

# Assessment of Cardiovascular Risk Factors and Knowledge among Students in Selected Schools of Indore

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**Abstract:** *The acceleration of cardiovascular diseases (CVD) has become an alarming health problem across the globe. The Global Burden of Diseases study has reported that by the year 2025, CVD would be the major cause of death all over the world including the developing countries. The present study was conducted to assess cardiovascular risk factors and knowledge among school students. A total of 100 samples were selected as the participants through non probability purposive sampling technique. Consent for the participation was taken from the participants and data was collected by using cardiovascular risk profile and knowledge assessment questionnaire. Findings of the study revealed that most of samples had detrimental dietary habits, lack of physical activity, possess unhealthy habits such as smoking and tobacco chewing. There is significant association between the knowledge level and selected demographic variables (age, gender, religion, class, school, monthly income, father's education, mother's education, father's occupation, family history of CVD) among private school students at the level  $p \leq 0.05$ . There is no significant association between the knowledge level and selected demographic variables (age, gender, religion, class, father's education, mother's education, father's occupation, family history of CVD) among government school students at the level  $p \leq 0.05$ . There is significant difference between the knowledge level among private and government school students. The mean knowledge score of government school students was  $9.76 \pm 1.57$  and that of private school students was  $15.94 \pm 3.17$ . Hence, there is a significant difference in the mean knowledge scores between the two schools with a higher mean in private school students in comparison to government school students. Keywords : Cardiovascular risk factors, knowledge.*

## 1. Background

Adolescence is a fascinating period of life and it is the most important age after childhood in all societies. Peer influences and education are of highest importance and these experiences ultimately influence pattern of their future lifestyle. A focus on children and adolescents in the primary prevention of health risks and disorders such as hypertension and cardiovascular diseases have been suggested in many reports, published throughout the world. Such a focus is important in India as it has a huge adolescents and children population along with economic, social and health inequalities among children population. Around 22 % of the Indian population falls into the adolescent age group of 10-19 years<sup>1</sup>.

A study was conducted to assess the prevalence of cardiovascular risk factors and its knowledge among school children of Delhi. We performed a cross-sectional survey among 485 school children studying in classes 6, 7 and 8 in two government and one private school in New Delhi using convenience sampling. Cardiovascular risk factors (physical activity, diet and smoking), knowledge about risk factors and family profile were assessed using a structured self report questionnaire. Weight, height and blood pressure measurements were taken. The mean age of the studied school children was  $12.8 \pm 1.6$  years. The prevalence of overweight and obesity was 9.5% and 11.5% respectively. The prevalence of prehypertension, stage 1 hypertension and stage 2 hypertension was 12.4%, 6.8% and 1.4% respectively. Of the total, 43.8% were physically active for at least 1 hour per day on all 7 days of the previous week. Daily consumption of fruits and vegetables was reported by 42% and 76% of the school children respectively. Nearly 5% of the school children reported to have used any form of

tobacco. One fifth of the school children had a family history of cardiovascular disease. Of the total, 25.4% had adequate knowledge regarding cardiovascular risk factors. Cardiovascular risk factors are highly prevalent among school children. Importantly, school children lack adequate knowledge regarding cardiovascular risk factors. School based interventions are required for cardiovascular risk reduction in childhood<sup>2</sup>.

## 2. Need of the Study

The facts given by WHO reveal the extent of the problem: An estimated 16.7 million or 29.2% of total global deaths results from various forms of CVDs many of which are preventable by action on the major primary risk factors such as unhealthy diet, physical inactivity and smoking. Out of the 16.7 million deaths from CVDs every year, 7.2 million are due to Coronary Artery Disease and 5.5 million are due to cerebrovascular diseases, and 3.9 million are due to hypertension and other heart conditions<sup>3</sup>.

Due to increased prevalence of overweight and obesity in childhood and adolescence is high. Excessive body fat at a young age is likely to persist into adulthood and is associated with physical and psychosocial co-morbidities, as well as lower cognitive, school and later life achievement. Lifestyle changes, including reduced caloric intake, decreased sedentary behaviour and increased physical activity, are recommended for prevention and treatment of child and adolescent. So it's necessary to assess the lifestyle, dietary and other factors in school students so that we can reduce the prevalence of risk of cardiovascular disorder<sup>4</sup>.

The progressive atherosclerotic process begins in childhood and develops gradually under the influence of conventional

risk factors including obesity, hypertension, dyslipidemia, cigarette smoking, family history of premature coronary artery disease, stress, and low levels of physical activity. The atherosclerotic processes are initiated early in childhood and are modified over the life course by both genetic and environmental interactions<sup>5</sup>.

The importance of atherosclerotic risk factors in children is increasingly being emphasized. The identification and prevention of risk factors for CVD among children and adolescents may prove to be the most cost effective way of prevention of premature CVD in India.

Knowledge of the predisposing risk factors is an important step in the modification of lifestyle behaviours conducive to optimal cardiovascular health.

A cross sectional study was conducted in Karachi, Pakistan: A Pilot Study to assess Cardiovascular disease risk factors among school children in Private schools. A total of 24 students (10 boys, 14 girls) were selected through a systematic random sampling. Data was collected through a structured questionnaire. Their height and weight were taken to calculate BMI. Majority of the study participants (66.7 and 62.5%) reported that CVDs were the leading cause of death among the adults in Pakistan, while 25% were not aware. Only 29.2% agreed that CVDs were preventable diseases. They had poor knowledge regarding the prevention of CVDs, 50 % reported only exercise as being a preventive measure of CVDs. The findings of this study highlight a significant lack of knowledge of modifiable risk factors among the study participants. The results suggest a need of planning health promotion program through schools by focusing on children and their parents in a participatory approach<sup>6</sup>.

A study was conducted to examine the prevalence of risk factors for CVD and diabetes (obesity, hypercholesterolemia, hypertension) and examine factors associated with the presence of these risk factors in school children aged 11-13. Participants will be recruited from schools across South Wales. Schools will be selected based on catchment area, recruiting those with high ethnic minority or deprived catchment areas. Data will include: anthropometrical variables (height, weight, waist, hip and neck circumferences, skinfold thickness at 4 sites), physiological variables (blood pressure and aerobic fitness), diet (self-reported seven-day food diary), physical activity (Physical Activity Questionnaire for Adolescents (PAQ-A), accelerometry) and blood tests (fasting glucose, insulin, lipids, fibrinogen (Fg), adiponectin (high molecular weight), C-reactive protein (CRP) and interleukin-6 (IL-6)). Deprivation at the school level will be measured via information on the number of children receiving free school meals.

This study is part of a larger project which includes interviews with older children regarding health behaviours and analysis of existing cohort studies (Millennium cohort study) for factors associated with childhood obesity. The study will contribute to the evidence base needed to develop multi-dimensional interventions for addressing childhood obesity<sup>7</sup>.

### 3. Statement of Problem

An Exploratory study to assess Cardiovascular risk factors and knowledge among school students of Indore in the year 2015- 2016

### 4. Purpose of the Study

- To explore cardiovascular risk factors contributing to the development of cardiovascular disease among school students.
- To create awareness among school students regarding cardiovascular risk factors.
- To impart knowledge regarding cardiovascular disease .

### 5. Objectives of the Study

- To assess the risk factors of cardiovascular disease among school students.
- To assess the level of knowledge regarding cardiovascular risk factors among school students.
- To find out the association between knowledge level and the selected demographic variables in students of private school.
- To find out the association between knowledge level and the selected demographic variables in students of government school.
- To compare the knowledge level among the student of selected private and government schools regarding cardiovascular risk factors.
- To prepare a booklet on prevention of cardiovascular risk factors for school students.

### 6. Hypotheses

- **H<sub>1</sub>**- There is significant association between the knowledge level and selected demographic variables at the level  $p \leq 0.05$  among private school students.
- **H<sub>2</sub>**- There is significant association between the knowledge level and selected demographic variables at the level  $p \leq 0.05$  among government school students.
- **H<sub>3</sub>**- There is significant difference between the knowledge level of government and private school students at the level  $p \leq 0.05$ .

### Conceptual Framework

The conceptual framework in this study is based on health promotion model given by Noha J Pender(1982). Figure No. 1

### 7. Research Methodology

**Research Design:** An exploratory research design. Figure No.2 (Pg No.37)

**Population:** In the present study, population is the school students.

**Sampling technique:** Non probability purposive sampling technique

**Sample size:** 100

**Setting:** Guru Harekrishna Public School, Sharada Kanya Higher Secondary School and Sanyogitaganj Higher Secondary School which are private and Government schools respectively.

**Tool:** The tool for collection of data for this study consisted of three sections.

**Section A-** Socio- demographic variables.

**Section B-** Cardiovascular risk profile to assess cardiovascular risk factors among school students.

**Section C-** Knowledge assessment questionnaire to assess the knowledge level among school students regarding cardiovascular disease.

### Section A- Socio Demographic Variables

First section consisted of a structured interview schedule to collect baseline data, which consist of 12 items for obtaining information about selected factors such as age, sex, religion, class, school, Monthly family income, type of family, Father's education, Mother's education, Father's Occupation, Mother's Occupation and family history of cardiovascular disease.

### Section B - Cardiovascular risk profile to assess the cardiovascular risk factor among school students

This section comprised of an interview schedule developed by the investigator to assess the risk factors for cardiovascular diseases among school students. The investigator went through various literatures about to assess cardiovascular risk factors among school students. This section of the tool comprised of 4 items namely, physiological parameters( 1-4), physical activity(5-7), diet( 8-9), unhealthy habits (10-12).

### Section C- Knowledge assessment questionnaire to assess the level of knowledge among school students regarding cardiovascular disease

This section comprised of a knowledge assessment questionnaire developed by the investigator to assess the level of knowledge among school students regarding cardiovascular disease. It has 21 items that measures the knowledge level regarding cardiovascular disease, preventive strategies and dietary aspects.

The scoring of the tool was done as follows:

- <11– Poor knowledge (i.e. <50% correct response)
- 11-16 – Average Knowledge (i.e. 50–75% correct response)
- >16 – Good Knowledge ((i.e. >75% correct response)

### Content Validity and Reliability

The prepared tool along with a request letter, validation certificate, statement of problem, objectives, criteria checklist was submitted to 7 experts including six nursing personnel from the field of Medical -Surgical Nursing, and one statistician. They were requested to give their opinion on the appropriateness and relevance of the items in the tool. Tool was prepared in English. One of them suggested to add more options in item no: 8 of section B that is cardiovascular risk profile. The suggestions given by experts was discussed with the guide and incorporated and final questionnaire was prepared.

The reliability of the BP assessment tool was done by using test- retest method and 'r' value computed by Karl Pearson's

formula of co-relation was 1 for BP instrument i.e. mercury sphygmomanometer.

Reliability of weighing machine was calculated by test-retest method. 5 subjects are measured by weighing machine. In which reliability of tool was found out by using Karl Pearson's co-relation coefficient formula and found to be  $r = 0.99$  which indicate tool was reliable.

Reliability of the structured knowledge assessment questionnaire was calculated using split half method and it was found 0.98

### Procedure for data collection

Written permission was obtained from the administrative authority and research ethical committee of Choithram hospital & Research Centre, Indore prior to the data collection. A total 100 samples were selected as participants through convenient sampling technique to meet the inclusion criteria. The actual data collection period was from 15th June 2016 to 7th July, 2016. The study was carried out in the same way as that of the pilot study. Consent was taken from all the samples and confidentiality was assured. An average 7- 8 samples met the inclusion criteria was interviewed every day using the structured Cardiovascular risk Profile and Knowledge assessment Questionnaire. The average time taken for each sample was 15- 20 minutes. The researcher terminated the data collection process by thanking the respondents for their cooperation and participation.

## 8. Findings of the Study

- The findings of the study indicated that out of 100 samples 24 (24%) student belonged to the age group 12- 14 years and majority of the students 48 (48%) belonged to the age group 15-16 years and 28 (28%) in the age group 17-18 years. Majority of the students belonged to the age group 15-16 years.
- It is evident that majority of the students were 55 (55%) males while, 45 (45%) of the students were females. There was a male preponderance in comparison to the female.
- Among all participants, majority 77 (77%) of the students belonged to the Hindu religion, 5 (5.0%) were Muslims and 18 (18%) of the students belonged to the other religion.
- It is apparent according to the class in which these students are studying showed that 27 (27%) of the students were studying in Class IX, 24 (24.0%) were studying in Class X, 22 (22.0%) were studying in Class XI and 27 (27.0%) were studying in Class XII.
- Among all the participants half of the students that is 50 (50%) of the students were from private and 50 (50%) of the students were from the government schools.
- The findings of the study according to monthly income shows that there was not a single students whose family monthly income was less than Rs. 5000, majority 27 (27%) students were having family monthly income of Rs. 5001 – Rs. 10000, 22 (22%) students were having family monthly income of Rs. 10001 – Rs. 15000, 1 (1%) student was having a family income between Rs. 15001 – Rs.

20000 and 50 (50.0%) students were having a family income of more than Rs. 20000.

- More than half of the subjects belonged to the type of family 68 (68%) of the students belonged to nuclear family, while the rest 32 (32%) of the students belonged to the joint family, while there were no students from extended family.
- Frequency and percentage distribution of students according to father's education showed that 3 (3%) of the father was illiterate, 3 (3%) had studied only upto primary school, 14 (14%) had studied upto secondary school, 25 (25%) had done their higher secondary, 43 (43%) had done their graduation / diploma and 12 (12%) had done their postgraduation. Hence, we can say that majority of the fathers were literate and well educated.
- The data concerning mother's education showed that 20 (20%) of the mother were illiterate, 1 (10%) had studied only upto primary school, 16 (16%) had studied upto secondary school, 19 (19%) had done their higher secondary, 37 (37%) had done their graduation / diploma and 7 (7%) had done their postgraduation. Illiteracy percentage was higher in mothers in comparison to fathers.
- The data concerning father's occupation revealed that 41 (41%) of the father's had a private job, 8 (8%) had government jobs, 45 (45%) were doing their business, 5 (5%) were farmers and only 1 (1%) of the father was a labour. All the fathers were doing some sort of work.
- It was inferred according to mother's occupation that 11 (11%) of the mothers were doing private job, 2 (2%) were doing government job, 10 (10%) were doing business, while the majority 77 (77%) were housewives, looking after their home and children.
- It was apparent that maximum of the students 83(83%) did not had any family history of CVD, while 17 (17%) of the students had a positive family history of CVD.
- It was evident by frequency percentage distribution according to knowledge level that from the private school, 4 (8%) students scored Inadequate knowledge grade, 22 (44%) students scored Moderately Inadequate knowledge grade, while 24 (48%) students scored Adequate knowledge grade. While from the government school, 34 (68%) students scored Inadequate knowledge grade, 16 (32%) students scored Moderately Inadequate knowledge grade, while none of the students scored Adequate knowledge grade. Overall there were 38 (38%) students who secured inadequate knowledge score grade, 38 (38%) secured moderately adequate knowledge grading and 24 (24%) score adequate knowledge grading. We can see that the knowledge score of government school students was much less as compared to the private school students.
- There is significant association between the knowledge level and selected demographic variables (age, gender, religion, class, school, monthly income, father's education, mother's education, father's occupation, family history of CVD) among private school students at the level  $p \leq 0.05$ . Thus research hypothesis  $H_1$  is accepted.
- There is no significant association between the knowledge level and selected demographic variables (age, gender, religion, class, father's education, mother's education, father's occupation, family history of CVD) among

government school students at the level  $p \leq 0.05$ . Thus research hypothesis  $H_2$  is rejected.

- There is significant difference between the between the knowledge level among private and government school students. The mean knowledge score of government school students was  $9.76 \pm 1.57$  and that of private school students was  $15.94 \pm 3.17$ . Hence, there is a significant difference in the mean knowledge scores between the two schools with a higher mean in private school students in comparison to government school students. Thus research hypothesis  $H_3$  is accepted.

## 9. Conclusion

Cardiovascular disease (CVD) is the number one cause of death globally. As such, more people die annually from CVD than from any other cause. This despite the fact that improved preventive measures diagnoses and therapies have resulted in a significantly improved survival rates in cardiac patients. An estimated 17.5 million people died from CVDs in 2012, representing 31% of all global deaths. Of these deaths, an estimated 7.4 million were due to coronary heart disease. Most cardiovascular diseases can be prevented by addressing behavioural risk factors such as tobacco use, unhealthy diet and obesity, physical inactivity and harmful use of alcohol using population-wide strategies.

It is clear that risk factors for atherosclerotic CVD can develop during childhood and adolescence. This results from both genetic and environmental factors. When risk factors develop at an early age, they are likely to track over time, maintaining a high-risk status. This tracking is reinforced by ongoing and new adverse health behaviours. This means that the development of CVD has its origins in families and that approaches to prevention must be directed at the developing child and adolescent and the family environment. Paediatricians and family physicians should view the prevention of risk factor development (primordial prevention) and the development of atherosclerotic lesions (primary prevention) as an important responsibility.

The study results revealed that school students possess detrimental eating habits, poor physical activity, unhealthy habits such as smoking and tobacco chewing. Few of the students do have a family history of cardiovascular disease. The risk factors identified by the investigator are explained below.

It was apparently revealed that knowledge level regarding cardiovascular disease was inadequate in Government school students in comparison to Private school students. Although it was seen that government school students had poor knowledge then also their eating habits and physical activity were quite good. On contrary the Private school students had good knowledge regarding cardiovascular disease then also they preferred more of fried and fast food. They indulged more in sedentary activities.

Majority of the Government school students had their family monthly income less than Rs.5000/-per month but they used tobacco and did smoking. Awareness and knowledge is essential for the students as well as for their parents so that good lifestyle can be adopted by their children. Even the

schools should also promote good dietary habits , physical regimen and impart knowledge regarding cardiovascular diseases. During parent teachers meeting the school authorities can guide the parents regarding a healthy lifestyle for their children which will help them to have a better future.

Prevention of atherosclerotic CVD is best achieved by maintaining cardiovascular health. Although this is challenging, it can be achieved by instituting and maintaining optimum health behaviours early in life and stressing improvement of the family environment to be the most important strategy to achieve these goals. This improves the likelihood that children and adolescents will maintain low-risk status into young adulthood and emphasis on diet and lifestyle advice should be first line management. Good nutrition and lifestyle changes can both contribute to a healthy life. Exercising and eating right can make a real difference in how you feel and in turn help you to be healthy.

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