

RESEARCH ARTICLE

Impact of Post-Pandemic Lifestyle Changes on the Incidence of Coronary Heart Disease in Urban Populations: A Retrospective Cohort Study

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Abstract:

The post-COVID-19 pandemic period has ushered in significant lifestyle changes, including shifts in dietary habits, physical activity, and stress levels, particularly in urban settings. This retrospective cohort study investigates the impact of these changes on the incidence of coronary heart disease (CHD) among urban adults in a tertiary care hospital in Western India from January 2022 to December 2024. Using medical records of 1,200 patients, we compared CHD incidence pre- and post-pandemic, adjusting for confounders like age, sex, and comorbidities. Results indicate a 15% increase in CHD incidence post-pandemic, associated with reduced physical activity (OR 1.8, 95% CI 1.3-2.5) and increased consumption of processed foods (OR 1.6, 95% CI 1.2-2.1). These findings underscore the need for targeted public health interventions to mitigate CHD risk in urban populations.

Keywords: Coronary heart disease, post-pandemic, lifestyle changes, urban population, India, retrospective cohort

INTRODUCTION

Coronary heart disease (CHD) remains a leading cause of mortality worldwide, claiming over 9 million lives annually, with urban populations facing elevated risks due to lifestyle-related factors.¹ The COVID-19 pandemic (2020–2022) disrupted global health systems, triggering significant lifestyle changes, including reduced physical activity, shifts in dietary habits, and increased psychological stress, particularly in urban settings. In India, where cardiovascular diseases account for approximately 27% of deaths, these changes may have amplified an already pressing public health challenge.² Understanding the impact of these post-pandemic shifts is critical for developing targeted preventive strategies in high-risk urban populations.

Prior research has well-documented traditional CHD risk factors, such as hypertension, diabetes, and smoking, but the effects of acute societal disruptions like pandemics remain underexplored.³ Recent studies suggest that lockdown measures reduced access to recreational facilities, promoting sedentary behavior,⁴ while economic pressures increased reliance on processed foods.⁵ However, there is a paucity of region-specific research in urban India, where cultural and socioeconomic factors uniquely influence lifestyle responses to global crises. This study addresses this gap by investigating the impact of post-pandemic lifestyle changes on CHD incidence in an urban cohort in Western India.

The central research question is: To what extent have post-pandemic changes in physical activity, diet, and

stress levels contributed to increased CHD incidence among urban adults in Western India? We hypothesize that reduced physical activity, increased processed food consumption, and elevated stress levels are significantly associated with higher CHD incidence post-pandemic. This research is significant as it provides evidence to guide public health interventions in urban India, where CHD prevalence is rising. Using a retrospective cohort design, we analyzed medical records from a tertiary care hospital in Ahmedabad, Western India, from 2022 to 2024, comparing CHD incidence with pre-pandemic baselines.

This paper is organized as follows: the Methods section outlines the study design and data collection; the Results section presents findings on CHD incidence and lifestyle associations; the Discussion explores implications and limitations; and the Conclusion offers recommendations for public health strategies.

MATERIAL AND METHOD

Study Design

We conducted a retrospective cohort study to explore how lifestyle changes after the COVID-19 pandemic affected the incidence of coronary heart disease (CHD) in an urban population. The study was carried out at a tertiary care hospital in Western India, focusing on data from January 2022 to December 2024. To understand the impact, we compared CHD incidence during this post-pandemic period with a pre-pandemic baseline from January 2018 to December 2020. This approach

allowed us to capture shifts in health outcomes tied to lifestyle changes following the pandemic.

Study Population

Our study included 1,200 adults aged 30 to 70 years who either received a CHD diagnosis or were evaluated for cardiovascular risk at our hospital's outpatient or inpatient departments. We focused on urban residents to reflect the unique lifestyle pressures of city life, such as high stress and limited physical activity spaces. Patients were identified using the International Classification of Diseases (ICD-10) codes I20–I25 for CHD, which includes conditions like angina and myocardial infarction. We excluded individuals with congenital heart defects, those living outside urban areas, or those with incomplete medical records to ensure data consistency.

Data Collection

We gathered data from the hospital's electronic health records, which provided a wealth of information about each patient. The data we collected included:

- **Demographic Details:** Age, sex, and socioeconomic status (based on occupation and income levels reported in patient intake forms).
- **Lifestyle Factors:** We looked at self-reported physical activity (measured as hours per week of moderate exercise), dietary habits (specifically the frequency of processed food consumption, like ready-to-eat meals or snacks), and stress levels (assessed using the Perceived Stress Scale, PSS-10, included in routine check-ups).
- **Clinical Information:** Body mass index (BMI), blood pressure, lipid profiles (cholesterol and triglycerides), smoking history, and comorbidities like diabetes or hypertension.
- **CHD Diagnosis:** Confirmed through diagnostic tests such as coronary angiography, electrocardiograms (ECG), or stress testing, as documented by cardiologists.

To ensure accuracy, two researchers independently reviewed the records, and any discrepancies were

resolved through discussion with a senior cardiologist.

Exposure and Outcome

The main exposure we studied was post-pandemic lifestyle changes, which we defined as:

1. **Reduced Physical Activity:** Less than 150 minutes per week of moderate exercise, such as brisk walking or cycling, based on WHO guidelines.
2. **Increased Processed Food Intake:** Consuming processed foods (e.g., packaged snacks, fast food) more than three times per week.
3. **Elevated Stress Levels:** A PSS-10 score greater than 20, indicating moderate to high stress.

The primary outcome was the incidence of new CHD diagnoses, identified as the first documented case of angina, myocardial infarction, or coronary artery disease in a patient's record during the study period.

Statistical Analysis

We started by summarizing patient characteristics, like age and BMI, using descriptive statistics—means and standard deviations for continuous variables and percentages for categorical ones. To calculate CHD incidence, we used person-years to account for varying follow-up times, expressing rates per 1,000 person-years. We then applied multivariable logistic regression to explore associations between lifestyle factors (physical activity, diet, stress) and CHD incidence, adjusting for potential confounders like age, sex, BMI, smoking status, and comorbidities. The results are presented as odds ratios (OR) with 95% confidence intervals (CI). A p-value less than 0.05 was considered statistically significant. All analyses were conducted using SPSS version 26, a reliable tool for handling this kind of data.

Ethical Considerations

The study was approved by the Institutional Ethics Committee of the tertiary care hospital in Ahmedabad. Since we used de-identified data from existing records, individual consent was not required. We followed strict data privacy protocols to protect patient information, ensuring compliance with ethical research standards.

RESULT:

Baseline Characteristics

Our study included 1,200 urban adults from a tertiary care hospital in Ahmedabad, Western India, with 580 patients from the pre-pandemic period (2018–2020) and 620 from the post-pandemic period (2022–2024). The group was 62% male, with an average age of 52.4 years (SD $\pm$ 8.7). Most participants were from middle-income households, reflecting Ahmedabad's urban demographic. When we looked at lifestyle changes, we found notable shifts post-pandemic: 68% of participants reported less than 150 minutes of weekly physical activity (compared to 42% pre-pandemic), 54% ate processed foods more than three times a week (up from 38%), and 47% had elevated stress levels with a PSS-10 score above 20 (up from 31%). These differences were statistically significant ($p < 0.001$ for all comparisons). Other factors, like smoking rates (22% pre- vs. 20% post-pandemic) and prevalence of diabetes (35% vs. 37%) or hypertension (40% vs. 42%), remained similar across periods.

CHD Incidence

We observed a clear rise in coronary heart disease (CHD) incidence post-pandemic. Before the pandemic, the incidence rate was 22.5 cases per 1,000 person-years, but this climbed to 26.0 cases per 1,000 person-years in the post-pandemic period—an increase of about 15% ($p = 0.02$). Specifically, we recorded 112 new myocardial infarctions and 188 cases of

angina post-pandemic, compared to 94 myocardial infarctions and 160 angina cases pre-pandemic. This uptick suggests that something about the post-pandemic environment is driving higher CHD rates.

Associations Between Lifestyle Factors and CHD Risk

To dig deeper, we used multivariable logistic regression to see how lifestyle changes were linked to CHD incidence, adjusting for age, sex, BMI, smoking, and comorbidities like diabetes and hypertension. The results pointed to three key factors:

- **Reduced Physical Activity:** People exercising less than 150 minutes per week had an 80% higher odds of developing CHD (OR 1.8, 95% CI 1.3–2.5, $p=0.001$). This was especially pronounced in older adults (aged 50+).
- **Increased Processed Food Intake:** Those eating processed foods more than three times a week showed a 60% increased odds of CHD (OR 1.6, 95% CI 1.2–2.1, $p=0.003$). This effect was stronger in women than men.
- **Elevated Stress Levels:** Participants with PSS-10 scores above 20 had a 40% higher odds of CHD (OR 1.4, 95% CI 1.0–1.9, $p=0.04$), with a notable impact among those with existing hypertension.

We also found interactions that amplified risk. For example, patients with diabetes who reported low physical activity had a higher CHD risk (OR 2.1, 95% CI 1.5–2.9), and those with hypertension and high stress levels faced a similar increase (OR 1.9, 95% CI 1.4–2.6). These findings highlight how lifestyle changes can hit harder when combined with existing health conditions.

Overall, our data show that the post-pandemic shift toward less exercise, more processed foods, and higher stress is closely tied to the rise in CHD cases in this urban population.

DISCUSSION

Our findings paint a clear picture of how life after the COVID-19 pandemic has reshaped heart health in urban Western India, with a noticeable 15% jump in coronary heart disease (CHD) incidence tied to less exercise, more junk food, and higher stress levels. This aligns with what we've seen in broader studies, where the pandemic's lingering effects—like remote work keeping people glued to screens and supply disruptions pushing folks toward convenient but unhealthy eats—have cranked up cardiovascular risks.^{4,5} In urban settings, where space for physical activity is already limited, these changes hit harder, much like reports from other densely populated areas showing similar spikes in heart issues post-lockdown.⁶

Diving deeper, the 80% higher odds of CHD from reduced physical activity echoes global trends where sedentary lifestyles during quarantines led to poorer heart outcomes.^{7,8} In India, where urban life often means long commutes and desk jobs, the shift to home-based routines amplified this, as seen in studies from Kashmir highlighting more inactivity in city dwellers.⁹ Similarly, our link between processed food binges and a 60% risk increase mirrors research on how pandemic stress and isolation drove comfort eating, worsening metabolic profiles and paving the way for artery-clogging issues.^{10,11} And let's not overlook stress—our 40% bump in odds for those with high PSS-10 scores fits with evidence that chronic worry from job losses or health fears triggers inflammation and blood pressure hikes, supercharging CHD risk.^{12,13}

These results aren't just numbers; they spotlight the need for smarter public health moves in cities like Ahmedabad. Think community programs for easy-access workouts, campaigns promoting home-cooked meals, and mental health support to dial down stress—

all of which could curb this rising tide.^{14,15} Especially for folks already dealing with diabetes or hypertension, where we saw amplified risks, tailored interventions could make a real difference, building on lessons from pandemic-era telehealth successes.^{16,17}

That said, our study has its limits. Being based at one hospital means we might not capture the full urban picture across India, and relying on self-reported habits could introduce some bias—people aren't always spot-on about their diets or stress.¹⁸ Plus, we didn't dive into long-term follow-ups, so we're missing how these changes play out over years. Future work should go multi-center, track patients longer, and maybe incorporate wearables for more accurate lifestyle data to build a stronger case.^{19,20}

In wrapping up, the post-pandemic world has nudged urban lifestyles in ways that are tough on the heart, but recognizing this is the first step toward turning things around with proactive strategies.

CONCLUSION

This study reveals a concerning 15% rise in coronary heart disease (CHD) incidence among urban adults in Western India following the COVID-19 pandemic, driven by significant lifestyle shifts. Reduced physical activity, increased reliance on processed foods, and heightened stress levels emerged as key contributors, amplifying CHD risk, particularly in those with diabetes and hypertension. These findings highlight the urgent need for public health interventions tailored to urban populations, where fast-paced lifestyles and post-pandemic challenges converge. We recommend community-based programs to promote accessible exercise options, such as urban walking groups or subsidized gym access, alongside education campaigns to encourage healthier eating habits and stress

management techniques like mindfulness or counseling. While our study provides valuable insights from a single tertiary care hospital, broader multi-center research is essential to confirm these trends across diverse urban settings in India and beyond. By addressing these modifiable lifestyle factors, we can take meaningful steps toward reducing the growing burden of CHD in urban communities.

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