EC CARDIOLOGY
Mini Review

Lifestyle-Related Health Behaviors Associated with Cardiovascular Health in Adolescents: A Stairway to Healthy Future

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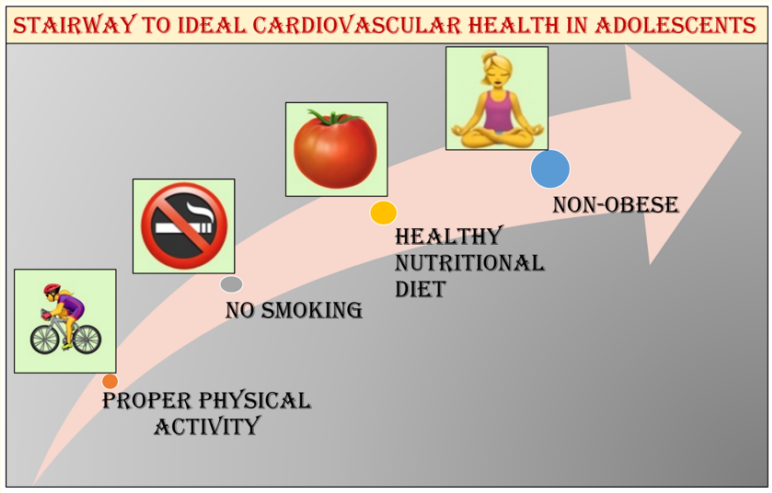
Received: December 30, 2019; **Published:** March 04, 2020

Graphical Abstract



Abstract

Cardiovascular disease (CVD) is generally a disease of adults, but the deterioration is initiated in adolescence based on various traditional risk factors, including smoking, obesity, hypertension and dyslipidaemia etc. These risk factors either belong to health factors or lifestyle-associated health behaviors. The lifestyle-associated health behaviors such as physical inactivity, smoking, obesity and unhealthy diet intake, are more prevalent among adolescents. These healthy behaviors during childhood and adolescence are a strong predictor of CVD development in adulthood. Early choices, life experiences, screening and prevention of risk factors in childhood and adolescence must be addressed to attain ideal cardiovascular health throughout the life course. Improving and promoting a healthy lifestyle in adolescents will help in reducing the burden of CVDs in adults. Various approaches and strategies are required to reinforce ideal cardiovascular health and to promote positive cardiovascular outcomes. In this review, we highlight the lifestyle-associated risk factors associated with cardiovascular health in adolescents transitioning to young adulthood.

Keywords: *Ideal Cardiovascular Health; Physical Inactivity; Obesity; Smoking; Healthy Diet*

Cardiovascular health in adolescents

Cardiovascular diseases (CVDs) remain the foremost cause of death worldwide, accounting for millions of deaths each year [1]. Adolescence is a critical age for the initiation of CVDs. The majority of CVDs occur at middle and older ages, but the deterioration in cardiovascular health initiates in children and adolescents [1,2]. In a study of the Pathobiological Determinants of Atherosclerosis (PDAY), the autopsy findings revealed the presence of intimal lesions in the coronary arteries of adolescents aged 15 to 19 years [3]. The vascular changes and plaque build-up are initiated and accelerated in children and adolescents but can be prevented by ensuring a healthy lifestyle [2,3]. Thus, it is conceivable that healthy behaviors during childhood are a strong predictor of CVD development in adulthood. Decades of data illustrating remarkably low morbidity and mortality due to CVD in adults, is a result of absent traditional risk factors [4]. Studies in the literature also suggest that nearly 80% of CVD events are preventable through modification of lifestyle and health behaviors [1,2,4]. It seems eminently rational to adopt a healthy lifestyle and attain good health factors in childhood and adolescence to maintain and improve cardiovascular health in adults. According to the definition and concept of ideal cardiovascular health introduced by American Heart Association (AHA) in 2010, ideal cardiovascular health is dependent on four lifestyle-related behaviors and three health factors, including

Lifestyle-related behaviors:

- Non-smoking
- Obesity
- Healthy dietary intake
- Physical activity.

Health factors:

1. Total cholesterol
2. Hypertension
3. Blood glucose [5].

The prevalence of cardiovascular health components encompasses the entire spectrum of health. These factors and health behaviors are well-known risk factors of CVDs. Among them, we have discussed lifestyle-related health behaviors to provide optimal information regarding cardiovascular health management in adolescents. Improving and promoting a healthy lifestyle in adolescents will help reduce the burden of CVDs in adults.

Physical activity

Physical inactivity is a modifiable and lifestyle-related risk factor for heart disease. A report from the Special Turku Coronary Risk Factor Intervention Project for Children (STRIP) study revealed that physical inactivity among adolescents is correlated with more subclinical atherosclerotic features such as increased mean aortic intima-media thickening and decreased endothelial function [6]. It is not only associated with increased risk of CVDs but also leads to the development of other traditional risk factors, including high cholesterol, high blood pressure, obesity, and diabetes [2,4].

In today's era, physical activity has been reduced due to various factors such as:

1. Children and adolescents rely on scooters, bikes and cars for transportation that amounts to decreased walking or bicycle use.
2. Interest in sedentary entertainment such as mobile phones, video games, play stations and television etc. rather than pursuing sports and outdoor activities.

3. Lack of a safe environment for outdoor sports.
4. Tight schedules of schools and tuitions [7].

A healthy lifestyle requires regular physical activities with maximal energy expenditure and exertion. Introducing physical activity in childhood and adolescence primes active adulthood. The benefits of regular exercise include prevention from the risk of CVDs, help in reducing weight, strengthening of bones, reduction in stress and increase in good cholesterol levels, etc [8].

Obesity

Obesity is another major risk factor for CVDs. Childhood obesity has become a problem in recent years. According to the documented data, the cases and rates of obesity have been increased 4-folds with an alarming fact that 1 out of every 3 adults is obese [9]. Obesity is well-associated with the repercussions of physical inactivity and increases the risk of many problems like type 2 diabetes, hypertension, high cholesterol, heart disease etc [10].

The cause and reasons behind adolescent obesity include:

1. Eating more calories than burning during exercise.
2. Consumption of junk food in daily life
3. Physical inactivity and its causes.
4. Mental pressure [11].

It is believed that obese children and adolescents are more prone to become obese adults with an increased risk of CVDs [9-11]. Therefore, it is necessary to control childhood and adolescent obesity by consuming healthy food and proper physical exercise.

Cigarette smoking

Cigarette smoking is a major, modifiable and well-known risk factor of CVDs. It has been identified as a behavioral and social illness and a chief cause of death worldwide [2]. Adolescents are more prone to begin and acquire the habit of smoking at this age [12]. According to the data obtained by the Centres for Disease Control (CDC), nearly 4,000 adolescents try their first cigarette every day. Reports also suggest that 9 out of 10 adult smokers had started smoking in their adolescence [13]. Smoking is more ubiquitous in teenagers and adolescents regardless of substantial health consequences, because of the following reasons:

1. Smoking is seen as a cool gesture.
2. To become a part of a particular group or to fit in a particular environment.
3. To look more mature.
4. Peer pressure.
5. To lose weight [14].

Both direct and passive smoking is responsible to incur health consequences. More than 90,000 people die each year due to CVDs caused by smoking [14]. The effects of smoking include narrowing of major arteries, increased heart rate, irregular heartbeats, build-up of fatty plaque in the arteries, increased cholesterol and increased risk of formation of blood clots [2,14]. Plenty of research has been carried out in this direction and it has shown that nicotine is the most addictive and harmful component in cigarettes. It is very hard to quit the habit of smoking as it leads to the withdrawal symptoms due to nicotine addiction [15].

Smoking cessation may reduce the risk of CVDs. Therefore, it is imperative to seek attention to the lifestyle of the adolescents and their needs that smoking fulfils, and take appropriate actions to adopt a non-smoking lifestyle in adolescents as the ideal [14]. Other interventions are also required to prevent the habitual use of smoking among adolescents.

Healthy diet intake

Adolescents are more vulnerable to become overweight and obese due to high fat intake and less physical activity [2]. It is another major risk factor for heart disease. The reasons for the consumption of unhealthy food include:

1. Children and adolescents consume munchy and junk food while watching TV or playing video games.
2. Due to the tight schedule of schools, coaching and tuitions, they consume "ready to eat" food more frequently.

Risk factors of CVDs are identifiable in children and adolescents and their screening is necessary. An effective approach should be adopted to achieve healthy dietary changes to reduce the risk of CVDs. Healthy diet and nutrition impart profound health benefits and also help in reinforcing ideal cardiovascular health [16]. Other benefits include potential decrease in the risk of CVDs and other traditional risk factors such as obesity, dyslipidaemia, and hypertension, etc. The diet of the adolescents should include plenty of fruits and vegetables on daily-basis, consumption of low-fat and non-fat dairy products, and lean meat [16].

Conclusion

The AHA's concept of ideal cardiovascular health is important to reduce the burden of CVDs in adulthood [3,4]. The promotion and improvement of cardiovascular health should be initiated and developed among children and adolescents. The prevention of CVD is highly based on lifestyle-related health behaviors. The modifiable lifestyle-associated factors and habits including, non-smoking, non-obese, proper physical activity and healthy diet can be integrated into adolescence to prime the better and CVD-free adulthood [17].

Conflict of Interest

None declared.

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Volume 7 Issue 4 April 2020