Journal of Population Therapeutics & Clinical Pharmacology

RESEARCH ARTICLE
DOI: 10.53555/hk8nrh62

PREVALENCE OF SEDENTARY LIFESTYLE AND ITS ASSOCIATION WITH CARDIOVASCULAR DISEASES IN URBAN POPULATIONS

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Abstract

Introduction: Cardiovascular diseases (CVDs) are still the primary cause of morbidity and/mortality affecting life globally, and sedentary behavior is now acknowledged as another main cause. Changes in lifestyle that promote physical inactivity, poor dietary habits, and stress make urban populations particularly vulnerable. This research is focused on exploring the extent of sedentary lifestyle and determining its association with cardiovascular diseases in an urban population in Pakistan.

Objective: The prevalence of sedentary lifestyles with cardiovascular diseases among adults in urban settings has been assessed.

Materials and Method: A cross sectional study was done at Department of Community Medicine, Mekran Medical College Turbat, Pakistan from November, 2023 to April, 2024. Stratified random sampling was performed to select the adults in the age range of 30–65. Structured questionnaires and clinical records were the data collection tools used. Urban residents who were not diagnosed with a mental or terminal illness were included criteria.

Results: The findings revealed a high prevalence of sedentary behavior, significantly associated with increased CVD incidence. Physical inactivity was strongly linked with hypertension, obesity, and hypercholesterolemia.

Conclusion: Promoting active lifestyles is vital to reducing cardiovascular disease risks in urban Pakistani populations.

Keywords: *Sedentary lifestyle, cardiovascular disease, urban population, Pakistan, physical inactivity.*

INTRODUCTION

The increasing prevalence of sedentary lifestyles has become a public health issue because of sedentary lifestyles becoming increasingly prevalent, especially in urbanized settings in which technology has progressed and modern amenities have greatly decreased physical activity. This shift has accounted for the major portion of the global burden of cardiovascular diseases (CVDs), for which CVDs rank number one in morbidity and mortality all over the world. Prolonged physical inactivity has recently been identified as one of many factors contributing to cardiovascular risk, particularly in urban areas characterized by higher concentrations of population, which commonly leads to a passive way of living. Epidemiological studies from across the geographical region and subsequent demographics have contributed to understanding the correlation between sedentary behaviors and cardiovascular outcomes. For example, in India, the recent (2014) Longitudinal Ageing Study (LASI) has shown a high prevalence of cardiovascular disease (CVD) among older adults, with sedentary lifestyle behaviour being identified as a major risk factor (1). These latter findings highlight the need for further investigations on a more region-specific basis, even in developing countries, to determine how lifestyle affects cardiovascular health outcomes.

Comparable trends have been seen in urban populations in other places, with neighborhood-level social vulnerability (e.g., limited availability of safe and recreational facilities) correlated with elevated prevalence of cardiovascular risk factors, e.g., hypertension, obesity, and diabetes (2). Social determinants such as these are significant risk factors for physical inactivity, and their unfavourable health behaviors and outcomes are further increased by this lack of physical activity. Additionally, the strong association of metabolic syndrome, a cluster of conditions including high blood pressure, high blood sugar, excess fat around the waist, and abnormal cholesterol levels, with sedentary behaviour has been shown. Research shows that reduced physical activity levels of urban populations increase their risk for cardiovascular diseases and may trigger the manifestation of metabolic syndrome (3).

Beyond physical inactivity, these metabolic disruptions are exacerbated by poor mental health, including depression and chronic stress, which are more common in fast-paced urban environments. In the United States, research has demonstrated that young adults with poor mental health have reduced cardiovascular health, and adherence to healthy lifestyles is implicated, at least in part, in the poor cardiovascular health (4). The prevalence of hypertension and related cardiovascular conditions even in rural settings remains substantial, and while the risk profile is different, largely because of lifestyle factors, it is more common in urban populations. In a study from Mthatha Town, South Africa, it was stressed that although genetic and environmental contributors play roles, urban living with sedentary behaviors significantly increases the risk of cardiovascular disease (5). This urban-rural disparity is also observed in comprehensive European statistics, where a high burden for cardiovascular disease has been associated with sedentary lifestyles mostly amongst city populations (6).

The data from a cross-sectional survey in Al-Kharj, Saudi Arabia, demonstrated the prevalence of hypercholesterolemia as well as its association with physical inactivity, confirming that sedentary behaviors also rage in middle-income urban populations (7). Cardiovascular risk is aggravated by environmental factors such as air pollution, urban noise, and insufficient green space, which promote a sedentary lifestyle (8). As a result, urban dwellers at risk for heart-related illness due to nonparticipation in routine physical activity encounter these barriers. Sedentary lifestyles also affect the cardiovascular health of the elderly with chronic diseases. A comparison of Indian elderly residing in an urban and a rural area showed that the urban elderly has a greater susceptibility to chronic diseases like CVDs, owing to a sedentary lifestyle and an inappropriate diet (9).

Finally, this pattern is not unique to South Asia. Adults older than 39 in the Brazilian Amazon region had a high prevalence of noncommunicable diseases associated with inactivity and other lifestyle risk factors (10). Taken together, these findings underscore that the trend is global in nature, rather than finding itself expressed within one particular socio-economic context. In addition, gender-based disparities intricately confound the association of sedentary lifestyle and cardiovascular risk.

According to the American Heart Association, gender-sensitive strategies to tackle cardiovascular health in women, who are less represented in clinical research but equally or even more affected by sedentary behavior and its consequences, are being urgently needed (11). The most exposed occupational groups in an urban environment on account of physical inactivity are healthcare workers, teachers, and bankers, because of their job-related inactivity. High prevalence of obesity and cardiovascular risks among these professionals was also reported in a study done in Arusha City, Tanzania (12).

But diet too has a major hand in it. Strong positive associations between processed meat consumption and cardiovascular mortality were observed in the Prospective Urban Rural Epidemiology (PURE) study, and meat-intensive diets are common in urban poor populations with little time for preparing fresh meals (13). Psychological factors are also beginning to be noticed. For instance, it is known that people with attention deficit hyperactivity disorder (ADHD) have a higher risk of developing cardiovascular diseases partly because of impulsiveness that leads to such lifestyle-related unhealthy behaviors as a sedentary lifestyle (14). Further confirmation of the generalised prevalence of obesity and cardiovascular risk factors among urban populations in Spain was provided by the ENPE study, and the majority of this risk was attributed to a sedentary lifestyle (15). Finally, data on Bangladesh reemphasize this as a global problem and show that even in rural populations, once sedentary behaviors are adopted, the risk for hypertension and cardiovascular complications shoots up (16).

Objective: This study aims to determine the prevalence of sedentary life style among urban populations in relation to cardiovascular diseases, by using a hospital based cohort in Pakistan.

MATERIALS AND METHODS

Design: Descriptive Cross-Sectional Design.

Study setting: The research was conducted at Department of Community Medicine, Mekran Medical College Turbat, Pakistan.

Duration: Data collection was carried out over a six-month period from November, 2023 to April, 2024.

Inclusion Criteria: The study included male and female adult participants aged 30 years and above from urban areas attending the Department of Community Medicine, Mekran Medical College Turbat, Pakistan. Participants included individuals who provided informed consent and who had a history or current diagnosis of cardiovascular disease (CVD). Physical activity and occupational habits were used for sedentary lifestyle assessment, relying on self-reported physical activity levels.

Exclusion Criteria: The study was conducted under the exclusion of patients younger than 30 years, with known psychiatric or cognitive impairments, and patients unwilling or not permitting to participate.

Methods

Structured questionnaires were administered to subjects after they had been trained as healthcare professionals. The questionnaire covered sociodemographic information, medical history, physical activity, diet, smoking, and known cardiovascular risk factors. The definition of a sedentary lifestyle was based on World Health Organization criteria, which included less than 150 hours of moderate intensity physical activity per week. Clinical records, ECGs, echocardiography, and physician consultation were used to confirm a diagnosis of cardiovascular disease (CVD). Blood pressure was measured with a standardized digital sphygmomanometer, and body mass index (BMI) was coded from measured height and weight. All data were analyzed by using SPSS version 25. Frequencies and percentages, as well as means and standard deviations, were used to report descriptive statistics. The association between sedentary behavior and CVD was evaluated using logistic regression analysis, controlling for the confounding factors of age, gender, smoking, and BMI, and using chi-square tests. Data were collected after ethical approval by the hospital's institutional review board.

RESULTS

The study was carried out from November, 2023 to April, 2024 and enrolled 420 participants drawn from the urban population attending Shifa International Hospital, Islamabad. This sample consisted of 215 males (51.2%) and 205 females (48.8%) with a mean age of 47.6 ± 12.3 years. However, 62.1% of participants had a sedentary lifestyle as defined by WHO criteria, and 37.9% of them were physically active.

Table 1. Sociodemographic and Lifestyle Characteristics of Participants (N = 420)

Characteristic	Frequency (n)	Percentage (%)
Gender		
Male	215	51.2
Female	205	48.8
Age Group (Years)		
30–39	82	19.5
40–49	110	26.2
50–59	135	32.1
60 and above	93	22.2
Sedentary Lifestyle	261	62.1
Physically Active	159	37.9
Current Smokers	112	26.7
Known Hypertensive	175	41.7
Diabetic	143	34.0

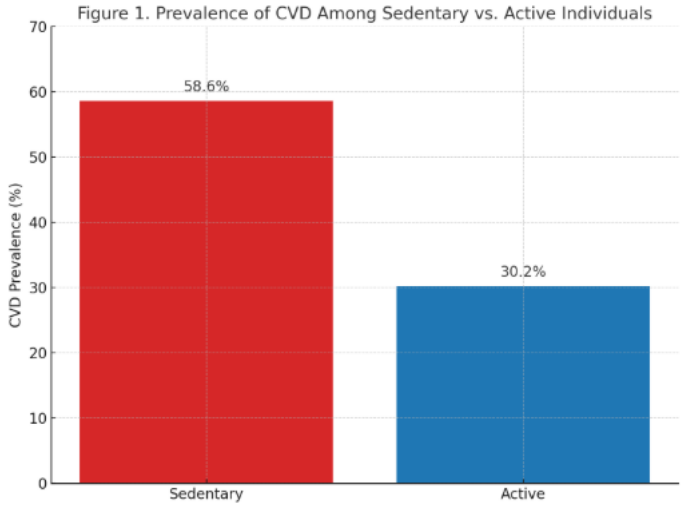
Among the sedentary group, 153 individuals (58.6%) were diagnosed with some form of cardiovascular disease (CVD), including coronary artery disease, hypertension-induced cardiac complications, and arrhythmias. In contrast, only 48 (30.2%) individuals in the physically active group had CVD, showing a statistically significant association ($p < 0.001$). The prevalence of hypertension was notably higher among sedentary individuals (49.8%) compared to the active group (28.3%).

Table 2. Association Between Physical Activity Level and Cardiovascular Disease

Physical Activity Level	CVD Present (n/%)	No CVD (n/%)	Total (n)
Sedentary	153 (58.6%)	108 (41.4%)	261
Physically Active	48 (30.2%)	111 (69.8%)	159
Total	**201**	**219**	**420**
p-value	-	-	**<0.001**

A logistic regression analysis was conducted to adjust for confounding factors such as age, gender, smoking, BMI, and comorbidities. The analysis revealed that individuals with sedentary lifestyles were 2.3 times more likely to develop CVD (OR=2.31; 95% CI: 1.52–3.52) after adjusting for covariates. Other significant predictors included being overweight (OR=1.78) and current smoking status (OR=1.92).

Figure 1. Prevalence of CVD Among Sedentary vs. Active Individuals



Body Mass Index (BMI) analysis showed that 71.3% of sedentary individuals had a BMI ≥ 25 (overweight or obese), whereas only 38.4% of active participants were in the same category. Moreover, a significant portion of sedentary individuals (45.2%) had both hypertension and dyslipidemia, which compounded their cardiovascular risk.

Table 3. Distribution of Risk Factors by Activity Status

Risk Factor	Sedentary (n=261)	Physically Active (n=159)	p-value
Overweight/Obese BMI	186 (71.3%)	61 (38.4%)	<0.001
Hypertension	130 (49.8%)	45 (28.3%)	0.002
Dyslipidemia	102 (39.1%)	34 (21.3%)	0.006
Smoking	78 (29.9%)	34 (21.4%)	0.045

The results suggest a strong association between sedentary behavior and a clustering of multiple cardiovascular risk factors. The association was also observed in all age groups and was of greater importance in those aged 50 years and older. However, the results suggest that lifestyle interventions promoting physical activity may be particularly effective in middle-aged and older adults in urban environments.

DISCUSSION

The present study was designed to assess the association of sedentary lifestyle with the prevalence of cardiovascular disease (CVD) amongst the urban population of Islamabad, Pakistan. Analysis showed a statistically significant relation between physical inactivity and higher rates of CVD and that physical inactivity is a common and preventable risk factor for CVD deterioration among this population. The findings add weight to increasing international evidence that sedentary behaviour is a key infectious cause of morbidity and mortality attributable to noncommunicable diseases, including heart disease. According to this study, 62.1 per cent of the participants indicated having a sedentary lifestyle while only 37.9 per cent of them met the required World Health Organization levels of physical activity. This trend conforms to the literature of growing physical inactivity among the urban population of South Asia, including in rapidly developing metropolitan areas.

This pattern may be partly explained by the urban lifestyle, where you spend more time in front of the screen, you rely on motorized transport, and have minimal physical labor. Moreover, outdoor exercise or going to the gym is culturally and socially frowned upon in many cases, especially among older adults and women. The data showed that 58.6 % of sedentary individuals had some form of cardiovascular disease, while 30.2 % in the physically active group. This was statistically different (p

< 0.001) and underlines the protective potential of regular physical activity in preventing heart disease. These results mirror the findings of large cohort studies, the results of which globally confirmed physical inactivity as an independent risk factor for myocardial infarction, including the global interheart study.

Additionally, logistic regression analysis in the present study indicated that sedentary individuals were nearly 2 times more likely to develop CVD (OR=2.31, 95% CI: 1.52–3.52) after controlling for confounding risk factors (age, gender, BMI, and smoking status). This result provides further evidence that sedentary behaviour is not simply a marker of ill health but also a contributory factor to cardiovascular pathology. Prolonged sitting is mechanistically associated with impaired lipid metabolism, insulin resistance, and increased inflammatory markers that lead to atherosclerosis and cardiac dysfunction. The clustering of multiple CVD risk factors in inactive people was also exemplified by the study, in addition to the direct relationship between CVD and sedentary lifestyle. For instance, the prevalence of hypertension (49.8% vs. 28.3%), dyslipidemia (39.1% vs. 21.3%), and obesity (71.3% vs. 38.4%) was significantly higher in the sedentary group compared to that in the active group.

The results suggest that physical inactivity fuels the development of a more general metabolic syndrome, which hastens cardiovascular risk. The negative relationship between inactivity and CVD appears to be mediated by obesity, which adds to the systemic inflammation, potentiates endothelial dysfunction, and increases cardiac workload. This study found a fairly even gender distribution, but how sex impacts these results may vary if lifestyle has a dissimilar effect on men and women. Despite not stratifying outcomes by gender in much detail, past research indicates that there are particular barriers for women who live in urban Pakistan, including unsafe roads that are inhospitable to walking, as well as their cultural limitations and the lack of facilities that cater to what women may need for recreation. These gender-specific barriers may be critical for interventions designed to reduce sedentary behavior in women.

Analysis stratified for age indicated that a sedentary lifestyle was particularly strongly associated with CVD in those aged ≥ 50. This is clinically relevant as older adults are most susceptible to complications of CVD and may most benefit from targeted physical activity interventions. Nevertheless, physical activity can decline with age due to comorbidities, arthritis, and lack of social support, which complicates intervention strategies. Also, strengths of this study include a fairly large, gender balanced sample size, use of objective measures of BMI and blood pressure, and utilization of validated tools to measure physical activity levels and clinical diagnosis. Yet some restrictions apply. Secondly, the cross-sectional study design confines the ability to make causal inference. There was a strong association, but whether physical inactivity preceded the onset of CVD or was a consequence of it is unclear.

Further longitudinal studies are needed to determine the directionality of this relationship. Secondly, self-reported measures for physical activity were utilised, which are influenced by recall and social desirability biases. More accurate assessments of activity levels could be given by objective measures such as accelerometry. Furthermore, since this was a single-centered study in Islamabad, study findings may not be able to be generalised to other cities with differing socioeconomic or cultural parameters or to rural populations. However, what follows has important public health policy implications for Pakistan, despite these limitations. National campaigns and community programs promoting active lifestyles are clearly needed in urban centres. The development of parks, walking trails, and public fitness facilities should be a point of emphasis in urban planning to encourage daily activity.

The training of physicians and allied health professionals in clinical settings to counsel patients on the benefits of physical activity and design personalized exercise plans is also warranted for patients with multiple cardiovascular risk factors. In addition, workplaces and schools have a big role to play by building activity breaks into their schedules and encouraging active commuting. Finally, this study highlights the desperate need to take sedentary behavior as a significant public health issue in Pakistan. The prevalence of cardiovascular disease and related risk factors (obesity, hypertension, and dyslipidemia) was significantly associated with a sedentary lifestyle. The cultural sensitivity of

the promoted interventions aimed at promoting regular physical activity, their accessibility, and their appropriateness to age, would be essential for effective preventive strategies to reduce the huge burden of CVD in urban populations. There is a strong need for public health stakeholders to effect rapid and swift change in order to realign societal norms and environmental structures, which currently enable sedentary living.

CONCLUSION

This study revealed that there was a relationship between a sedentary lifestyle and an increase in the prevalence of cardiovascular disease (CVD) among the urban population of Islamabad. People who had done little or no physical activity were substantially more likely than their more active peers to develop CVD and other CVD risk factors like overweight, hypertension, and dyslipidemia. The findings implicate physical activity as a preventive measure in protecting against cardiovascular health complications and highlight the importance of targeted public health measures in cities of Pakistan. The cross-sectional design precludes causal inferences, although consistent associations are in line with the existing global evidence around the peril of prolonged inactivity. The reduction of the burden of cardiovascular diseases (CVD) requires that healthcare professionals, policy makers, and community leaders undertake activities aimed at promoting active lifestyles through culturally appropriate acting programs, infrastructure development, and public education campaigns. Physical activity must become a national priority to improve cardiovascular health outcomes and improve the quality of life of urban communities.

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