

**HEALTH IMPACTING BEHAVIOUR OF SCHOOL GOING ADOLESCENT STUDENTS
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ABSTRACT

Background: Globally, there are approximately 1.2 billion adolescents, between 10 and 19 years of age. In India, adolescents account for roughly 21% of the total population. Targeting this group allows for early identification of knowledge gaps and behavioural patterns that may influence long-term health. The present study attempts to investigate health impacting behaviour of school-going adolescents aged 14-19 and to identify the prevalence of risk factors of hypertension and diabetes. **Methods:** A descriptive cross-sectional study was conducted among 182 students selected from four schools in Sunder Nagar, located in District Mandi of Himachal Pradesh, India. by using stratified random sampling technique. **Results:** Study included 182 adolescent students aged 14–19 years. Majority of respondents were female (65.93%, n=120). Maximum participants were from Class 12 (26.4%), followed closely by Classes 9 and 10 (25.3% each), while Class 11 had the fewest participants (23.1%). Most participants engaged in physical activity sometimes (N = 63, 34.6%), education. Out of 182 participants, most participants reported experiencing moderate stress levels (N=89, 48.9%), with similar proportions among males (N=28, 46.7%) and females (N=61, 50.0%). The most common leisure activity among participants was using social media (31.3%). Out of 182 participants, the majority reported having high (37.9%) or very high (26.4%) sleep quality. More females (N = 48, 39.3%) than males (N = 21, 35.0%) reported high sleep quality, while only a small proportion experienced low (7.7%) or very low (2.2%) sleep quality. Association between knowledge of healthy health impacting choices and gender was not significant (P = 0.224). Out of 182 participants, the most reported challenge in maintaining a healthy health impacting was lack of knowledge about healthy habits (N=64, 35.2%), followed by difficulty finding healthy food options (N=54, 29.7%) and lack of time (N=51, 28.0%). **Conclusions and Suggestions:** Study concluded that awareness and life impacting behaviour of adolescent students concerning diabetes and hypertension in studied population is far from satisfactory. Gender played a role in shaping awareness and health impacting choices for hypertension and diabetes. The study highlights the urgent need for structured, age-appropriate, and engaging health education for adolescents. Involvement of health professionals in health literacy programs in schools can play a vital role in improving adolescent health literacy and promoting long-term healthy behaviours to reduce the risk of hypertension and diabetes.

KEYWORDS: Adolescents; Diabetes; Health Impacting Behaviour; Hypertension; Non-Communicable Diseases (NCD).

INTRODUCTION

Adolescence, defined as the period between 10 and 19 years of age, represents a critical window for establishing health behaviours that influence future disease risk. Globally, there are approximately 1.2 billion adolescents, forming the largest adolescent generation in history. In India, adolescents account for roughly 21% of the total population, with approximately 253 million individuals falling within this age group.^[1] Targeting this group allows for early identification of knowledge gaps and behavioural patterns that may influence long-term health. Data from the World Health Organization (WHO)

indicates that in 2021, NCDs accounted for approximately 43 million deaths, representing nearly three-quarters of all deaths not related to pandemics.^[2] Presently, NCDs claim over 5.8 million lives annually in India, significantly affecting the country's healthcare infrastructure, economy, and population well-being. Major contributors to the global mortality rate include cardiovascular diseases, hypertension, diabetes, etc. The primary risk factors contributing to hypertension and diabetes are well established and largely modifiable. These include the use of tobacco, sedentary health impacting s, unhealthy dietary patterns, excessive

alcohol intake, and exposure to environmental pollutants.^[3] Globalization, urbanization, and economic transitions have substantially altered health impacting s, leading to a surge in risk behaviours associated with chronic diseases. Importantly, the development of hypertension and diabetes is rooted in early life stages, particularly during adolescence.^[4]

While adolescence is often perceived as a relatively healthy life stage, evidence increasingly highlights its critical role in the onset of lifelong health patterns. Research suggests that around 70% of premature adult deaths are linked to risk behaviours that begin during adolescence, including poor dietary habits, substance use, sedentary behaviour, and obesity. The age range of 14 to 19 years marks a pivotal stage in adolescence when individuals begin to make more independent health impacting choices. During this developmental period, habits related to diet, physical activity, stress management, and overall health behaviour begin to solidify and often continue into adulthood.^[5-6]

In the Indian context, about one-fourth of adolescents fail to meet recommended physical activity levels, with a notable disparity among urban girls who are particularly at risk. Concurrently, rates of overweight and obesity are rising sharply during adolescence, further escalating the risk for chronic diseases later in life.^[7] Substance use among adolescents, including tobacco, alcohol, and illicit drugs, compounds the risk of hypertension and diabetes but also contributes to a range of physical and mental health problems. The Global Youth Tobacco Survey (GYTS) 2019 revealed that nearly 14.6% of Indian adolescents aged 13 to 15 years currently use tobacco products.^[8] A descriptive cross-sectional study carried out among 634 students aged 17 to 19 years enrolled in government schools within the Maharagama Education Division reported a low level (43% n = 272) of awareness and practice regarding healthy behaviours among adolescents. The limited knowledge about NCDs and related risk behaviours underline the urgent need for routine monitoring of NCD risk factors and the implementation of preventive health programs targeting youth.^[9-10] Studies encompassing a broader range of risk factors among adolescents in Indian set-ups are limited.

A study on investigating lifestyle behaviour of 634 school- going adolescents aged 14-19 and to identify the prevalence of risk behaviours in Sri Lanka reported overall 43% knowledge of NCDs and knowledge of NCDs and their life style was found to be associated with several factors including gender, SES and academic stream.^[11] Perceptions and awareness regarding risk factors of NCDs particularly of hypertension and diabetes will be of utmost importance to generate evidence that can inform public health strategies aimed at promoting healthier health impacting s among adolescents and mitigating the future burden of non-communicable diseases^[12] In this context, the present study attempts to investigate health impacting behaviour

of school-going adolescents aged 14-19 and to identify the prevalence of factors influencing hypertension and diabetes risk.

MATERIALS AND METHODS

Study Design

It was a descriptive cross-sectional study during January 2025 to June 2025 conducted at Sunder Nagar, located in District Mandi of Himachal Pradesh; Study population included 182 adolescent students aged 14-19 years.

Sample Technique

Schools were selected using a convenient sampling method. Within selected schools, adolescent students aged 14-19 years studying in class 9th to 12th standard were selected by using stratified random sampling with proportional allocation.

Data Collection Tool

Data were collected using an interviewer administered semi structured questionnaire on socio-demographic characteristics and economic status, knowledge on hypertension and diabetes and .health impacting practices.

Ethical Concerns

Respondents were interviewed in privacy with their informed consents following all ethical norms. Their confidentiality was ensured.

Data Analysis

Descriptive statistics were used for describing quantitative parameters and associations between gender and of life impacting factors was tested by using Chi square test. Data analysis was carried out by using SPSS -26.0 software.

RESULTS

Study included 182 adolescent students aged 14–19 years. Majority of respondents were female (65.93%, n=120), while males made up 34.06% (n=62). Maximum participants were from Class 12 (26.4%), followed closely by Classes 9 and 10 (25.3% each), while Class 11 had the fewest participants (23.1%). Majority of parents were graduates (72.0%, n=131), while 22.0% (n=40) had completed secondary education. Table-1 shows that the majority of participants were females, with the highest number from the 15-year age group (N=33) (27.0%). Among males, the largest group was 14 years (N=20) (33.3%).

Table 1: Distribution of respondents by age and gender.

| Age in years | Gender | | Total |
|--------------|---------------|-----------------|-----------|
| | Male n (%) | Female n (%) | n (%) |
| 14 | 20 (33.3) | 29 (23.8) | 49 (26.9) |
| 15 | 13 (21.7) | 33 (27.0) | 46 (25.3) |
| 16 | 12 (20.0) | 31 (25.4) | 43 (23.6) |
| 17 | 13 (21.7) | 24 (19.7) | 37 (20.3) |
| 18 | 2 (3.3) | 4 (3.3) | 6 (3.3) |
| 19 | 0 (0.0) | 1 (0.8) | 1 (0.5) |

The most common leisure activity among participants was using social media (31.3%), followed by outdoor games or sports (27.5%). Watching TV or playing video games accounted for 22.0%, and 19.2% spent their free time reading or studying. These findings highlight a mix

of sedentary and active behaviours. While high screen time may contribute to inactivity-related health risks, engaging in outdoor activities can help lower the chances of developing health impacting conditions like diabetes and hypertension.

Table 2: Distribution of respondents by leisure activities respondents.

| Leisure activity | Frequency N | Percent N% |
|---------------------------------|----------------|---------------|
| Watching TV/playing video games | 40 | 22.0 |
| Outdoor games/sports | 50 | 27.5 |
| Reading/studying | 35 | 19.2 |
| Using social media | 57 | 31.3 |
| Total | 182 | 100.0 |

Table- 3 presents distribution respondents by consumption of fast food, physical activity and gender. Most participants consumed fast food sometimes, with N = 131 (72.0%) reporting this habit N = 45 males (75.0%) and N = 86 females (70.5%). A smaller proportion ate fast food often (n = 15)(8.2%) or very often (N = 5)(2.7%). Only n = 4 (2.2%) never consumed fast food. Overall, fast food intake was slightly more frequent among males. Most participants engaged in physical activity sometimes (N = 63, 34.6%), with more females (N = 47) than males (N = 16). A total of N = 35 (19.2%) reported exercising often, and N = 32 (17.6%) did so very often. Total 40 (22.0%) engaged in physical activity

rarely, while only N = 12 (6.6%) never participated in any form of physical activity.

Out of 182 participants, the majority reported having high (37.9%) or very high (26.4%) sleep quality as presented in Table-4. More females (N = 48, 39.3%) than males (N = 21, 35.0%) reported high sleep quality, while only a small proportion experienced low (7.7%) or very low (2.2%) sleep quality. Out of 182 participants, most participants reported experiencing moderate stress levels (N=89, 48.9%), with similar proportions among males (N=28, 46.7%) and females (N=61, 50.0%). A very high stress level was observed slightly more in females (N=11, 9.0%) than males (N=3, 5.0%).

Table-3: Distribution of respondents by consumption of fast food, physical activity and gender.

| | GENDER | | TOTAL |
|------------------------------------|-------------------|--------------------|--------------------|
| | MALE (N%) | FEMALE (N%) | |
| Consume fast food | | | |
| Never | 1 (1.7) | 3 (2.5) | 4 (2.2) |
| Rarely | 10 (16.7) | 17 (13.9) | 27 (14.8) |
| Sometimes | 45 (75.0) | 86 (70.5) | 131 (72.0) |
| Often | 3 (5.0) | 12 (9.8) | 15 (8.2) |
| Very Often | 1 (1.7) | 4 (3.3) | 5 (2.7) |
| Engage in physical activity | | | |
| Never | 5 (8.3) | 7 (5.7) | 12 (6.6) |
| Rarely | 10 (16.7) | 30 (24.6) | 40 (22.0) |
| Sometimes | 16 (26.7) | 47 (38.5) | 63 (34.6) |
| Often | 15 (25.0) | 20 (16.4) | 35 (19.2) |
| Very Often | 14 (23.3) | 18 (14.8) | 32 (17.6) |
| Total | 60 (100.0) | 122 (100.0) | 182 (100.0) |

Out of 182 participants, the most reported challenge in maintaining a healthy health impacting was lack of knowledge about healthy habits (N=64, 35.2%), followed by difficulty finding healthy food options (N=54, 29.7%) and lack of time (N=51, 28.0%) as shown in Table-6. . A smaller portion cited peer influence as a barrier (N=13, 7.1%). However, the association between knowledge of the biggest challenge in maintaining a healthy health impacting and gender was not significant (P= 0.65%).

Health impacting choices of respondents with gender are presented in Table-5. Among the 182 participants, over half (N=96, 52.7%) were moderately sure about their ability to make healthy health impacting choices. A larger proportion of males (50.0%) and females (54.1%) fell into this category. Additionally, 39 participants

(21.4%) were very sure, with more males (30.0%) expressing this confidence compared to females (17.2%). A smaller portion (N=12, 6.6%) were not sure at all. Association between knowledge of healthy health impacting choices and gender was not significant (P = 0.224). This highlights the importance of targeted interventions to boost motivation and practical knowledge about healthy living. Among the 182 participants, the most common motivators for maintaining a healthy health impacting were to avoid getting sick (N=61, 33.5%) and to look and feel good (N=61, 33.5%). This was followed by advice from doctors or health experts (N=32, 17.6%) and influence from family and friends (N=28, 15.4%). However, the association between knowledge about living a healthy health impacting and gender was not significant (P = 0.49).

Table 4: Distribution of respondents by sleep quality stress level and gender.

| Sleep quality and Stress level | GENDER | | TOTAL |
|--------------------------------|------------|-------------|-------------|
| | MALE (N%) | FEMALE (N%) | |
| Sleep Quality | | | |
| Very low | 2(3.3) | 2(1.6) | 4(2.2) |
| Low | 3(5.0) | 11(9.0) | 14(7.7) |
| Moderate | 20(33.3) | 27(22.1) | 47(25.8) |
| High | 21(35.0) | 48(39.3) | 69(37.9) |
| Very high | 14(23.3) | 34(27.9) | 48(26.4) |
| Daily Stress Level | | | |
| Very low | 11 (18.3) | 10 (8.2) | 21 (11.5) |
| Low | 9 (15.0) | 23 (18.9) | 32 (17.6) |
| Moderate | 28 (46.7) | 61 (50.0) | 89 (48.9) |
| High | 9 (15.0) | 17 (13.9) | 26 (14.3) |
| Very high | 3 (5.0) | 11 (9.0) | 14 (7.7) |
| TOTAL | 60 (100.0) | 122 (100.0) | 182 (100.0) |

Table 5: Distribution of respondents by health impacting choices and gender.

| Adapting Healthy health impacting choices | GENDER | | TOTAL |
|---|------------|-----------------|------------|
| | MALE (N %) | FEMALE (N %) | |
| Not sure at all | 3 (5.0) | 9 (7.4) | 12 (6.6) |
| Slightly sure | 9 (15.0) | 26 (21.3) | 35 (19.2) |
| Moderately sure | 30 (50.0) | 66 (54.1) | 96 (52.7) |
| Very sure | 18 (30.0) | 21 (17.2) | 39 (21.4) |
| | | $\chi^2 = 4.37$ | P= 0.22 |
| Factors encouraging healthy health impacting | | | |
| To avoid getting sick | 16(26.7) | 45(36.9) | 61(33.5) |
| To look and feel good | 16(26.7) | 45(36.9) | 61(33.5) |
| Influence from family and friends | 14(23.3) | 14(11.5) | 28(15.4) |
| Advice from doctors or health experts | 14(23.3) | 18(14.8) | 32(17.6) |
| TOTAL | 60(100.0) | 122(100.0) | 182(100.0) |
| | | $\chi^2 = 7.86$ | P= 0.49 |

Table 6: Gender-wise distribution of respondents based with biggest challenge to healthy living.

| BIGGEST CHALLENGE IN LIVING A HEALTHY HEALTH IMPACTING | GENDER | | TOTAL |
|--|---------------|-----------------|-------------|
| | MALE (N %) | FEMALE (N %) | |
| Not knowing enough about healthy habits | 19 (31.7) | 45 (36.9) | 64 (35.2) |
| Not having enough time | 15 (25.0) | 36 (29.5) | 51 (28.0) |
| Difficulty finding healthy food options | 21 (35.0) | 33 (27.0) | 54 (29.7) |
| Influence from friends | 5 (8.3) | 8 (6.6) | 13 (7.1) |
| TOTAL | 60 (100.0) | 122 (100.0) | 182 (100.0) |
| | | $\chi^2 = 1.63$ | P= 0.65 |

DISCUSSION

This study assessed adolescents' understanding and behaviours related to the risk factors of diabetes and hypertension. Most participants (72.0%) consumed fast food occasionally, while 14.8% did so rarely. This suggests that fast food intake is prevalent among adolescents and it may contribute to unhealthy dietary habits associated with hypertension and diabetes. Majority of adolescents (64.3%) reported high or very high sleep quality, while 25.8% had moderate sleep and 9.9% reported poor sleep. Good sleep appears to be a protective factor against life style related risks like hypertension and diabetes, though poor sleep may still impact metabolic and emotional health. The data revealed that nearly half of the adolescents (48.9%) experienced moderate daily stress, while 22% rated their stress as high or very high. Around 29% reported low to very low stress levels. These findings indicate that a significant proportion of adolescents face moderate to high stress, which may influence their health impacting choices, mental well-being, and vulnerability to health risks such as hypertension and diabetes. This underscores the need to integrate stress management strategies into adolescent health education. Extended screen time may contribute to sedentary behaviour, reduced physical activity, and sleep disturbances factors that increase the risk of developing health impacting conditions such as hypertension and diabetes. These insights highlight the need to promote balanced screen habits as part of adolescent health education.

The findings show that the most common barrier to living a healthy health impacting among adolescents is a lack of knowledge about healthy habits (35.2%), followed by limited time (28.0%) and difficulty accessing healthy food (29.7%). Peer influence was the least cited factor (7.1%).

This highlights the need for better health education and increased access to healthy options, suggesting that equipping youth with practical knowledge and resources could significantly improve their health impacting choices.

Gender differences were noted in health impacting behaviors but not in awareness levels. For example, 86.8% of participants reported frequently eating home-cooked meals, with female students (86.1%) doing so slightly more than males (88.3%). Physical activity

levels were varied: only 17.6% reported engaging in exercise very often, while 22.0% rarely and 6.6% never exercised. This pattern is concerning, given the well-established role of physical activity in preventing non-communicable diseases.

In conclusion, adolescents, many hold misconceptions or lack complete knowledge about prevention and risk factors. Their health impacting habits also reflect a mix of healthy and unhealthy behaviours. Gender, parental education, and income appear to influence these behaviors. These findings underscore the need for targeted, accurate, and engaging health education initiatives aimed at adolescents to foster better understanding and healthier choices during this crucial stage of life.

The results presented in this study show that more than half of the respondents (52.7%) are moderately confident in their ability to make healthy health impacting choices, while 21.4% feel very sure. In contrast, 19.2% are only slightly confident, and 6.6% are not confident at all. This indicates that while a majority have a fair level of self-efficacy regarding health-related decisions, there is still a notable portion of adolescents who may lack confidence in adopting or maintaining healthy habits.

According to the data, 33.5% of respondents stated that avoiding illness and enhancing appearance and well-being were the primary reasons why adolescents should adopt healthy health impacting behaviour. Enhancing educational efforts on healthy health impacting behaviour could help in early prevention and promote healthier health impacting choices to reduce future health risks.

The study has some strength in terms of focusing on school going adolescents aged 14–19 and their health impacting behaviour related to diabetes and hypertension during a vital developmental stage where lifelong health behaviours begin to take shape, making the findings timely and impactful. Their opinions regarding their options to join health programs highlight an opportunity for designing youth-focused preventive interventions. In spite of several strengths, present study is also subjected to certain limitations as it was confined only to two non-communicable diseases (NCDs), Diabetes and Hypertension. Moreover, findings of the present study can't be extrapolated to general population as it was

limited to students in schools of one particular city in Himachal Pradesh. Detailed practices and impact of health interventions in selected schools couldn't be assessed due to limited time frame.

CONCLUSIONS

Study concluded that awareness and life impacting behaviour of adolescent students concerning diabetes and hypertension in studied population is far from satisfactory. A large proportion of adolescent students were lacking knowledge of risk factors such as imbalanced diet, physical inactivity, increased screen time, in adequate or disturbed sleep etc. Gender played a role in shaping awareness and health impacting choices. Female participants were more likely to report healthier habits, such as consuming home-cooked meals, and adolescents from families with higher education or income levels showed slightly better awareness. Majority of participants expressed interest in participating in health awareness programs, showing a strong willingness to learn if given the right opportunities. The study highlights the urgent need for structured, age-appropriate, and engaging health education for adolescents. Involvement of health professionals in health literacy programs in schools can play a vital role in improving adolescent health literacy and promoting long-term healthy behaviours to reduce the risk of hypertension and diabetes. There is a need of continuous evaluation of behavioral changes over time and to assess the efficacy of school-based health interventions, which may be subject matter of future research.

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