

# Effectiveness of intervention on adolescent's knowledge regarding hypertension - A school-based study from central Karnataka, India

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## Abstract

**Background:** The most important time in life is the childhood and adolescent age group during which the behaviours are formed and habits for nutrition, physical activities are inculcated which have immediate and long-term implications on health

**Aim & Objective:** To assess the Knowledge change among adolescents regarding health-related aspects through school-based intervention using structured module.

**Settings and Design:** The intervention study was carried out in English medium schools from October 2019 to March 2020

**Methods and Material:** Baseline knowledge of the students was assessed using pre-test questionnaire which was followed by teaching module and after 3 months post intervention knowledge was assessed. A questionnaire was also used to assess the utility and acceptability among students regarding intervention teaching module.

**Statistical analysis used:** Descriptive data was presented in the form of mean, standard deviation and Paired t-test was used to observe the difference within and between scores.

**Results:** Majority of the students were in the age group 13-14 years and were females with 53% of the students had family history of hypertension. Participants' felt that understanding of health is needed and knowing about health-related events is important. There was significant improvement in knowledge after intervention ( $t=10.05$ ,  $p<0.0001$ )

**Conclusions:** Majority of the students felt the need of knowing health related issues. Post intervention teaching module there was significant improvement in the knowledge of students.

Key words: Adolescents; School based intervention; Hypertension

## Introduction

The most important time in the life is the childhood and adolescent age groups during which the habits for nutrition and physical activities are formed. These habits have direct and long-term implications on health. Therefore, there is a need to sensitize the adolescents regarding various health related issues. Hypertension is a chronic condition of concern due to its role in the causation of coronary heart disease, stroke, and other vascular complications. It is the major public health challenge to population in socio-economic and epidemiological transition. The

global prevalence of hypertension is estimated to be 1.13million in 2015<sup>[1]</sup>. Hypertension is responsible for 57% of all stroke deaths and 24% of all coronary heart disease deaths in India<sup>[2]</sup>. An estimated 1.3 million youth ages 12 to 19 would have high blood pressure according to the new guidelines, or about 1 in 25 children. In a classroom of 30 youth, 1 person would have hypertension, and about 3 more would have elevated blood pressure<sup>[3]</sup>. The prevalence of hypertension across studies ranged from 2% to 20.5%<sup>[4]</sup>.

Among adolescents predominate form of hypertension is primary hypertension which is seen as a result of puberty, obesity, and associated metabolic problems.

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More and more frequently, primary hypertension is diagnosed even in the absence of any clinical signs. Primary hypertension in children correlates with obesity and a family history of the condition, just like in adults. Obesity, hypercholesterolemia, hypertension, and behaviours that raise the risk of cardiovascular illnesses are more likely to persist into adulthood if they begin in childhood. Any preventative measures against these diseases in maturity will therefore be much too late. This is why early education initiatives that encourage physical activity, a healthy diet, and quitting smoking should be incorporated into their curricula. This study is a part of pilot study of the Life Skills Education and Health Promotion (LEAP) Module by Indian Association of Preventive and Social Medicine (IAPSM) regarding Hypertension. The study was carried out to sensitize adolescents regarding hypertension and its risk factors.

#### **Aim & Objective(s)**

1. To assess the knowledge of adolescents regarding hypertension before and after intervention module.
2. To assess the acceptability and utility of the intervention module among the adolescents.

**Materials and Methods:** A School based intervention study (Pilot testing of LEAP Modules) was done in 10 randomly selected English medium schools of state & central syllabus in urban Davanagere from October 2019 to March 2020. This was conducted as a pilot study to test LEAP PROJECT of IAPSM REECH in the field.

For selection of the study participants cluster randomisation was followed. 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 in each cluster, bringing the final sample size to 600 children.

Ethical clearance was taken from the Institutional ethical committee and permission from the school authorities, informed written consent from parents and assent from the students was taken before initiation of the study.

Study was conducted among high school students of 9<sup>th</sup> and 10<sup>th</sup> standard in the age group 14-16 years and teachers of the institution. Attendance register was used to line list students present on the day of the study and systematic sampling was done to select required sample from each educational institution for the study. All the teachers present on the day of

visit to the institution and willing to participate were included in the study.

#### **Study tools:**

- I. Assessment of knowledge - A validated closed end questionnaire (multiple choice questions) consisting of 10 questions with maximum score of 25 was used for assessing knowledge regarding hypertension. The questions which were asked regarding normal blood pressure, risk factors of hypertension, complications of high blood pressure, preventive measures, about recommended physical activity, salt consumption, and dietary changes.
- II. Assessment of acceptability and utility of the intervention: To assess acceptability and utility of the teaching module Likert scale was utilized. (Strongly agree/Agree/Neutral/Disagree/Strongly disagree). Difficulty index ranging from 1-10, 1 being easy and 10 being difficult was also used to assess the acceptability of the intervention module. Open ended questions were asked to understand the problems faced and good things on the intervention.
- III. Assessment of basic health awareness: A validated close end questionnaire was used to assess basic health awareness among adolescents.
- IV. Assessment of knowledge of teachers regarding hypertension: Focus group discussions (FGD) were conducted among teachers in each of the schools. FGD guide was prepared which covered the following domains, as follows:
  - Need of hypertension health education
  - Hypertension health education is good in school
  - Hypertension health education needs doctors only
  - Teachers trained in health education can be better trainers to the students

Ten English medium schools including 5 CBSE school and state syllabus teaching schools were selected. The schools were visited by the research team consisting of faculty, postgraduate and 2 interns after pre-intimation to ensure maximum presence of both students and teachers. The total teaching hours of the module was divided and spread over 3 months with consensus with the teachers. A questionnaire to assess the knowledge about hypertension, on need of knowledge and interest towards health awareness were used. Teachers were also given the written material of the module after the session. After 3 months the knowledge was retested with same questions. A questionnaire on acceptability and utility

of the module was also introduced to the students. Similar questionnaire to understand the acceptability and utility by teachers and their willingness and difficulty to undertake the module by their own was also introduced. FGD in the schools for teachers was conducted to get more inputs on the module. Difficulty index to conduct the session was checked using rating scale by teachers. Difficulty scale for understanding was used among the students.

The intervention was a teaching module on hypertension as a power point presentation provided by the IAPSM LEAP Project for Adolescent program.

Data was entered in MS Excel 2016 and analysed using IBM SPSS v20. Descriptive statistics was

used. Data was presented in the form of text, tables, and figures. Paired t-test was used to observe the difference within and between the mean scores. The FGD analysis will be thematic analysis and any new themes come in will be mentioned.

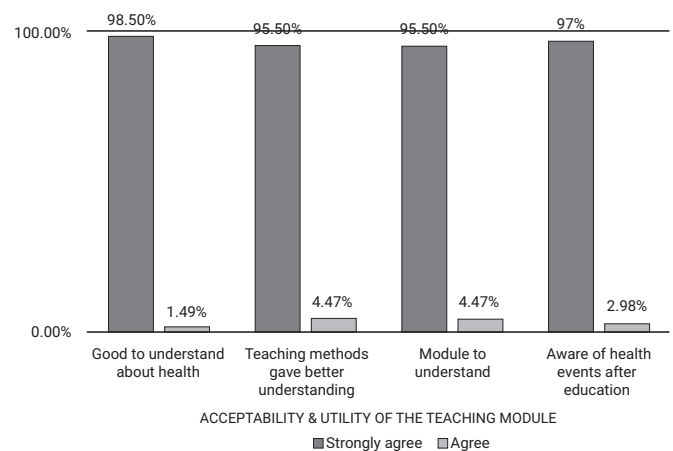
**Results:**

A total of 667 students were part of the study among them 333 students were from a school with state syllabus & 334 students from school with central syllabus. Mean age of the study participants was 13.78 ± 0.69 yrs. Majority (52%) of the study participants were female followed by 47% were male and 53% of the study participants had family history of hypertension.

**Table 1: Hypertension Knowledge assessment of study participants**

Sl. No.	Questions	Pre-test Correct response	Post-test Correct response
1	Normal Blood Pressure range for SBP (systolic blood pressure)	129 (19.4%)	647 (70.1%)
2	Risk Factors for developing High Blood Pressure	109 (16.4%)	654 (80.6%)
3	High Blood Pressure if left uncontrolled can lead to damage to which body organ	109 (16.4%)	655 (82.1%)
4	High Blood Pressure can be prevented by	169 (25.4%)	660 (89.5%)
5	Blood Pressure is pressure of ..... inside the arteries	159 (23.9%)	662 (92.5%)
6	A Risk Factor ..... the chances of developing high Blood Pressure	209 (31.3%)	667 (100%)
7	Physical activity of minimum ..... Minutes duration on 5 days a week should be taken.	69 (10.4%)	657 (85%)
8	High Salt consumption (more than 5 grams/day) can lead to development of High Blood Pressure – True/False	467 (70.1%)	667 (100%)
9	High Blood Pressure can be controlled only by taking Medicines – True/False	527 (79.1%)	667 (100%)
10	Consumption of processed and preserved foods is better than taking fresh fruits and vegetables for prevention of high blood pressure – True/False	229 (34.3%)	667 (100%)

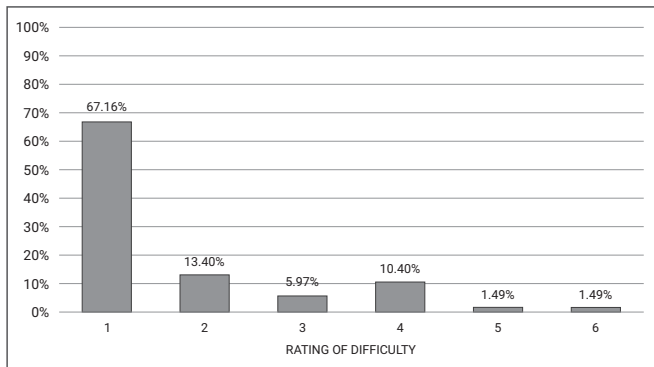
Table 1 depicts the pre and post-test knowledge assessment of the study participants. The mean pre-test score of the boys was 12.9 (95% CI 12.6-13.2) which increased to 19 (95% CI 18.7-19.4) after the intervention. The pre-test score of the girls was 13.8 (95% CI 12.9-14.4) which increased to 19.9 (95% CI 19.7-20.2) after the intervention. The overall mean pre-test score of the study participants was 14.42 (95% CI 13.98-14.95) which increased to 19.54 (95% CI 19.03-20.47) post intervention with t-value of 10.517 and p value <0.0001 indicating the improvement in the mean score of the study participants was statistically significant and that the intervention improved the knowledge level of the study participants.



**Figure 1: Acceptability and Utility of the Teaching Module among students**

The acceptability and utility of the teaching module by the students.

In our study it was observed that 98.5% of the study participants felt the need to understand about health-related issues. About 95.5% study participants felt that teaching methods gave better understanding about health issues. About 95% of the study participants felt that there should be a module for better understanding of the topic. About 97% of the study participants were aware of health events after the educational intervention.



**Figure 2: Rating of difficulty index of teaching module by the study participants**

### Rating of difficulty index of teaching module by the study participants

The rating of difficulty index of the teaching module which was used as educational intervention for the study participants. About 67% of the study participants rated 1 as a difficulty index (easy) and about 1.4% of the study participants rated it as 6. The mean rating observed was  $1.70 \pm 1.20$ . This implies that the educational intervention module was easier to understand and thus had a significant impact on the knowledge levels of the study participants.

### Discussion

The adolescent age group (10-19 years) have drastic changes in the body both physically and mentally. Both physical personality and behaviour changes takes place during this crucial period. The behaviours which are formed during this period last throughout life. Therefore, there is a need to educate adolescent regarding healthy behaviour and health related issues. In our study majority 335 (52.2%) were female and 332 (47.7%) were male who participated in the study. Mean age of the participants was  $13.78 \pm 0.69$  yrs. In a similar kind of study done by Rathod et al<sup>[5]</sup> among college students the mean age of the students was  $18.5 \pm 0.6$  years.

In our study majority of the students lacked knowledge on hypertension which was similar to a study done

by AH Gamage et al<sup>[6]</sup> it was seen that the knowledge regarding non communicable diseases was poor in the age group 17-19 years age group and in a study done by Sanjivani Maral et al<sup>[7]</sup> the knowledge of the students' regarding hypertension was found to be about 57.3% with males 62% and 37% females in the study. In another study conducted by Aliabd al-latif<sup>[8]</sup> it was observed that only 36% of the students had good knowledge regarding hypertension. Also, in a study done by Iga Grad et al<sup>[9]</sup> it was seen that 13.2% of the study participants had medium level of knowledge regarding hypertension, compared to a study done by Thaworn Lorga et al<sup>[10]</sup> two-thirds correctly recognized hypertension as an NCD and as a disease which is not curable, in another study done Yahia et al<sup>[11]</sup> it was observed that 80% of the students correctly identified the symptoms and complications of hypertension. In a study done by Rizwana B Shaik et al<sup>[12]</sup> it was seen that about 60% of the students had good knowledge about the modifiable risk factors of hypertension.

In our study the mean of pre-test score of the study participants was 14.42. Following educational intervention, the post test score mean was observed to be 19.54 with t-value of 10.517 and p value  $<0.0001$  indicating the improvement in the mean score of the study participants was statistically significant and that the intervention influenced the knowledge level of the study participants. In a similar kind of study done by Rathod et. Al<sup>[5]</sup> the baseline knowledge increased from 21% to 64% following single educational interventional session. In another study done by Sunil Nayak et al<sup>[13]</sup> it was seen that there was a significant improvement in the knowledge level of students from 21% to 64% following educational activity which was statistically significant. In a similar kind of study done by C Muthulakshmi et al<sup>[14]</sup> it was seen that the pre-test mean of the students regarding knowledge level was 8.23 and post-test mean was 20.68 with t-value 29.170 which were consistent with our present study findings.

In a study done by Almomani et al<sup>[15]</sup> it was seen that there was significant improvement in the knowledge on health specific topics in university students after the educational intervention about health-promoting behaviours.

In our study it was observed that majority (98.5%) of the study participants felt the need to understand about health-related issues. Majority of the study participants felt that teaching methods gave better understanding about health issues. 95% of the study participants felt that there should be a module for better understanding of the topic. Majority of the study participants 97% of the study participants

believed the educational activity made them aware of hypertension and its consequences.

In our study the difficulty index of the teaching module was assessed. About 67% of the study participants rated 1 as a difficulty index and about 1.4% of the study participants rated it as 6. The mean rating observed was  $1.70 \pm 1.20$ . This implies that the educational intervention module was easier to understand and has a significant impact on the knowledge levels of the study participants.

### Conclusion

There was significant improvement in the knowledge of the students following intervention teaching module and it was statistically significant. Majority of the study participants felt that by the teaching module was easy to understand and it made them aware of the health issues.

**Recommendation:** Knowledge about HTN among adolescents remains unsatisfactory and random, indicating the necessity for routine education in this field, especially of HTN symptoms. Also, importance of routine blood pressure measurement and role of family history of HTN could be added in education programs. The module could be introduced as part of curriculum in schools.

**Relevance of the study:** Educational intervention regarding health-related issues plays a role in adolescent health.

**Acknowledgement:** This was a pilot study to test LEAP PROJECT in the field which could help in implementing a better adolescent program. I would like to express my sincere gratitude to the authors of LEAP project under IAPSM REECH program for providing the teaching module for the adolescents. We whole heartedly thank Department of Community Medicine, JJMMC for all the cooperation during the study. We would also like to thank the teachers and students of the schools for their active participation in the study.

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