# Use of Physical Activity Module as an Intervention to Enhance Knowledge among High School Children – A Pilot Study

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### Abstract:

**Introduction**: Among children, one of the most serious public health challenges of the 21<sup>st</sup> century is childhood obesity, namely central obesity. This increases the risk of cardiovascular disease and diabetes. Studies show that, children who are physically active are less likely to have central obesity making it a key element in the prevention and treatment of both chronic diseases. **Objectives:** To assess the baseline knowledge and post-interventional knowledge of the students and teachers on the physical activity; to assess the utility and acceptability of the intervention module. **Method:** An interventional study in 2 schools by administering tests prior to and after giving a class on the importance of physical activity and focused group discussion with teachers to assess the utility and acceptability of intervention. Data analysed using SPSS software, tabulated and interpreted by applying statistical tests. **Results:** Among the 120 students who participated, a significant increase in knowledge regarding the need for physical activity after health education was observed. **Conclusion:** Health education approach in schools was found to be effective and feasible in improving the knowledge and behavioural practices regarding physical activity among adolescents to reduce childhood obesity and to improve overall health.

Keywords: Adolescents, Health, Obesity, Physical Activity

### Introduction:

Among children, one of the most serious public health challenges of the 21<sup>st</sup> century is childhood obesity, particularly the urban settings.<sup>[1]</sup> Worldwide, in 2016 the number of overweight children under the age of five was estimated to be over 41 million.<sup>[2]</sup> Many children today are overweight or obese than ever before. "Overweight" means that the individual weighs more than what is recommended for a given height.<sup>[3,4]</sup> "Obesity" is an excess of body fat and central (abdominal) body fat is linked to cardiovascular disease and diabetes.<sup>[5,6]</sup> Studies examining the relationship between physical activity and abdominal fat suggest that those who are more active are less likely to have central obesity.<sup>[7]</sup> Lack of physical activity is one of the main factor contributing to the rise of the childhood obesity crisis.<sup>[8]</sup> Children who embrace healthy eating and exercise habits during middle childhood will have a much easier time maintaining a healthy lifestyle

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through adolescence and adulthood than individuals who try to make the shift later in life.<sup>[9]</sup> Thus promoting physical activity in children may lead to a healthy lifestyle in adulthood and further help in reducing the burden of chronic diseases.<sup>[10]</sup> Schools are probably an ideal medium for intervention as they are central to children's lives and relatively quick dissipation of information can occur through this channel.<sup>[11]</sup>

Life skills "can help people to make informed decisions, communicate effectively and develop coping and self-management skills that may help an individual to lead a healthy and productive life." These skills are often taught to adolescents, as they can help them successfully transition "from childhood to adulthood by healthy development of social and emotional skills." So, the Indian Association of Preventive and Social Medicine (IAPSM) came up with an idea of bringing in a comprehensive education module which will deal with the students in their early age to understand their own and their family health so that the overall healthy behaviours are incorporated into the individual from their growing age by itself. LEAP (Life Skills Education and Health Promotion)module was created by IAPSM-REECH team consists of around 100 contributors from various parts of the country. The ideas of different people are put across in a single SOP (Standard Operating Procedure) to make a common content on nutrition, physical activity, common illness (malaria, tuberculosis, obesityetc.), stress and depression etc. The LEAP covers all 4 objectives of RKSK through school health component.

Therefore, present study was conducted among children and teachers with below mentioned objectives.

- To assess the baseline & post interventional knowledge of the students & Teachers on Physical activity
- 2. To assess the utility and acceptability of the intervention module

# Method:

An interventional study was done among students of class  $8^{th}$  or  $9^{th}$  of two schools(a CBSE and a state syllabus school)which were selected using convenience sampling technique for 6 months. Selection of the participants was done by cluster randomization. Permission from the school, consent from parents and assent from students were obtained. For keeping power of study at 80% and number of clusters being 2, with considering intra cluster correlation coefficient at 0.03, and expecting a change by 4 times with base knowledge to be 50% the total sample size 50. Adding the 20% non-response in this will give a final sample size of 60 and 30 in each cluster.

The total teaching hours of the module was divided and spread over 3 months with consensus with the teachers. The physical activity module for adolescents was introduced in vicinity of the teachers and the teachers were given a hard copy of the module (one copy per school) and were requested to learn the same. A validated pre-tested pre-test questionnaire (having mutiple choice questions) was administered to the students in order to assess their knowledge of physical activity (likes various types, duration of physical activityetc.), benefits of physical activity, health hazards caused by physical inactivity The knowledge of students and teachers were re-tested by administering the questionnaire formerly used after 3 months. A validated and pre-tested general questionnaire on acceptability and utility of the module was also introduced to the students and teachers. Teachers were also introduced with a questionnaire to assess their willingness and the difficulty to undertake the module. Two Focused Group Discussion (FGD) for teachers of both the schools were conducted to get more inputs on the module which included 6 teachers per group and the discussions were taperecorded, transcribed and analysed accordingly.

The data were entered in Microsoft Excel and analysed using SPSS 16. Frequency and percentage were calculated for test scores. To test the association between utility and a change in knowledge chisquare test was used. To assess the difference in knowledge between pre-test and post-test, the difference in knowledge was graded wherein a score >5 was considered to be good while a score of 3-5 was awarded an average grade. Difficulty index of the module was also assessed and the scoring option given ranged from 1 to 10, wherein 1 stood for module being easy while a score of 10 was considered difficult to understand.

# **Results:**

A total of 120 students were enrolled for the study from two English medium schools- a CBSE syllabus (school 1) and a state syllabus (school 2). Out of 120, 80 were from school 1 and 40 belonged to school 2. On assessing the basic awareness regarding the importance of health among the students, it was observed that 70% of the students in school 1 and 48% of students in school 2 had strongly agreed that understanding the need for physical activity is good for them. While 69% of the students in school 1 and 73% of students in school 2 strongly agreed that they think health is important for all. Only 30% of students in school 1 and 25% of students in school 2 strongly agreed that knowing health-related issues will make them a better person.

On an assessment of awareness regarding understanding the need for physical activity among teachers, it was observed that 100% of them strongly agreed to it. Cent percent of the teachers strongly agreed that as a teacher they need to know more about health-related issues and that health is important for all. Following the health education, all the teachers strongly agreed that they are aware of health hazards due to lack of physical health activity. On comparing the results of pre-test and post-test, it

	School 1	l (n=80)	School 2 (n=40)		
Knowledge	Before class n(%)	After class n(%)	Before class n(%)	After class n(%)	
Regarding physical activity	75(93.75)	80(100)	23(57.5)	40(100)	
Regarding benefits of physical activity	55(69)	71(89)	4(10)	38(95)	
Regarding health hazards caused by physical inactivity	28(35)	56(70)	14(35)	35(87)	

Table 1: Distribution of knowledge regarding physical activity, its benefits and health hazardscaused by physical inactivity prior to and after health education class among students

	School 1	l (n=80)	School 2 (n=40)		
Knowledge	Pre test n(%)	Post test n(%)	Pre test n(%)	Post test n(%)	
Recommended duration of physical activity	28(35)	64(80)	6(15)	40(100)	
Recommended level physical activity	31(39)	62(77)	8(20)	40(100)	
Moderate aerobic exercise in children	8(10)	13(16)	3(8)	33(83)	
Sleep	28(35)	77(96)	14(35)	35(88)	
Posture	79(98)	80(100)	33(82)	40(100)	

Variables		Increase in Knowledge – School 1 (n=80)			Increase in Knowledge – School 2 (n=40)				
		Average	Good	Total	p- value*	Average	Good	Total	p- value*
Unders- tanding physical health is good	Neutral	1(2%)	1(4%)	2	0.113				0.973
	Agree	9(16%)	9(36%)	18		6(35%)	8(35%)	14	
	Strongly agree	45(82%)	15(60%)	60		11(65%)	15(65%)	26	
The utility of teaching methods is good	Neutral	4(7%)	4(11%)	8	. 0.133	-	-	_	0.012
	Agree	12(22%)	9(24%)	21		5(29%)	16(70%)	21	
	Strongly agree	39(71%)	25(65%)	51		12(71%)	7(30%)	19	
	Disagree	0(0%)	1(5%0	1	0.201	1(6%)	1(4%)	2	0.755
module	Neutral	13(26%)	9(45%)	22		4(24%)	9(39%)	13	
was	Agree	20(37%)	5(25%)	25		9(53%)	9(39%)	18	
easy to understand	Strongly agree	20(37%)	5(25%)	25		3(17%)	4(18%)	7	
Post education awareness improved	Strongly disagree	1(2%)	0(0%)	1	0.006	-	-	_	0.262
	Disagree	4(7%)	2(8%)	6		4(24%)	3(13%)	7	
	Neutral	1(2%)	5(20%)	6		2(12%)	9(39%)	11	
	Agree	16(29%)	12(48%)	28		7(40%)	8(35%)	15	
	Strongly agree	33(60%)	6(24%)	39		4(24%)	3(13%)	7	
Difficulty index value (1-10)	1	23(42%)	8(32%)	31	0.861	9(47.4%)	2(4.8%)	11	0.035
	2	14(25%)	8(32%)	22		2(10.5%)	1(4.8%)	3	
	3	12(22%)	6(24%)	18		3(15.8%)	7(33.3%)	10	
	4	6(11%)	3(12%)	9		5(26.3%)	11(52.4%)	16	

# Table 3: Association of acceptability and utility of the module with the change in knowledge

\*( p value was calculated by chi square test.)

was observed that there was an increase in knowledge regarding the types of physical activity, benefits of physical activity, and the ill effects of physical inactivity.

On comparing the pre-test and post-test scores, an increase in knowledge was noted after the administration of health education class regarding the duration of physical activity, level of physical activity that is required for the adolescent age groups (Table 1).

The students showed an improvement in the post-test regarding knowledge about the requirement and benefits of sleep and also regarding the posture and its benefits (Table 2).

A paired-sample t-test was conducted to compare the mean difference in scores of pre-test and post-test in school 1 and school 2. There was a significant difference was observed in the scores of school 1 (Mean =3.2, Standard Deviation=0.88) and school 2 (Mean=10.17, Standard Deviation=1.81) as well.

When the association between acceptability and utility of the module and the change in knowledge of the students and teachers were assessed it was seen that there was no significant association between the change in knowledge and acceptability and utility of the module, although the participants agreed that the module was good for understanding the need for physical activity among adolescents. (Table 3)

### Discussion:

The school setting has long been defined as the ideal setting for physical activity promotion interventions. Physical activity can help kids cope with stress and it also promotes healthy growth and development, better self-esteem, stronger bones, muscles and joints, better posture and balance, better focus and concentration during school.<sup>[12]</sup> Since adolescence is the age group where a healthy habit can be promoted which can benefit the individual in the future, a special interest should be taken to provide the right education regarding the need for physical activity and other health-related issues. In this study, which was conducted in school, it was found that the majority of students strongly agreed that the understanding regarding the need for physical activity was good for them. Students and teachers also agreed that teachers need to know more about health-related issues. Esther M F et al in their study concluded that multicomponent interventions and interventions including school and family or community involvement may make important differences in physical activity levels in adolescents.<sup>[13]</sup> It was evident in this study that intervention with health education showed a significant increase in knowledge among students. Structured physical activity programming can improve psycho-social outcomes such as selfconcept, social behaviours, goal orientation, and most notably self-efficacy. Henceforth, it can be said that a properly structured health education modules can certainly make an impact on the knowledge and behaviour among adolescents as in this study

## **Conclusion:**

In schools, health education approach was found to be effective and feasible in improving the knowledge and behavioural practices among adolescents to reduce childhood obesity and to improve overall health. There was a significant increase in knowledge regarding the need for physical activity among students. Although there was no statistically significant association between the utility of module and knowledge, overall there was a positive impact considering the knowledge acquired by students from the module.

### **Declaration:**

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Conflict of interest: Nil

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