The Growing Burden of Sedentary Lifestyle: Implications for Cardiac and Metabolic Health

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Key points:

- Introduction
- Sedentary behavior and metabolic health
- Sedentary behavior and cardiovascular health
- Role of Physical Activity (PA)
- Conclusion

Introduction

The lifestyle of modern adolescents has become increasingly sedentary, largely due to greater use of digital technology and reduced levels of physical activity. This growing trend has been associated with several adverse health outcomes in children and adolescents. Sedentary behavior (SB) refers to activities that involve an energy expenditure of less than 1.5 metabolic equivalents while sitting, reclining, or lying down. When prolonged, sedentary behavior contributes to an increased risk of cardiovascular and metabolic diseases.[1,2]

Higher levels of sedentary behavior have been associated with an increased risk of cardiovascular disease, including hypertension, ischemic heart disease, and cerebrovascular disease, independent of factors such as body mass index and smoking. This association may be partly explained by reduced levels of physical activity.[2]

Even short periods of prolonged sitting can impair blood vessel function and increase blood pressure, while repeated sedentary episodes may contribute to arterial stiffness and a greater risk of cardiovascular disease. Although current evidence supports this association, differences in study design and factors such as sitting duration, diet, sleep, and posture make direct comparisons between studies challenging.[3]

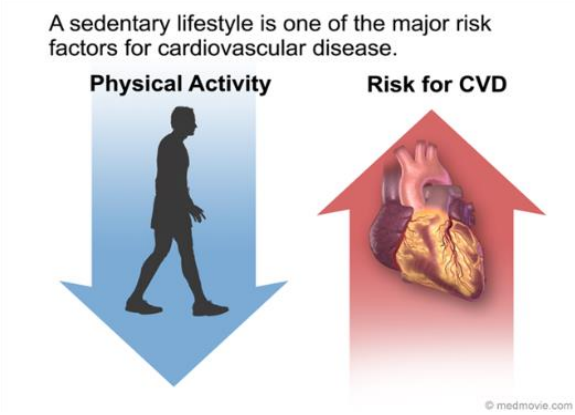


Figure 1: *An image showing sedentary lifestyle negatively impacts CVS.*[4]

Sedentary Behavior and Metabolic Health

Sedentary behavior in children and adolescents is closely linked to declines in metabolic health. Extended periods of sedentary behavior, combined with low

physical activity, passive leisure, and unhealthy eating habits, contribute to elevated body mass index (BMI), blood pressure, waist-to-height ratio (WHtR), visceral adiposity index (VAI), and insulin resistance. Screen-based sedentary activities, such as watching television, are associated with higher obesity risk, especially when physical activity is limited. These metabolic disturbances are especially concerning in obese youth, who already exhibit compromised metabolic health and face an increasing risk of type 2 diabetes, hypertension, and metabolic syndrome as they get older.[7]

Role of Physical Activity:

Both low-intensity physical activity (LPA) and moderate-to-vigorous physical activity (MVPA) are associated with improved metabolic health and a lower risk of overweight and obesity in children and adolescents, with MVPA providing greater benefits.[7] Regular physical activity helps lower blood glucose and triglyceride levels, promotes fat oxidation, and reduces overall and visceral body fat.Breaking up prolonged periods of sitting with short bouts of light physical activity, together with engaging in moderate-to-vigorous physical activity for 30–60 minutes, 3–5 times per week, can further improve metabolic health. These habits also support healthy hormone regulation, increase motivation for physical activity, and contribute to long-term weight management.[9]

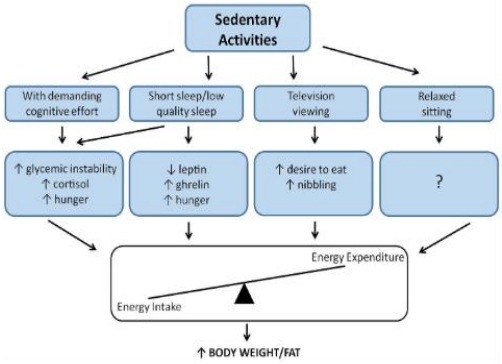


Figure 2: *Sedentariness and Health.*[8]

Conclusion

Sedentary behavior is an important risk factor for poor cardiovascular and metabolic health in children and adolescents. Prolonged sitting and low levels of physical activity increase the risk of obesity, insulin resistance, and cardiovascular disease. Encouraging regular physical activity, including short activity breaks during prolonged sitting and routine moderate-to-vigorous exercise, can improve metabolic health and help reduce long-term health risks. Early lifestyle interventions are therefore essential to promote lifelong cardiovascular and metabolic well-being.[1-9]

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