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RESEARCH ARTICLE

A STUDY OF BLOOD PRESSURE AND ITS RELATION WITH ANTHROPOMETRIC MEASUREMENTS AMONG ADOLESCENTS IN A PARTICULAR COMMUNITY

[1*]Miss. Rukmini, S., [2]Kokilamma, B., [3]Dr. Sudha Rani P. and [4]Dr. M. Sreelatha

[1]M.SC Nursing Student, Department of Community Health Nursing, College of Nursing, Sri Venkateswara Institute of Medical Sciences, Tirupati

[2] Assistant professor, Department of community health nursing, college of nursing, Sri Venkateswara Institute Of Medical Sciences, Tirupathi-517507, Chittoor- Dist, Andhra Pradesh, India

[3]Professor I/C Principal, College of Nursing, Sri Venkateswara Institute Of Medical Sciences, Tirupathi-517507, Chittoor- Dist., Andhra Pradesh, India

[4]Assistant professor, Department of Community Health Nursing, College of Nursing, Sri Venkateswara Institute Of Medical Sciences, Tirupathi-517507, Chittoor- Dist, Andhra Pradesh, India

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****Corresponding author:***

ABSTRACT

Introduction: Majority of non communicable disease related deaths are attributed to four groups of diseases, cardiovascular diseases, cancers, diabetes and chronic respiratory diseases. Main risk factors for non communicable diseases include dietary habits, physical inactivity, tobacco and alcohol use. Other risk factors include high blood pressure, high cholesterol levels, high glucose levels and genetic susceptibility (history of premature death or disability due to coronary heart disease or stroke, diabetes and hypertension). Two thirds of premature deaths in adults are associated with childhood conditions and behaviours, and behaviour associated with NCD risk factors is common in young people. Over 150 million young people smoke; 81 percent adolescents don't get enough physical activity; 11.7 percent of adolescents take heavy episodic drinking and 41 million children under 5 years old are overweight or obese. Hypertension is one of the most common public health problems globally among adults, and recent data suggests that there is an increase in the incidence of childhood hypertension as well. **Methodology:** Non experimental approach was adopted to achieve the objectives of the study, which is felt to be most appropriate in the field of education for its practicability in real life situation. It was advantages of practicability, feasibility and to a certain extent for generalization. In this study descriptive research design was used. The study was conducted at Annur panchat, Karveti nagaram mandal, Chittoor (DT). The population includes adolescent age group 14-15 years of both male and female students. Sample size consists of 100 adolescents under inclusion criteria. Non probability convenient sampling technique was adopted based on inclusion criteria. **Results:** Regarding the assessment of Blood Pressure out of 100 adolescents, majority of 78 per cent were normal Blood Pressure, 22 per cent were pre hypertension. The mean and standard deviation scores were 1.22 ± 0.416. Regarding the BMI, Out of 100 adolescents, 82 per cent were normal weight, 10 per cent were under weight, and 8 percent shows over weight. The mean and standard deviation scores of BMI 1.98±0.426Where as W/H ratio 59 per cent have low risk, 16 per cent have moderate risk, and 25 per cent have high risk. The mean and standard deviation scores 1.66 ± 0.855. Statistically significant association of Blood Pressure with anthropometric measurements like height was significant at 0.05 level and other anthropometric measurements like weight, waist circumference, Hip circumference were significant at 0.01 level. BMI and W/H ratio were not showing any significant association. There was association between Blood Pressure with age, gender, education, mother education, mother occupation, income at 0.05 levels. Hence H01was rejected. And some of the variables such as religion, father occupation, and family type are not showing any significant association. Association between BMI related to gender, education, mother education, father occupation, income at 0.05 levels. Hence H02 was rejected. Where as remaining demographic variables (religion) is not showing any significant association **Conclusion:** The present study revealed that adolescents having pre hypertensive and overweight. There is a significant association between Blood Pressure with anthropometric measurements. Information booklet was given for further reference to enhance their knowledge levels and it may help to prevent the non communicable diseases.

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INTRODUCTION

Child hood obesity is associated with a higher chance of obesity, premature death and disability in adulthood. But in addition to increased future risks, obese children experience breathing difficulties, increased risk of fractures, hypertension, and early markers of cardiovascular disease, insulin resistance and psychological effects. Body mass index (BMI) is a simple index of weight- for- height that is commonly used to classify overweight and obesity in adults. It is defined as a person's weight in kilograms divided by the square of his height in meters (kg/m2). BMI greater than or equal to 25 is overweight. A BMI greater than or equal to 30 is obesity. There were many studies that linked hypertension with overweight and obese among the adolescents. Although the evidences gathered have a mixed conclusion on the relationship between hypertension and body fat, measurement of body fat using anthropometric indicators had proven to be an effective approach in predicting hypertension, particularly in a large population and community based studies. There are few studies which showed that different patterns of Blood Pressure were found in Indian children and adolescents, particularly in relation with anthropometric characteristics, but there is a dearth of the literature on BP profile among children and adolescent, particularly in this part of the country.

NEED FOR THE STUDY: A recent report by the WHO (2016) has shown that over 340 million children and adolescents aged 5 to 19 were overweight or obese. More than 1.9 billion adults, 18 years and over were overweight and 13 per cent were obese. Most of the world's population lives in countries where overweight and obesity kills more people than under weight. Over weight and obesity are now on the rise in low and middle income countries particularly in urban settings. The prevalence of overweight and obesity has led to an increase in insulin resistance along with a concomitant rise in blood pressure in children. Hence it becomes important to detect hypertension and its precipitating and aggravating factors if one has to evolve appropriate preventive measures. In worldwide according to American academy of pediatrics (AAP 2013-2016), More than 1 in 7 united state youth aged 12-19 years has hypertension or elevated blood pressure. According to new guidelines, an estimated 1.3 million youth age 12-19 would have hypertension, and about 3 more would have elevated blood pressure. Youth who have cardiovascular disease risk factors such as hypertension, obesity and diabetes, is more likely to have these risk factors as adults, putting them at greater risk for heart disease and stroke. According to AAP clinical practice guideline (2017) **–** Too many youth have high blood pressure and other risk factors for heart disease and stroke. A new CDC (Centers for disease control) study shows that about1 in 25 (4%) youth aged 12-19 years have hypertension, another1 in 10 (10%) have elevated blood pressure (Pre hypertension). Youth with obesity had the highest prevalence of hypertension. High blood pressure in youth is linked to health problems later in life. Compared to the former guideline, the updated guideline reclassifies 2.6percent of youth in the United States, or nearly 800,000 young people, as having high blood pressure.

MATERIALS AND METHODS

Research approach: Non experimental approach was adopted to achieve the objectives of the study, which is felt to be most appropriate in the field of education for its practicability in real life situation. It was advantages of practicability, feasibility and to a certain extent for generalization.

Research design: A research design is overall plan, structured and strategy of investigations of answering the questions. It is the blue print the researcher selects to carry out the study. In this study descriptive research design was used.

Variables

Independent Variables: - In this study socio demographic variables, dietary pattern and physical activity was the independent variable.

Extraneous variables which could influence the study were age, standard of the study, father's education, father's occupation, mother's education, mother's occupation, Family income, physical activity and dietary habits.

DEPENDENT VARIABLE: In this study Blood Pressure and anthropometric measurements was dependent variable.

SETTING OF THE STUDY: The study was conducted at Annur panchayat, Karvetinagaram mandal, Chittor (DT)

POPULATION: The target population chosen for this study was adolescent age group 14-15 years of both male and female students.

SAMPLE: The sample for the present study comprised that students studying 9^{th} and 10^{th} class.

SAMPLE SIZE: The sample size was 100 students who are available at the time of data collection.

SAMPLING TECHNIQUE: Non Probability convenient sampling technique was adopted for the present study based on inclusion criteria.

Criteria for Sample Selection

Inclusion criteria

Adolescents who are

✓studying 9^{th} and 10^{th} class
✓able to understand Telugu and English
✓age group 14-15 years of age both male and female students
✓ available at the time of data collection
✓ willing to participate in the study.

Exclusion criteria

Adolescents who are

✓Not willing to participate in the study

Development and description of the tool: The tool was developed with the help of related literature from text books, journals, websites, discussion and guidance from the experts in the field of nursing and medicine.

The tool consists of two sections:

SECTION I: consists of socio- demographic data

SECTION II: consists of Blood Pressure and Anthropometric measurements

Table III- Classification of Hypertension

Blood pressure	systolic pressure	diastolic pressure
Normal	< 120	< 80 mmHg
Pre hypertension	120-139	80-90 mmHg
Stage 1 hypertension	140-159	90-99mmHg
Stage 2 hypertension	≥ 160	≥100 mmHg

Source: JNC VII Joint National Committee report; (2003)

Table IV-BMI (Body Mass Index) Classification

CLASSIFICATION	BMI(kg/m2)
Underweight	< 18.5
Normal range	18.5-24.9
Overweight(pre obese)	25.0-29.9
Class I	30.0-34.9
Class II	35.0-39.9
Class III	≥ 40.0

Source: World health organization (2014)

Section III: consists of physical activity

Section IV: consists of dietary habits

Content Validity: The content validity was obtained from Nursing and Medical experts. The content validity of the tool was given to 11 experts along with objectives. There were 6 experts from the community medicine and 5 experts from the community health nursing department, 1 expert from obstetrics and gynecology nursing. The experts were permitted to give their opinions and suggestions from the experts necessary modifications were made in the tool. It was translated into Telugu language and its appropriateness was obtained from Telugu pundit. The modified tool was fit for the pilot study.

Reliability of the tool: Reliability of the tool was established by using the data collected from the adolescents who are studying 9^{th} and 10^{th} class in Annur panchayat. The reliability Cronbach's alpha formula was established by Chi-square test. The tool was reliable with the score of r=0.79.The test was conducted on 30-6-2020.

Pilot Study: The investigator conducted a pilot study in Annur panchayati, Karvetinagaram mandal from 1-7-2020 to 3-7-2020 to test the 'feasibility' and 'practicability' of the tool used. Prior to the study formal permission was obtained from the Annur panchayati secretary in sachivalayam. The 1/10 adolescents were selected for the pilot study by using convenient sampling technique. Rapport was established with self introduction and written consent from the participants to participate in the study was obtained. The questionnaire was administered by the investigator after making the adolescents to sit comfortably. Necessary requirements were given which include pen, pencil and pad. Instructions were given to the participants to answer the questionnaire and the response of participants was noted and also the investigator Blood Pressure and anthropometric measurements were assessed and recorded. The data collection took 10-15 minutes for each participant.

After the completion of questionnaire, an information booklet was given which consisted of introduction, definition, incidence, risk factors, and Health promotive measures for prevention of non communicable diseases among adolescents. During the pilot study, the investigator found that many of the subjects could not answer a few questions and felt the need to exclude a few questions with the permission from the guide, so as to make the questions better understood. Necessary modification was done and the modified questionnaire was used for the main study. Statistical analysis was done by using descriptive and inferential statistics. The findings of the study revealed that the tool was reliable and feasible for conducting the study.

PROCEDURE FOR DATA COLLECTION

The investigator obtained prior formal permission from the Annur panchayati secretary for conducting the study. 100 samples were selected by non probability convenience sampling technique with minimum 10 samples per day from 2pm-4pm on every day for data collection. The investigator initially established rapport with the study subjects and the purpose of the study was explained to them. Written consent from the subjects was obtained and confidentiality was maintained throughout the study. The investigator collected the data from adolescents through self administered questionnaire, given multiple choice question and samples were response will kept in the given bracket. The data collection took 10-15 minutes for completion from each participant. After the completion of data collection, information booklet which consisted of introduction, definition, incidence, risk factors and health promotive measures for prevention of non communicable diseases among adolescents was given to all participants for future references, dually thanking the participants for their willingness and co-operation. The same procedure was followed for all 100 samples.

Total duration of data collection was 10 days. The schedule adopted was given below

Date	Time	number of samples per day	duration of data collection
6-7-2020	2pm-4pm	10	2hours
7-7-2020	2pm-4pm	10	2hours
8-7-2020	2pm-4pm	10	2hours
9-7-2020	2pm-4pm	10	2hours
10-7-2020	2pm-4pm	10	2hours
11-7-2020	2pm-4pm	10	2hours
12-7-2020	2pm-4pm	10	2hours
13-7-2020	2pm-4pm	10	2hours
14-7-2020	2pm-4pm	10	2hours
15-7-2020	2pm-4pm	10	2hours

RESULTS

- Regarding the assessment of Blood Pressure out of 100 adolescents, majority of 78 per cent were normal Blood Pressure, 22 per cent were pre hypertension. The mean and standard deviation scores were 1.22 ± 0.416.
- Regarding the BMI, Out of 100 adolescents, 82 per cent were normal weight, 10 per cent were under weight, and 8 percent shows over weight. The mean and standard deviation scores of BMI 1.98±0.426Where as W/H ratio 59 per cent have low risk, 16 per cent have moderate risk, and 25 per cent have high risk. The mean and standard deviation scores 1.66 ± 0.855

- Regarding the habit of physical activity out of 100 adolescents 45 percent doing moderately, 41 per cent was inactive, 14 percent were doing vigorously. The mean and standard deviation scores 1.73 ± 0.694
- Regarding the habit of dietary pattern out of 100 adolescents, 51 per cent had poor level of dietary pattern, 31 per cent had fallow healthy dietary pattern, and 18 per cent had taking unhealthy dietary pattern. The mean and standard deviation scores were 1.67±0.766
- Statistically significant association of Blood Pressure with anthropometric measurements like height was significant at 0.05 level and other anthropometric measurements like weight, waist circumference, Hip circumference were significant at 0.01 level. BMI and W/H ratio were not showing any significant association.
- The present study shows there is a Statically significant association between Blood Pressure with age, gender, education, mother education, mother occupation, income at 0.05 level where as remaining demographic variables (religion, father occupation, family type) are not showing any significant association.
- The present study shows there is a significant association between BMI related to gender, education, mother education, father occupation, income at 0.05 level where as remaining demographic variables (religion) is not showing any significant association

DISCUSSION

The discussion of the present study is based on the findings obtained from the descriptive statistical analysis of the collected data.

The first objective of the study to assess the Blood Pressure of adolescents: Present study shows that among 100 adolescents 78 per cent have normotensive, 22 per cent have Pre hypertension.

The second objective of the study to assess the Anthropometric measurements among adolescents: Present study shows that among 100 adolescents 82 per cent having normal BMI, 10 per cent were in under weight and 8 per cent were shows over weight. Where as the W/H ratio (59 %) have in low risk, 16 per cent having moderate risk, and 25 per cent having high risk.

The third objective of the study to assess the physical activity levels of adolescents: Present study shows that among 100 adolescents 41 per cent were inactivity, 45 per cent were doing moderately, and 14 per cent were doing high physical activity. The mean and standard deviation scores were 1.73±0.694.

The fourth objective of the study to assess the dietary habits of adolescents: Present study shows that among 100 adolescents 51 per cent were having fallow poor dietary pattern, 31 per cent were fallow healthy dietary pattern, 18 per cent have fallow unhealthy dietary pattern. The mean and standard deviation scores were 1.67±0.766.

The fifth objective of the study to associate the Blood Pressure and anthropometric measurements among adolescents: Statistically significant association of Blood Pressure with anthropometric measurements like height was significant at 0.05 level and other anthropometric measurements like weight, waist circumference, Hip circumference were significant at 0.01 level. BMI and W/H ratio were not showing any significant association.

The sixth objective of the study to associate the Blood Pressure with socio demographic variables: The present study shows there is a Statically significant association between Blood Pressure with age, gender, education, mother education, mother occupation, income at 0.05 level where as remaining demographic variables (religion, father occupation, family type) are not showing any significant association.

The seventh objective of the study to associate the anthropometric measurement with socio demographic variables: The present study showed there is a significant association between BMI related to gender, education, mother education, father occupation, income at 0.05 level where as remaining demographic variables (religion) is not showing any significant association.

Conclusion

- The present study revealed that adolescents having pre hypertensive and overweight. There is a significant association between Blood Pressure with anthropometric measurements.
- Information booklet was given for further reference to enhance their knowledge levels and it may help to prevent the non communicable diseases.

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