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Sedentary Lifestyles and Hypokinetic Diseases: A Public Health Crisis

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Abstract: Sedentary lifestyles, which involve extended periods of physical inactivity, have dramatically increased in the contemporary era. These lifestyles are frequently associated with changes in work conditions and the widespread use of technology. The rising incidence of hypokinetic disorders, which include a variety of ailments like cardiovascular disease, type 2 diabetes, obesity and several malignancies, is mostly due to this move towards sedentarism. These illnesses not only place a heavy cost on individuals but also present a serious public health emergency that affects healthcare systems and economies across the globe. This study explores the complex relationship between hypokinetic disorders and sedentary lifestyles, looking at risk factors, underlying mechanisms and consequences for public health. Any awake activity, such as sitting, lying down and screen-based activities that requires energy less than 1.5 metabolic equivalents is considered sedentary behaviour. Complex interactions between the circulatory, musculoskeletal and metabolic systems are part of the pathogenesis. Hypokinetic disorders have a significant influence on public health due to their high rates of morbidity, mortality and financial expenses. Thus, the public health issue of hypokinetic disorders has been greatly exacerbated by the rise of sedentary lifestyles. Coordinated actions by all sectors to encourage physical activity and lessen the prevalence of these avoidable diseases are necessary. The effects of hypokinetic disorders on society and the economy are staggering and astounding. Therefore, reducing sedentary behaviours and increasing physical activity are the need of the hour to cope with emerging public health challenges.

Keywords: Sedentary lifestyles, Hypokinetic diseases, Public health crisis

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Introduction

Sedentary lifestyles have become a worrying trend in today's culture and provide a serious threat to public health (Park *et al.,* 2020). Urbanization, technological development and adjustments to work and leisure schedules have all combined to cause a global decline in physical activity levels among populations (Boakye *et al.*, 2023). The public health implications of this transition toward a more sedentary lifestyle are significant, mainly because of its link to hypokinetic disorders. Humans have always had a natural tendency to be physically active. Moving around a lot was part of daily life, whether it was for agriculture, hunting and gathering or other labour-intensive jobs. But

the beginning of the industrial revolution signalled a change, with lifestyles becoming progressively more sedentary and less physically demanding. Sedentary behaviours have become more ingrained in modern society due to the rise in desk-bound jobs, the ease of motorized transportation and the pervasive use of electronic gadgets for communication and entertainment, where wide-ranging effects on all age groups and socioeconomic backgrounds are witnessed as a result of this shift (Cardinal, 2016).

Sedentary lifestyle has serious and complex health consequences. Inactivity can result in the build-up of risk factors such as high blood pressure, high cholesterol and atherosclerosis, which can ultimately raise the risk of heart attacks and strokes (Huston, 2022). Additionally, sedentary lives are a key risk factor for a wide range of other chronic illnesses, since obesity is becoming more and more common. A multimodal approach is necessary to address the public health crisis caused by hypokinetic disorders and sedentary lifestyles. The promotion of physical activity through workplace wellness programs that include frequent exercise, urban planning that supports walking and cycling and educational campaigns that emphasize the value of physical fitness must be given top priority in public health policies. Through the inclusion of physical education in their curricula and the provision of chances for active play, schools also play a crucial role in promoting healthy habits from an early age. In addition, health care providers ought to promote physical exercise as a prophylactic and an essential part of managing chronic illnesses. Thus, the present study is an attempt to explore the interconnections between sedentary lifestyles and the surge in hypokinetic diseases and its emergence as a formidable public health crisis.

The rise of sedentary lifestyles

Humans have always had busy lives, with extensive physical labour playing a big role in day-to-day activities. But sedentary jobs became more prevalent with the advent of industrial revolution. With the arrival of the digital age, when technology is integral to both work and play, this trend has only gotten stronger. Sedentary lifestyle has become a prevalent and concerning trend in the 21st century, posing a serious threat to public health. Urbanization, changing work and leisure schedules and technology improvements are the main causes of this trend toward inactivity (Bueno-Antequera and Munguía-Izquierdo, 2023). Globally, populations have become significantly less physically active as a result of this change which has significant repercussions, especially in terms of hypokinetic disorders. Modern sedentary behaviours refer to activities that involve prolonged sitting or reclining while awake and typically result in very low energy expenditure. According to observations of Mahumud *et al.* (2021), teenage obesity and overweight are major global health issues that may have an impact on an adult's weight and morbidity. These behaviours are increasingly common due to changes in lifestyle and technology which pave the way for the rise in sedentary lifestyles where the key aspects include:

- *Screen Time*: This includes watching TV, using a computer, playing video games and browsing the internet on smartphones or tablets.
- *Work-Related Sitting*: Many jobs, especially in office settings, involve long hours of sitting at a desk or in meetings.
- *Commuting*: Extended periods of sitting in cars, buses, trains or airplanes.
- *Leisure Activities*: Reading, crafting and other hobbies that involve sitting for extended periods.

Thus, sedentary behaviours are common in today's digital world. An important factor in the rise in physical inactivity is the increase in screen time brought about by the widespread use of smartphones, computers and televisions. According to Nakshine *et al.* (2022) increased screen time is the cause of declining physical, psychological health and sleep patterns. Furthermore, desk employment and other sedentary work situations make this problem

more worse. Daily routines, where convenience and automation frequently obviate the need for movement, are another area where physical activity levels have decreased. Several studies have emphasized the negative consequences of overuse of electronic gadgets which profoundly influences mood, sleep and social relationships (Lissak, 2018). Globally, internet addiction (IA) is becoming a serious public health issue in many countries on several continents, including Asia with unimaginable mental repercussions (Kuss and Lopez-Fernandez, 2016).

Hypokinetic disorders

Hypokinetic disorders are a group of neurological conditions characterized by reduced movement which primarily affect the motor system, leading to symptoms such as muscle rigidity, tremors and bradykinesia (slowness of movement). The term bradykinesia derived from the Greek, means slowness (brady-) of movement (kinesis) and in general, hypokinesia, bradykinesia and akinesia can be grouped under the umbrella term of "bradykinesia" (Bologna *et al.*, 2020). Because hypokinetic movement disorders exhibit clinical symptoms of idiopathic Parkinson's disease (IPD), they are frequently referred to as parkinsonisms which makes it challenging to differentiate IPD from other parkinsonian disorders and misdiagnosis is sometimes not discovered until after death (Borrell, 2000). There are many conditions that exhibit parkinsonian traits. The three that are more frequently seen are progressive supranuclear palsy, multiple system atrophy and IPD. The major hypokinetic disorders are given below:

- *Obesity*: It is impossible to overestimate the detrimental impact of a sedentary lifestyle on obesity. Sitting over extended periods of time reduces energy expenditure significantly, which hinders the body's capacity to digest fats and carbs. Because of this, those who lead sedentary lifestyles are far more likely to develop obesity, a complicated illness with wide-ranging health effects. Being sedentary increases the risk of weight gain and obesity, which are major contributors to an imbalance between caloric intake and expenditure and a number of chronic illnesses (Silveira *et al.*, 2022). Thus, obesity is a consequence of a high saturated fat, a refined carbohydrate diet and an increased input over expenditure, combined with reduced exercise (Graham *et al.*, 2015).

- *Cardiovascular diseases*: It is beyond dispute that a significant risk factor for the emergence of cardiovascular illnesses is physical inactivity. Sedentary lifestyles pose a serious threat to public health globally because of their detrimental effects on blood pressure, lipid profiles and insulin sensitivity (Higgins *et al.*, 2022). These factors increase the risk of cardiovascular diseases such as coronary heart disease and stroke. Extended periods of inactivity are linked to a higher risk of heart-related conditions, such as high blood pressure, heart attacks and strokes (Lavie *et al.*, 2019).

- *Type 2 diabetes*: People who lead sedentary lives are more likely to develop insulin resistance and impaired glucose regulation, which increases their risk of developing type 2 diabetes. Engaging in consistent physical activity is essential for preserving a healthy glucose metabolism and reducing the likelihood of developing type 2 diabetes. Low levels of physical exercise have a detrimental effect on insulin sensitivity and increase the risk of type 2 diabetes (Li *et al.*, 2022; Deng *et al.*, 2022).

- *Musculoskeletal disorders*: Reduced physical activity leads to weakening of the bones, stiffness in the joints and imbalances in the muscles, all of which can result in musculoskeletal illnesses like osteoporosis, neck discomfort and lower back pain. Living a sedentary lifestyle increases the risk of developing musculoskeletal ailments by causing bone loss, joint issues and muscle weakness (Stefansdottir and Gudmundsdottir, 2017). Cross-sectional associations of occupational and non-occupational sedentary

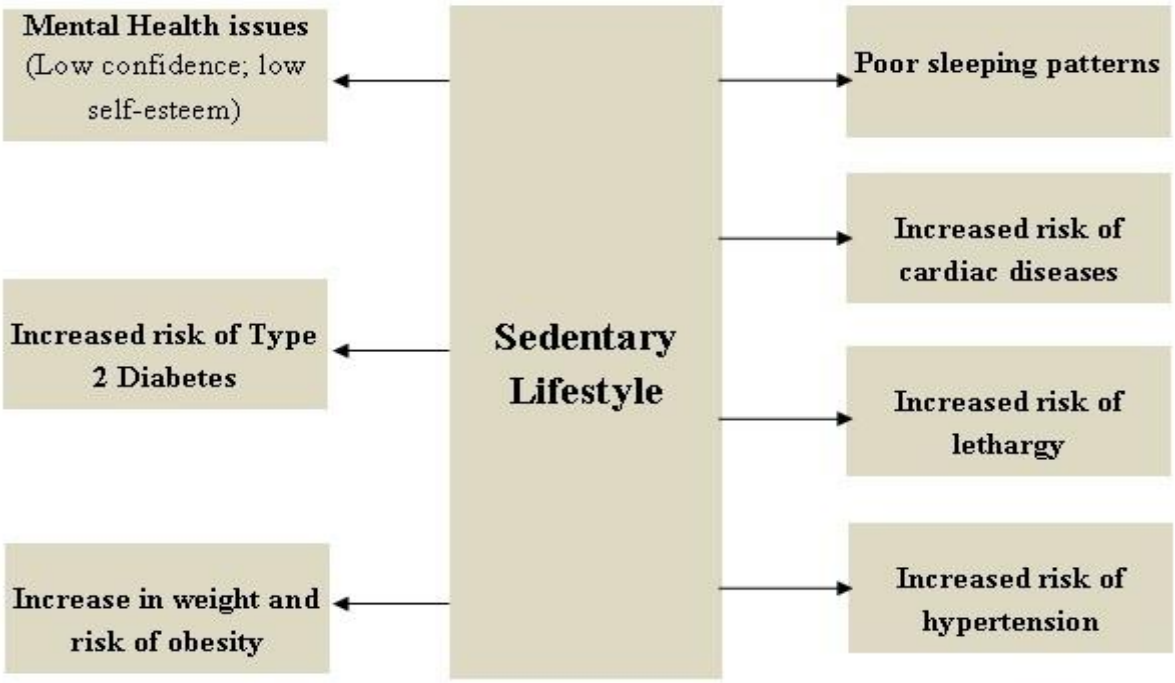

Fig. 1: Major consequences of a sedentary lifestyle.

behaviour with musculoskeletal pain were already established (Dzakpasu *et al.*, 2021).

- *Mental health issues*: Reduced physical exercise has long been linked to a higher chance of mental health problems, such as anxiety and depression (Ellingson *et al.*, 2018; Huang *et al.*, 2020). The need to treat this element of hypokinetic diseases is highlighted by the function that exercise plays in generating endorphins, which promote better mood and decreased stress. An increased risk of sadness, anxiety and other mental health issues is associated with inactivity.
- *Poor sleeping patterns*: Yang *et al.* (2017) recorded that prolonged sedentary behaviour tends to be associated with an elevated risk of insomnia and sleep disturbances. Koohsari *et al.* (2023) also reiterated interconnections between the sedentary behaviour and sleep quality.

Public health implications

In recent years, sedentary lifestyle has become a major public health concern as it has far-reaching consequences that impact many facets of both individual and social health. The risk of chronic diseases is one of the most direct health effects of a sedentary lifestyle. Physical inactivity is the fourth leading risk factor for global mortality, accounting for 6% of global mortality (WHO, 2010). The development of cardiovascular illnesses, such as hypertension, coronary artery disease and stroke, is closely associated with physical inactivity. The ramifications for public health go beyond personal well-being and financial effects. Higher healthcare expenses are a result of the rising prevalence of chronic diseases linked to sedentary lifestyles. Significant medical resources are needed for the treatment of obesity, diabetes, cardiovascular disease and its associated consequences. Moreover, sedentary behaviour-related disease and disability that reduce productivity place a heavy financial cost on society (Rosenkranz *et al.*, 2020). This covers indirect costs like missed workdays and diminished production in addition to direct healthcare costs. A diversified strategy is needed to combat the epidemic of inactive lifestyles. Campaigns for public health must stress the value of consistent

Table 1: Key takeaways of WHO guidelines on physical activity and sedentary behaviour 2020

Infants (less than 1 year old)	• Should be physically active several times a day, particularly through interactive floor-based play. • For those not yet mobile, at least 30 minutes of tummy time spread throughout the day while awake.
Children and Adolescents (5-17 years old)	• Should do at least 60 minutes per day of moderate to vigorous-intensity, mostly aerobic, physical activity. • Incorporate vigorous-intensity aerobic activities, as well as those that strengthen muscle and bone, at least three days a week. • Limit sedentary screen time, though specific limits were not defined.
Adults (18-64 years old)	• Should do at least 150-300 minutes of moderate-intensity aerobic physical activity, or at least 75-150 minutes of vigorous-intensity aerobic physical activity, or an equivalent combination throughout the week. • Additional health benefits can be gained by engaging in more than 300 minutes of moderate-intensity physical activity per week. • Muscle-strengthening activities involving major muscle groups should be done on two or more days a week. • Limit sedentary behavior, particularly time spent in front of screens, and engage in more physical activity of any intensity to reduce the health risks associated with high levels of sedentary behavior.
Older Adults (65 years and older)	• Follow the same recommendations as adults but include activities that enhance balance and prevent falls on three or more days a week. • Should do physical activity that is varied and consistent with their abilities to enhance functional capacity and prevent frailty.

physical activity and offer doable methods for fitting exercise into everyday schedules. The construction of accessible and safe areas for physical activity, such parks, bike lanes and walking trails, should be given top priority in urban development. Schools and businesses have a critical role to play in encouraging physical activity by providing facilities and organized programs that reward mobility. In addition, medical professionals must regularly evaluate their patients' levels of physical activity and provide customized guidance to lessen sedentary behaviour. Policies that encourage physical exercise, such gym membership subsidies or tax advantages for businesses that run wellness initiatives, can also be successful. Major consequences of a sedentary lifestyle are depicted in Figure 1.

The skyrocketing of hypokinetic diseases places a considerable strain on healthcare systems worldwide, as treating these conditions is costly and resource-intensive which underscores the need for preventive measures to reduce the incidence of these diseases. Thus, a sedentary lifestyle has wide-ranging negative effects on the physical, emotional, and financial well-being of the public. In order to address this problem, people, communities and legislators must work together to encourage active lives and lessen the negative consequences of prolonged inactivity. Society can lessen the burden of chronic diseases linked to sedentary behaviour and improve overall health outcomes by addressing the underlying causes and encouraging frequent physical activity.

WHO guidelines on physical activity and sedentary behaviour 2020

Regardless of gender, cultural background or socioeconomic status, the public health recommendations made as WHO Guidelines in 2020 on physical activity and sedentary behaviour apply to all populations and age groups between the ages of 5 and 65 and beyond (WHO, 2020). The quantity of research on the effects of various forms, intensities and lengths of physical activity on health as well as the effects of sedentary behaviour and how it relates to physical activity levels and health has been elaborated in recent years with profound impacts on global public

health and discussed in detail in the 2020 guidelines. Action 4.1 of the Global Action Plan on Physical Activity 2018-2030 mandates that WHO create and distribute worldwide guidelines for sedentary behaviour and physical activity in children under five, adults, older adults and certain subpopulations, including pregnant women, those with disabilities and people with chronic illnesses. This is in line with the main tenets and objectives of the global action plan on physical activity, which are to lessen inequality and encourage daily physical activity among all people. The WHO's 2010 recommendations did not address sedentary behaviour, but over the years, a growing body of research has examined the health consequences linked to various forms and metrics of sedentary behaviour. The way that individuals work, learn, travel and use their free time has been impacted by technology and digital communications. Children and teenagers are spending more time in most nations participating in sedentary behaviours, especially for leisure activities like watching television or using computers, as well as using mobile phones and other digital communications devices make the more vulnerable in terms of public health. Thus sedentary lifestyle or behaviour is gaining attention among the international community and platforms, which is a positive sign with long lasting quiverings in global public health arena. The guidelines provide comprehensive recommendations for various age groups and special populations to promote health and well-being through physical activity and the reduction of sedentary behaviour. Key takeaways of the guidelines are given in Table 1.

The WHO guidelines emphasize that every move counts and that it is crucial to integrate more physical activity into daily routines while minimizing sedentary time to improve health outcomes across all age groups and populations.

Conclusion

Physical activity is beneficial not only for health but also for human spirit as well. It enables individuals to engage with life and enjoy its joys and completeness. Hypokinetic illnesses and sedentary lifestyles pose a serious threat to public health. A holistic strategy is needed to address the sedentary lifestyle. Together, people, communities and legislators can build a society that is healthier and more active. Thus, comprehensive, multi-faceted methods are needed to address the public health crisis caused by sedentary lifestyles and hypokinetic disorders. Public health initiatives should focus on promoting physical activity through policy changes, community programs, and individual interventions. To minimize the sedentary behaviour habit, workplace wellness initiatives, school-based physical education and urban planning that promotes active mobility are recommended. Reaching a variety of demographics can also be accomplished by utilizing technology to encourage physical activity, such as fitness applications and online workout regimens. Campaigns for education and awareness are essential in encouraging people to lead more active lives and to change their attitudes and actions. Healthcare professionals need to be prepared to prescribe exercise and coach patients on the value of physical activity as part of their regular care. Tailored therapies are crucial since research keeps elucidating the ideal kinds and quantities of physical exercise required to prevent hypokinetic disorders. To sum up, the increase in hypokinetic illnesses that follows the rise in sedentary lifestyles represents an imminent global public health issue which has contributed to a rise in chronic illnesses that have a substantial negative influence on one's physical and mental health. In order to combat this public health catastrophe, people, communities and policy-makers must work together to prioritize and promote active living, which will improve health outcomes and raise people's quality of life across the globe.

Ethical Statement

This is a review article hence no Ethical Approval needed.

Conflict of Interest

The author declares no conflicts of interest.

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