



LIFESTYLE BEHAVIOURS AND RISK OF EARLY-ONSET NON-COMMUNICABLE DISEASES AMONG YOUNG ADULTS: A SYSTEMATIC REVIEW

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ABSTRACT

Background: Non-communicable diseases (NCDs) are the leading cause of global morbidity and mortality, with an increasing trend of early onset among young adults. This shift is largely driven by modifiable lifestyle behaviours such as obesity, physical inactivity, unhealthy dietary habits, inadequate sleep, and substance use. The growing prevalence of these risk factors, particularly in developing countries like India, poses a significant public health challenge.

Objective: This narrative review aims to examine the association between lifestyle behaviours and the risk of early-onset NCDs among young adults, and to identify key determinants and preventive strategies aligned with global priorities.

Methodology: A narrative review was conducted using literature from PubMed, Google Scholar, Scopus, and Web of Science, along with reports from national and international organizations such as the World Health Organization. Studies published between 2010 and 2025 were included. Relevant articles were screened based on predefined inclusion and exclusion criteria, and findings were synthesized into thematic domains including obesity, physical inactivity, dietary patterns, sleep behaviour, and substance use.

Results: The review found that overweight and obesity affect approximately 20–30% of young adults in India, while 30%–40% exhibit physical inactivity. Unhealthy dietary patterns were observed in more than 50% of individuals, with low consumption of fruits and vegetables. Inadequate sleep (<7 hours) was reported in 30%–40% of young adults, contributing to metabolic disturbances. Substance use, including tobacco (20%–25%) and alcohol (15%–20%), further increased NCD risk. These factors were associated with a 1.5 to 3 times higher risk of developing early-onset diabetes, hypertension, and cardiovascular diseases, particularly when multiple risk factors coexisted.

Conclusion: Lifestyle behaviours play a crucial role in the development of early-onset NCDs among young adults. The clustering of modifiable risk factors significantly increases disease burden, highlighting the need for early preventive interventions. Strengthening health promotion strategies, behavioural change communication, and policy-level interventions is essential to reduce the long-term impact of NCDs.

Keywords: Non-Communicable Diseases, Young Adults, Lifestyle Behaviours, Obesity, Physical Inactivity, Diet, Sleep, Substance Use, Public Health.

INTRODUCTION

Non-communicable diseases (NCDs) have emerged as the leading cause of morbidity and mortality worldwide, accounting for nearly 74% of all global deaths, with a substantial proportion occurring prematurely before the age of 70 years [1]. Traditionally considered diseases of older adults, NCDs such as cardiovascular diseases, diabetes, hypertension, and certain cancers are increasingly being reported among younger populations.

This shift toward early-onset NCDs is closely linked to modifiable lifestyle behaviours, making it a critical area of concern from a public health perspective. The World Health Organization has emphasized the prevention and control of NCDs through addressing behavioural risk factors as a key global priority.

Young adulthood represents a crucial period during which lifestyle habits are established and consolidated. Behaviours such as unhealthy diet, physical inactivity, inadequate sleep, and substance use have been identified as major contributors to the development of NCD risk factors at an early age. Globally, it is estimated that over 1.9 billion adults are overweight or obese, with a growing proportion belonging to younger age groups [2]. Physical inactivity is another major concern, with nearly 27% of adults worldwide not meeting recommended



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physical activity levels, thereby increasing the risk of metabolic disorders [3].

In the Indian context, the burden of NCD risk factors among young adults is rising rapidly due to urbanization, sedentary lifestyles, and dietary transitions. Recent surveys indicate that the prevalence of overweight and obesity among young adults ranges between 20% and 30%, while physical inactivity is reported in approximately 30%–40% of individuals [4]. Dietary patterns characterized by high consumption of processed foods, sugar-sweetened beverages, and low intake of fruits and vegetables further exacerbate the risk. Additionally, irregular sleep patterns and increasing screen time have been linked to metabolic disturbances, including insulin resistance and obesity.

Substance use, including tobacco and alcohol consumption, is another significant behavioural risk factor contributing to early-onset NCDs. Studies have shown that 20%–25% of young adults engage in tobacco use, while alcohol consumption is also prevalent, particularly in urban settings [5]. These behaviours not only increase the risk of cardiovascular and respiratory diseases but also act synergistically with other lifestyle factors to accelerate disease progression.

The interaction of these lifestyle behaviours leads to the early development of risk factors such as obesity, hypertension, dyslipidemia, and impaired glucose tolerance, which eventually progress to overt NCDs. Evidence suggests that individuals exposed to multiple risk factors have a significantly higher likelihood of developing chronic diseases at a younger age. Early identification and modification of these behaviours are therefore essential to reduce the long-term burden of NCDs.

From a public health perspective, addressing lifestyle-related risk factors among young adults is crucial for achieving national and global health targets. The World Health Organization Global Action Plan for the Prevention and Control of NCDs highlights the importance of promoting healthy behaviours, including physical activity, balanced diet, and avoidance of harmful substances, as key strategies for reducing premature mortality [6].

Therefore, this narrative review aims to explore the association between lifestyle behaviours and the risk of early-onset NCDs among young adults, with a focus on obesity, physical inactivity, diet, sleep, and substance use, to provide insights for preventive strategies and policy interventions.

This narrative review aims to comprehensively examine the association between lifestyle behaviours and the risk of early-onset non-communicable diseases (NCDs) among young adults, with a focus on key modifiable factors such as obesity, physical inactivity, unhealthy diet, sleep patterns, and substance use. The objectives are to assess the prevalence and patterns of these lifestyle behaviours among young adults; to analyze their

role in the early development of NCD risk factors such as hypertension, diabetes, and cardiovascular diseases; to evaluate the interaction between multiple behavioural risk factors and their cumulative impact on health outcomes; and to explore preventive strategies aligned with global priorities set by the World Health Organization for NCD control. Additionally, the review aims to identify gaps in awareness, behavioural practices, and health promotion efforts that contribute to increasing NCD risk in this population.

The justification for this study lies in the rising burden of early-onset NCDs, which poses a significant challenge to public health systems, particularly in low- and middle-income countries like India. Increasing urbanization, sedentary lifestyles, and changing dietary patterns have led to a growing prevalence of modifiable risk factors among young adults, making early intervention crucial. Since lifestyle behaviours are largely preventable and modifiable, understanding their impact is essential for designing effective health promotion strategies, policy interventions, and community-based programs. From a Community Medicine perspective, this review provides evidence-based insights to support early risk identification, promote healthy lifestyle practices, and contribute to reducing the long-term burden of NCDs.

METHODOLOGY

This narrative review was conducted to synthesize available evidence on the relationship between lifestyle behaviours and the risk of early-onset non-communicable diseases (NCDs) among young adults. A comprehensive literature search was performed using electronic databases including PubMed, Google Scholar, Scopus, and Web of Science to identify relevant studies published between 2010 and 2025. In addition, reports and guidelines from international and national agencies such as the World Health Organization, Government of India publications, and global NCD frameworks were reviewed to ensure policy relevance and contextual understanding. Keywords used in the search strategy included combinations of “lifestyle behaviours,” “young adults,” “non-communicable diseases,” “obesity,” “physical inactivity,” “diet,” “sleep,” “tobacco,” and “alcohol,” applied using Boolean operators (AND, OR) to refine the search.

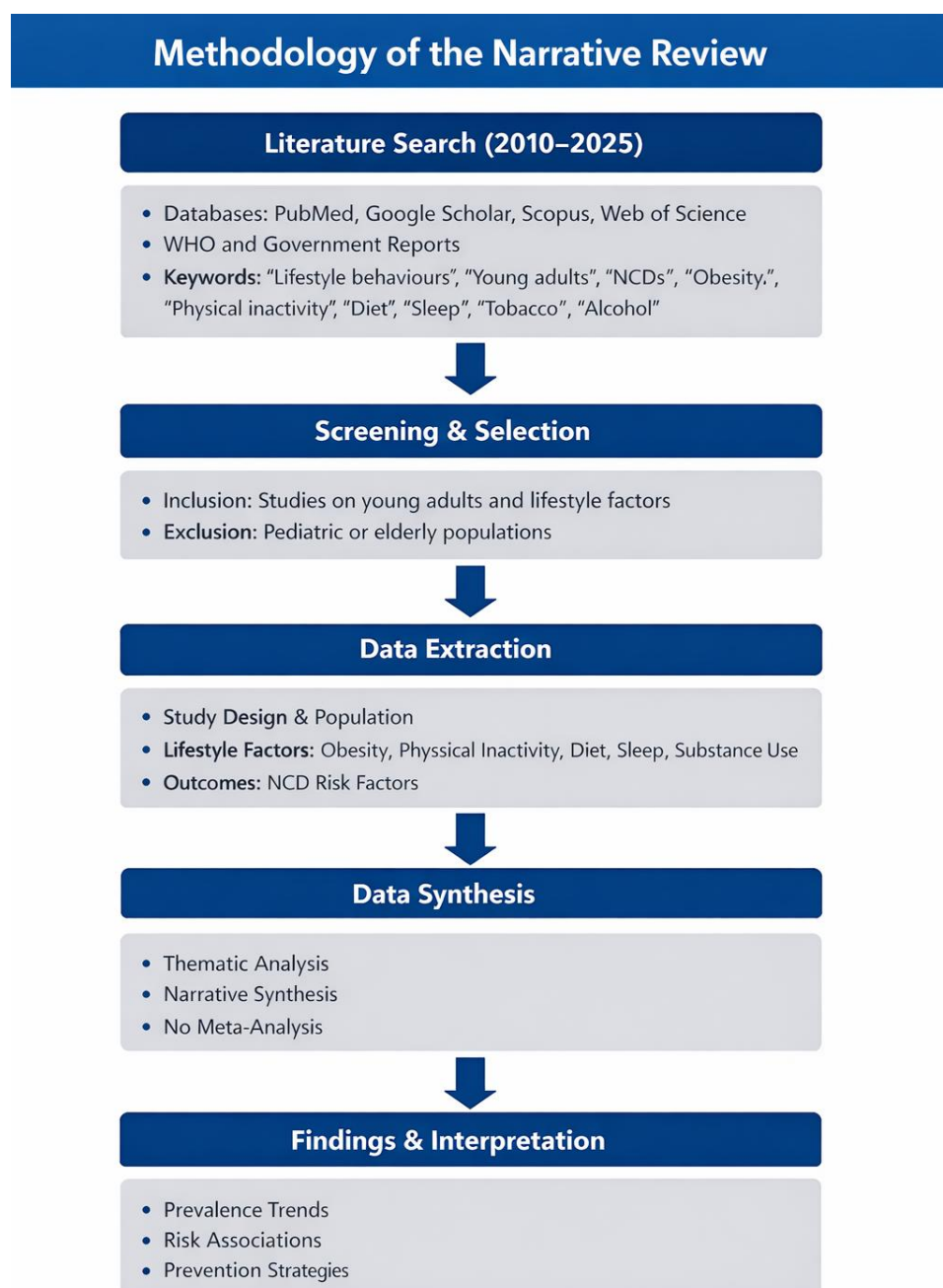
Studies were included if they focused on young adults (typically aged 18–35 years) and examined associations between lifestyle behaviours and NCD risk factors such as obesity, hypertension, diabetes, dyslipidemia, or cardiovascular diseases. Both quantitative and qualitative studies, including cross-sectional studies, cohort studies, systematic reviews, and relevant reports, were considered to provide a comprehensive perspective. Studies that focused exclusively on older populations, pediatric groups,

or clinical treatment outcomes without behavioural context were excluded. Only studies published in English and with adequate methodological clarity were included. Titles and abstracts were initially screened, followed by full-text review of eligible articles.

Data extraction was carried out using a structured format, capturing details such as author, year, study design, population characteristics, type of lifestyle behaviour assessed, prevalence of risk factors, and key findings. Extracted data were organized into thematic domains including obesity and metabolic risk, physical inactivity, dietary patterns, sleep behaviour, substance use, and their combined effects on early NCD development.

A narrative synthesis approach was adopted to integrate findings across studies, focusing on identifying patterns, associations, and variations in lifestyle behaviours and their impact on NCD risk. No statistical pooling or meta-analysis was performed, as the objective of the review was descriptive and interpretative. Quality appraisal of included studies was conducted informally based on study design, sample size, relevance, and methodological rigor.

The findings are presented thematically to facilitate understanding of the multifactorial relationship between lifestyle behaviours and early-onset NCDs and to provide insights for preventive strategies, public health interventions, and policy development.



Theme 1: Obesity and Early Metabolic Risk among Young Adults

Obesity is a major risk factor for early-onset non-communicable diseases and is increasingly prevalent among young adults. Globally, more than 1.9 billion adults are overweight, of which over 650 million are obese, with a rising trend in younger populations [8]. In India, studies report that 20%–30% of young adults are overweight or obese, particularly in urban areas. Obesity is strongly associated with early development of metabolic abnormalities such as insulin resistance, dyslipidemia, and hypertension. Evidence suggests that obese individuals have a 2 to 3 times higher risk of developing type 2 diabetes and cardiovascular diseases at a younger age, highlighting the urgent need for early preventive interventions.

Theme 2: Physical Inactivity and Sedentary Behaviour

Physical inactivity is a significant contributor to the increasing burden of NCDs among young adults. According to global estimates, approximately 27% of adults do not meet recommended physical activity levels, while in India, inactivity levels range from 30% to 40% among young populations [9]. Sedentary behaviours such as prolonged screen time and desk-based activities further exacerbate the risk. Studies have shown that individuals with low physical activity levels have a 20%–30% higher risk of cardiovascular diseases and all-cause mortality. Regular physical activity, on the other hand, has been shown to reduce the risk of NCDs by improving metabolic health and cardiovascular fitness.

Theme 3: Unhealthy Dietary Patterns and Nutritional Risk

Dietary transitions characterized by increased consumption of processed foods, high sugar intake, and low consumption of fruits and vegetables are key contributors to NCD risk. Studies indicate that more than 50% of young adults consume diets high in saturated fats, salt, and sugar, while less than 30%

meet the recommended intake of fruits and vegetables [10]. Such dietary patterns are associated with obesity, hypertension, and metabolic syndrome. High intake of sugar-sweetened beverages and fast foods has been linked to a 1.5 to 2 times increased risk of obesity and type 2 diabetes, emphasizing the role of diet in early disease development.

Theme 4: Sleep Patterns and Metabolic Health

Inadequate and poor-quality sleep is increasingly recognized as an important risk factor for NCDs. Studies have shown that 30%–40% of young adults experience insufficient sleep (<7 hours per night), often due to academic stress, work schedules, and excessive screen time [11]. Sleep deprivation has been associated with hormonal imbalances, increased appetite, and reduced insulin sensitivity, contributing to obesity and metabolic disorders. Evidence suggests that individuals with chronic sleep deprivation have a 20%–40% higher risk of developing obesity, hypertension, and diabetes, highlighting the importance of sleep as a modifiable risk factor.

Theme 5: Substance Use and Risk of Early-Onset NCDs

Substance use, including tobacco and alcohol consumption, significantly contributes to the burden of NCDs among young adults. In India, 20%–25% of young adults use tobacco, while alcohol consumption is reported in approximately 15%–20% of individuals, particularly in urban settings [12]. Tobacco use is strongly associated with cardiovascular diseases, respiratory disorders, and cancers, while alcohol consumption contributes to liver disease, hypertension, and metabolic disturbances. Studies indicate that individuals engaging in substance use have a 1.5 to 2 times higher risk of developing NCDs compared to non-users. Moreover, the combined effect of substance use with other lifestyle risk factors further accelerates disease progression [13,14].

RESULT

Table 1: Summary of Lifestyle Behaviours and Risk of Early-Onset NCDs among Young Adults

Lifestyle Factor	Prevalence (%) / Data	Associated Risk
Overweight/Obesity	20–30% (India); >1.9 billion globally	2–3 times higher risk of diabetes and CVD
Physical Inactivity	30–40% (India); ~27% globally	20–30% increased risk of CVD and mortality
Unhealthy Diet	>50% high-fat/sugar intake; <30% adequate fruits/vegetables	1.5–2 times higher risk of obesity and diabetes
Inadequate Sleep	30–40% (<7 hours/day)	20–40% higher risk of obesity, hypertension, diabetes
Tobacco Use	20–25% (young adults)	1.5–2 times higher risk of NCDs
Alcohol Consumption	15–20%	Increased risk of liver disease, hypertension, metabolic disorders
Multiple Risk Factors	Common clustering	Synergistic increase in early NCD development

The results of this narrative review indicate that lifestyle-related risk factors are highly prevalent among young adults and significantly contribute to the development of early-onset non-communicable diseases. Overweight and obesity affect approximately 20–30% of young adults in India, increasing the risk of diabetes and cardiovascular diseases by 2–3 times. Physical inactivity is reported in 30–40% of individuals, further elevating the risk of cardiovascular morbidity. Unhealthy dietary patterns, characterized by high consumption of processed and sugary foods, are observed in more than half of the population and are strongly associated with obesity and metabolic disorders. Additionally, 30–40% of young adults experience inadequate sleep, which contributes to hormonal imbalance and increased risk of hypertension and diabetes. Substance use, including tobacco (20–25%) and alcohol (15–20%), further exacerbates the risk of early NCD development. Importantly, the clustering of multiple lifestyle risk factors results in a synergistic increase in disease risk, highlighting the need for comprehensive lifestyle modification strategies aligned with priorities set by the World Health Organization.

DISCUSSION

The present narrative review highlights that modifiable lifestyle behaviours play a central role in the rising burden of early-onset non-communicable diseases (NCDs) among young adults. The prevalence of overweight and obesity observed in this review (20–30% in Indian young adults) is consistent with global estimates, where obesity has nearly tripled over the past decades. Evidence indicates that individuals with obesity have a 2–3 times higher risk of developing type 2 diabetes and cardiovascular diseases, even at a younger age, due to early metabolic dysregulation and insulin resistance [15]. These findings emphasize that obesity is not merely a cosmetic issue but a major metabolic risk factor requiring early intervention.

Physical inactivity further contributes significantly to early NCD risk. Studies have demonstrated that approximately 27% of adults globally and up to 40% in developing countries do not meet recommended physical activity levels, which is strongly associated with increased cardiovascular morbidity and mortality [16]. Sedentary lifestyles, particularly among students and young professionals, have been linked to reduced energy expenditure and increased adiposity. Comparative data suggest that physically inactive individuals have a 20%–30% higher risk of cardiovascular diseases, highlighting the importance of promoting regular physical activity as a preventive strategy.

Dietary patterns among young adults have undergone a significant transition, with increased consumption of processed foods and reduced intake of fruits and vegetables. Evidence shows that diets

high in saturated fats, sugar, and salt are associated with a 1.5 to 2 times higher risk of obesity and metabolic syndrome, contributing to early onset of NCDs [17]. These findings are particularly relevant in the Indian context, where urbanization and changing lifestyles have led to widespread adoption of unhealthy dietary habits. The coexistence of poor diet and physical inactivity further amplifies disease risk.

Sleep behaviour has also emerged as an important determinant of metabolic health. Studies have reported that 30%–40% of young adults experience inadequate sleep, which is associated with hormonal imbalance, increased appetite, and reduced insulin sensitivity [18]. Chronic sleep deprivation has been linked to a 20%–40% increased risk of obesity, hypertension, and diabetes, indicating that sleep should be considered alongside traditional lifestyle risk factors. Despite its significance, sleep is often overlooked in public health interventions.

Substance use, including tobacco and alcohol consumption, remains a major contributor to early NCD development. Evidence indicates that 20%–25% of young adults use tobacco, while alcohol consumption is reported in 15%–20%, both of which significantly increase the risk of cardiovascular diseases, cancers, and metabolic disorders [19]. The combined effect of substance use with other lifestyle factors such as poor diet and physical inactivity results in a synergistic increase in disease risk, accelerating the progression of NCDs at a younger age.

Importantly, the clustering of multiple lifestyle risk factors is common among young adults and has a multiplicative effect on health outcomes. Studies have shown that individuals exposed to two or more risk factors have a significantly higher likelihood of developing NCDs compared to those with a single risk factor, emphasizing the need for integrated prevention strategies [20]. From a public health perspective, interventions targeting multiple behavioural factors simultaneously are likely to be more effective in reducing the burden of early-onset NCDs.

Overall, the discussion indicates that early-onset NCDs among young adults are driven by a complex interplay of lifestyle behaviours. Addressing these modifiable risk factors through health promotion, policy interventions, and community-based programs aligned with the World Health Organization priorities is essential to reduce the long-term burden of chronic diseases and improve population health outcomes.

CONCLUSION

This narrative review highlights that lifestyle behaviours such as obesity, physical inactivity, unhealthy dietary patterns, inadequate sleep, and substance use are major contributors to the rising burden of early-onset non-communicable diseases

among young adults. The increasing prevalence of these modifiable risk factors, particularly in rapidly urbanizing settings, has led to early development of metabolic abnormalities including obesity, hypertension, diabetes, and cardiovascular diseases. The clustering of multiple lifestyle risk behaviours further amplifies disease risk and accelerates progression at a younger age. From a public health perspective, these findings underscore the urgent need for early identification and modification of behavioural risk factors. Strengthening health promotion strategies aligned with priorities set by the World Health Organization is essential to reduce premature morbidity and mortality due to NCDs and to ensure a healthier future population.

Limitations of the Study

This study, being a narrative review, is subject to certain limitations. The absence of a systematic search strategy may introduce selection bias and limit the comprehensiveness of included studies. Additionally, no meta-analysis was performed, which restricts the ability to provide pooled quantitative estimates of risk. The included studies demonstrate variability in design, population characteristics, and measurement of lifestyle factors, thereby limiting direct comparability across findings. Most of the evidence is derived from cross-sectional studies, which precludes establishing causal relationships between lifestyle behaviours and NCD outcomes. Furthermore, there is limited availability of region-specific data, particularly from rural and underserved populations, which may affect the generalizability of the findings

Recommendations

Addressing the rising burden of early-onset NCDs requires a comprehensive and multi-sectoral approach focusing on lifestyle modification. There is a need to implement targeted health education programs that promote healthy dietary practices, regular physical activity, adequate sleep, and avoidance of substance use among young adults. Educational institutions and workplaces should play a proactive role in fostering healthy environments through structured wellness programs. Public health policies should prioritize early screening for NCD risk factors and integrate behavioural interventions into primary healthcare services. Strengthening community-based initiatives and leveraging digital platforms for health promotion can further enhance outreach and awareness. Additionally, longitudinal and interventional studies are recommended to better understand causal relationships and to evaluate the effectiveness of lifestyle interventions in preventing early-onset NCDs.

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