



PREHYPERTENSION AMONG COLLEGE AND SCHOOL STUDENTS IN DIFFERENT SEASON: A REVIEW

Medical Science

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ABSTRACT

According to Seventh Report of the Joint National Committee on the Prevention Detection, Evaluation, and Treatment of High Blood Pressure (JNC7) Prehypertension refers to a systolic blood pressure of 120 to 139 mmHg systolic or diastolic blood pressure of 80 to 89 mmHg. This paper aims to increase awareness of near-normal levels of BP so that such prehypertensives would make lifestyle changes like yoga, Pranayam, Talahridaya marma, and a specific diet to control further hypertension. In this paper we analyze published work related to the prevalence of prehypertension and its association with BMI and other cardiovascular diseases in both genders. 13 studies were included in this review from the year 2012 to 2018 among students of age 17 to 30 years. Studies reported the prevalence of prehypertension ranges from 1.6 % to 50%. A large number of prehypertension among college and school students in various studies justifies the need for blood pressure measurement and it would be more appropriate if integrated into school health programs.

KEYWORDS

Prehypertension, Cardiovascular disease, Blood Pressure.

INTRODUCTION

In today's time, lifestyle has been changed a lot which increases metabolic diseases like hypertension, diabetes mellitus etc. These diseases affect individual as well as combined in a manner. Most of the money of an average middle class family has been consumed in these diseases only. Hypertension is one of these diseases and is a desired topic for various researchers. Its pattern and associated factors are still being studied

Prehypertension is a predecessor of clinical hypertension which causes cardiovascular diseases. Hypertension is a non transmissible disease which causes high morbidity and mortality.^[1] The Seventh Report of the Joint National Committee on the Prevention Detection, Evaluation, and Treatment of High Blood Pressure (JNC7) introduced a new hypertension category "pre-hypertension", defined as a systolic blood Pressure of 120 to 139 mmHg or diastolic blood pressure of 80 to 89 mmHg. According to New American College of Cardiology and American Heart Association (ACC/AHA) High Blood Pressure Guidelines.

Category	SYSTOLIC (mmHg)	AND	DIASTOLIC (mmHg)
Normal	Less than 120	And	Less than 80
Elevated	120-139	Or	Less than 80
Stage 1 Hypertension	130-139	Or	80-89
Stage 2 Hypertension	At least 140	Or	At least 90

Prehypertension persons have a greater threat of developing hypertension than those with lower blood pressure levels.^[2] Adolescence is an significant development period of growth and maturation and most of changes occur during this period.^[3] The prevalence of Prehypertension and hypertension continues into adult where young adults undergo from cardiovascular disorders even before the age of 45 or 40 years.^[4,5] More than three-quarters of cardiovascular deaths occur in low and middle-income countries. In 2013, Indonesia reported that roughly 13.6% and 14% of adult men and women suffered from CVD, respectively.^[6] Sub-Saharan African countries are experiencing one of most unexpected epidemiological alteration characterized by growing urbanization and changeable lifestyle.^[7,8] A study among young adults (20-30 years) found that students were at important risk for prehypertension in assessment to general youth population.^[9] Hypertension is the common non communicable disease which affect both male and female in all races.^[13]

METHOD

A literature study used to recognize appropriate published works associated to occurrence of cardiovascular disease threat among males and female college students of different countries from 2012 to 2018. This paper review the published works related to prevalence of Prehypertension among male and female college students and school

adolescents of dissimilar countries. A three step search strategy utilized in the review using the following source: Google scholar, (2012 to 2018). 1: The search was taken using well-known keywords. Step 2: the titles and abstracts of all the articles of probable interest were reviewed for the inclusion and exclusion of studies. Step 3: the mention lists of all renowned reports and articles were searched for other relevant studies.

The reviewed papers are as follow:

1. Daniel Gyamfi et, al. studied cross sectional study on 540 students of age 18 to 20 years on prevalence of Prehypertension and hypertension among undergraduate students in South Ghana from Period of February 2016 to April 2016 and founded that 141 students were Prehypertensive and 387 had normal Blood Pressure.

2. Siti Nur Hani Rafan et, al. studied cross-sectional study on 155 students of age 18 to 25 years Prevalence of prehypertension and its associated factors among adults in Northeast Malaysia in South west monsoon season and reported that 57 students were prehypertensive.

3. Janatin Hastuti et, al. studied cross-sectional study on Anthropometric Indicators for Blood Pressure and the occurrence of Hypertension of 467 Indonesian College Students Aged 18-25 Years. It was found that the prevalence of prehypertension was in 201 students. All anthropometric measures weight, wrist circumference BMI are significantly associated systole and diastole in boys and systole in girls.

4. G Anuradha et, al. studied cross-sectional study on Prevalence of Prehypertension and hypertension among 631 adolescent school students of age 14 to 17 years in semi urban area of Erode District, Tamil Nadu. There are 81 students in Prehypertension.

5. Karl Peltzer et, al. studied cross-sectional study on Prehypertension and psychosocial risk factors among 4649 university students in 7 ASEAN countries of 18 to 30 years of age. It was found 883 of the undergraduate university students across ASEAN countries had Prehypertension. There was country variation in Prehypertension prevalence, ranging from 11.3% in Indonesia and 11.5% in Malaysia to above 18% in Laos, Myanmar and Thailand..

6. Maha Moussa Mohamed Moussa et, al. studied comparative cross-sectional study on Port-Said and Damietta Cities University Hostel students in hot summer and mild winter season. They included the sample of 2029 students of 18 to 25 years from 1st October 2013 to May 2014. It was reported that prevalence of Prehypertension was 236 students in Damietta University compared to 249 students in Port Said University.

7. Gethadevi Madhvikutty Amma et, al. studied cross-sectional analytical study on Prevalence and determinants of Prehypertension

and hypertension among 1000 adolescents of age 13 to 17 years from period of July 2013 to March 2014 in monsoon and winter season from govt. medical college kottayam Kerala. It was found that 245 students were Prehypertensive.

8. Takele Tadesse et, al. studied a cross-sectional study on Hypertension and associated factors among 610 university students of 18 years and greater in Gondar, Ethiopia in Dry Season: It was found that a total of 47(7.7%) students were hypertensive. About 35.7% had pre-hypertensive and 55.1% had normal blood pressure.

9. J. Jain et, al. studied cross-sectional study on 300 students of age 17 to 26 years of chiriayu medical college Central India from Dec 2013 to Jan 2014 in winter season. It was found that out of total 300 subjects 128 were prehypertensives.

10. Ashleigh L. May et, al. studied cross-sectional study on Prevalence of Cardiovascular disease risk factors among US adolescents, from 1999 to 2008 in all four seasons summer, Autumn, Winter and Spring. The study sample included 3383 participants aged 12 to 19 years of age. It was found that 55 adolescent have Prehypertension.

11. Mahajan and Negi studied cross-sectional study among the students of Shimla city in the State of Himachal Pradesh in North India. from July to Dec 2015 it was found that 756(22.3%) out of 3385 students of Shimla district in Himachal Pradesh of North India were in prehypertensive stage.

12. Sunandha Senthil et, al. studied cross-sectional study on 84 undergraduate medical students aged between 18-23 years in April 2015 of either sex. In 84 students prehypertension was found in 42 students (50%). All of the prehypertensives were in prehypertensive range, and 20 students (24%) were diastolic prehypertensives. All those who had DBP in prehypertensive range, also had SBP in prehypertensive range.

13. Chitrapu and Thakkallapalli et, al. studied a total of 275 medical students of first to final year MBBS in the age group 17-25 were included in the study. There were 148 males and 127 females. The overall prevalence of prehypertension in the study sample was 37.45% (103/275).

RESULT

Prehypertension

Systolic blood Pressure of 120 to 139 mmHg and diastolic blood pressure of 80 to 89 mmHg. There are 13 studies were included in this review and it has been founded that nine studies shows prevalence of Prehypertension among university students of age 17 to 30 years and four studies shows prevalence of Prehypertension among school adolescent between the age of 12 to 19 years, there were 140(25.9%) students were in prehypertensive stage out of 540 students from first study, 57(37.1%) out of 155 prehypertensives from North East Malaysia in second study, 201(43%) out of 467 were prehypertensive in third study, 81(12.83%) out of 631 students in fourth study, 883(19.0%) out of 4649 in fifth study, 485(23.9%) students from Damietta and Portsaid university out of 2029 students in sixth study. In seventh study prehypertensives were 245(24.5%) out of 1000, 217(35.7%) out of 610 in eighth study, 201(43%) students out of 467 were prehypertensives in third study, 217(35.7%) out of 610 in eighth study, 128(42.6%) out of 300 were prehypertensive in ninth study, 55(1.6%) out of 3383 adolescent in tenth study, 756(22.3%) out of 3385 students, 42 students (50%) out of 84 and 37.45% (103/275) in last three studies.

Anthropometry Measurement

Body Mass Index (BMI) was calculated as body weight divided by height squared (kg/m²). With respect to the BMI, there were four groupings of subjects: under-weight (BMI < 19 kg/m²), normal (BMI between 19 and 24.9 kg/m²), overweight (BMI between 25 and 29.9 kg/m²) and obese (BMI > or = 30 kg/m²). The prevalence of BMI was reported in 8 studies. In paper one 395 of population have normal BMI, 71 were overweight, 29 were obese and 42 underweight. In third study 145 were normal, 19 were underweight, 16 were overweight and 29 were obese, 427 were normal, 165 were underweight and 39 were overweight/obese in fourth study. In paper six 503 students from Damietta and 451 from Port Said have normal BMI, 419 and 311 were overweight, 187 and 115 were obese and 25 and 20 were underweight. 25 were obese/overweight and 975 were normal/underweight in seventh study, 365 have normal BMI, 24 were overweight, 4 were

obese and 217 were underweight in eighth study. In ninth study 168 were Normal, 38 were overweight, 54 were obese and 40 were underweight. In tenth study 2142 students were Normal weight, 580 were overweight 661 were obese.

CONCLUSION

This is the review of the published work of 13 studies from 2012 to 2018 to focus Prehypertension among university students and school adolescents. In all thirteen studies, it has been reported that prehypertension rate ranges from 1.6% to 50% which is quite high. The study revealed prevalence rates of pre-hypertension with a positive correlation to BMI. Students who were overweight or obese are more prevalent in the prehypertensive category as compared to students having normal BMI. There would be advised to the families with BP above the optimal level with respect to diet, exercise and reduced salt intake for maintenance of normal BP. Studies related to blood pressure may provide additional information for prevention and treatment of consequent hypertension in adulthood. A large number of prehypertension among various studies justifies the need for such study and measurement of Blood Pressure should be integrated into school health programs.

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