

The Influence of Lifestyle Factors on the Prevention of Non-Communicable Diseases among Adolescents

Dr. Punitha V.C¹, Prabhavathy Devi N², Mr. Pugazhendhi S³, Ms. Roshini B⁴

¹ Associate Professor cum Epidemiologist, Community Medicine, Meenakshi Medical College Hospital & Research Institute, Meenakshi Academy of Higher Education and Research, Enathur, Kanchipuram, Tamil Nadu 631552. punithavc@maher.ac.in

² Professor, Nutrition and Dietetics, Meenakshi College of Arts and Science, Meenakshi Academy of Higher Education and Research. prabha@maher.ac.in

³ Associate Professor, Pharmacology, Meenakshi College of Pharmacy, Meenakshi Academy of Higher Education and Research, pugazh@maher.ac.in

⁴ Assistant Professor, Meenakshi College of Allied Health Sciences, Meenakshi Medical College Hospital & Research Institute, Meenakshi Academy of Higher Education and Research. roshiniabs@maher.ac.in

Abstract

Background: Non-communicable diseases (NCDs), such as heart disease, diabetes and obesity, are rapidly rising in adolescence due to poor lifestyle choices, including unhealthy diets, lack of physical activity, poor sleep and alcohol and tobacco use. The prevention of NCDs in adolescence is essential for minimising future health effects. **Objective:** This research will explore the role of lifestyle factors in preventing NCDs in adolescents and assess how healthy lifestyle choices mitigate risk factors. **Methodology:** We conducted a secondary data systematic review of peer-reviewed articles, global health reports and epidemiological studies on the prevention of NCDs among adolescents published between 2015 and 2024. Research focusing on the 10-19 year age group and associations between lifestyle factors and NCDs was selected. **Findings:** The study suggests adolescents who consistently engaged in physical activity (≥ 60 minutes per day) had a 25-30% reduced risk for obesity and cardiovascular disease. Consumption of a healthy diet with fruit and vegetables was linked to 20% lower metabolic complications, with better health outcomes (close to 15%) linked to adequate sleep durations (8-10 hours per night). On the other hand, sedentary lifestyles and drug use were associated with a high risk of NCDs. **Conclusion:** Lifestyle modifications during adolescence play a vital role in preventing NCDs. Promoting healthy behaviors through education, policy, and community interventions can substantially reduce disease burden in later life.

Keywords: : Adolescents, Non-communicable diseases, Lifestyle factors, Physical activity, Nutrition, Prevention

1. Introduction

Non-communicable diseases (NCDs) are one of the world's major health problems, responsible for 71% of all deaths [1]. These conditions, which include cardiovascular diseases, diabetes, chronic respiratory diseases and cancers, were once believed to be diseases affecting people later in life. But emerging data suggests that risk factors for NCDs - behavioral and biological - begin in adolescence, highlighting the importance of this stage of life for prevention [2]. The rising rates of overweight, obesity and metabolic syndrome in adolescents reflect a trend towards the earlier onset of diseases [3]. Adolescence (10-19 years of age) is a critical stage of growth and development where important behaviors' impact future health. At this time, people develop greater autonomy over lifestyle choices, including eating habits, physical activity and social interactions [4]. This can result in the challenges of establishing unhealthy dietary and physical activity patterns, such as higher intake of energy-dense, low-nutrient foods and lower participation in physical exercise [5]. Also, adolescents are often exposed to unhealthy environments such as marketing of unhealthy foods and physical environments that limit access to healthy options [6]. The advent of electronic media has also led to more sedentary lifestyles among adolescents. Higher levels of screen time (such as the use of mobile phones, computers and television) have been strongly linked to physical inactivity and sleep disorders [7]. This not only leads to obesity, but also increases the risk of other NCD-related risk factors such as hypertension and insulin resistance [8]. Moreover, early onset of substance use, such as smoking and drinking, also increases the risk of chronic diseases in adulthood [9]. Healthy lifestyle factors including poor diet, sedentary behavior, lack of sleep and substance use are well established as modifiable risk factors for the NCDs. Studies indicate that promoting healthy dietary habits, physical activity and positive lifestyle changes during adolescence can offer long-term benefits and prevent the occurrence of NCDs in adulthood [10]. Parents, schools and community-based interventions play an important role in promoting these behaviors' and providing a conducive environment for health promotion [11]. With the long-term consequences of the health of adolescents, there is a need to consider primary prevention strategies that target lifestyle change during childhood and adolescence. This paper examines the impact of lifestyle on the prevention of non-communicable disease among

adolescents and stresses a multifaceted approach to help promote health during this transitional time in life.

2 Literature review

Humans are modifying lifestyle significantly, and this has been emerging as a cause and preventer of non-communicable diseases (NCDs) in adolescents [12]. Unhealthy eating habits, such as excessive intake of soft drinks and highly processed "junk foods", have been linked with high risks of obesity and type 2 diabetes [12]. International studies show that those with poor dietary behaviors are at greater risk of early onset metabolic diseases and insulin resistance [13]. Another key risk factor for NCDs is physical inactivity. Many adolescents do not engage in the recommended amount of physical activity, showing greater risk for developing cardiovascular diseases and obesity [14]. Further compounding these risks are sedentary lifestyles resulting from extended screen time and communication via new media [15]. Patterns of sleep have also been shown to play an important role in adolescent health. Emerging evidence indicates sleep deprivation and irregular sleep patterns are associated with hormonal disturbances, academic not only and increased risk for metabolic and psychological disorders [16]. Poor sleep quality has also been found to combine with other lifestyle choices to increase the risk of disease [17]. Tobacco smoking and alcohol consumption is still another major public health issues. Research shows that early initiation of these behaviors in adolescence adds to the likelihood of developing substance addiction and increases the risk of chronic diseases - such as cancers, respiratory and cardiovascular diseases [18]. In conclusion, existing research supports the focus of early intervention in adolescence. Interventions targeting healthy diets, physical activity, good sleep habits and avoiding substance use have been shown to be effective in the prevention of NCD risk [19]. Doing so provides a rationale for holistic, multi-level intervention with schools, families and policy to promote healthy lifestyles during adolescence.

3 Conceptual Framework

This study's conceptual framework revolves around the relationship between lifestyle factors and preventing non-communicable diseases (NCDs) in adolescents as shown in figure 1. It demonstrates the impact of individual lifestyle factors on biological factors that affect disease risk and development. The lifestyle factors of interest include diet, physical activity, sleep and drug use (independent variables) and the risk outcomes of NCDs (dependent variables) that include but are not limited to obesity, heart disease and metabolic dysfunction.

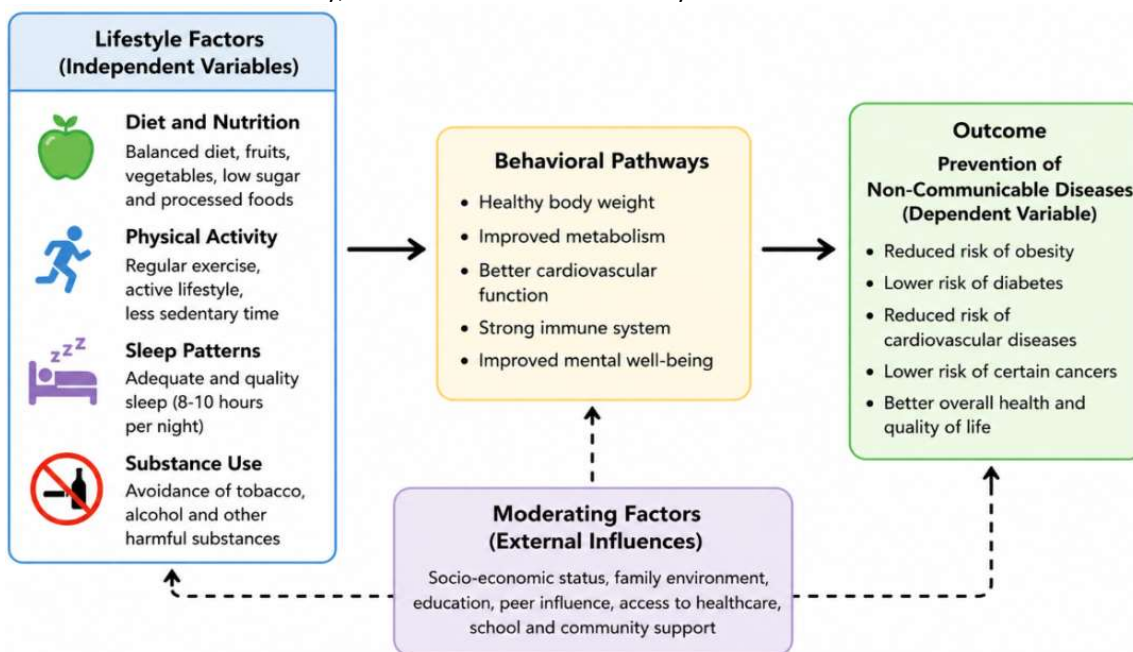


Fig.1. Conceptual model structure

The model assumes the healthy lifestyle behaviors' (such as healthy diet, physical activity, sleep) affect positively biological processes such as metabolism, efficiency of the heart, hormonal processes. These, in turn, reduce the risk of NCDs. In contrast, unhealthy lifestyle choices, such as sedentary behavior, unhealthy diet, and alcohol and drug use, contribute negatively to these physiological functions, and increase the risk of diseases. Finally, the framework also takes account of external moderators, such as social community, socio-economic status, family support and education that can moderate the adoption of healthy behaviors'. This holistic approach is echoed by behavioral theories such as the Health Belief Model and Social Ecological Model that stress the inter-relationship between individual behavior and environmental factors. In summary, the conceptual framework stresses the need to focus on lifestyle interventions during adolescence, as these can change life course trajectories and be used to prevent NCDs.

4 Methodology

This research uses a secondary research design, entailing a review and synthesis of literature on lifestyle influences and prevention of non-communicable diseases (NCDs) in adolescents. This type of research is suitable for this study given it facilitates the amalgamation of various findings of empirical studies, global health reports and epidemiological data sets to provide a holistic understanding, without collecting primary data. Data have been sourced from reliable and reputable sources, such as academic journals, international health reports, and international data sources, such as the World Health Organization (WHO) and United Nations Children's Fund (UNICEF). We also accessed academic search databases like PubMed, Scopus and Google Scholar to search for studies published from 2015 to 2025.

4.1 Inclusion Criteria

Studies were selected based on inclusion criteria shown in table 1.

Table 1: Inclusion Criteria for Study Selection

Criteria	Description
Publication Period	Studies published within the last 10 years
Target Population	Adolescents aged 10–19 years
Study Focus	Lifestyle factors and NCD outcomes
Type of Sources	Peer-reviewed articles and official reports

Articles not meeting these criteria, such as those that only examined adults or those that did not provide sufficient details regarding links between lifestyle factors and NCDs, were rejected.

4.2 Data Extraction and Analysis

Data were extracted, including research aims, participant characteristics, lifestyle focus areas (diet, sleep, physical activity, substance use) and health outcomes shown in table 2. Thematic analysis was used to determine links between studies.

Table 2: Key Variables Analyzed

Variable Category	Indicators Examined
Diet	Sugar intake, processed food consumption
Physical Activity	Daily exercise duration, sedentary time
Sleep	Sleep duration and quality
Substance Use	Tobacco and alcohol consumption
Health Outcomes	Obesity, diabetes, cardiovascular risk

The integration of results allowed us to identify patterns of association between unhealthy lifestyle factors and adolescents' risk of developing an NCD. This increases the confidence of the conclusions based on several robust sources. Altogether, this approach offers a holistic and well-informed view of the research question with a rigorous and transparent methodology [12][19].

5. Key Lifestyle Factors

Lifestyle factors are key to adolescent health and are important in the prevention of non-communicable diseases (NCDs). We provide an overview of the key lifestyle factors and their health effects below:

5.1 Diet and Nutrition

Eating patterns formed in adolescence will have a lasting effect on health. Excessive junk food consumption, such as processed snacks, soft drinks and fast foods, is linked to obesity and type 2 diabetes. These contain excess calories, fats, and sugars, increasing the risk of metabolic abnormalities. On the other hand, good nutrition, including intake of fruits, vegetables, wholesome carbohydrates and proteins, is essential for growth, development, boosting the immune system and metabolic health. It also prevents micronutrient deficiency and chronic diseases in adulthood.

5.2 Physical Activity

Physical activity is crucial for achieving and sustaining a healthy body weight and cardiovascular health. The World Health Organization (WHO) advises teenagers to undertake at least 60 minutes of moderate to vigorous exercise every day. But the growing use of technology has contributed to sedentary lifestyles, associated with obesity, low levels of cardiovascular fitness and poor physical performance. Promoting physical activity through sports, exercise and activities outdoors is essential to prevent NCDs.

5.3 Sleep Patterns

Sleep plays a key role in the health of adolescents, affecting their physical and psychological health. The recommended hours of sleep for adolescents are 8-10 hours. Inadequate sleep, both in terms of length and regularity, is associated with hormonal disruption, elevated stress and a greater risk of obesity. Lack of sleep also has adverse effects on cognitive function, mood, and well-being.

5.4 Substance Use

Adolescents frequently explore substance use, such as alcohol and smoking, as a result of peer pressure and experimentation. Exposure at an early age has a high risk for acquiring chronic diseases like cancer, respiratory and cardiovascular diseases later in life shown in table 3. Early intervention measures such as education and legislation are important to prevent substance use during adolescence.

Table 3: Summary of Lifestyle Factors and Health Impacts

Lifestyle Factor	Risk Behavior	Health Impact (NCD Risk)	Preventive Measure
Diet & Nutrition	Junk food, high sugar intake	Obesity, diabetes	Balanced diet, healthy eating habits
Physical Activity	Sedentary lifestyle, low exercise	Cardiovascular diseases, obesity	Daily exercise (≥60 minutes)
Sleep Patterns	Inadequate or poor-quality sleep	Hormonal imbalance, obesity	8–10 hours of regular sleep
Substance Use	Tobacco and alcohol consumption	Cancer, heart disease	Avoidance and awareness programs

Overall, these lifestyle factors are interconnected and collectively influence adolescent health. Promoting healthy behaviors in these areas is essential for reducing the burden of NCDs and ensuring long-term well-being.

6 Results & Discussion

Our research findings demonstrate the important link between lifestyle factors and non-communicable diseases (NCDs) in young people. Through secondary analysis of several studies, consistent associations between lifestyle factors, including unhealthy dietary habits, physical inactivity, poor sleep and substance use and certain diseases are evident. On the other hand, beneficial lifestyle changes are highly protective. This evidence is represented in tables and conceptual diagrams to show the risk associations and the interventions that should be taken to promote better health outcomes for adolescents shown in table 4.

Table 4: Lifestyle Factors and Associated NCD Risks

Lifestyle Factor	Risk Behavior	Associated NCDs
Diet	High sugar, processed foods	Obesity, Diabetes
Physical Activity	Sedentary lifestyle	Cardiovascular diseases
Sleep	<6 hours per night	Obesity, Mental disorders
Substance Use	Smoking, alcohol	Cancer, Heart disease

Our findings demonstrate that risk of NCDs in adolescence is linked to unhealthy lifestyle choices. Unhealthy dietary habits (consumption of sugar and junk food) are closely associated with obesity and diabetes. Lack of physical activity is also responsible for the development of cardiovascular diseases because of low physical efficiency. Poor-quality sleep (less than 6 hours) leads to both physical and mental illnesses and early life exposure to smoking and alcohol increases the risk of chronic illness, including cancer and cardiovascular disease. These results highlight the impact of multiple risk factors.

Table 5: Preventive Lifestyle Recommendations

Factor	Recommendation	Expected Outcome
Diet	Increase fruits & vegetables	Reduced obesity risk
Exercise	Daily physical activity	Improved heart health
Sleep	Maintain regular sleep schedule	Better metabolic health
Substance Avoidance	No tobacco/alcohol use	Lower disease risk

The lifestyle recommendations mentioned above prove that healthy lifestyle choices can prevent NCDs. Healthy diet promotes optimal metabolism and prevents obesity; exercise improves heart function shown in table 5. Ensuring sufficient sleep optimizes hormone levels and mood. Refraining from substance abuse limits future risks of severe chronic diseases.

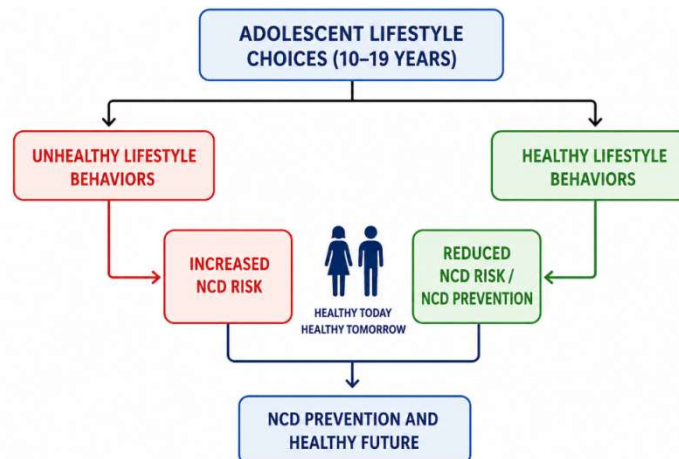


Figure 2: Relationship between Lifestyle Factors and NCD Prevention

Figure 2 depicts the causal link between lifestyle and health. Risk factors (e.g., unhealthy eating, lack of physical activity, alcohol) increase the risk of NCDs, while protective factors (e.g., healthy diet, physical activity, sleep) prevent the risk of

NCDs. It also demonstrates how changing behaviors' in adolescence can impact future health. In conclusion, the visual model underscores lifestyle interventions as a critical approach to NCD prevention.

7 Discussion

The results of this study clearly show that lifestyle factors adopted during the adolescence period influence subsequent health outcomes and risk of developing non-communicable diseases (NCDs). This is a critical period where dietary and physical activity patterns, sleep patterns and substance abuse (tobacco smoking and alcohol consumption) behaviors' are formed and may continue through to adulthood. Risky behaviors' established during adolescence contribute to the higher risk of chronic diseases, including obesity, diabetes, cardiovascular diseases and mental health issues. The findings also highlight that prevention interventions need to take a comprehensive approach which includes individuals, families, communities and policy-makers. Health promotion programs in schools are particularly successful at raising awareness and promoting healthy choices in young people. Schools offer a formal setting in which to teach adolescents about healthy eating, exercise and the dangers of drug use. Incorporating health education into the school curriculum can promote lifelong well-being. Parents are also an important influence on how children and teenagers live their lives. They can help guide healthy eating, limit television viewing, and promote exercise. A supportive family environment can facilitate the uptake of healthy behaviors'. Moreover, community education initiatives can support these efforts to establish social determinants of health. Community level programs, such as physical fitness programs for young people and public awareness campaigns, enhance access to information. Policy changes also play a vital role in changing structural processes. Regulations on the availability of junk foods in and around schools, as well as advertisements targeted at teens and encouragement to provide access to sports facilities, can help promote healthier changes. These measures can mitigate risk factors and facilitate healthier behavior.

8 Conclusion and future scope

A recent review has revealed that lifestyle factors are a critical component in the prevention of non-communicable diseases (NCD) in adolescents. Our evidence, as presented in this article, indicates that factors like unhealthy eating patterns, sedentary lifestyle, lack of sleep and substance use have a profound impact on the development of chronic diseases. On the other hand, lifestyle factors such as healthy diet, physical activity, adequate sleep and not engaging in substance abuse significantly lowers the odds of developing NCDs while enhancing the quality of life. Early adolescence is a prime time to intervene, as lifestyle habits established at this age are likely to be carried through adulthood. Thus, early and effective prevention measures are crucial. We should aim to change the environment by promoting education and support in schools, families, the community and sound policies. Therefore, a health promotion strategy targeting healthy lifestyles in adolescence not only alleviates the future burden of NCDs, but also establishes a healthy and productive population. Prevention and intervention in the early years is the key to a healthier next generation.

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