food habits		
Eat Outside Food /Tiffin Food	**Frequency**	**Percent**
Tiffin	178	98.9
Outside	2	1.1
Tiffin Food Readymade (Junk Food) /Homemade	**Frequency**	**Percent**
Homemade	179	99.4
Readymade	1	0.6
Evening Snacks Homemade/Outside	**Frequency**	**Percent**
Homemade	179	99.4
Outside Food	1	0.6
Homemade Food Balanced/Unbalanced	**Frequency**	**Percent**
Balanced	163	90.6
Unbalanced	17	9.4
More Preference To Sweets	**Frequency**	**Percent**
Yes	143	79.4
No	37	20.6
More Preference To Fried Food	**Frequency**	**Percent**
Yes	165	91.7
No	15	8.3
More Preference To Aerated Drinks	**Frequency**	**Percent**
Yes	143	79.4
No	37	20.6
Energy (Calorie)	**Frequency**	**Percent**
Near about RDA	148	82.2
Less than RDA	23	12.8
More than RDA	9	5.0
Total	180	100.0

Every 9 out of 10 children were having mixed diet .91.1% children had 4 meal pattern(2 major meals twice snacks) in a day.99.4 % children had more preference to homemade tiffin food and evening snacks.90.6% children had balanced homemade food .A greater proportion of children exhibited more preference to sweet, fried foods and aerated drinks at 79.4%, 91.7% and 79.4% respectively.Majority (82.2%) of the children were taking optimal calorie intake daily, (12.8%)were taking less than RDA and (5.0%) were taking more than RDA.

Table-2 Distribution of children according to weight,height,BMI

Weight for Age (Z-Score)	Boys	Percent	Girls	Percent	Total	Percent
Normal (median±2 SD)	74	84.1	84	91.3	158	87.8
Under weight (<2 SD)	8	9.1	7	7.6	15	8.3
Severe underweight (<3 SD)	3	3.4	1	1.1	4	2.2
Over weight (>2 SD)	3	3.4	0	0.0	3	1.7
Height for Age (Z-Score)						
Normal (median±2SD)	77	87.5	83	90.2	160	88.9
Stunted (<2 SD)	9	10.2	8	8.7	17	9.4
Severely stunted (<3 SD)	2	2.3	1	1.1	3	1.7
BMI for Age (Z-Score)						
Normal (median±2 SD)	75	85.2	83	90.2	158	87.8
Under weight (<2 SD)	7	8.0	7	7.6	14	7.7
Severe underweight (<3 SD)	2	2.3	1	1.1	3	1.7
Over weight (>2 SD)	4	4.5	1	1.1	5	2.8
Total	88	100.0	92	100.0	180	100.0

According to weight for age (Z score), 84.1% boys and 91.3% girls were normal,9.1% boys and 7.6% girls were under weight, 3.4% boys and 1.1% girls were severe underweight and 3.4% boys were overweight.

According to height for age (Z score), 87.5% boys and 90.2% girls were normal, 10.2% boys and 8.7% girls were stunted and 2.3% boys and 1.1% girls were severely stunted.

According to BMI for age (Z score), 85.2% boys and 90.2% girls were normal, 8.0% boys and 7.6% girls were under weight, 2.3% boys and 1.1% girls were severe underweight and 4.5% boys and 1.1% girls were overweight.

TABLE 6: Impact of health education on calorie consumption

Energy (Calorie)	Before		After	
	Frequency	Percent	Frequency	Percent
Near about RDA	148	82.2	161	89.4
Less than RDA	23	12.8	13	7.3
More than RDA	9	5.0	6	3.3
Total	180	100.0	180	100.0

82.2% of the children were taking optimal calorie intake daily, which hiked up to 89.4% after nutrition education session. Children taking less and more than the RDA were nearly reduced to half after nutrition education session.

Table-7 Comparison of anthropometric status before and after nutrition education

Anthropometric Parameters	Paired Differences					t test	df	p value
	Mean	SD	SE of Mean	95% Confidence Interval of the Difference				
				Lower	Upper			
Weight: Before and After	-2.21	6.12	0.46	-3.11	-1.31	-4.84	179	0.000
Height: Before and After	-3.52	8.33	0.62	-4.74	-2.29	-5.67	179	0.000
BMI: Before and After	-0.66	2.71	0.20	-1.05	-0.26	-3.25	179	0.001

The mean weight before (20.07 ± 4.41 kg)and after (22.28 ± 5.44 kg) intervention revealed significant improvement.(p value <0.05). The mean height before (116.59 ± 8.33 cm) and after (120.11 ± 8.74 cm) intervention revealed significant improvement .(p value <0.05). The BMI before (14.65 ± 1.85) and after (15.30 ± 2.25) intervention revealed significant improvement (p value <0.05).

DISCUSSION

Mehrotra Monika (2011)[6]statedthatenergy deficiency was exhibited by 11.3% of urban children. **A R Dongre (2006)** [9]**found that**.

According to weight for age (Z score), 87.8% children were normal, Under weight, (8.3%),severe underweight(2.2%) and overweight.(1.7%). According to height for age (Z score), 88.9% children were normal, 9.4%were stunted and 1.7% were severely stunted.According to BMI for age (Z score), 87.8% children were normal, 7.7% were under weight, 1.7% were severe underweight and 2.8% were overweight. Girls had better nutritional status than boys .**Jayita Pal et al (2017)**[10] observed that according to weight for age (Zscore), 35.2% children were normal, 46.3% were under weight, 10.2% were severe underweight and 8.3% were overweight. According to height for age (Z score), 82.4% children were normal, 16.7% were stunted and 0.9% were severely stunted.

According to BMI for age (Z score), 42.6% children were normal, 34.3% were under weight, 17.6% were severe underweight and 5.6% were overweight.

Debnath M and Agrawal S (2016) [11] found that merely 47% of the cases were taking optimal calorie intake daily, which hiked up to 72% after nutrition education session. Children taking less and more than the RDA nearly reduced to half whereas, among the controls there was no such significant increase in the number of children taking optimal dietary intake after the study period.

Debnath M. et al (2016)[11] The mean weight before(15.70 ± 3.00 kg) and after (16.61 ± 3.11 kg) intervention revealed significant improvement. The mean height before(100.74 ± 5.64 cm) and after (102.26 ± 5.62 cm) intervention revealed significant improvement .The BMI before (15.43 ± 2.38) and after (15.82 ± 2.41) intervention revealed significant improvement.**Jayita Pal et al (2017)**[10]showed that 51.9%, 56.5% and 16.7% of children were suffering from under nutrition according to BMI for age Z score, WAZ and HAZ respectively. Post-intervention at 12 months after baseline survey showed that 9.2% of children of study school were suffering from under nutrition according to BMI for age Z score, WAZ and HAZ. Proportion of overall under-nutrition (using any criterion) had been decreased from 68.5% at baseline level to 47.1% at 6 months and 21.4% at 12months follow up in the study school.

CONCLUSION

The study was conducted to assess the effectiveness of health education programme regarding dietary habits on improvement of nutritional status of primary school children in urban area..After health education sessions were conducted for a year , it was observed that daily optimal calorie intake , mean weight , mean height , BMI, revealed significant improvement. The study suggests that health education plays an important role in comprehensive health of school children.

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