

Effectiveness of IEC Package on Body Mass Index of Adolescents in selected High Schools, D. K. District



Medical Science

KEYWORDS :

Dr. Theresa Leonilda Mendonca

Vice Principal, Laxmi Memorial College of Nursing, AJ. Towers, Balmatta , Mangalore -575002

Dr. Indrani Dasarathan

ABSTRACT

Adolescence is a period between childhood and adulthood: it assumes critical position in the lifecycle of human beings, characterized by an exceptionally rapid rate of growth. Energy balance plays a critical role in nutritional status of the adolescents. An Experimental study was conducted with the aim to assess the effectiveness of Information, Education and Communication (IEC) package on Body Mass Index (BMI) of adolescents in selected high schools, Dakshina Kannada district. BMI was calculated by anthropometric measures, IEC package on "Information Book on Nutrition and Physical Activity for Adolescents." was prepared and administered. Random selection of subjects in both experimental and control group was done. The total samples were 400 (200 experimental and 200 control). IEC package was administered to experimental group. After the administration of IEC package BMI was measured at intervals of 3 months and 6 months. In the experimental group a significant difference between mean BMI in three different test periods ($F_{2,597}=7.505, p=0.001$) was observed. But in the control group there was no significant difference ($F_{2,597}=0.340, p=0.712$). Post hoc analysis revealed that a significant change in total BMI from pre to post I ($p=0.004$) and pre to post II ($p=0.002$). But in the control group there was no significant difference from pre-test to post-test I, post-test II and from post-test I to post-test II. Results also showed that the difference in the mean BMI before and after IEC package is significant among underweight, healthy weight and overweight adolescents of experimental group ($p<0.01$).

Introduction

The nutritional problems among adolescents are common throughout the country. They have to encounter a series of serious nutritional challenges not only affecting their growth and development but also their livelihood as adults. As adolescents have a low prevalence of infection compared with under-five children, and of chronic disease compared with ageing people, they have generally been given little health and nutrition attention (Gupta & Kocher, 2009). Nutritional status assessment using anthropometry is a simple, and yet extremely useful initial approach to adolescent nutrition. Anthropometry is especially important during adolescence because it allows the monitoring and evaluation of the changes in growth. It would appear relevant to consider anthropometric assessment of adolescents based on BMI as routine in health care, and perhaps also in school health.

BMI is an indicator of nutritional status. For children, BMI is used to screen for obesity, overweight, healthy weight, or underweight. BMI does not measure body fat directly, but BMI correlates to direct measures of body fat. Being underweight is normally the result of deficit energy consumption, while being overweight is related to excess energy intake. These two problems are related to distinct public health problems. It is recognized that the extremes of over nutrition and under nutrition are often times concurrent problems in adolescent populations. For many adolescents inadequate quality and quantity of food are the prime determinants of nutritional problems. This may be due to inadequate nutritional knowledge, micronutrient malnutrition or due to household food insecurity ("Public health at a glance –adolescent nutrition"). School-based nutrition-physical activity education improves dietary practices and physical activity level that affect young persons' health, growth, and intellectual development. School-based nutrition education is particularly important because today's children and

Objectives of the Study

1. To determine BMI among adolescents..
2. To determine the effectiveness of IEC package on BMI among adolescents.
3. To find an association of post test BMI with their selected variables like age, gender, standard of education, type of food, type of family, education of parents, occupation of parents .

Materials and Methods

An experimental research approach was used

True experimental time series design was adopted for the study.

Group	Pre-test	Intervention	Post-test 1	Post-test 2
G ₁	O ₁₁	X	O ₁₂	O ₁₃
G ₂	O ₂₁	-	O ₂₂	O ₂₃

The study was conducted in eight selected high schools of Mangalore city region and Moodabidri region of D.K district.

The total sample consisted of 400 adolescents. Two hundred adolescents from four high schools of Mangalore city region and 200 adolescents from four high schools of Moodabidri region of Dakshina Kannada district were selected.

Sampling technique adopted was random sampling technique with lottery method. It was decided to draw 50 samples from each school to have total of 400 samples.

Further each school was divided as strata based on class of study. Proportionate to the strata using lottery method sample were drawn from each class.

Formal written permission was obtained from higher authorities. The investigator visited the school on the given date. The purpose of the study was explained to them and consent was taken from them. Each child's standing height was taken with the bare foot. Weight was taken for all the children with the calibrated weighing machine. Using weight and height, body mass index was calculated, interpreted and students were classified as underweight, Normal, overweight and obese.

IEC package included microteaching lessons on nutrition, Video show on demonstration of type of physical activity. The lecture was followed by an interactive discussion. The interactive session brought out students doubts which were answered. The other pedagogical method followed to enhance learner understanding was a spot quiz which evaluated the students understanding comprehension.

Results

Data in figure 1 and 2 shows that majority of subjects in experimental, 160 (80%) and control group, 159 (79.5%) were healthy, 22 (11%) in experimental and 20 (10%) in control were underweight, 12 (6%) in experimental and 14 (7%) in control were overweight and least in experimental, 6 (3%) and control 7 (3.5%) were obese. After the intervention, in the post test I in experimental group no change was observed where as in control group percentage of healthy decreased (77%), over-

weight (8%) and obese (5%) increased. In the post test II in experimental group percentage of overweight decreased to 4.5% and obese remained same (3%) where as in control group there was no change.

Data in the table 1&2 shows that ANOVA results showed a significant difference between mean BMI in three different test periods in the experimental group ($F_{2,597}=7.505, p=0.001$). But in the control group there was no significant difference ($F_{2,597}=0.340, p=0.712$). Post-hoc analysis revealed that in the experimental group there was significant change in total BMI from pre to post test I ($p=0.004$) and pre to post test II ($p=0.002$). But in the control group there was no significant difference from pre-test to post-test I, post-test II and from post-test I to post-test II. Results also showed that the mean BMI of overweight/obese adolescents decreased from 26.18 to 24.17 in the experimental group where as in the control group it increased from 26.19 to 27.41. The difference in the mean BMI before and after IEC package is significant among underweight, healthy weight and overweight adolescents of experimental group ($p<0.01$).

A school-based multidisciplinary lifestyle intervention seems to be a promising strategy to reduce body weight and improve aspects of metabolic syndrome.

Logistic regression analysis showed that except mother's education and occupation, demographic variables did not show any association with the post test BMI.(Table3.)

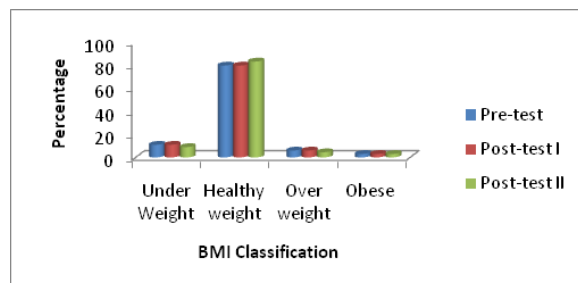


Fig 1. Diagram showing Percentage Distribution of Sample on BMI Classification in Experimental group

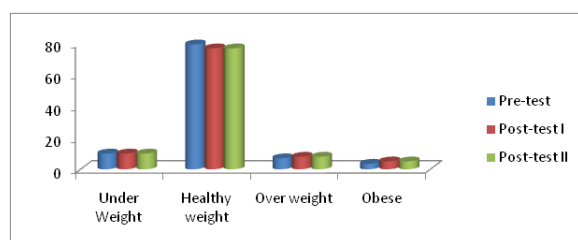


Fig 2. Diagram showing Percentage Distribution of Sample on BMI Classification in Control group

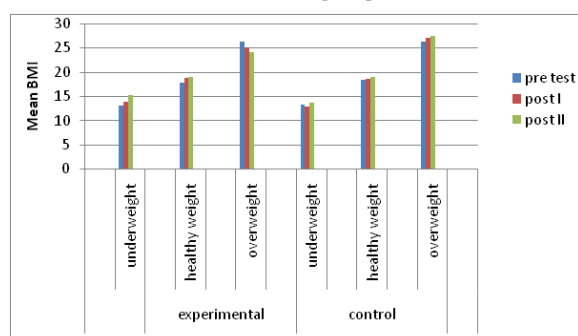


Fig.3. Bar Graph showing Mean BMI among Underweight, Healthy weight and Overweight/obese Adolescents of Experimental and Control group.

Table 1. ANOVA results showing Significance of Difference in the Mean BMI during Three Test periods among Underweight, Healthy weight and Overweight Adolescents

Group		SS	MS	df	F
Control					
Underweight	Between	4.345	2.173	2	5.397
	Within	22.944	0.403	57	P=0.000
Healthy weight	Between	26.839	13.420	2	2.135
	Within	2,978.869	6.285	474	P=0.119
Overweight & Obese	Between	15.943	7.972	2	1.232
	Within	388.212	6.470	60	P=0.299
Experimental					
Underweight	Between	44.239	22.120	2	46.532
	Within	29.948	0.475	63	P=0.000
Healthy weight	Between	124.619	62.309	2	16.249
	Within	1829.104	3.835	477	P=0.000
Overweight & Obese	Between	36.728	18.364	2	6.013
	Within	155.766	3.054	51	P=0.005

Table 2. Post hoc Analysis showing the Significance of Difference of Mean BMI across Pre and Post-test in Experimental and Control group among Underweight, Healthyweight and Overweight Adolescents

Group	BMI	(I) time	(J) time	Mean Difference (I-J)	Sig.
Control	Under weight	Pre	Post I	.23000	1.000
		Pre	Post II	-.41429	0.616
		Post I	Post II	-.64429	0.165
	Healthy weight	Pre	Post I	-.26061	1.000
		Pre	Post II	-.58244	0.123
		Post I	Post II	-.32183	0.759
	Over weight	Pre	Post I	-.76611	0.625
	&Obese	Pre	Post II	-1.22736	0.135
		Post I	Post II	-.46125	1.000
Experimental	Under weight	Pre	Post I	-.77726*	0.032
		Pre	Post II	-1.99137*	0.000
		Post I	Post II	-1.21411*	0.002
	Healthy weight	Pre	Post I	-1.01247*	0.000
		Pre	Post II	-1.14799*	0.000
		Post I	Post II	-.13552	1.000
	Over weight	Pre	Post I	1.18731	0.068
	& Obese	Pre	Post II	2.01032*	0.001
		Post I	Post II	.82301	0.265

Table 3. Logistic Regression Analysis showing the Significant Predictors of BMI of Experimental group

Time	Variables	B	SE	Wald	P	OR	95% CI	
							Lower	Upper
Pre	Age in years	-2.463	2.545	2.604	0.626	0.085	0.001	12.500
	Gender	0.668	0.807	0.687	0.407	1.951	0.402	9.480
	Standard of education	2.161	1.237	3.051	0.081	8.677	0.768	98.000
	Type of family	-1.571	1.348	1.359	0.244	0.208	0.015	2.917
	Education status of mother	-0.173	42587.724	0.000	1.000	0.841	0.000	
	Education status of father	-2.377	8.574	0.077	0.782	0.093	0.000	1844397
	Occupation status of the mother	-17.999	23820.546	0.000	0.999	0.000	0.000	
	Occupation status of the father	-3.076	2.221	1.919	0.166	0.046	0.001	3.584
	Monthly income	1.661	1.522	1.191	0.275	5.263	0.267	103.857
	Duration of watching TV	-4.890	3.266	2.242	0.134	0.008	0.000	4.529
	Sleeping hours	-0.154	1.924	0.006	0.936	0.858	0.020	37.256
	Suffering from illness	-1.865	0.883	4.463	0.035	0.155	0.027	0.874
	Constant	-10.430	40193.035	0.000	1.000	0.000		
Post I	Age in years	-3.830	2.451	2.441	0.118	0.022	0.000	2.651
	Gender	-0.283	0.705	0.160	0.689	0.754	0.189	3.004
	Standard of education	0.628	1.156	0.295	0.587	1.873	0.195	18.040
	Type of family	-0.449	1.276	0.124	0.725	0.638	0.052	7.791
	Type of food	-0.301	0.958	0.099	0.753	0.740	0.113	4.837
	Education status of mother	17.527	40193.294	0.000	1.000	4.100	0.000	
	Occupation status of mother	-16.942	24124.883	0.000	0.999	0.000	0.000	
	Occupation status of the father	-5.007	2.055	5.937	0.015	0.007	0.000	0.376
	Monthly income	1.174	1.411	0.692	0.405	3.235	0.204	51.388
	Place of residence	-0.239	0.842	0.080	0.777	0.787	0.151	4.102
	Suffering from illness	-2.185	0.806	7.347	0.007	0.112	0.023	0.546
	Constant	-6.323	40193.295	0.000	1.000	0.002		

Discussion

The present study findings are consistent with the pilot study findings of Nayak and Bhat (2011) to evaluate the effectiveness of a school based multi-component intervention on body fat, lifestyle practices and self esteem of obese and overweight children in Udupi district of Karnataka. There was a significant changes in BMI of intervention group at the end of 4 weeks which was statistically significant

Findings are also supported by a similar study conducted by Dirk, et al. (2008) to evaluate the effect of a multidisciplinary school-based lifestyle intervention for overweight and obese students attending vocational secondary school (VSE). Mean weight change after 6 months was -2.23 kg in the intervention

group compared to +1.39 kg in the control group ($p < 0.001$). This resulted in a change in BMI of -0.78 kg/m² in the intervention group and +0.49 kg/m² in the control group ($p < 0.001$).

Conclusion:

There is great concern to inculcate good healthy habits among adolescents to promote positive health. The present study provides necessary information to mothers, school administrators and nurse educators to identify the lifestyle practices, promoting physical exercises and controlling the diet of the children which will help in preventing lifestyle related disorders. The results of the study have implication for nursing education, nursing practice, nursing research and nursing administration.

REFERENCE

1. Dirk, V, An De Meulenaere, Christel, V, Koen, V., & Annemie. | (2008). Effect of a multidisciplinary school-based lifestyle intervention on body weight and metabolic variables in overweight and obese youth. European Society for Clinical Nutrition and Metabolism, 5(2). doi:10.16/j.eclnm. 2008.05.002. | 2.Gupta, N., Kocher, G. K. The journal of nutrition and wellness. volume 7. http://www.lspub.com. | 3.Helen, T., Benjamin, C., Elodi, S., Magali, B., & Sylvie, M. T. (2010). Risk factors for overweight & Obesity in French adolescents: Physical activity, sedentary Behaviour, and parental Characteristics. Nutrition, 26, 192-200. | 4.Hockenberry, M. J., David, W. (2009). Wong's Essentials of Paediatric Nursing (8th ed). St. Louis: Mosby. | 5.Nayak, B., & Bhat, H. V. (2010). A study to evaluate the effectiveness of multi-component intervention on lifestyle practices, body fat and self-esteem of obese/overweight school children in selected english medium schools of Udupi district. International Journal of Nursing Education, 2(2), 9-11. | 6.WHO (2009). Interventions on diet and physical activity: what works. Summary report. Geneva. | 7.WHO (2009). Report of WHO programme for adolescent health and development. UNICEF UNEPA, Study group publication. Geneva.