

# How lifestyle factors can contribute to cardiovascular disease incidence; a review study

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**Received:** 7 Sep. 2023

**Accepted:** 14 Nov. 2023

**ePublished:** 4 Dec. 2023

**Keywords:** Lifestyle, Cardiovascular diseases, Sedentary behavior, Diet, Stress, Alcohol drinking, Obesity, Smoking

## Abstract

Cardiovascular diseases (CVDs) are a group of diseases that include cardiac and blood vessels. Lifestyle factors for cardiovascular diseases refer to the behaviors and habits that can enhance or reduce the risk of developing heart disease. In this review study, we did a comprehensive search in the online database, including PubMed, Web of Science, Scopus, and motor search engines such as Google Scholar. We investigated the studies that assessed lifestyle factors for CVD incidence. Results showed that physical inactivity, unhealthy diet, alcohol consumption, smoking, obesity, and stress are the most common lifestyle factors related to the incidence of CVDs.

## Introduction

Research has demonstrated that cardiovascular disease (CVD) is a leading global cause of death. Modifiable risk factors, such as physical activity, smoking, diet, alcohol consumption, and body weight, have been identified as significant contributors to the incidence and mortality of CVD. Many studies have investigated the association between these lifestyle factors and the risk of CVD (1-3). A healthy lifestyle is linked to a decreased risk of CVD, cerebrovascular disease (CVA), and heart disease (1). Despite the abundance of evidence linking lifestyle factors to CVD risk, most coronary patients have unhealthy habits, such as smoking, poor diet, and a sedentary lifestyle (4). The study of lifestyle medicine examines how lifestyle factors affect the risk of CVD (5).

## Objectives

This review study aimed to evaluate how lifestyle factors can contribute to CVD incidence

## Cardiovascular diseases and why are they a major health concern

Cardiovascular diseases refer to a group of conditions that impact the heart and blood

## Key point

This review study found that sedentary behavior, unhealthy diet, alcohol consumption, smoking, obesity, and stress are the most common lifestyle factors related to the incidence of CVDs.

vessels. They are the primary cause of illness and death in developed nations, and their prevalence is increasing worldwide (5-7). The underlying cause is a buildup of plaque in the arteries, leading to heart disease (5,6,8). The etiological risk factors leading to the onset of CVDs are well recognized and include hyperlipidemia, hypertension, diabetes, obesity, smoking, and lack of physical activity (5). The risk factors for developing CVDs are well-known and include high cholesterol, high blood pressure, diabetes mellitus, overweight, cigarette, and lack of exercise (5,6). Cardiac disease landed a significant economic burden on society, primarily due to the rising costs of healthcare (5). Although CVDs have a high fatality rate, identifying and managing risk factors can prevent onset (5,9).

## Definition of lifestyle factors for CVDs

Lifestyle factors for CVDs refer to the

**Citation:** Jafari N, Alivand S, Molaee H, Shahabi Rabori V, Asadian A, Abbasian S, Faramarzzadeh R. How lifestyle factors can contribute to cardiovascular disease incidence; a review study. *J Prev Epidemiol.* 2024;x(x):e35232. doi: 10.34172/jpe.2023.35232.



behaviors and habits that can enhance or reduce the risk of developing heart disease. There are two types of risk factors that contribute to heart disease: modifiable and non-modifiable. Modifiable risk factors can be controlled or changed, and they include physical inactivity, an unhealthy diet, smoking, high blood pressure, high cholesterol, obesity, prediabetes or diabetes, and stress. Non-modifiable risk factors, on the other hand, cannot be changed and include age, gender, and family history of heart disease. To reduce risk of developing heart disease, individuals can take steps to modify their lifestyle factors by increase physical activity, maintain a heart-healthy diet, and quit smoking, managing stress, and maintaining a healthy weight (5).

### Lifestyle and its correlation with CVDs

Based on the published articles in the databases, it has been found that lifestyle has a significant effect on cardiovascular incidence. Among adults with type 2 diabetes, adhering to a healthy lifestyle substantially lowers the risk of CVD incidence and death (2). Sedentary characteristics increase CVD risk in healthy-weight adults as much as in overweight adults (3). Lifestyle risk behaviors, such as smoking, physical inactivity, and unhealthy diet, tend to occur together and can significantly impact health on a global scale (10). Structured lifestyle interventions can decrease the risk of developing diabetes and CVD in individuals with impaired glucose (11). A lifestyle intervention could reduce CVD risk, especially in high-risk populations (12). A healthy lifestyle is correlated with a reduced risk of disease, including 60% for stroke and 69% for heart disease (1).

### Common lifestyle factors for CVD

CVD is a leading reason of death worldwide, and lifestyle factors significantly contribute to its development. According to articles on the online databases, the most common lifestyle factors that contribute to CVD are:

- *Physical inactivity*: A lifestyle with little physical activity, known as a sedentary lifestyle, has been associated with a higher likelihood of developing CVD (13). Engaging in regular physical activity can reduce the chances of developing CVD and mortality. This means that regular physical activity can prevent CVD development and reduce the risk of death. Engaging in physical activity is also important in helping to prevent the development of other conditions that are risk factors for CVD, such as diabetes and hypertension. The benefits of physical activity include improving brain health, managing weight, strengthening bones and muscles, and improving overall well-being (5,13).
- *Unhealthy diet*: A highly saturated diet with trans fats, salt, and sugar increases the risk of CVD (1,5). A diet rich in fruits, vegetables, whole grains, and

lean protein reduces the risk of CVD (5).

- *Smoking*: Smoking is a significant risk factor for CVD (1,13), Smoking quit can significantly reduce the risk of CVD (5).
- *Alcohol consumption*: Excessive consumption of alcohol has been linked to a higher likelihood of developing CVD (5,13). Moderate alcohol intake, however, may reduce the risk of CVD and death (13).
- *Obesity and overweight*: Maintaining a healthy weight reduce the risk of CVD and being overweight or obese increases the risk (5,13).
- *Stress*: The presence of chronic stress can increase the likelihood of developing CVD. Managing stress through relaxation techniques, exercise, and social support can reduce the risk of CVD (5).

Adherence of a healthy lifestyle can significantly decrease the burden of CVD and lower mortality risk in middle-aged and elderly women (13). A healthy lifestyle involves regular exercise, a nutritious diet, no smoking, and moderate alcohol consumption maintaining a healthy weight, and managing stress (5,13).

### Physical inactivity

Being physically inactive is a significant risk factor for CVD (14-18). Epidemiological investigations show that physical inactivity is associated with approximately half the incidence of CAD in sedentary persons compared to active persons (14). Various national and international organizations consider physical inactivity to be among the most crucial modifiable risk factors for cardiovascular morbidity and mortality (14). A meta-analysis of prospective cohort studies found that engaging in high levels of physical activity during leisure time and moderate levels of physical activity at work can have a positive impact on cardiovascular health. This can reduce the risk of developing coronary heart disease (CHD) and stroke by 20%-30% and 10%-20% respectively in both men and women (16). Not being physically active can increase the risk of developing stroke and diabetes (15). Physical inactivity contributes to 7.2% of all-cause deaths and 7.6% of CVD deaths globally. Non-communicable diseases like hypertension and dementia also have a significant proportion of cases linked to physical inactivity, ranging from 1.6% to 8.1%. Interestingly, low-income countries have a higher risk of CVD associated with physical inactivity than high-income countries. This highlights the importance of regular physical activity for preventing both primary and secondary CVD (17).

### Unhealthy diet

Having an unhealthy diet can greatly increase one's risk of developing CVD (19-23). A diet that is of poor quality is significantly linked to an increased risk of morbidity and mortality related to CVD (20). Consuming too

much sodium, processed foods, added sugars, unhealthy fats, and animal products, while not eating enough whole grains, fruits, and vegetables, increases the risk of developing CVD (21,23). An unhealthy diet is linked to other risk factors for CVD, such as hypertension, diabetes, and obesity. It is important to promote a healthy diet to decrease the morbidity and mortality of CVD (19). Healthy eating patterns like the Mediterranean, Dietary Approaches to Stop Hypertension (DASH), and plant-based diets have significant benefits for preventing CVD (19,20,22). Consuming legumes, nuts, and chocolate, and following a vegetarian diet significantly lowers the risk of CHD (19). A healthy diet should consist of whole grains, fruits, vegetables, lean proteins, and healthy fats, and limit the intake of added sugars, saturated and trans fats, and sodium (22).

### Smoking

Cigarette smoking is a significant contributor to the development of CVD (24-28). Cigarette smoking increases the risk of CHD by 2 to 4 times, causes a 70% higher rate of death from CHD, and increases the risk of sudden death (26). The risk of death from CVD increases with greater exposure to cigarette smoke. This exposure is measured by the number of cigarettes smoked daily, the duration of smoking, the degree of inhalation, and the age at which smoking began (27). Smoking increases the risk of stroke, peripheral artery disease, aortic aneurysm, and sudden death (28). The risks of CVD increase with the amount and duration of smoking cigarettes (24). Non-smokers exposed to environmental tobacco smoke have a 20%-30% higher risk of CHD (27). Using electronic cigarettes also has implications for cardiovascular health due to the toxic effects of nicotine (25). Cigarette smoking cessation lowers disease risks, but elevated risks may persist for a decade (24). Therefore, quitting smoking plays a crucial role in reducing the risk of CVD and death (28).

### Alcohol consumption

Numerous studies have explored the effects of alcohol consumption on CVD, which can be modified with certain lifestyle changes. Although some studies have found that low to moderate alcohol consumption may have a positive impact on CVD, it is widely acknowledged that excessive alcohol consumption can lead to increased mortality rates and a greater burden of CVDs (29,30). A study using Mendelian randomization found that higher alcohol consumption is causally linked to an increased risk of stroke and peripheral artery disease (29). However, short-term randomized controlled trials have found possible benefits of alcohol consumption for cardiovascular health (30). A systematic review of peer-reviewed studies found that consuming 1-4 drinks of wine per week was linked to a lower risk of cardiovascular mortality (31). Overall, excessive alcohol consumption is a known risk factor for

CVD. The effects of moderate alcohol consumption on CVD are still under debate and require further research (30,32).

### Obesity and overweight

Being overweight or obese increases the risk of developing CVD as an independent factor (33-37). Obesity directly contributes to cardiovascular risk factors such as dyslipidemia, type 2 diabetes, hypertension, and sleep disorders. It also independently leads to the development of CVD and mortality (33). The pathophysiological mechanisms of CVDs in obesity include insulin resistance, inflammation, oxidative stress, endothelial dysfunction, and abnormal Adipokine secretion (36). Obesity causes changes to the structure and function of the heart, including left ventricular hypertrophy, and diastolic and systolic dysfunction (37). The effect of overweight on the diagnosis, clinical management, and outcomes of CKD were approved (33). Therefore, maintaining a healthy weight is important for preventing CVD.

### Stress

Stress is a major risk factor for CVD (38-42). Chronic stress can cause autonomic dysregulation by increasing sympathetic activity and reducing parasympathetic activity. This shift can lead to a range of negative clinical manifestations involving the cardiovascular system, including arrhythmias, platelet aggregation, acute coronary syndromes, and heart failure (40). Stress can have a significant impact on the circulatory system, and it can either have positive or negative effects, playing a major role in various pathophysiological processes associated with the circulatory system (38). However, in CVD, stress mostly is related to deleterious results (38,41). Chronic stress is a significant predictor of CHD, and employees who experience work-related stress and individuals who are socially isolated or lonely have an increased risk of a CHD event (41). Anxiety, anger, and depression can be considered as triggers of CVD events (42). Stress can increase the risk of acute coronary syndrome onset, and it is also associated with the prognosis of CVD and the development of stress cardiomyopathy; however, effective coping strategies such as moderate-to-vigorous lifestyle activity and/or structured exercise, and a good-to-excellent level of cardiorespiratory fitness, can attenuate the magnitude of hyperarousal associated with the stress response and be highly cardio-protective (40). Therefore, stress management is crucial to prevent CVD.

### Conclusion

Identifying lifestyle factors related to CKD incidence is crucial in preventing these diseases. Taking steps to lower the risk of heart disease by changing modifiable factors such as diet, physical activity, and avoiding unhealthy habits like smoking and excessive alcohol consumption

is very important. These factors can be controlled, and their modification can substantially reduce the risk of developing heart disease.

#### Authors' contribution

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#### Conflicts of interest

The authors declare that they have no competing interests.

#### Ethical issues

Ethical issues (including plagiarism, data fabrication, double publication) have been completely observed by the authors.

#### Funding/Support

None.

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