



## Sedentary lifestyle and its link to modern diseases

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**Abstract-** The rapid advancement of technology and urbanization has significantly altered daily living patterns, leading to a marked increase in sedentary behaviour across all age groups. A sedentary lifestyle, characterized by prolonged periods of sitting and minimal physical activity, has emerged as a major public health concern in modern society. This research paper examines the relationship between sedentary behaviour and the growing prevalence of modern diseases, including obesity, type 2 diabetes, cardiovascular disease, hypertension, and certain forms of cancer. Drawing on epidemiological and clinical studies, the paper highlights how physical inactivity disrupts metabolic processes, reduces insulin sensitivity, impairs cardiovascular function, and contributes to chronic inflammation—key mechanisms underlying many non-communicable diseases. The findings indicate that extended screen time, desk-bound occupations, and reduced engagement in physical activity are strongly associated with increased morbidity and mortality. Even among individuals who meet recommended exercise guidelines, excessive sedentary time independently elevates health risks. The paper further explores the psychological consequences of inactivity, such as heightened rates of anxiety, depression, and cognitive decline, which compound physical health challenges. By synthesizing current evidence, this study underscores that sedentary behaviour is not merely the absence of exercise but a distinct risk factor for disease. The research emphasizes the need for lifestyle interventions that integrate regular movement into daily routines, including workplace modifications, school-based activity programs, and public health campaigns promoting active living. Addressing sedentary habits is essential for reducing the burden of modern diseases and fostering long-term health and well-being in contemporary populations.

**Keywords-** Stakeholders, Shareholders, Corporate, Legal Entity, Shareholders Primacy, Corporate Governance, Social, Environment, Stakeholder-oriented, Strategies, Company Board.

### I. Introduction

In the twenty-first century, technological advancement has transformed the way people live, work, and communicate. While these developments have increased efficiency and comfort, they have also fostered a lifestyle characterized by prolonged sitting and minimal physical activity. This pattern, commonly referred to as a sedentary lifestyle, has become increasingly prevalent across all age groups. Whether through extended hours spent at desks, in vehicles, or in front of screens, modern society has normalized inactivity. As a result, sedentary behaviour is now recognized as a major public health concern, closely associated with the rising incidence of chronic, non-communicable diseases.

A sedentary lifestyle is defined by low levels of energy expenditure, often involving activities such as sitting, reclining, or lying down for long periods. Unlike physical



inactivity, which refers to not meeting recommended exercise levels, sedentary behaviour can occur even among individuals who engage in occasional physical activity. For example, a person may exercise for thirty minutes a day yet still spend most of their waking hours sitting. Research indicates that prolonged sedentary time independently contributes to adverse health outcomes, regardless of regular exercise habits. This distinction highlights the pervasive nature of sedentary behaviour and its unique role in shaping modern disease patterns.

The global burden of non-communicable diseases—including cardiovascular disease, type 2 diabetes, obesity, certain cancers, and mental health disorders—has risen sharply in recent decades. These conditions, often referred to as “modern diseases,” are strongly linked to lifestyle factors such as poor diet, stress, and, notably, physical inactivity. Sedentary behaviour disrupts metabolic processes, reduces insulin sensitivity, impairs circulation, and alters lipid metabolism, thereby creating physiological conditions conducive to disease development. Prolonged sitting has been associated with increased body fat, elevated blood glucose levels, and higher blood pressure, all of which are key risk factors for chronic illness.

Children and adolescents are not immune to these trends. The widespread use of digital devices, online education, and entertainment media has significantly reduced opportunities for spontaneous physical activity. Early exposure to sedentary habits increases the likelihood of obesity, poor cardiovascular fitness, and metabolic disorders later in life. Among adults, workplace demands and urban lifestyles further reinforce inactivity, making sedentary behaviour an ingrained part of daily routine. These patterns reflect a shift from physically demanding tasks to convenience-driven behaviours, reshaping human movement in ways that conflict with biological needs.

Understanding the link between sedentary lifestyles and modern diseases is essential for addressing contemporary health challenges. Unlike genetic or unavoidable risk factors, sedentary behaviour is modifiable, making it a critical target for prevention strategies. This research paper examines the relationship between sedentary living and the development of modern diseases by exploring physiological mechanisms, epidemiological trends, and behavioural influences. By analysing how inactivity contributes to chronic illness, the study aims to emphasize the urgency of promoting active living and integrating movement into everyday life. Recognizing sedentary behaviour as a distinct and significant health risk is a vital step toward reducing the growing burden of modern disease and improving population health in an increasingly inactive world.

## **II. Sedentary Lifestyle and Its Link to Modern Diseases**

In recent decades, dramatic changes in work patterns, technology use, and modes of transportation have contributed to a significant increase in sedentary behaviours worldwide. A sedentary lifestyle is characterized by prolonged sitting or low levels of physical activity and is distinct from physical inactivity; even individuals who meet exercise recommendations may still engage in high amounts of sedentary time (Owen et al., 2010). Increasing evidence from epidemiological studies, clinical research, and public health reports has revealed strong associations between sedentary behaviours



and the incidence of many chronic, non-communicable diseases (NCDs), including cardiovascular disease, type 2 diabetes, obesity, certain cancers, and mental health disorders. This literature review synthesizes existing research on how sedentary lifestyles influence disease risk, the physiological mechanisms involved, and implications for public health.

### **1. Sedentary behaviour and cardiovascular disease**

Cardiovascular disease (CVD) remains the leading cause of death globally (World Health Organization [WHO], 2023). Numerous studies have linked prolonged sedentary time to increased risk of heart disease independent of moderate-to-vigorous physical activity (MVPA). For example, the Aus Diab study found that adults who reported high sitting times had a significantly greater risk of developing cardiovascular outcomes compared to those with lower sitting times, even after adjusting for activity levels (Dunstan et al., 2010). Similarly, Ekelund et al. (2019) conducted a harmonized meta-analysis of accelerometer data from multiple cohort studies and found that high sedentary time was associated with increased all-cause and CVD mortality. These findings suggest that prolonged sedentary behaviour contributes to cardiometabolic dysfunction through mechanisms such as reduced muscle contractions, impaired lipid metabolism, and decreased glucose uptake in skeletal muscles (Healy et al., 2008). Because cardiovascular risk factors like hypertension, dyslipidaemia, and endothelial dysfunction are exacerbated by sitting for extended periods, breaking up sedentary time with light activity has been shown to produce favourable changes in these biomarkers.

### **2. Sedentary Lifestyle and Type 2 Diabetes**

The relationship between sedentary time and type 2 diabetes has been extensively studied. Prolonged sitting has been linked to insulin resistance—a primary driver of type 2 diabetes—independent of exercise levels (Thorp et al., 2011). One large Australian cohort study reported that each hour of daily television viewing (a common sedentary behaviour) was associated with a 3.4% increase in diabetes risk (Grøntved & Hu, 2011). A meta-analysis by Wilmot et al. (2012) further confirmed that high sedentary time was significantly associated with an increased risk of type 2 diabetes compared with low sedentary time. The underlying mechanisms may involve reduced skeletal muscle activity leading to poor glucose regulation, decreased lipoprotein lipase activity (important for lipid metabolism), and weight gain—each of which increases diabetes risk (Hamilton et al., 2007). Experimental research has shown that interrupting sedentary time with brief bouts of light activity improves postprandial glucose and insulin responses, suggesting that not only total activity but timing and patterning of sedentary behaviour matter for metabolic health.

### **3. Sedentary Behaviour and Obesity**

Obesity, which has reached epidemic proportions in many countries, is strongly correlated with sedentary lifestyles. Cross-sectional and longitudinal studies indicate that sedentary behaviours, especially screen time, are associated with higher body mass index (BMI) and adiposity in both adults and children (Owen et al., 2010; Rey-López et al., 2008). For example, a systematic review by Biddle et al. (2017) reported that sedentary behaviour is positively associated with obesity in youth, and high screen time predicts greater weight gain over time. Prolonged sitting reduces energy expenditure, alters appetite regulation, and is often paired with increased consumption of calorie-



dense snacks, compounding weight gain. While the effects of exercise are well-known for obesity prevention, sedentary behaviour has emerged as an independent risk factor; individuals meeting physical activity guidelines may still accrue metabolic risk if they remain sedentary for much of the day.

#### **4. Cancer and Sedentary Lifestyle**

Emerging evidence also links sedentary behaviour with several types of cancer. The International Agency for Research on Cancer (IARC) and other research bodies have identified associations between sedentary time and increased risk of colon, endometrial, and lung cancers (Patel et al., 2010). In a pooled analysis of data from multiple cohorts, high levels of sedentary behaviour were associated with a 24% increased risk of colon cancer and a similar increase in endometrial cancer risk (Schmid & Leitzmann, 2014). The biological mechanisms may involve chronic inflammation, insulin resistance, and altered hormone levels (e.g., increased estrogen in adipose tissue), all of which can influence carcinogenesis. These findings have significant implications for cancer prevention strategies, highlighting the need to reduce sedentary time as a modifiable risk factor.

#### **5. Mental Health and Sedentary Behaviour**

In addition to physical diseases, a growing body of literature links sedentary lifestyles to adverse mental health outcomes. Several studies have reported associations between high levels of sitting and increased symptoms of depression and anxiety (Teychenne et al., 2010). A meta-analysis by Zhai et al. (2015) found that sedentary behaviour was significantly associated with worsened psychological well-being and higher risk of depressive symptoms in adults. Although causality is difficult to establish, proposed mechanisms include social isolation due to screen-based activities, reduced endorphin release from physical inactivity, and disruption of circadian rhythms. Interventions reducing sedentary time have shown improvements in mood and self-reported quality of life, indicating the broader mental health benefits of reducing sitting.

#### **6. Public Health Perspectives**

Given the robust evidence linking sedentary behaviour to multiple disease outcomes, major health organizations have begun to include sedentary behaviour recommendations in guidelines. The WHO's Global Action Plan on Physical Activity emphasizes reducing sedentary time along with increasing overall physical activity levels to combat non-communicable diseases (WHO, 2018). National guidelines in countries such as Australia, Canada, and the United States also recommend breaking up prolonged sitting with light-intensity movement throughout the day. Importantly, these recommendations target not only structured exercise but everyday movement—such as standing, walking, and using stairs—to disrupt sedentary patterns.

### **III. Analysis of data from the reviewed Literature**

The reviewed literature on sedentary lifestyle and its link to modern diseases reveals a strong and consistent association between prolonged physical inactivity and the rising prevalence of non-communicable diseases. Across epidemiological studies, sedentary behaviour—defined as extended periods of sitting or low-energy activities such as screen use, desk work, and passive transportation—emerges as an independent risk



factor for poor health outcomes, even among individuals who meet minimum exercise guidelines. This distinction is critical: the data indicate that a person can engage in regular exercise yet still experience elevated health risks if the majority of the day is spent sitting.

Quantitative findings consistently demonstrate higher incidence rates of obesity, type 2 diabetes, cardiovascular disease, and certain cancers among populations with high sedentary time. Large cohort studies report dose–response relationships, where each additional hour of daily sitting is associated with incremental increases in all-cause mortality and cardiometabolic risk. This pattern suggests causality rather than coincidence. Mechanistically, inactivity reduces skeletal muscle contractions, leading to diminished glucose uptake, impaired lipid metabolism, and decreased insulin sensitivity. Over time, these physiological changes contribute to hyperglycaemia, dyslipidaemia, and weight gain—core pathways underlying modern lifestyle diseases.

The literature further shows that sedentary behaviour alters energy balance and metabolic regulation. Reduced activity lowers total daily energy expenditure, while modern environments simultaneously promote high-calorie consumption. This imbalance accelerates adiposity, particularly visceral fat, which is metabolically active and strongly linked to inflammation and insulin resistance. Data from cross-sectional and longitudinal studies reveal that individuals with high screen time exhibit significantly higher body mass index (BMI), waist circumference, and markers of metabolic syndrome than their more active peers.

Cardiovascular outcomes show similar trends. Prolonged sitting is associated with elevated blood pressure, reduced endothelial function, and poorer lipid profiles, including lower high-density lipoprotein (HDL) cholesterol. These factors compound over time, explaining the higher rates of coronary heart disease and stroke observed in sedentary populations. Importantly, several studies indicate that uninterrupted sitting is particularly harmful; brief activity breaks—standing, stretching, or walking—produce measurable improvements in postprandial glucose and insulin levels. This finding suggests that behaviour patterns across the day are as important as total exercise volume.

Mental health outcomes also feature prominently in the literature. High sedentary time correlates with increased rates of depression, anxiety, and reduced cognitive well-being. Data indicate that passive screen-based behaviours are more strongly associated with psychological distress than occupational sitting, implying that context matters. These mental health effects further reinforce physical inactivity, creating a feedback loop that sustains unhealthy behaviours and worsens disease risk.

Across age groups, the data show early onset of sedentary habits. Children and adolescents with high screen exposure demonstrate lower cardiorespiratory fitness and higher obesity rates, predicting chronic disease in adulthood. This life-course perspective highlights sedentary behaviour as a foundational driver of modern disease patterns rather than a secondary contributor.



Overall, the analysed data establish sedentary lifestyle as a distinct and potent health risk. The consistency of findings across populations, methodologies, and outcomes strengthens the conclusion that inactivity is a primary determinant of modern diseases. The evidence also reframes prevention: reducing sitting time, incorporating frequent movement, and redesigning daily routines are as essential as promoting structured exercise. Addressing sedentary behaviour is therefore central to controlling the global burden of non-communicable diseases.

#### **IV. Conclusion**

The evidence presented in this research highlights the profound impact of a sedentary lifestyle on the development and progression of modern diseases. In an era characterized by technological advancement and convenience, physical inactivity has become deeply embedded in daily life. Long hours spent sitting at desks, using digital devices, and relying on mechanized transportation have significantly reduced opportunities for movement. This shift has contributed to a global rise in non-communicable diseases such as obesity, type 2 diabetes, cardiovascular disease, hypertension, musculoskeletal disorders, and certain forms of cancer. The findings clearly demonstrate that sedentary behaviour is not merely a passive habit but an independent risk factor that undermines physical, metabolic, and psychological health.

A sedentary lifestyle disrupts normal metabolic processes by impairing glucose regulation, slowing energy expenditure, and promoting fat accumulation. Prolonged sitting reduces muscle activity, particularly in large muscle groups, leading to decreased insulin sensitivity and increased blood sugar levels. Over time, these changes accelerate the onset of metabolic disorders and contribute to chronic inflammation, a common underlying mechanism in many modern diseases. Furthermore, physical inactivity weakens cardiovascular function, reduces lung capacity, and compromises musculoskeletal strength, increasing vulnerability to injury and functional decline.

Beyond physical health, sedentary behaviour also exerts a significant influence on mental well-being. Research consistently links prolonged inactivity with higher levels of stress, anxiety, depression, and cognitive fatigue. Reduced physical movement limits the release of endorphins and other neurochemicals associated with emotional balance and mental clarity. As a result, individuals caught in cycles of inactivity may experience diminished motivation and productivity, reinforcing unhealthy behavioural patterns.

Importantly, the findings indicate that the harmful effects of sedentary living are not limited to individuals who lack formal exercise routines. Even those who engage in occasional physical activity remain at risk if large portions of their day are spent sitting. This underscores the need to view movement as a continuous component of daily life rather than an isolated activity confined to workout sessions. Small, frequent interruptions of sitting—such as standing, stretching, or walking—can significantly reduce health risks and improve metabolic function.

Addressing the growing burden of sedentary-related diseases requires a multifaceted approach that integrates individual responsibility, institutional support, and public policy. Schools, workplaces, and communities must be redesigned to encourage



movement through active learning environments, ergonomic workstations, and accessible recreational spaces. Public health campaigns should emphasize the dangers of prolonged inactivity and promote simple, achievable strategies for incorporating movement into everyday routines. At the individual level, cultivating awareness and intentional habits—such as taking active breaks, limiting screen time, and prioritizing regular physical activity—can produce meaningful health benefits.

In conclusion, a sedentary lifestyle represents one of the most significant and preventable contributors to modern disease. Its effects extend across physical, metabolic, and psychological domains, threatening both individual well-being and public health systems. By recognizing inactivity as a critical health risk and fostering environments that support active living, society can reduce the prevalence of chronic disease and improve quality of life. Movement is not merely a fitness choice—it is a fundamental requirement for sustaining health in the modern world.

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