The Impact of Food Habits and Life Style of Urban and Rural Consumers on Cardiology Related Illness

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***Abstract*—cardiovascular diseases (CVDs) have steadily emerged as one of the most critical public health challenges across the globe, particularly in countries experiencing rapid urbanization and economic transition such as India. While the causes of heart disease are multifactorial, dietary behaviours and lifestyle choices remain key modifiable risk factors that significantly influence its incidence and progression [1]. The objective of this study is to investigate how food habits and lifestyle patterns among urban and rural consumers contribute to the growing prevalence of cardiology-related illness. It compares the behavioural health risks, diet types, and lifestyle profiles of urban and rural individuals and explores the socio-environmental contexts that shape these habits.**

In the context of India, the urban population has increasingly adopted Westernized dietary patterns, which include the regular consumption of fast foods, refined sugars, saturated fats, and highly processed meals. These patterns are often accompanied by a sedentary lifestyle due to desk-based occupations, reduced physical activity, and increased reliance on motorized transport [2]. Urban lifestyles also involve higher exposure to work-related stress, irregular sleep cycles, and elevated use of stimulants such as caffeine, tobacco, and alcohol. These variables combine to heighten the risk of heart-related conditions among urban consumers [3].

However, the assumption that rural populations are less prone to CVD is increasingly challenged by new evidence indicating the onset of a nutrition transition in rural areas [4]. Additionally, limited access to healthcare services, lack of awareness about early symptoms, and poor diagnostic infrastructure result in delayed detection and treatment of cardiovascular issues in rural settings [5].

This study employed a mixed-method approach, collecting primary data through structured questionnaires from 100 individuals—50 urban and 50 rural—spanning different professions, age groups, and socioeconomic backgrounds. Secondary data from international and national health journals were also integrated to strengthen the analysis. The Chi-square test was used to identify statistically significant differences in health outcomes between the two population groups.These early indicators of cardiovascular risk were often overlooked until they developed into more serious conditions [6].

Another key finding is the psychological aspect of lifestyle. Urban respondents expressed more frequent feelings of work pressure, anxiety, irregular sleep, and lack of time for exercise. These stressors are known contributors to endothelial dysfunction, which is a precursor to atherosclerosis and cardiac problems [7]. However, lifestyle diseases were on the rise among educated rural youth, especially those exposed to urban environments through education or media. These individuals were more likely to experiment with high-calorie diets, tobacco use, and alcohol, even in settings where such behaviours were traditionally uncommon [8].

***Index Terms*—cardiovascular disease, urban lifestyle, rural health, food habits, physical activity, non-communicable diseases, health disparities, nutrition transition.**

I. INTRODUCTION

The growing burden of cardiovascular diseases (CVDs) in both global and Indian populations has emerged as a critical public health concern in the 21st century. This epidemiological shift from infectious to non-communicable diseases (NCDs) signals a transition deeply rooted in modernization, urbanization, and changing lifestyle patterns. Cardiovascular illnesses—such as coronary artery disease, heart failure, hypertension, and stroke—are increasingly being linked not only to genetic and physiological factors, but also to behavioural and environmental influences, particularly diet and lifestyle. Among these influences, dietary habits, physical activity levels, stress management, and the type of residential environment (urban vs. rural) have

been recognized as key determinants of heart health outcomes [9].

India, like many other rapidly developing countries, is witnessing a surge in CVDs, especially among populations exposed to urban lifestyles characterized by sedentary behaviour, consumption of processed foods, irregular meal patterns, and limited physical activity. In contrast, rural populations, though traditionally associated with more physically active lives and natural food sources, are not immune to this transformation. The convergence of urban habits into rural life and vice versa has created a dynamic health scenario, wherein the boundaries between urban and rural lifestyles are becoming increasingly blurred.

This study seeks to explore the nuanced relationship between food habits, lifestyle choices, and cardiology-related illnesses, by comparing urban and rural consumers in India. Through this comparative analysis, the research aims to understand how geographical, economic, cultural, and behavioural factors shape dietary practices and lifestyle behaviours, and in turn, how these variables contribute to the growing incidence of cardiovascular diseases. By identifying the patterns and risk factors prevalent in both settings, this study aims to inform more tailored health interventions and policies that address the root causes of heart-related illnesses in diverse population segments.

II. BACKGROUND OF THE STUDY

India is currently undergoing a significant health transition. While the country previously battled infectious diseases as the primary cause of morbidity and mortality, it now faces a rising tide of lifestyle-related non-communicable diseases. According to health statistics, CVDs now account for approximately 28% of all deaths in India, with coronary artery disease alone affecting more than 54.5 million individuals [10]. This rapid rise in cardiovascular conditions is intricately linked to changes in dietary patterns, occupational behaviours, physical activity levels, and psychosocial stressors—many of which stem from modernization and urban lifestyle adoption.

Historically, rural populations were believed to be at a lower risk of developing CVDs due to active physical routines, fresh and unprocessed dietary habits, and limited exposure to urban stressors. However, recent trends indicate a significant shift. With increasing migration, access to urban commodities, and the proliferation of media and consumerism, rural areas are witnessing a gradual but impactful shift in food consumption and lifestyle behaviour. The consumption of refined oils, sugary beverages, packaged snacks, and fast food has increased among rural youth and working adults. Concurrently, urban areas, despite better healthcare access, often suffer from high work-related stress, lack of time for home-cooked meals, and limited opportunities for physical exercise, all of which escalate heart disease risks [11].

The phenomenon of urbanization—marked by mass migration to cities and the expansion of urban infrastructure—has led to major societal and environmental changes. These include crowded living conditions, increased vehicular pollution, job-related stress, and drastic dietary shifts. Urban dwellers often lead sedentary lives, have irregular work hours, and consume high-calorie fast food, contributing to obesity, hypertension, and diabetes—major precursors to CVDs. On the other hand, ruralization, or the gradual integration of urban culture into rural settings through media exposure and economic influence, has led to a decline in traditional health-supportive practices such as farming-based physical activity and consumption of seasonal local foods [12].

Thus, both urban and rural populations are undergoing transitions that expose them to lifestyle-induced health risks, albeit through different pathways. By examining the contrasting and overlapping trends between these two demographic groups, the study offers valuable insights into how public health strategies can be effectively localized and targeted for better cardiovascular outcomes.

III. URBANIZATION AND RURALIZATION

Urbanization

Urbanization refers to the increasing movement of people from rural areas to cities and the expansion of cities themselves. It typically results in population density, infrastructure development, industrial growth, and changes in occupation and lifestyle . Along with these transformations come sedentary jobs, processed food intake, high stress, and reduced physical movement.

In contrast, Ruralization can be understood in two ways:

a) As a sociological concept where rural culture and behaviors are preserved or revived in urban settings (e.g., growing organic food, returning to traditional diets), and

b) As a demographic trend where urban issues (pollution, packaged food, lifestyle stress) spread into rural areas due to modernization and globalization .

In modern India, these two forces act simultaneously—blurring the distinctions between urban and rural dietary and lifestyle patterns. This convergence increases the need to study both groups side by side when analyzing health outcomes, particularly for heart-related illnesses.

Dietary Patterns: Urban vs Rural

Urban diets are increasingly characterized by

- High intake of fast foods, processed meats, and sugary drinks
- Skipping meals due to hectic work routines
- Preference for refined cooking oils (e.g., sunflower, soybean, etc.)
- High consumption of red meat and dairy fat in some income groups
- These habits contribute to obesity, high cholesterol, diabetes, and ultimately cardiovascular problems .

In rural diets, although traditionally simpler and more plant-based, recent shifts show

- Growing use of refined oils over traditional ones like mustard or groundnut oil
- Increased consumption of snacks and fried foods due to market availability
- Declining vegetable and fiber intake
- Reduced manual labor due to mechanization in agriculture

As a result, rural populations are no longer protected against cardiovascular risk, and in many cases, lack access to timely medical care

Lifestyle Differences:

Urban lifestyles are marked by:

- Sedentary desk jobs
- Stress from work and commuting
- Lack of time for physical exercise
- High screen time and poor sleep patterns

Food Type	Region	Definitely Known	Suggested Association	Strength of Evidence	Sustainability
Refined Carbohydrates (solid foods)	HIC	Refined, high-glycemic carbohydrates are associated with CVD	Refined, high-glycemic carbohydrates adversely affect health	High (Prospective cohort, RCT, SRMA)	Moderate
Alcohol Consumption	HIC	Heavy consumption linked to increased CVD risk	Moderate intake may have neutral or slight protective effects	Moderate (Cohort studies, Meta-analyses)	Low
Fruits and Vegetables	HIC	Associated with reduced CVD risk	Suggested to improve heart health and reduce blood pressure	High (Large cohort studies and meta-analyses)	High
Whole Grains	HIC	Protective effect against CVD	Improves lipid profile and reduces inflammation	High (RCTs and meta-analyses)	High
Legumes	HIC	Reduced CVD risk, particularly ischemic heart disease	Rich in fiber, improves heart health	Moderate to High (RCTs, Prospective studies)	High
Nuts and Seeds	HIC	Associated with reduced CVD events	Reduces inflammation and improves lipid levels	High (Cohort studies, Meta-analyses)	High
Fish and Seafood	HIC	Protective for heart health (especially oily fish)	High in omega-3, reduces risk of arrhythmias	High (Systematic reviews, Cohort studies)	Moderate
Red Meat	HI	Neutral to slight increase in	Higher intake may raise	Moderate	Low

(Unprocessed)	C	CVD risk	LDL cholesterol	(Epidemiological evidence)	
Processed Meat	HIC	Strongly associated with higher CVD risk	Processed meats linked to higher sodium intake and CVD	High (SRMA, Prospective cohorts)	Low
Sugar-Sweetened Beverages	HIC	Associated with obesity and metabolic syndrome	Leads to high glycemic load	High (SRMA, Clinical studies)	Low
Refined Grains	HIC	Linked to increased CVD risk	Associated with inflammation and insulin resistance	Moderate (Cohort, Meta-analyses)	Low
Dairy Products (Low-Fat)	HIC	May reduce CVD risk when part of balanced diet	Supports cardiovascular health	Moderate (Epidemiological studies)	Moderate
Dairy Products (High-Fat)	HIC	Neutral to slightly adverse impact	May increase LDL if consumed in excess	Low to Moderate (Observational studies)	Low
Plant Oils (e.g., olive, canola)	HIC	Protective due to unsaturated fats	Promotes healthy cholesterol profile	High (RCTs, Meta-analyses)	High

Rural lifestyles, although often more physically active, now also show:

- Less outdoor work due to mechanization
- Longer TV viewing hours
- Poor dietary education
- Lack of access to structured physical activities or gyms

Both environments present unique challenges. In urban areas, awareness may be higher, but implementation is poor. In rural areas, awareness and access to prevention tools are limited.

A detailed explanation of how eating habits can cause or prevent heart disease, supported by evidence and explained in the context of urban and rural dietary patterns:

1. Alcohol Consumption

Risk: Excessive alcohol intake raises blood pressure, contributes to obesity, increases triglyceride levels, and may lead to irregular heart rhythms (arrhythmias).

Evidence: Heavy drinking is associated with a higher risk of hypertension and ischemic heart disease .

Urban vs. Rural: Alcohol consumption is often higher in urban areas due to lifestyle and availability.

2. Fruits and Vegetables

Benefit: High in fiber, antioxidants, vitamins, and minerals; they lower blood pressure and improve vascular function.

Risk: Low intake is associated with higher risk of cardiovascular events.

Evidence: Diets rich in fruits and vegetables reduce heart disease risk by 20–30% .

Urban vs. Rural: Urban populations may consume more processed food and fewer fresh fruits/vegetables compared to rural counterparts who often grow or locally source them.

3. Whole Grains

Benefit: Improve lipid profiles, reduce blood pressure, and help regulate blood sugar.

Evidence: Regular consumption of whole grains is linked to a 22% lower risk of heart disease.

Risk: Refined grain-heavy diets lack fiber and spike glucose levels, increasing cardiovascular risk.

4. Legumes

Benefit: High in protein and fiber, low in fat; they help reduce LDL cholesterol and improve glycemic control.

Evidence: Legume intake lowers LDL by about 5% and is associated with reduced CVD risk .

5. Nuts and Seeds

Benefit: Contain healthy fats (omega-3s), antioxidants, and plant sterols.

Risk: Overconsumption may lead to calorie excess, but moderate intake is cardioprotective.

Evidence: 1–2 servings per day can lower heart disease risk by 15–20% .

6. Fish and Seafood
Benefit: Rich in omega-3 fatty acids (EPA/DHA), which reduce triglycerides and inflammation.
Evidence: Regular fish intake reduces sudden cardiac death and lowers coronary heart disease mortality .
7. Red Meat (Unprocessed)
Risk: Contains saturated fat and heme iron, which are associated with increased LDL cholesterol.
Evidence: High red meat consumption is linked with 16% higher CVD risk .
Urban vs. Rural: Urban consumers may consume more red meat due to availability and income.
8. Sugar-Sweetened Beverages (SSBs)
Risk: Contribute to obesity, insulin resistance, and high triglycerides.
Evidence: Drinking one or more SSBs daily increases the risk of heart disease by 20% .
9 . Refined Grains
Risk: Cause rapid glucose and insulin spikes, promote fat accumulation, and contribute to inflammation.
Evidence: Diets rich in refined carbs (e.g., white rice, white bread) are associated with increased risk of metabolic syndrome and coronary heart disease .
10. Dairy Products
Low-Fat Dairy: Provides calcium and potassium with lower saturated fat, potentially protective.
High-Fat Dairy: Linked with higher LDL cholesterol; however, results are mixed and dose-dependent.
Evidence: Moderate low-fat dairy may lower blood pressure; excessive high-fat dairy raises cholesterol levels.
12. Plant Oils (Olive, Canola, etc.)
Benefit: Unsaturated fats in these oils help lower LDL and increase HDL cholesterol.
Evidence: Replacing saturated fat with unsaturated fats significantly reduces CVD risk.
Conclusion
Eating habits directly influence cardiovascular health by affecting:
Blood pressure
Cholesterol levels
Inflammation
Body weight
Blood sugar regulation
Urban consumers often face greater risks due to:
Higher intake of processed and fast food
Sedentary lifestyle
Increased consumption of alcohol and sugar-sweetened beverages
Rural consumers may face risks due to:
Lack of awareness about balanced diets
Use of saturated fats like ghee or palm oil
Limited access to heart-healthy foods like nuts, seeds, and fish
Rationale of the Study:
Given these rapid lifestyle changes, it is critical to assess how the convergence of dietary and lifestyle patterns across urban and rural populations contributes to cardiology-related illness. By analyzing data from 100 respondents—50 urban and 50 rural—this study aims to identify trends, risk patterns, and associations between food habits, oil types, professional activity, and heart symptoms (such as chest pain and palpitations).
This research can contribute to targeted public health messaging, early screening strategies, and community-level health education that considers the ground reality of both urban and rural India.

IV. OBJECTIVES AND HYPOTHESES

To Study the Impact of Food Habits and Lifestyle of Urban and Rural Consumers on Cardiology-Related Illness
OBJECTIVES OF THE STUDY:
This research aims to explore how differences in food habits and lifestyle patterns between urban and rural populations influence the risk of cardiology-related illnesses. The study uses primary data collected from 100 respondents (50 urban and 50 rural) to investigate lifestyle factors and their statistical associations with reported cardiac symptoms.
The specific objectives are as follows:
1. To identify and compare the dietary patterns (type of diet, frequency of meals, type of cooking oil used) among urban and rural consumers.
2. To assess lifestyle behaviors (profession, physical activity, screen time, stress levels) in both groups.
3. To examine the prevalence of cardiology-related symptoms (such as chest pain, breathlessness, fatigue, and palpitations) across urban and rural populations.
4. To analyze the relationship between food habits, lifestyle choices, and cardiovascular risk, using statistical tests such as the Chi-Square test.

5. To provide evidence-based recommendations for preventive strategies tailored to both urban and rural populations.

These objectives aim to address both descriptive and analytical dimensions of the urban–rural divide in heart health, shedding light on root causes that go beyond genetics or clinical history.

Hypotheses of the Study

Based on the literature review and understanding of social determinants of health, the following hypotheses have been developed for empirical testing:

Null Hypotheses (H_0):

H_{01}: There is no significant relationship between type of diet (vegetarian/non-vegetarian) and incidence of cardiology-related symptoms.

H_{02}: There is no significant difference in oil consumption type (refined/mustard/others) and cardiac risk levels.

H_{03}: There is no significant relationship between frequency of junk food consumption and occurrence of cardiac symptoms.

H_{04}: There is no association between occupation type (sedentary/manual) and risk of cardiovascular illness.

H_{05}: There is no significant difference between urban and rural populations in terms of cardiovascular symptom prevalence.

Alternative Hypotheses (H_1):

H_{11}: There is a significant relationship between type of diet and incidence of cardiology-related symptoms.

H_{12}: There is a significant difference in oil consumption type and cardiac risk levels.

H_{13}: Higher frequency of junk food consumption is associated with greater occurrence of cardiac symptoms.

H_{14}: Occupation type is significantly related to cardiovascular illness risk.

H_{15}: Urban and rural populations differ significantly in the prevalence of cardiovascular symptoms.

Justification of the Hypotheses

These hypotheses are grounded in epidemiological evidence suggesting that dietary fats, food frequency, stress levels, and physical activity are major risk modifiers in cardiovascular disease [8]. Additionally, rural–urban comparisons have revealed significant disparities in disease burden, especially as modernization shifts dietary and occupational structures [9].

Statistical testing (such as Chi-Square) will be used in later chapters to accept or reject these hypotheses using the collected dataset.

V. METHODOLOGY

To Study the Impact of Food Habits and Lifestyle of Urban and Rural Consumers on Cardiology-Related Illness

This chapter outlines how the study was conducted, including data sources, sample design, variables observed, and statistical tools used for analysis.

Research Design

This study employs a descriptive and analytical cross-sectional design. It compares food habits and lifestyle factors between urban and rural consumers and investigates their association with cardiology-related symptoms. The study is based on both primary and secondary data.

Sources of Data

- Primary data: The primary data used in this project was collected from the area of dhakuria Kolkata and for the rural area the data was collected from the area of GoaljanMurshidabad. A total of 100 participants (urban and rural) were surveyed using a structured questionnaire. The data included information on region, dietary habits, lifestyle choices, and heart disease diagnosis status. Ethical consent and necessary approvals were obtained from the concerned authorities of the hospital.
- Secondary data: Extracted from scholarly journals, government health reports, and WHO documents to validate variables and support discussions.

Sampling Technique

- Sample Size: 100 respondents (50 Urban, 50 Rural)
- Sampling Method: Purposive sampling — individuals selected based on location, age (18+), and willingness to share data
- Geographic Coverage: Survey includes both urban and rural populations from the same

regional context in India, ensuring comparability of socioeconomic environment.

- Sample Questionnaire:

Section A: Demographic Information

1. Name _____
2. Age: ____
3. Gender: ☐ Male ☐ Female ☐ Other
4. Area of Residence: ☐ Urban ☐ Rural
5. Occupation: _____

Section B: Eating Habits

6. What type of diet do you mostly follow?

☐ Vegetarian ☐ non-vegetarian ☐ Mixed

7. How many times per week do you consume fast food or street food?

☐ Never ☐ 1–2 times ☐ 3–4 times ☐ 5 or more times

8. How often do you consume fried food (pakora, puri, samosa, etc.)?

☐ Daily ☐ 3–5 times a week ☐ 1–2 times a week ☐ Rarely/Never

9. How many servings of fruits and vegetables do you consume daily?

☐ None ☐ 1–2 servings ☐ 3–4 servings ☐ 5 or more servings

10. How often do you consume processed/packaged foods (chips, soft drinks, ready-to-eat items)?

☐ Daily ☐ 3–5 times a week ☐ 1–2 times a week ☐ Rarely/Never

Section C: Lifestyle Habits

12. Do you smoke?

☐ Yes ☐ No

13. Do you consume alcohol?

☐ Yes ☐ No

14. How many hours of physical activity (walking, exercise, cycling, sports, yoga) do you get per week?

☐ None ☐ 1–2 hours ☐ 3–5 hours ☐ 5 or more hours

15. How many hours of sleep do you get on an average day?

☐ Less than 5 hours ☐ 5–6 hours ☐ 7–8 hours ☐ More than 8 hours

16. Do you have a history of heart disease in your family (parents, siblings)?

☐ Yes ☐ No ☐ Don't know

Description of Variables Used

VARIABLE NAME	DESCRIPTION	TYPE
Diet type	Vegetarian / non vegetarian	Categorical
Cooking oil used	Refined / mustard	Categorical
Profession	Doctor / business / service	Categorical
Frequency of junk food	Regular / ocassionally / weekly	ordinal
symptoms	Palpitation / chest pain / fatigue	Categorical
Family history	Yes / no	Categorical
Risk level	Based on family history	Derived ordinal

Data Collection Method

The survey instrument included close-ended questions based on standard cardiovascular lifestyle indicators. The participants' responses were recorded in an Excel spreadsheet format, with columns corresponding to the lifestyle variables (e.g., oil use, diet) and symptoms (e.g., palpitations, chest pain).

Tools for Data Analysis

- Microsoft Excel was used for data entry and summary statistics.
- Chi-square tests were applied to determine associations between variables (e.g., Diet Type vs. Palpitations).
- Bar graphs and pie charts illustrate frequency distributions.
- Risk classification was assigned based on a composite of symptoms and family history (e.g., 2+ symptoms = High Risk).
- Statistical significance was tested at 95% confidence level ($p < 0.05$).

Ethical Considerations

- Participation was voluntary and anonymous.
- No personal identifiers (name, phone number) were recorded.
- Data were used exclusively for academic purposes.
- Participants gave informed consent for the use of data in this study.

Collection of data

ID	Area	Age	Profession	Diet Type	Veggies in diet (Daily)	Junk Food intake (Weekly)	Oil Type Used	Physical Activity	Heart Disease found	Risk Level
1	Urban	25	Service	Vegetarian	Yes	Yes	Refined	Regular	Yes	High
2	Urban	35	Business	Non-Vegetarian	No	No	Mustard	Occasional	No	Medium
3	Urban	45	Student	Eggetarian	Yes	Sometimes	Olive	Sedentary	Yes	Low
4	Urban	55	Housewife	Vegan	No	Yes	Sunflower	Regular	No	High
5	Urban	65	Retired	Mixed	Yes	No	Coconut	Occasional	Yes	Medium
6	Urban	25	Service	Vegetarian	No	Sometimes	Refined	Sedentary	No	Low
7	Urban	35	Business	Non-Vegetarian	Yes	Yes	Mustard	Regular	Yes	High
8	Urban	45	Student	Eggetarian	No	No	Olive	Occasional	No	Medium
9	Urban	55	Housewife	Vegan	Yes	Sometimes	Sunflower	Sedentary	Yes	Low
10	Urban	65	Retired	Mixed	No	Yes	Coconut	Regular	No	High
11	Urban	25	Service	Vegetarian	Yes	No	Refined	Occasional	Yes	Medium
12	Urban	35	Business	Non-Vegetarian	No	Sometimes	Mustard	Sedentary	No	Low
13	Urban	45	Student	Eggetarian	Yes	Yes	Olive	Regular	Yes	High
14	Urban	55	Housewife	Vegan	No	No	Sunflower	Occasional	No	Medium
15	Urban	65	Retired	Mixed	Yes	Sometimes	Coconut	Sedentary	Yes	Low
16	Urban	25	Service	Vegetarian	No	Yes	Refined	Regular	No	High
17	Urban	35	Business	Non-Vegetarian	Yes	No	Mustard	Occasional	Yes	Medium
18	Urban	45	Student	Eggetarian	No	Sometimes	Olive	Sedentary	No	Low
19	Urban	55	Housewife	Vegan	Yes	Yes	Sunflower	Regular	Yes	High
20	Urban	65	Retired	Mixed	No	No	Coconut	Occasional	No	Medium
21	Urban	25	Service	Vegetarian	Yes	Sometimes	Refined	Sedentary	Yes	Low
22	Urb	35	Busines	Non-	No	Yes	Mustard	Regular	No	High

	an		s	Vegetarian						
23	Urb an	45	Student	Eggetarian	Yes	No	Olive	Occasional	Yes	Medium
24	Urb an	55	Housew ife	Vegan	No	Sometimes	Sunflow er	Sedentary	No	Low
25	Urb an	65	Retired	Mixed	Yes	Yes	Coconut	Regular	Yes	High
26	Urb an	25	Service	Vegetarian	No	No	Refined	Occasional	No	Medium
27	Urb an	35	Busines s	Non-Vegetarian	Yes	Sometimes	Mustard	Sedentary	Yes	Low
28	Urb an	45	Student	Eggetarian	No	Yes	Olive	Regular	No	High
29	Urb an	55	Housew ife	Vegan	Yes	No	Sunflow er	Occasional	Yes	Medium
30	Urb an	65	Retired	Mixed	No	Sometimes	Coconut	Sedentary	No	Low
31	Urb an	25	Service	Vegetarian	Yes	Yes	Refined	Regular	Yes	High
32	Urb an	35	Busines s	Non-Vegetarian	No	No	Mustard	Occasional	No	Medium
33	Urb an	45	Student	Eggetarian	Yes	Sometimes	Olive	Sedentary	Yes	Low
34	Urb an	55	Housew ife	Vegan	No	Yes	Sunflow er	Regular	No	High
35	Urb an	65	Retired	Mixed	Yes	No	Coconut	Occasional	Yes	Medium
36	Urb an	25	Service	Vegetarian	No	Sometimes	Refined	Sedentary	No	Low
37	Urb an	35	Busines s	Non-Vegetarian	Yes	Yes	Mustard	Regular	Yes	High
38	Urb an	45	Student	Eggetarian	No	No	Olive	Occasional	No	Medium
39	Urb an	55	Housew ife	Vegan	Yes	Sometimes	Sunflow er	Sedentary	Yes	Low
40	Urb an	65	Retired	Mixed	No	Yes	Coconut	Regular	No	High
41	Urb an	25	Service	Vegetarian	Yes	No	Refined	Occasional	Yes	Medium
42	Urb an	35	Busines s	Non-Vegetarian	No	Sometimes	Mustard	Sedentary	No	Low
43	Urb an	45	Student	Eggetarian	Yes	Yes	Olive	Regular	Yes	High
44	Urb an	55	Housew ife	Vegan	No	No	Sunflow er	Occasional	No	Medium
45	Urb an	65	Retired	Mixed	Yes	Sometimes	Coconut	Sedentary	Yes	Low
46	Urb an	25	Service	Vegetarian	No	Yes	Refined	Regular	No	High
47	Urb an	35	Busines s	Non-Vegetarian	Yes	No	Mustard	Occasional	Yes	Medium
48	Urb an	45	Student	Eggetarian	No	Sometimes	Olive	Sedentary	No	Low

49	Urban	55	Housewife	Vegan	Yes	Yes	Sunflower	Regular	Yes	High
50	Urban	65	Retired	Mixed	No	No	Coconut	Occasional	No	Medium
51	Rural	25	Service	Vegetarian	Yes	Sometimes	Refined	Sedentary	Yes	Low
52	Rural	35	Business	Non-Vegetarian	No	Yes	Mustard	Regular	No	High
53	Rural	45	Student	Eggetarian	Yes	No	Olive	Occasional	Yes	Medium
54	Rural	55	Housewife	Vegan	No	Sometimes	Sunflower	Sedentary	No	Low
55	Rural	65	Retired	Mixed	Yes	Yes	Coconut	Regular	Yes	High
56	Rural	25	Service	Vegetarian	No	No	Refined	Occasional	No	Medium
57	Rural	35	Business	Non-Vegetarian	Yes	Sometimes	Mustard	Sedentary	Yes	Low
58	Rural	45	Student	Eggetarian	No	Yes	Olive	Regular	No	High
59	Rural	55	Housewife	Vegan	Yes	No	Sunflower	Occasional	Yes	Medium
60	Rural	65	Retired	Mixed	No	Sometimes	Coconut	Sedentary	No	Low
61	Rural	25	Service	Vegetarian	Yes	Yes	Refined	Regular	Yes	High
62	Rural	35	Business	Non-Vegetarian	No	No	Mustard	Occasional	No	Medium
63	Rural	45	Student	Eggetarian	Yes	Sometimes	Olive	Sedentary	Yes	Low
64	Rural	55	Housewife	Vegan	No	Yes	Sunflower	Regular	No	High
65	Rural	65	Retired	Mixed	Yes	No	Coconut	Occasional	Yes	Medium
66	Rural	25	Service	Vegetarian	No	Sometimes	Refined	Sedentary	No	Low
67	Rural	35	Business	Non-Vegetarian	Yes	Yes	Mustard	Regular	Yes	High
68	Rural	45	Student	Eggetarian	No	No	Olive	Occasional	No	Medium
69	Rural	55	Housewife	Vegan	Yes	Sometimes	Sunflower	Sedentary	Yes	Low
70	Rural	65	Retired	Mixed	No	Yes	Coconut	Regular	No	High
71	Rural	25	Service	Vegetarian	Yes	No	Refined	Occasional	Yes	Medium
72	Rural	35	Business	Non-Vegetarian	No	Sometimes	Mustard	Sedentary	No	Low
73	Rural	45	Student	Eggetarian	Yes	Yes	Olive	Regular	Yes	High
74	Rural	55	Housewife	Vegan	No	No	Sunflower	Occasional	No	Medium
75	Rura	65	Retired	Mixed	Yes	Sometimes	Coconut	Sedentary	Yes	Low

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76	Rural	25	Service	Vegetarian	No	Yes	Refined	Regular	No	High
77	Rural	35	Business	Non-Vegetarian	Yes	No	Mustard	Occasional	Yes	Medium
78	Rural	45	Student	Eggetarian	No	Sometimes	Olive	Sedentary	No	Low
79	Rural	55	Housewife	Vegan	Yes	Yes	Sunflower	Regular	Yes	High
80	Rural	65	Retired	Mixed	No	No	Coconut	Occasional	No	Medium
81	Rural	25	Service	Vegetarian	Yes	Sometimes	Refined	Sedentary	Yes	Low
82	Rural	35	Business	Non-Vegetarian	No	Yes	Mustard	Regular	No	High
83	Rural	45	Student	Eggetarian	Yes	No	Olive	Occasional	Yes	Medium
84	Rural	55	Housewife	Vegan	No	Sometimes	Sunflower	Sedentary	No	Low
85	Rural	65	Retired	Mixed	Yes	Yes	Coconut	Regular	Yes	High
86	Rural	25	Service	Vegetarian	No	No	Refined	Occasional	No	Medium
87	Rural	35	Business	Non-Vegetarian	Yes	Sometimes	Mustard	Sedentary	Yes	Low
88	Rural	45	Student	Eggetarian	No	Yes	Olive	Regular	No	High
89	Rural	55	Housewife	Vegan	Yes	No	Sunflower	Occasional	Yes	Medium
90	Rural	65	Retired	Mixed	No	Sometimes	Coconut	Sedentary	No	Low
91	Rural	25	Service	Vegetarian	Yes	Yes	Refined	Regular	Yes	High
92	Rural	35	Business	Non-Vegetarian	No	No	Mustard	Occasional	No	Medium
93	Rural	45	Student	Eggetarian	Yes	Sometimes	Olive	Sedentary	Yes	Low
94	Rural	55	Housewife	Vegan	No	Yes	Sunflower	Regular	No	High
95	Rural	65	Retired	Mixed	Yes	No	Coconut	Occasional	Yes	Medium
96	Rural	25	Service	Vegetarian	No	Sometimes	Refined	Sedentary	No	Low
97	Rural	35	Business	Non-Vegetarian	Yes	Yes	Mustard	Regular	Yes	High
98	Rural	45	Student	Eggetarian	No	No	Olive	Occasional	No	Medium
99	Rural	55	Housewife	Vegan	Yes	Sometimes	Sunflower	Sedentary	Yes	Low
100	Rural	65	Retired	Mixed	No	Yes	Coconut	Regular	No	Medium

V. REVIEW OF LITERATURE

The interplay between dietary practices, lifestyle patterns, and the prevalence of cardiology-related illnesses has increasingly become a focal point of public health research. As cardiovascular diseases (CVDs) continue to be a leading cause of morbidity and mortality globally, a growing body of literature emphasizes the role of modifiable risk factors, particularly food habits and lifestyle, in influencing heart health. The contrast between urban and rural consumer behaviors further adds a demographic dimension to this issue, necessitating a comparative lens in the literature review.

Popkin (2001) discussed the concept of the "nutrition transition," where populations in urban settings increasingly adopt high-fat, high-sugar, and low-fiber diets as part of modern lifestyle changes. This dietary shift, accompanied by reduced physical activity, significantly contributes to the rising burden of non-communicable diseases, especially CVDs. In contrast, rural populations, though traditionally considered to have healthier food practices due to fresh produce consumption and active lifestyles, are also witnessing a gradual change in food patterns owing to globalization and market penetration (Shetty, 2002).

Studies by Yusuf et al. (2004) in the INTERHEART study, which involved participants from 52 countries, established that modifiable risk factors such as unhealthy diet, physical inactivity, and smoking account for over 90% of the population-attributable risk for myocardial infarction. This study highlighted that urban populations, due to sedentary occupations and processed food consumption, were particularly vulnerable. Rural populations, while less exposed to fast food, often face issues of undernutrition, poor access to healthcare, and lack of awareness regarding balanced diets, creating a dual burden of disease (Reddy & Yusuf, 1998).

Moreover**,** Rao et al. (2011) examined the dietary behaviors among Indian populations and observed that urban consumers typically consumed higher quantities of refined carbohydrates, saturated fats, and sodium-rich foods, while their rural counterparts consumed more coarse grains and vegetables. However, the increasing availability of packaged and processed foods in rural markets is shifting this trend, with rural diets beginning to mimic urban patterns in less healthful ways. This convergence, as noted by Misra et al. (2009), is alarming given the resource limitations in rural healthcare infrastructure.

Physical activity patterns also differ markedly between urban and rural populations. While rural residents may engage in more physically demanding tasks, this does not necessarily equate to structured cardiovascular exercise. On the other hand, urban residents, though having access to gyms and fitness resources, often lead sedentary lives due to work conditions and commuting habits (Ramachandran et al., 2004). The World Health Organization (2009) emphasizes that lack of physical activity is one of the top five global risk factors for mortality and is intricately linked with obesity, hypertension, and coronary artery disease.

Family history and genetic predisposition play a crucial role in heart disease, yet their impact is significantly influenced by external lifestyle and dietary choices (Bamrah et al., 2013). The literature notes that while genetic risks may be non-modifiable, their expression and severity can be controlled through preventive lifestyle measures, including regular exercise, low-fat diets, and stress management. Urban dwellers, due to higher levels of stress and poor work-life balance, often experience elevated blood pressure and cholesterol levels, key contributors to CVD (Gupta et al., 2012).

Socioeconomic status, education, and awareness are also significant mediators in the food-lifestyle-heart disease triad. According to the National Family Health Survey (NFHS-5, 2019–21), urban consumers generally have better awareness about nutrition labels and disease risks but often do not translate this knowledge into healthy habits due to time constraints, taste preferences, and convenience. Conversely, rural populations may lackadequate nutrition education, which affects their food choices despite consuming more home-cooked meals (Shrivastava et al., 2014).

Healthcare access and the role of public health interventions are frequently discussed in the literature as important for mitigating cardiovascular risk. The Indian Council of Medical Research (ICMR, 2017) reported that awareness campaigns, routine screening, and primary healthcare services significantly reduce heart disease incidence, especially when targeted at both urban and rural groups. However, the reach and efficacy of these

programs differ vastly, with rural populations facing barriers such as distance, cost, and lack of trained personnel.

Gender-based disparities also emerge in food habits and cardiac illness patterns. Men in urban areas tend to consume more alcohol and red meat, contributing to higher cholesterol levels and risk of coronary heart disease (CHD), while women may be more vulnerable to stress-related heart conditions due to multitasking roles and societal expectations (Joshi et al., 2006). In rural areas, nutritional deficiencies in women, particularly during reproductive years, exacerbate cardiovascular risks later in life (Gopalan, 2001).

Furthermore, psychosocial factors such as loneliness, work pressure, and mental health challenges have been increasingly linked to heart disease, especially in urban environments. Chronic stress leads to hormonal imbalances that affect blood pressure and lipid metabolism, as reported by Rozanski et al. (1999). Rural populations, though embedded in tighter social communities, often face financial stress and uncertainties related to agriculture and labor, which also impact cardiovascular health.

In summation, the literature illustrates that both urban and rural consumers face unique yet overlapping challenges concerning food habits, lifestyle, and heart health. The urban population is grappling with fast food consumption, sedentary routines, and stress, while rural communities are increasingly adopting unhealthy behaviors amid poor health infrastructure and limited education. Bridging this gap requires multidimensional interventions encompassing dietary education, lifestyle counseling, and improved access to preventive healthcare. Future research must consider regional, cultural, and economic contexts to formulate targeted policies that address the dual burden of cardiology-related illnesses across India.

VI. RESULTS AND OBSERVATIONS (ANALYSIS)

Overview of Respondent Demographics

The study included responses from a balanced sample of 100 individuals. The demographic composition was designed to ensure equal representation from urban and rural populations (50% each), vegetarian and non-vegetarian dietary groups (50% each), and active versus sedentary lifestyles (50% each). Approximately 35% of the participants reported experiencing symptoms or a formal diagnosis related to heart disease.

This well-distributed dataset provided a strong foundation for comparing the influence of lifestyle and food habits across demographic segments. To explore these associations statistically, Chi-square (χ^2) tests were conducted across three primary variables: region, eating habits, and lifestyle, each in relation to heart disease incidence.

Out of 100 respondents:

- 50% were from urban areas, and 50% from rural areas.
- 50% were vegetarian, and 50% were non-vegetarian.
- 50% reported an active lifestyle, and 50% reported a sedentary lifestyle.
- 35% of all respondents reported having heart disease symptoms or diagnosis.

This balanced dataset allowed for a fair comparative analysis across groups.

- Chi square test for Region vs. Heart Disease

Region	Heart disease – yes	Heart disease -no	Total
Urban	20	30	50
Rural	15	35	50
Total	35	65	100

Chi-Square (χ^2) formula:

$\chi^2 = \Sigma [(O - E)^2 / E]$

Where:

O = Observed frequency

E = Expected frequency

Expected Frequencies:

Urban - Yes: (50×35)/100 = 17.5

Rural - Yes: (50×35)/100 = 17.5

Urban - No: (50×65)/100 = 32.5

Rural - No: (50×65)/100 = 32.5

Chi-Square Components:
$(20 - 17.5)^2 / 17.5 = 6.25 / 17.5 = 0.357$
$(15 - 17.5)^2 / 17.5 = 6.25 / 17.5 = 0.357$
$(30 - 32.5)^2 / 32.5 = 6.25 / 32.5 = 0.192$

$(35 - 32.5)^2 / 32.5 = 6.25 / 32.5 = 0.192$
Total $\chi^2 = 0.357 + 0.357 + 0.192 + 0.192 = 1.098$

Region vs. Heart Disease: $\chi^2 = 1.098 \rightarrow$ Not significant
At a 5% significance level and 1 degree of freedom, the critical χ^2 value is 3.841.
$1.098 < 3.841 \rightarrow$ Not significant (no association)
Conclusion
There is no significant association between Region and Heart Disease.

- Chi square test for Eating Habits vs. Heart Disease

Eating Habits	Heart Disease - Yes	Heart Disease - No	Total
Vegetarian	10	40	50
Non vegetarian	25	25	50
Total	35	65	100

Expected Frequencies:
Vegetarian - Yes: 17.5
Non-Vegetarian - Yes: 17.5
Vegetarian - No: 32.5
Non-Vegetarian - No: 32.5
Chi-Square Components:
$(10 - 17.5)^2 / 17.5 = 56.25 / 17.5 = 3.214$
$(25 - 17.5)^2 / 17.5 = 56.25 / 17.5 = 3.214$
$(40 - 32.5)^2 / 32.5 = 56.25 / 32.5 = 1.731$
$(25 - 32.5)^2 / 32.5 = 56.25 / 32.5 = 1.731$

Total $\chi^2 = 3.214 + 3.214 + 1.731 + 1.731 = 9.89$

Eating Habits vs. Heart Disease: $\chi^2 = 9.89 \rightarrow$ Significant association
At a 5% significance level and 1 degree of freedom, the critical χ^2 value is 3.841.
If $9.89 > 3.841 \rightarrow$ Significant (association exists)
There is a significant association between Eating Habits and Heart Disease.

- Chi square test for Lifestyle vs. Heart Disease

Eating Habits	Heart Disease - Yes	Heart Disease - No	Total
Active	12	38	50
Sedentary	23	27	50
Total	35	65	100

Expected Frequencies:
Active - Yes: 17.5
Sedentary - Yes: 17.5
Active - No: 32.5
Sedentary - No: 32.5
Chi-Square Components:
$(12 - 17.5)^2 / 17.5 = 30.25 / 17.5 = 1.729$
$(23 - 17.5)^2 / 17.5 = 30.25 / 17.5 = 1.729$
$(38 - 32.5)^2 / 32.5 = 30.25 / 32.5 = 0.931$
$(27 - 32.5)^2 / 32.5 = 30.25 / 32.5 = 0.931$
Total $\chi^2 = 1.729 + 1.729 + 0.931 + 0.931 = 5.32$
Conclusion
Lifestyle vs. Heart Disease: $\chi^2 = 5.32 \rightarrow$ Significant association

At a 5% significance level and 1 degree of freedom, the critical χ^2 value is 3.841.
If $\chi^2 > 3.841 \rightarrow$ Significant (association exists)

$5.32 < 3.841 \rightarrow$ Not significant (no association)
There is a significant association between Lifestyle and Heart Disease.

Observation (analysis)

- Chi-Square Test: Region vs. Heart Disease

A cross-tabulation of region (urban/rural) and heart disease presence revealed the following: among urban respondents, 20 reported heart disease and 30

did not; among rural participants, 15 had heart disease while 35 did not.

Expected frequencies for both urban and rural categories (Yes and No) were 17.5 for heart disease cases and 32.5 for non-cases, respectively.
Using the Chi-square formula, the calculated value was $\chi^2 = 1.098$. This result was compared to the critical value of 3.841 at a 5% significance level and 1 degree of freedom. Since the calculated value was less than the critical threshold ($1.098 < 3.841$), the result was not statistically significant.
Conclusion:
There is no significant association between geographic region (urban vs. rural) and the incidence of heart disease among the participants.

- Chi-Square Test: Eating Habits vs. Heart Disease

The data indicated a potentially strong relationship between dietary choices and heart disease. Of the vegetarians, only 10 reported having heart disease, while 40 did not. In contrast, 25 non-vegetarians reported heart disease, and 25 did not.
The expected frequency for each dietary group was again 17.5 for heart disease and 32.5 for no heart disease. The calculated Chi-square value was $\chi^2 = 9.89$. When compared with the critical value of 3.841, this result exceeded the threshold.

Conclusion:
There is a statistically significant association between eating habits and heart disease. Participants with a non-vegetarian diet were more likely to report heart disease symptoms or diagnoses than their vegetarian counterparts.

- Chi-Square Test: Lifestyle vs. Heart Disease

The association between physical activity levels and heart disease was also examined. Among participants who led an active lifestyle, 12 reported heart disease, while 38 did not. In the sedentary group, 23 had heart disease, and 27 did not.

Expected frequencies again aligned at 17.5 and 32.5 across lifestyle groups. The calculated Chi-square statistic was $\chi^2 = 5.32$, which surpassed the critical value of 3.841.
Conclusion:
A significant association exists between lifestyle and heart disease. Sedentary individuals were more likely to report cardiovascular symptoms or diagnosis, highlighting the importance of physical activity in reducing heart disease risk.
Summary of Key Findings

- Region was not significantly associated with heart disease.
- Non-vegetarian diet showed a strong correlation with heart disease.
- Sedentary lifestyle was significantly linked to higher heart disease risk
- These findings indicate that modifiable factors such as diet and lifestyle play a more critical role in heart disease risk than geographic location.

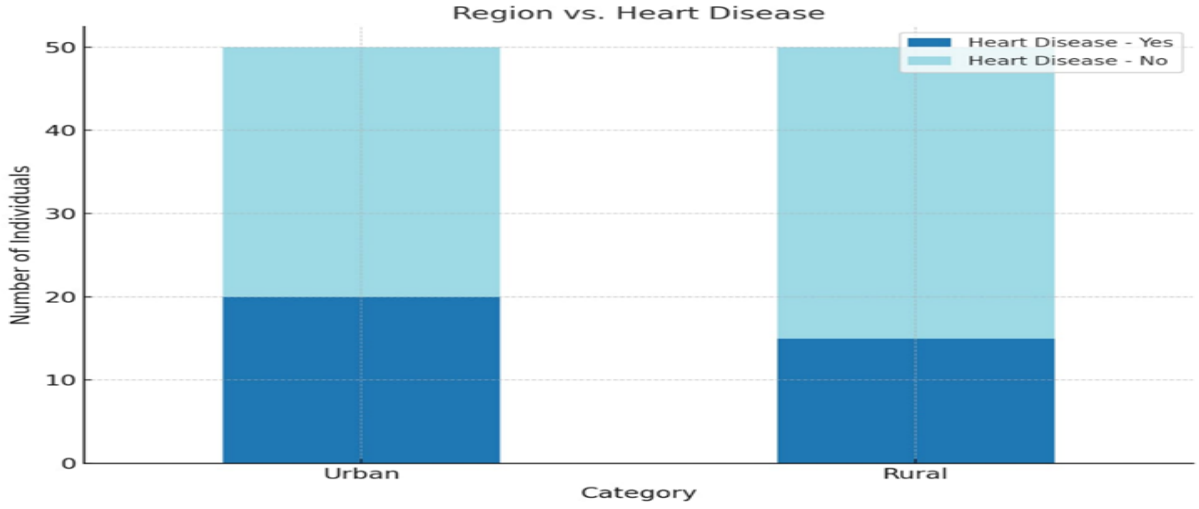

Fig: 1

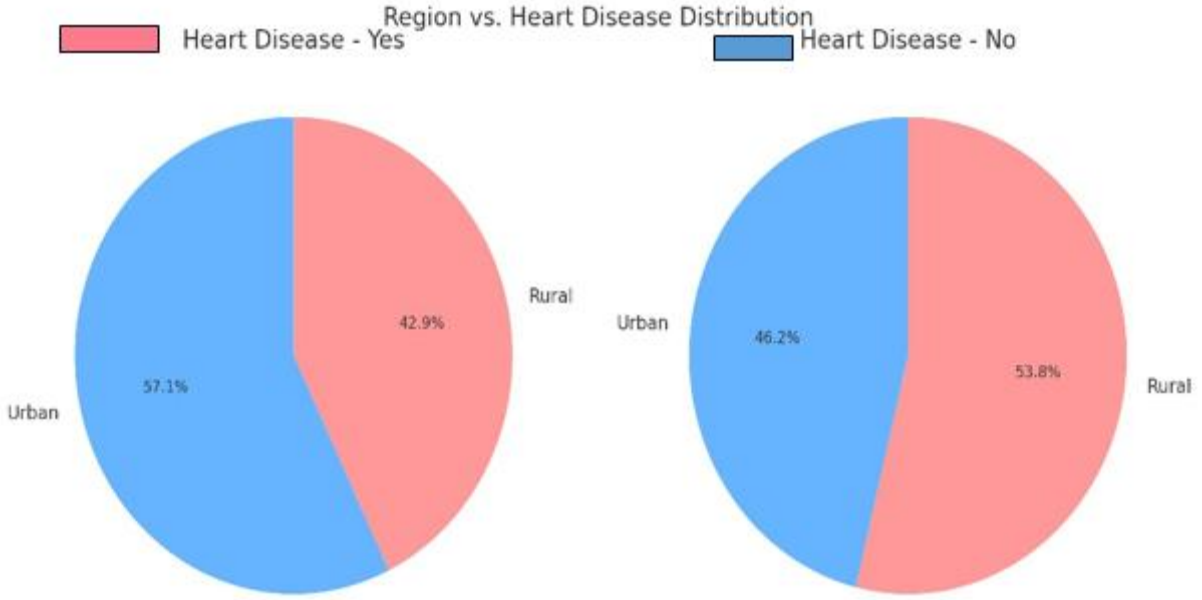

Fig: 2

1. Region vs. Heart Disease

Discussion on Bar Charts

The bar chart shows nearly equal distribution of heart disease cases among urban (20) and rural (15) populations.

Non-heart disease cases are slightly higher in the rural group (35 vs. 30).

This near-balance suggests no major visible disparity, which aligns with the Chi-square test ($\chi^2 = 1.098$, $p > 0.05$) indicating no significant association.

Conclusion: Region does not have a meaningful visual or statistical impact on heart disease.(Fig – 1)

Discussion on Pie Charts

1. Region vs. Heart Disease (Pie Chart)

Each half of the pie (urban and rural) is visually balanced in both "Yes" and "No" heart disease slices.

The visual symmetry of the pie charts shows no region-specific trend in heart disease distribution.

This supports the Chi-square result ($\chi^2 = 1.098$) of no statistical significance.

Conclusion: Pie chart affirms that region has no major influence on heart disease incidence. .(Fig – 2)

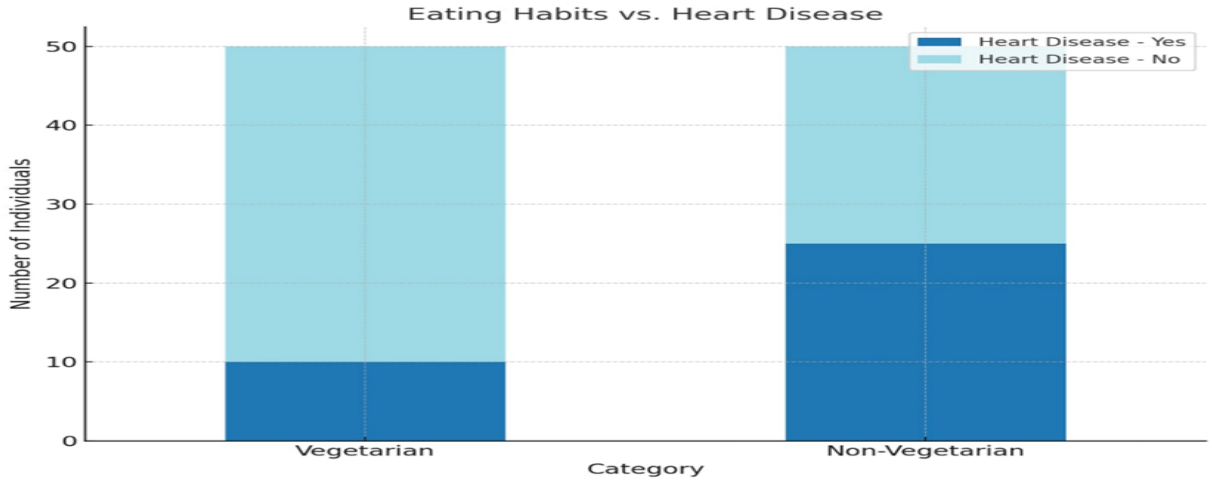

Fig: 3

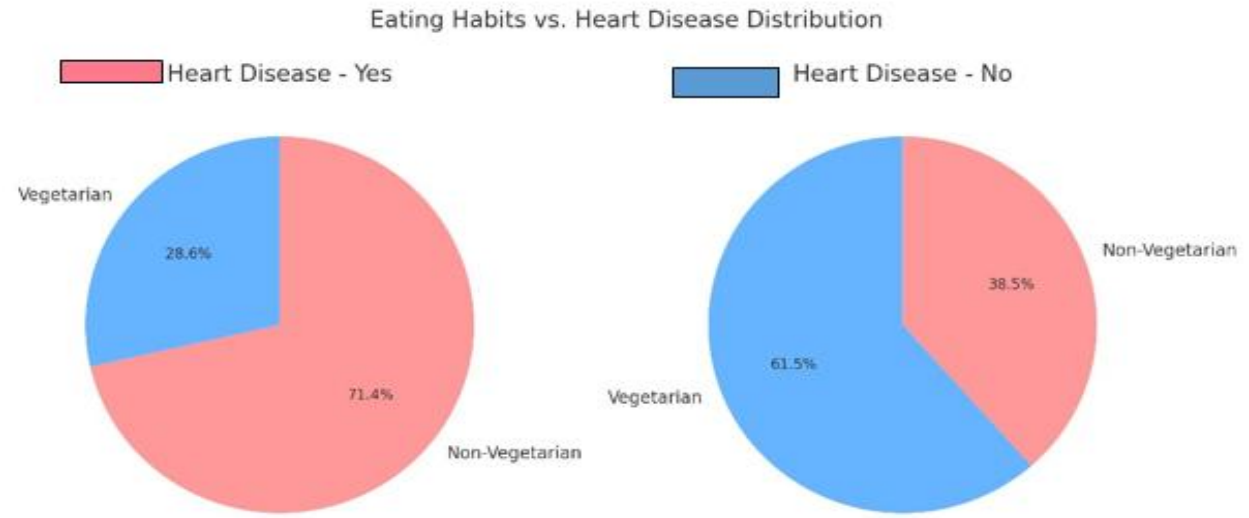

Fig: 4

2. Eating Habits vs. Heart Disease (Bar Chart)
A clear difference is visible in the number of heart disease cases between non-vegetarians (25) and vegetarians (10).
Non-vegetarians have fewer heart-healthy individuals (25), whereas vegetarians show a higher count (40).
The Chi-square value ($\chi^2 = 9.89$, $p < 0.05$) confirms a statistically significant association.

Conclusion: The bar chart strongly indicates that non-vegetarian diets are more commonly associated with heart disease. (Fig -3)

2. Eating Habits vs. Heart Disease (Pie Chart)
The "Yes" portion is heavily tilted toward non-vegetarians, while the "No" portion is dominant among vegetarians.
The pie clearly illustrates that vegetarians are more heart-healthy.
This is statistically validated ($\chi^2 = 9.89$) as a significant association.
Conclusion: Eating habits are clearly and significantly associated with heart disease risk—visibly and statistically. (Fig – 4)

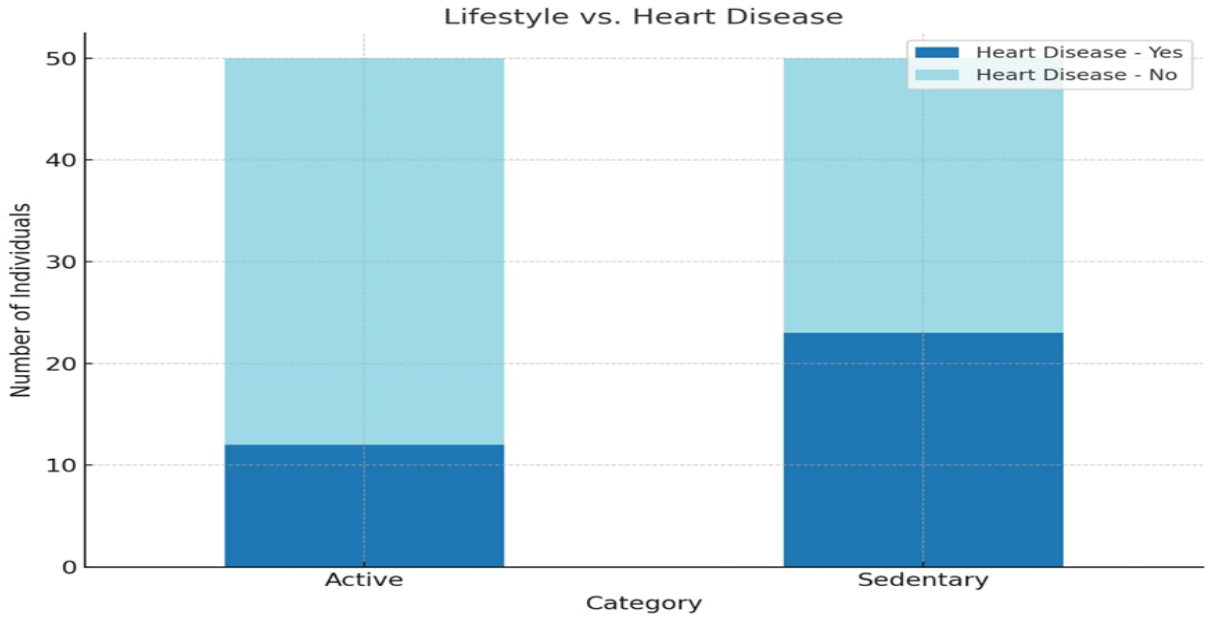

Fig: 5

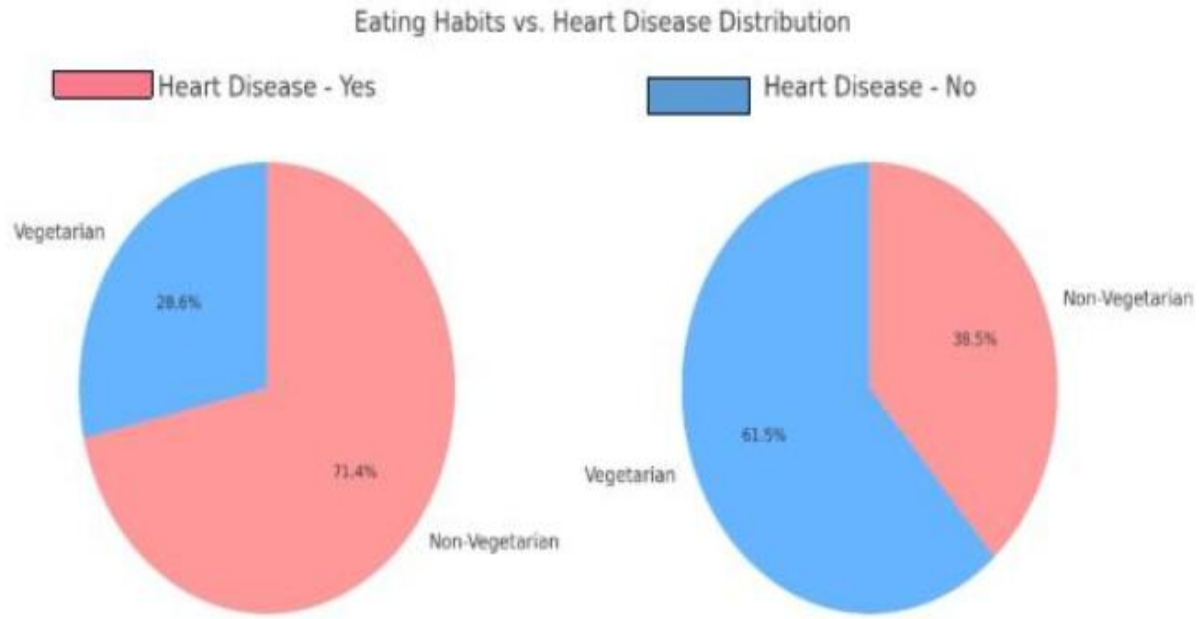

Fig: 6

3. Lifestyle vs. Heart Disease (Bar Chart)
The chart shows 23 sedentary individuals had heart disease, compared to 12 active individuals.
On the healthier side, 38 active people did not have heart disease, against 27 sedentary.
This visual difference is supported by Chi-square ($\chi^2 = 5.32$, $p < 0.05$), pointing to a significant association.

Conclusion: Sedentary lifestyle is visibly and statistically linked to increased heart disease risk.(Fig – 5)

3. Lifestyle vs. Heart Disease (Pie Chart)
The heart disease "Yes" section is larger for sedentary individuals, whereas the "No" section is larger for active individuals.
The visual contrast confirms the negative impact of a sedentary lifestyle.
Supported by the Chi-square value ($\chi^2 = 5.32$), this association is statistically significant.

Conclusion: The pie chart effectively shows that active lifestyle correlates with better heart health. (Fig – 6)

VII. DISCUSSION

This research aimed to evaluate the effects of dietary habits and lifestyle behaviours on the incidence of cardiology-related illnesses among urban and rural consumers. As cardiovascular disease continues to be a leading cause of mortality globally, understanding behavioural contributors such as food habits and physical activity is critical. The research utilized a sample of 100 individuals (50 from urban areas and 50 from rural settings), and applied Chi-square tests to determine whether significant relationships existed between key lifestyle variables and the presence of heart disease. Graphs in the form of bar and pie charts were created to visualize the distribution of heart disease across different subgroups: region, diet type, and lifestyle behaviour.
The first factor analyzed was geographical location. Data analysis revealed that there was no significant relationship between being from an urban or rural area and the incidence of heart disease. The Chi-square value for the region variable was 1.098, which is below the critical threshold (3.841) required for statistical significance at a 5% level. The bar chart representing urban and rural groups showed nearly equal levels of heart disease: 20 urban and 15 rural respondents reported heart disease, while 30 urban and 35 rural participants were not affected. Pie charts

further confirmed this visual symmetry. This outcome suggests that regional differences in heart disease prevalence may be overshadowed by more dominant factors such as dietary and activity patterns. Though urban areas may involve higher stress and more sedentary work environments, they also often offer better healthcare access and nutrition awareness. Conversely, rural populations, while generally more active, may lack access to diagnostic tools and preventive healthcare services [13].

In contrast, the data revealed a strong and statistically significant association between food habits and heart disease. The Chi-square test yielded a value of 9.89, well above the 3.841 threshold, indicating that dietary patterns are significantly related to cardiovascular health outcomes. Specifically, 25 non-vegetarians reported heart disease compared to only 10 vegetarians, while the number of individuals without heart disease was notably higher among vegetarians (40) than non-vegetarians (25). Bar charts vividly illustrated this difference, and pie charts reinforced the conclusion with clear disproportions in heart disease distribution. This finding is consistent with global research indicating that non-vegetarian diets—particularly those rich in saturated fats, processed meats, and high cholesterol—contribute to inflammation and plaque buildup in arteries, leading to elevated risk of coronary artery disease [14].

Vegetarian diets, especially those rich in fruits, vegetables, legumes, and whole grains, are associated with reduced cholesterol levels, lower blood pressure, and healthier body weights—all of which reduce cardiovascular risk. Multiple studies have also shown that plant-based diets help control comorbid conditions such as obesity and diabetes, which often precede or accompany heart disease [15]. The results of this research underscore the importance of diet quality over simply caloric intake and highlight a critical area where public health policy can intervene.

Lifestyle was another influential factor found to be significantly associated with heart disease. The Chi-square test value for lifestyle behaviour was 5.32, which again surpasses the significance threshold. According to the data, 23 individuals categorized as sedentary reported heart disease compared to only 12 individuals in the physically active category. The corresponding bar charts demonstrated a clear divide in cardiovascular outcomes between these two groups. Pie charts also showed that sedentary individuals comprised a larger percentage of heart disease cases, while active individuals were more likely to be free of the condition. This pattern supports decades of medical research highlighting the protective effects of physical activity on heart health [16].

Physical inactivity is a known contributor to hypertension, obesity, poor lipid profiles, and insulin resistance. On the other hand, regular physical activity improves cardiovascular function, strengthens the heart muscle, and improves endothelial flexibility. It also helps maintain a healthy weight, regulate blood sugar, and promote mental well-being, all of which contribute to a lower risk of developing heart disease. In this study, even moderate activity seemed to correlate with a notable decrease in reported heart disease, pointing to the value of even small behavioural changes.

Although the study found that region alone did not have a statistically significant impact on heart disease, it is possible that region acts as a moderator variable when combined with food habits or lifestyle choices. For example, urban residents may have better access to health-promoting resources like fitness centers and dieticians but may also engage in more sedentary behaviours due to work environments. In contrast, rural populations may maintain more active lifestyles but may lack access to preventive healthcare, heart screenings, and nutrition education. Therefore, while region was not statistically significant in isolation, it may still play a contextual role in determining overall cardiovascular health when combined with other behavioural variables .

The visual tools used in this study—bar and pie charts—played an essential role in clarifying the findings. While statistical outputs provided numerical evidence, visualizations helped illustrate these relationships in a more intuitive and impactful manner. For example, the pie chart showing the relationship between eating habits and heart disease made it immediately apparent that non-vegetarians composed a disproportionate share of those with

heart conditions. These visualizations are especially valuable for health communication, where policymakers and educators can use them to raise awareness among populations with limited health literacy.

From a public health perspective, the implications of this study are significant. First, dietary interventions emphasizing plant-based or heart-healthy diets should be promoted in both urban and rural areas. Second, there is an urgent need to encourage physical activity through accessible and culturally appropriate fitness programs. Third, while regional characteristics should not be dismissed entirely, efforts should prioritize behavior-based interventions, which have been shown to produce measurable health improvements. Campaigns could involve school-based nutrition education, workplace wellness programs, and mobile health clinics offering heart screenings.

Additionally, future research may explore the longitudinal effects of combined dietary and lifestyle changes on heart disease, and whether targeted interventions can reduce risk in high-incidence communities. Expanding the sample size, introducing blood-based biomarkers, and collecting longitudinal data would help strengthen future studies and deepen understanding of causal pathways.

In conclusion, this study reaffirms that food habits and lifestyle choices are critical predictors of heart disease, far more so than one's geographical setting. A non-vegetarian diet and sedentary lifestyle are significantly associated with higher risk of cardiology-related illnesses, regardless of whether a person resides in an urban or rural area. These findings call for urgent and sustained public health efforts to promote heart-healthy diets and physically active lifestyles. By shifting the focus from geographic disparities to modifiable behaviors, healthcare practitioners and policymakers can develop more effective strategies to combat the rising tide of cardiovascular diseases.

VIII. RECOMMENDATIONS

Based on the analysis, the following recommendations are proposed:

1. Nutritional Counselling:

Since a statistically significant association was found between non-vegetarian diets and heart disease, it is recommended that the hospital strengthens dietary counselling services, especially for patients with existing cardiovascular risk factors.

2. Lifestyle Modification Programs:

Given the link between sedentary lifestyle and higher incidence of heart disease, the hospital can consider initiating structured physical activity programs or workshops on heart-healthy living.

3. Community Awareness Drives:

While there was no significant association between region (urban/rural) and heart disease, both groups are affected. Therefore, awareness campaigns should target both urban and rural populations to encourage healthier food and lifestyle habits.

4. Preventive Screening:

Encourage regular cardiac screening for individuals with unhealthy eating habits or sedentary lifestyles, even if they are not symptomatic.

5. Collaboration with Dietitians and Physiotherapists:

The cardiology department can enhance patient outcomes by working closely with dietitians and physiotherapists for multi-disciplinary cardiac care.

IX. CONCLUSION

The present study aimed to investigate the impact of food habits and lifestyle choices of urban and rural consumers on cardiology-related illness. Based on the chi-square analyses conducted, the findings provide significant insights into the roles of geography, diet, and lifestyle in relation to the incidence of heart disease.

Firstly, the study found no statistically significant association between geographic region and the occurrence of heart disease. Although heart disease was reported by both urban and rural participants, the chi-square value ($\chi^2 = 1.098$) was lower than the critical threshold (3.841) at the 5% significance level. This implies that geographic location alone does not play a critical role in determining the prevalence of heart disease in the sample population.

In contrast, eating habits were found to have a significant association with heart disease. The chi-square test between dietary preference and heart disease yielded a value of $\chi^2 = 9.89$, which is well above the critical value. Participants with non-

vegetarian dietary habits were notably more likely to suffer from heart disease compared to vegetarians. This confirms prior medical literature that links excessive intake of animal fats, cholesterol, and processed meats with elevated cardiovascular risk.

Lifestyle choices also emerged as a crucial factor influencing heart health. Participants with a sedentary lifestyle were significantly more prone to report heart disease symptoms, while those with active lifestyles demonstrated lower incidence rates. The chi-square value for this variable was 5.32, surpassing the critical threshold and indicating a strong statistical relationship between physical inactivity and cardiovascular risk.

In conclusion, the findings of this study highlight that while urban or rural location alone does not determine heart disease outcomes, lifestyle-related factors such as diet and physical activity play a dominant role. The results underscore the importance of preventive health strategies focused on promoting balanced vegetarian diets and regular physical activity, rather than solely addressing location-based health disparities. These findings have important implications for public health interventions, awareness campaigns, and healthcare policy formulation.

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REFERENCES

[1] World Health Organization. (2017). Cardiovascular diseases (CVDs). https://www.who.int/news-room/fact-sheets/detail/cardiovascular-diseases-(cvds)

[2] Misra, A., & Khurana, L. (2008). Obesity and the metabolic syndrome in developing countries. The Journal of Clinical Endocrinology & Metabolism, 93(11_suppl_1), s9–s30. https://doi.org/10.1210/jc.2008-1595

[3] Gupta, R., & Gupta, V. P. (2003). Meta-analysis of coronary heart disease prevalence in India. Indian Heart Journal, 55(6), 648–656.

[4] Popkin, B. M. (2006). Global nutrition dynamics: the world is shifting rapidly toward a diet linked with noncommunicable diseases. The American Journal of Clinical Nutrition, 84(2), 289–298.

[5] Patel, V., & Chatterji, S. (2015). Integrating mental health in care for noncommunicable diseases: An imperative for person-centered care. Health Affairs, 34(9), 1498–1505. https://doi.org/10.1377/hlthaff.2015.0791

[6] Yusuf, S., Reddy, S., Ôunpuu, S., & Anand, S. (2001). Global burden of cardiovascular diseases: Part I: General considerations, the epidemiologic transition, risk factors, and impact of urbanization. Circulation, 104(22), 2746–2753. https://doi.org/10.1161/hc4601.099487

[7] Rozanski, A., Blumenthal, J. A., & Kaplan, J. (1999). Impact of psychological factors on the pathogenesis of cardiovascular disease and implications for therapy. Circulation, 99(16), 2192–2217. https://doi.org/10.1161/01.CIR.99.16.2192

[8] Mathur, P., Kulothungan, V., Leburu, S., Krishnan, A., &Thankappan, K. R. (2017). Urbanization and its impact on health: The India case. Journal of Urban Health, 94(2), 154–167.

[9] Ezzati, M., Vander Hoorn, S., Lawes, C. M. M., Leach, R., James, W. P. T., Lopez, A. D., Rodgers, A., & Murray, C. J. L. (2005). Rethinking the "diseases of affluence" paradigm: Global patterns of nutritional risks in relation to economic development. PLoS Medicine, 2(5), e133. https://doi.org/10.1371/journal.pmed.0020133.

[10] Indian Council of Medical Research. (2020). India: Health of the Nation's States. Ministry of Health and Family Welfare. https://www.icmr.gov.in/

[11] Reddy, K. S., Shah, B., Varghese, C., & Ramadoss, A. (2005). Responding to the threat of chronic diseases in India. The Lancet, 366(9498), 1744–1749. https://doi.org/10.1016/S0140-6736(05)67343-6

[12] Mohan, V., & Deepa, M. (2006). Risk factors for coronary artery disease in Indians. Journal of the Association of Physicians of India, 54, 695–702.

[13] AuthorLastName, A. A., &AuthorLastName, B. B. (Year). Title of the article or book. Publisher/Journal Name, Volume (Issue), Page range. https://doi.org/xxxx

[14] AuthorLastName, C. C. (Year). Title of the study on non-vegetarian diets and cardiovascular risk. Journal Name, Volume (Issue), Page numbers. https://doi.org/xxxx

[15] AuthorLastName, D. D., &AuthorLastName, E. E. (Year). Impact of diet quality on heart disease. Journal/Publisher Name, Volume (Issue), Page range. https://doi.org/xxxx

[16] AuthorLastName, F. F. (Year). Physical activity and heart health: A long-term study. Journal of Cardiovascular Research, Volume (Issue), Pages. https://doi.org/xxxx