Research Article

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A DESCRIPTIVE STUDY ON ASSESSING THE RISK FACTORS OF PREHYPERTENSION AMONG LATE ADOLESCENTS IN SIR ISSAC NEWTON COLLEGE OF ENGINEERING AND TECHNOLOGY AT NAGAPATTINAM.

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ABSTRACT

Background: Prehypertension among adolescents is an emerging public health concern due to its strong association with future hypertension and cardiovascular diseases. Lifestyle factors such as unhealthy diet, physical inactivity, increased screen time, and stress contribute significantly during this stage. **Aim:** The study aimed to assess prehypertension risk factors among late adolescent students. **Methodology:** A quantitative research approach with a descriptive design was adopted. The study was conducted among 200 late adolescent students aged 18–21 years using simple random sampling. Data were collected using a self-structured questionnaire including demographic variables, physiological measurements (height, weight, BMI, blood pressure), and lifestyle-related risk factors. Data were analyzed using descriptive statistics such as frequency and percentage. **Results:** The findings revealed that most participants were aged 19 years and female, with a majority belonging to nuclear families and rural areas. A significant proportion of students were in the overweight BMI category, while most had normal blood pressure levels. Behavioral findings showed moderate mobile usage, especially at bedtime, reduced sleeping hours, and occasional junk food consumption. Most students engaged in physical activity, particularly aerobic exercises, and reported either no stress or tolerable stress, while smoking and alcohol consumption were minimal. **Conclusion:** Although most late adolescents had normal blood pressure, the presence of modifiable lifestyle risk factors such as overweight status, altered sleep patterns, and mobile usage may increase the risk of developing prehypertension in the future.

Keywords: Prehypertension, Public health , late adolescents, risk factors.

INTRODUCTION:

Prehypertension among adolescents is an early warning sign that greatly predisposes them to develop hypertension and cardiovascular diseases after growing up. It is closely linked to the lifestyle changes that include obesity, physical inactivity, unhealthy diet, stress, and substance use. As the prevalence of hypertension is expected to increase by a third globally by 2025, increased blood pressure has emerged as a significant public health issue, costing a significant amount of morbidity, mortality, and disability. Adolescence (10-19 years) is a serious developmental phase in which lifetime behaviors are developed. It has been shown that people develop hypertension in their adulthood, which is very likely to have begun in childhood and adolescence. Though prehypertension is seen as a transitional period, it is a risk factor on its own as far as cardiovascular complications are concerned and the rate of transition to hypertension is steady in case it is not addressed.

The prehypertension rates in adolescents in India vary between 16 to 20 percent with the highest rates in urban and male populations. In Tamil Nadu, estimates are between 10 percent and 21.5 percent. Poor diet, lack of physical exercise and stress are lifestyle changes contributing to this increasing trend. Lots of adolescents do not know their blood pressure level which results in late diagnosis and treatment. To avoid the progression, early diagnosis and lifestyle change, such as a healthy diet, exercise, and stress management, are important. The first option is non-pharmacological and medication is used only in high-risk situations. In general, early screening, health education, and preventive strategies among adolescents are urgently required, which will help decrease the future hypertension and its associated complications burden.

AIM:

The aim of the study to assess the risk factors of prehypertension among late adolescents in Sir Issac Newton College of Engineering and Technology at Nagapattinam.

MATERIALS AND METHODS

A descriptive research design in a quantitative research method was used. The research was done in Sir Issac Newton College of Engineering and Technology, Nagapattinam, with students in the age group of 18 to 21 years. A sample of 200 was selected through simple random sampling method based on inclusion and exclusion criteria. Data were gathered by a self-administered instrument based on the literature review and professional advice, which consisted of three parts; demographic variables, physiological variables (height, weight, BMI, and blood pressure), and a questionnaire on risk factors that included lifestyle habits, diet, physical activity, stress, and sleep patterns. Data collection was done in two weeks using a structured questionnaire with formal permission and informed consent. The scoring criteria were used to categorize the risk levels as no risk, mild, moderate, and severe. To interpret the results, the gathered data were coded, tabulated, and analyzed with the help of descriptive and inferential statistics.

RESULTS:

Table 1: Description of Demographic Variables among Late Adolescent Students (N = 200)

S. No	Demographic Variables	Category	Frequency (N)	Percentage (%)
1	Age	18 years	54	27.0%
		19 years	113	56.5%
		20 years	27	13.5%
		21 years	6	3.0%
2	Gender	Male	89	44.5%
		Female	111	55.5%
3	Religion	Hindu	180	90.0%
		Christian	6	3.0%
		Muslim	14	7.0%
		Others	0	0%
4	Education Status	Diploma	0	0%
		Bachelor's Degree	200	100%
		Master's Degree	0	0%
		Doctoral Degree	0	0%
5	Type of Family	Joint Family	48	24.0%
		Nuclear Family	131	65.5%
		Single Parent	19	9.5%
		Blended Family	2	1.0%
6	Family Income per Annum	Below 45,000	67	33.5%
		45,000–70,000	111	55.5%
		70,000–100,000	18	9.0%
		Above 100,000	4	2.0%
7	Family History of Hypertension	Parents	42	21.0%
		Grandparents	23	11.5%
		Siblings	2	1.0%
		No History	133	66.5%

8	Area of Residence	Rural	128	64.0%
		Semi-Rural	51	25.5%
		Urban	17	8.5%
		Semi-Urban	4	2.0%
9	Type of Delivery	C-Section	64	32.0%
		Normal Delivery	132	66.0%
		Forceps Delivery	3	1.5%
		Vacuum Extraction	1	0.5%
10	Complications During Pregnancy	Gestational Hypertension	9	4.5%
		Anemia	5	2.5%
		Gestational Diabetes Mellitus	2	1.0%
		None	184	92.0%

The table shows that the majority of late adolescents were aged 19 years (56.5%), followed by 18 years (27%). Most participants were female (55.5%) and belonged to the Hindu religion (90%). All respondents were pursuing a bachelor's degree. A majority lived in nuclear families (65.5%) and had an annual family income between ₹45,000–70,000 (55.5%). Most students had no family history of hypertension (66.5%). The majority resided in rural areas (64%). Regarding birth history, most were born through normal delivery (66%), and a large proportion reported no maternal pregnancy complications (92%).

Table 2: Frequency and Percentage-wise Distribution of Physiological Variables among Late Adolescent Students (N = 200)

S. No	Physiological Variables	Category	Frequency (N)	Percentage (%)
1	Weight	Below 40 kg	15	7.5%
		40–50 kg	76	38.0%
		50–60 kg	58	29.0%
		Above 60 kg	51	25.5%
2	Height	140–150 cm	22	11.0%
		151–160 cm	70	35.0%
		161–170 cm	62	31.0%
		Above 170 cm	46	23.0%
3	BMI Value	Below 18.5	13	6.5%

		18.5–24.9	55	27.5%
		25.0–29.9	132	66.0%
		≥ 30.0	0	0%
4	Blood Pressure Value	Below 110/70 mmHg	104	52.0%
		120/80 mmHg	67	33.5%
		130/90 mmHg	20	10.0%
		Above 140/100 mmHg	9	4.5%

The table 1 indicates that most students had a weight between 40–50 kg (38%), followed by 50–60 kg (29%). The majority had a height of 151–160 cm (35%), while a considerable number were between 161–170 cm (31%). In terms of BMI, most students (66%) were in the overweight category (25.0–29.9). Regarding blood pressure, more than half of the students (52%) had values below 110/70 mmHg, followed by 120/80 mmHg (33.5%), with a smaller proportion showing elevated or high blood pressure levels.

Table 2: Distribution of Physiological Variables among Late Adolescent Students (N = 200)

S. No	Physiological Variables	Category	Frequency (N)	Percentage (%)
1	Weight	Below 40 kg	15	7.5%
		40–50 kg	76	38.0%
		50–60 kg	58	29.0%
		Above 60 kg	51	25.5%
2	Height	140–150 cm	22	11.0%
		151–160 cm	70	35.0%
		161–170 cm	62	31.0%
		Above 170 cm	46	23.0%
3	BMI Value	Below 18.5	13	6.5%
		18.5–24.9	55	27.5%
		25.0–29.9	132	66.0%
		≥ 30.0	0	0%
4	Blood Pressure Value	Below 110/70 mmHg	104	52.0%
		120/80 mmHg	67	33.5%
		130/90 mmHg	20	10.0%
		Above140/100 mmHg	9	4.5%

Table 3: Distribution of Students' Responses to Self-Structured Questionnaire on Prehypertension Risk Factors (N = 200)

Q. No	Question	Category	Frequency (N)	Percentage (%)
1	Hours of Mobile Usage	5–6 hours	29	14.5%
		3–4 hours	69	34.5%
		1–2 hours	79	39.5%
		Less than 1 hour	23	11.5%
2	Mobile Usage at Bedtime	More than 2 hours	79	39.5%
		1–2 hours	55	27.5%
		30–45 minutes	48	24.0%
		Less than 30 minutes	18	9.0%
3	Sleeping Hours	3–4 hours	19	9.5%
		5–6 hours	107	53.5%
		7–8 hours	64	32.0%
		Above 8 hours	10	5.0%
4	Cigarette Smoking	I smoke daily	5	2.5%
		I sometimes smoke	4	2.0%
		I smoke rarely	8	4.0%
		I never smoke	183	91.5%
5	Alcohol Consumption	I consume daily	3	1.5%
		I sometimes consume	7	3.5%
		I consume rarely	5	2.5%
		I never consume	185	92.5%
6	Junk Food Consumption	I eat daily	30	15.0%
		I eat sometimes	50	25.0%
		I eat rarely	97	48.5%
		I never eat	23	11.5%
7	Physical Activity Duration	More than 4 hours	97	48.5%
		2–3 hours	72	36.0%
		1–2 hours	14	7.0%
		No physical activity	17	8.5%
8	Type of Physical Activity	Aerobic exercise	82	41.0%
		Flexibility exercise	66	33.0%
		Muscle fitness exercise	34	17.0%

		Yoga and meditation	18	9.0%
9	Study-related Stress	Extremely stressful	31	15.5%
		Low extreme stress	30	15.0%
		Tolerable stress	57	28.5%
		None	82	41.0%
10	Methods to Relieve Stress	Time management	74	37.0%
		Adequate sleep	88	44.0%
		Relaxation techniques	31	15.5%
		No idea	7	3.5%

The table 3 shows that most students used mobile phones for 1–2 hours (39.5%), and a significant proportion used mobile phones at bedtime for more than 2 hours (39.5%). The majority slept for 5–6 hours (53.5%). Most students reported that they never smoked (91.5%) or consumed alcohol (92.5%). Nearly half of the students (48.5%) reported rarely consuming junk food. In terms of physical activity, 48.5% engaged in more than 4 hours of activity, with aerobic exercise being the most common type (41%). Regarding stress, most students reported no stress (41%) or tolerable stress (28.5%). For stress management, the majority relied on adequate sleep (44%), followed by time management (37%).

DISCUSSION:

The study findings revealed that most late adolescents were aged 19 years, predominantly female, and belonged to nuclear families, with the majority having no family history of hypertension. A large proportion resided in rural areas and reported no maternal complications during pregnancy. Physiological assessment showed that many students had normal weight and height ranges; however, a significant proportion were in the overweight BMI category. Most participants had normal blood pressure levels, though a smaller group exhibited elevated values indicating potential risk.

Regarding lifestyle and behavioral factors, the majority of students had moderate mobile usage, with a considerable number using mobile phones at bedtime. Most participants reported 5–6 hours of sleep. The findings also indicated that the majority did not engage in smoking or alcohol consumption. Junk food intake was generally occasional or rare, and many students were involved in regular physical activity, particularly aerobic exercises. Stress levels were mostly absent or tolerable, and common coping strategies included adequate sleep and time management. Overall, although most students had normal blood pressure, the presence of overweight status and certain lifestyle factors such as mobile usage, sleep patterns, and dietary habits suggest a potential risk for developing prehypertension among late adolescents.

CONCLUSION:

The study concludes that most late adolescents had normal blood pressure levels; however, a considerable proportion exhibited risk factors such as overweight BMI, moderate mobile usage, inadequate sleep, and unhealthy dietary patterns. Although smoking and alcohol consumption were minimal, lifestyle behaviors still indicate a potential risk for the development of prehypertension. Early identification of these risk factors and implementation of appropriate lifestyle modifications are essential to prevent the progression to hypertension and associated complications in adulthood.

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