

## Research Article

### Assessing Self-efficacy of school children for making choices for Physical activity and healthy food

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One of the missions of AACCI- Association of Adolescent and Child Care in India, is to increase awareness of healthy lifestyle in children to help in reducing the incidence of NCD's in child and adult population. We are doing multi-centric studies in India using a validated scale Physical Activity and Healthy Food Efficacy in children (PAHFE-C) which assesses Self-efficacy for healthy eating and goal setting. Such studies shared with the school authorities and parents help in getting permission to conduct programs in school to empower children for good decision making about healthy food and physical exercise in school children which will track into adolescence.

This pilot -a cross-sectional study 273 children from Std VII and IX a secondary school in New Delhi. Our results showed a wide range of variability in the scores and the mean score achieved were less than 60% which are not satisfactory. In the older age group, the boys had statistically significant higher scores than girls. This may reflect more independence given to boys for decision making and this age girls having other issues like concern about the body image, restriction of physical activities, and safety issues. The girls had statistically significant higher scores in the lower age group. This could reflect more developmental and emotional maturity of girls at the same age compared to boys and having lesser concern of body image at this younger age. In our further studies we plan to incorporate all these variables and compare with age and gender.

**Keywords:** PAHFE-C scale, Self-efficacy, children, adolescents, prevention of NCD's setting goals, Decision making, Physical activity, healthy diet choices

## INTRODUCTION

Since the risk factors for obesity - like sedentary lifestyle and unhealthy eating behaviour starts from childhood and tracks into adolescence and adulthood, inculcating positive health behaviour for physical activity and healthy food in children at school level is an important preventive measure for adult onset Lifestyle diseases or Non-Communicable diseases -NCD's.

WHO has identified four risky behavioral factors in adolescents for development of Non-Communicable diseases NCDs :1) unhealthy food habits, 2) reduced physical activity, 3) tobacco and 4) harmful consumption of alcohol. Reduced level of physical activity in child population has contributed to significant global childhood obesity crisis, which are tracked in adolescence and adult obesity. Recently, WHO has identified 4 behavioral risk factors in adolescence which is conducive-to-obesity and non-communicable diseases (NCD) in adolescence population and track into adulthood leading to the further development of adult non-communicable diseases (3). These include unhealthy food habits, reduced physical activity, consumption of tobacco and alcohol (1). Various studies show that these unhealthy habits are increasing world over in adolescents (2)

Only knowledge about health behaviour need not necessarily translate into healthy lifestyle. There are other factors that determine behaviour change e.g., Self- efficacy is one factor that determines healthy eating and exercise behaviour. Self-efficacy, as per the construct of Albert Bandura's Social Cognitive Theory (SCT), is defined as the belief in one's own ability to achieve actions necessary to produce a desired effect (3). It relates to an individual's confidence in achieving and maintaining behavioral changes.

Hence, it is rational to anticipate that physical activity, intervention programs may benefit from incorporating SCT modifications and to further evaluate self-efficacy as a component in determining behavioral change. The impact of self-efficacy as a mediator of behavior changes on physical activity and healthy food choices need more studies. Although the etiological consideration of obesity is multi-factorial; weight loss can be achieved by dietary measures and activity behavioral modification ((4) ).

Hence, it is very much necessary to initiate some interventional therapy at school level to create awareness of these risk factors and capacity in building up the behavior changes to inculcate healthy lifestyle. School interventions are considered as the best options to reduce risk factors and ultimately leading to decrease in NCD prevalence. The intervention will become mandatory for healthcare policymakers to focus on the student population and encourage their involvement more in physical activities by educating about risks of obesity leads to NCDs (5). Before implementation of any intervention, it would be mandatory to conduct a baseline survey among the school population to get a concept about interventions which are most likely to give good results and also plan for a post interventional study to see the impact.

The study was conducted by Arifa et al. in 2018 in India on dietary habits of students among the age group of 6-14 years with new USDA (US Department of Agriculture) Multiple-Pass recall method, assessed their physical activity using modified Global Physical Activity Questionnaire developed by WHO (6). The assessment demonstrated the deficiency or excess calories intake from the diet by the children of urban and rural background. The urban background children consumed more calorie content diet with the highest proportion of calorie observed among urban males aged 6-8 years and urban females aged 9-11 years.

European energy balance research project conducted a large-scale survey about prevention of excessive weight gain among youth population (EUROPEAN ENERGY Report Summary 2016) in seven European countries (7) among 1000 children aged 10-12 years demonstrated the cause of obesity depends on social difference and potential determinants, like physical activity and healthy diet, immunogenicity, and vital status.

A set of questionnaires on PAHFE (Physical Activity, Healthy Food Efficacy) scale mentioned by Perry CM, 2018 (8) had been considered as a useful predictor of physical activity and healthy eating behavior. There are few clinical studies, based on PAHFE-C scale showed effective and consistent positive outcomes. However, other factors might also need to be included in this study to measure the desired outcomes. This survey-based study will encourage children for participating in positive health-related programs, which can be customized in the more effective manner.

## METHODS

### *Ethical considerations*

Our study was approved by Institutional Ethics Committee of AACCI. The permission was taken from the school principal and written assents was obtained from each student for filling the questionnaire and being part of this research project.

### *Study design and sample*

This is a cross-sectional multi-centric study conducted on children in one of the English medium co-eds secondary school in Dwarka a -suburb of New Delhi, India, using a validated PAHFE-C scale (Physical Activity, Healthy Food Efficacy Scale for Children).

The principal gave us permission for taking the VII and IX classes as they did not have any exam scheduled at the time of our survey. Parental permission was taken by the principal A total 273 children (aged group between 9-16 years) were included from standard VII (70) and 203 children from standard IX. The scale was filled under supervision and explained by teachers trained by AACCI.

### *Tool used*

PAHFE-C (Physical Activity, Healthy Food Efficacy Scale for Children) (8) is a self-efficacy scale for measuring children's (9-16yrs) perceived confidence to make decisions about following: 1) Physical Activity and 2) Healthy Food It is a 5 point Likert's scale (*Not Sure to Completely Sure*); it may be considered as a useful predictor tool for both physical activity and eating behavior.

It identifies into four subscales:

1. Goal setting for Physical Activity,
2. Goal setting for Healthy Food Choices,
3. Decision-Making for Physical Activity,
4. Decision-Making for Healthy Food Choices.

Each sub-scale had *Not Sure to Completely Sure* internal consistency reliability, and subscale scores, which are related in ways we would expect to measure of demographics, social support, and social skills, lending a measure to construct a validity to the scale.

PAHFE-C Scale:

- ✓ Reliability: Internal consistency coefficient 0.87
- ✓ Validity: Construct validity is well established with significant convergent validity evidence

The scores on each of these subscales showed a moderate to high degree of internal consistency ( $0.59 \leq \alpha \leq 0.87$ ). The Decision-Making for Healthy Food Choice subscale and the Decision-Making for Physical Activity subscale scores showed significant convergent validity evidence.

*Data collection*

The questionnaire was administered in the class VII and IX by the teachers who was trained by AACCI team ‘

*Statistical Analysis*

This was done using Microsoft excel

**RESULTS**

We had more boys in both the classes -VII and IX

**Class wise distribution of boys and girls (Table 1)**

<b>Table-1: Class wise Distribution of Boys and Girls</b>			
<b>Class</b>	<b>Girls No / %</b>	<b>Boys No / %</b>	<b>Total n=270</b>
<b>IX</b>	88(43.3%)	115 (56.7%)	203 (74.40%)
<b>VII</b>	32 (45.7%)	38 (54.3%)	70 (25.60%)

**Age comparison of total sample (Table 2)**

The younger children from VII Std had higher score, but the difference was not statistically significant

<b>Table 2 PAHFE-C Score</b>						
<b>Total Sample- Comparison of VII and IX class students</b>						
<b>n=273 missing data – nil</b>						
<b>Class</b>	Mean	Mode	Std deviation	Variance	Range	P value
<b>IX n=203</b>	56.59	60	140.037	197.026	28-89	
<b>VII n=70</b>	58.10	49	13.321	177.454	20-92	P=0.431
<b>Maximum score is 100.</b>						
<b>The mean scores of 56.9 and 58.0 are not satisfactory</b>						

There was wide range of variability, Class IX some students scored below 20 while some students scored 92 (Fig. 1) In Class VII some students scored as low as 28 and some had 89 score (Fig. 2).

Fig 1 Self-efficacy Score Std IX

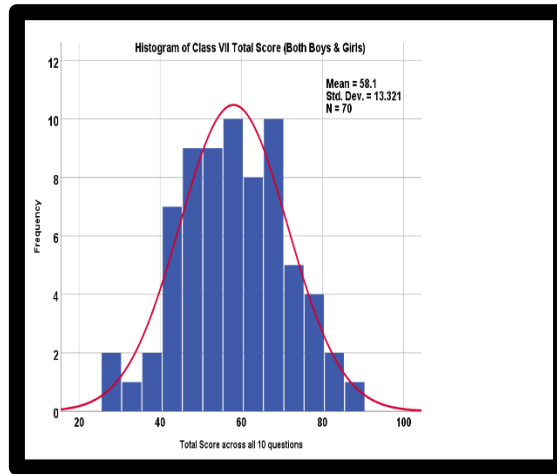
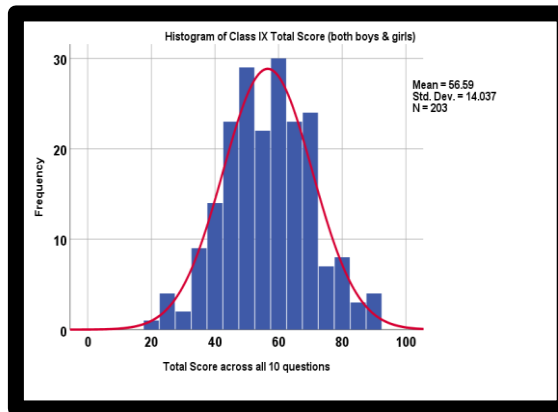


Fig 2 Self efficacy Score STD VII



Comparison of scores in Boys and girls showed that boys had higher score which was statistically significant  $P=0.038$  (Table 3)

TABLE 3 PAHFE-C- score					
Total sample comparison between boys and girls					
n=273 ( missing data nil )					
Maximum score -100					
GENDER	Number	Total mean Score	Std. Deviation	Std.Error Mean	P Value
Boys	120	55.02	14.014	1.27	
Girls	153	58.51	13.565	1.09	$P=0.038$ $P<0.05$
the boys had a higher score than girls which was statistically significant					

### Comparison of age and gender (Table 4)

The younger girls of class VII achieved higher than boys which were statistically significant  
The older boys from Std IX achieved higher scores than girls which was highly significant statistically.

Table-4 : Comparison of PAHFE-C scores- in boys and girls ( n=273 ) n=273 missing data – nil maximum score -100						
GENDER	Number	Total Mean Score	Range of Score	Std. Deviation	Std. Error Mean	P Value
Girls IX std	88	52.50	Minimum-23 Maximum -92	13.660	1.456	
Boys IX std	115	59.71	Minimum 20 Maximum-90	13.563	1.265	P=0.000 P<0.001
Girls VII std	32	61.94	Minimum 35 Maximum-89	14.014	1.279	
Boys VII std	38	54.87	Minimum 28 Maximum-80	13.563	1.0979	P=0.026 P<0.05

## DISCUSSION

AACCI - Association of Adolescent and Child Care in India, has been working since its establishment in 2007 towards prevention of NCDs by the promotion of holistic health in children and the young people through teachers and parents.

In this sample, we found that overall- the mean score – less than 60% , achieved by the students was not satisfactory and these children need to enhance their self-efficacy to improve their health behavior for PE- Physical activity and HF-Healthy food.

Comparison of age - We found better scores in the younger children i.e., standard VII as compared to the older children i.e., standard IX. Older children lower scores may reflect more independence to make food choices which generally follow an unhealthy choice due to peer pressure and impact of food advertising. The younger children's higher scores may reflect - more parental control in decision making and goal setting over their choices of food and physical activity pattern. Similar findings were also reported by Brown et al (9) . Another study (11) also inferred that those younger children are more under parental control whereas older children are under peer influence.

A curriculum-based intervention by Stuart J Fairclough (10) included physical activity and healthy food intake with involvements of parents in the children's learning, focusing on the positive aspects of physical activity and healthy eating habits where they compared the modeling and control theory of parental influence on children's eating attitudes and behavior with a focus on snack foods. These results demonstrated the support for both the modeling and the control theories of parental influence and positive support for parental role model which may be a better method for improving a child's diet than attempts at dietary control. Hence when AACCI does intervention programs on healthy lifestyle parents are very actively involved.

Gender comparison of the total sample demonstrated that boys had higher scores which were statistically significant. This may reflect the more independence given to boys for decision making.

Gender comparison in younger children of class VII showed statistically significant higher scores in the girls as compared to boys. This could reflect more developmental and emotional maturity of girls at the same age compared to boys. And also lesser concern of body image at this younger age

In comparison the opposite was seen in the older children from standard IX where the boys showed statistically significant higher scores than girls of STD IX. This may be a reflection of other issues related to healthy eating and physical activity at this age in girls e.g. their concern about the body image, restriction of physical activities, and safety issues. It can also reflect more independence given to boys.

In our study the younger girls scored higher than older girls. This may be a reflection of other issues related to healthy eating and physical activity at this age in girls e.g. their concern about the body image, restriction of physical activities, and safety issues. It can also reflect more independence given to boys since this was a pilot study to see the use of this scale we had not factored other variables all this along with the questionnaire. Which we plan to include when we do larger studies.

A cluster-randomized intervention by Stuart J Fairclough (10), 2013 showed a significant effect among girls, overweight/obese students via school-based curriculum intervention.

Owen and his team (11) demonstrated the similar type of effects in their meta-analysis focusing on the effectiveness of school-based physical activity interventions for adolescent girls; in which they found that the intervention effects were very small which indicates that changing physical activity behaviors in adolescent girls through school-based interventions is challenging. Multi-component interventions and interventions underpinned by theory may be the most effective approaches to positively change adolescent girls' physical activity levels.

On reviewing literature for other studies done for school based interventions we found one the interventional study from Lebanon conducted by Habib (7) and his team on Social Cognitive Theory comprising of three components: 1). Class curriculum, 2). Family involvement, and 3). Food services etc. in 9-11 years old Lebanese children randomized from eight schools of different socioeconomic strata in two groups: controlled intervention reported that the multi-component school-based intervention offered the promotion of healthy eating and physical activity in the children. After the study completion, for the intervention group, the result showed self-efficacy scores increased with  $p < 0.001$ . Post-intervention, no difference in physical activity and in BMI between groups was noted.

Another recent study was conducted by Lassetter et al. (2018) (12) on 517 school children of average age 10.6 years, to analyze self-efficacy related to physical activity and healthy food and to promote a healthy lifestyle by preventing childhood obesity. It was a socio-cognitive theory-based study containing two sets of the psychometric test: Healthy Eating and Physical Activity Self-Efficacy Questionnaire for Children (HEPASEQ-C) and Healthy Eating and Physical Activity Behavior Recall Questionnaire for Children. In this study the

content validity index ranged from 0.80 to 1.00 for HEPASEQ-C and 0.88 to 1.00 for HEPABRQ-C, demonstrating that all items in this study judged were content valid.

A systematic review within the HOPE project: School-based interventions promoting both physical activity and healthy eating in Europe conducted by Bourdeaudhuij et al. (13) in which interventions were further assessed for behavioral determinants i.e. diet, physical activity, and weight-related outcomes. The environmental interventions included organized physical activities; improved availability of physical activity opportunities; increased physical education lesson time; improved availability of healthy food options; and restriction on unhealthy food options. Post-intervention, the results of this review suggested that children need healthy dietary behavior with the help of strong parental support.

Our study results show that such school-based surveys conducted are useful to get an idea about the behavior patterns of the sample studies. Such studies help in motivating school authorities to share and discuss the results with the parents and teachers, and this makes them aggregable to AACCI offer of conducting customized training programs or workshops to inculcate positive health behavior – choosing healthy diet and goal setting exercises We also feel that that PAHFE –C scale can be considered as an important tool to assess the self-efficacy in children for physical activity and healthy food habits.

## LIMITATIONS OF THE STUDY

Self-efficacy and food choice behaviour has many other variables like body image concerns, emotional and developmental maturity, parental lifestyle and school environmental factors like availability of physical activity facilities and choice of food available in the school canteen and peer pressure. In this pilot study we have not added these variables and plan to add them when we plan a larger study.

Significance of results/inference: The conclusion is based on a pilot study. Hence it has a limited significance.

There is need to conduct study on a bigger sample which should be true representation of both urban and rural population.

## CONCLUSION

1. Our results showed that the total mean scores in both standard VII and IX were not satisfactory- being less than 60%. There was wide range of variability. From the maximum score of 100 some students scored below 20 while some students scored 92
2. In the total sample the boys had statistically significant higher scores which may reflect more independence given to boys for decision making and choices The younger girls of class VII achieved statistically significant higher scores than boys. This could reflect more developmental and emotional maturity of girls at the same age compared to boys. and also lesser concern of body image at this younger age
3. The older boys from Std IX achieved higher scores than girls which was highly significant statistically. This may be a reflection of other issues related to healthy eating and physical activity at this age in girls e.g., their



concern about the body image, restriction of physical activities, and safety issues. It can also reflect more independence given to boys. We need to do a larger study taking into account all these factors also.

4. Such studies shared with the school authorities and parents help in getting permission to conduct programs in school to empower children for good decision making skills about healthy food and physical exercise.
5. Thus we can help inculcate healthy lifestyle in school children which will track into adolescence. This will reduce the incidence of obesity and risk factors for NCD and go a long way in reducing the incidence of NCD's in adult population which is the mission of AACCI.

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