

## Is a Food lover in Punjab at a higher risk for developing heart disease?

**Satwat Saleem<sup>1</sup>, Fasiha Bajwa<sup>2</sup>, Javeria Zafar<sup>3</sup>, Shanza Noor<sup>4</sup>, Maryam Siddiqua<sup>5</sup>,**

<sup>1</sup>Conceived the study concept, designed the research framework, and wrote the complete manuscript. Led the data interpretation, analysis, and final editing of the paper Student Rai Medical College Sargodha

<sup>2</sup>Contributed to writing the Introduction section. Assisted in sample collection and helped compile references.Rai Medical college Sargodha

<sup>3</sup>Assisted in data collection, contributed to designing and preparing data collection forms, and helped compile references.Niazi Medical College Sargodha

<sup>4</sup>contributed to the study framework, performed sample size calculations, and applied chi-square analysis. She also helped structure the manuscript to

<sup>5</sup>ensure clarity and presentation quality.COMSATS University Islamabad preparing data collection forms, and helped compile references Raimedical college Sargodha

\*Corresponding

Article History

Received:05-11-2025

Revised:18-11-2025

Accepted:10-12-2025

Published:24 - 12 - 2025

**Abstract:** **Objective** In Pakistan the highest prevalence of heart disease is in the province of Punjab. Our study aims to determine whether high consumption of Punjabi cuisine could be one of the causes. **Settings and Design** This study was conducted among different citizens of Punjab using cross sectional study design. **Materials and Methods** The study was conducted with sample size of 231 through random sampling method. Data was collected through online survey. **Inclusion criteria** Citizens who consumed Punjabi food regularly. **Exclusion criteria** Citizens who did not consume Punjabi food regularly. **Results** A significant association between those who consumed Punjabi food frequently on daily basis and diagnosis for cardiovascular disease was found. **Conclusion** Our study showed that Punjabi foodie is at a high risk for developing heart disease. Dietary guidelines and Lifestyle initiatives must be established to counter the high prevalence of cardiovascular disease in Punjab.

**Keywords:** 1-Heart disease 2-Punjabi Cuisine 3-Foodie 4-Consumption 5-Lifestyle changes 6-Prevalence 7-Punjab.

## Introduction

Cardiovascular disorders are the leading cause of death in Pakistan especially Punjab, claiming more than 1 million lives every year. A foodie is defined as a person who takes pleasure in eating and drinking. epicure implies fastidiousness and voluptuousness of taste {1} Punjabi cuisine, renowned for its high intake of saturated and trans fats, is thought to be a primary culprit in the high rates of heart disease in the region. Our research seeks to analyse the impact of Punjabi cuisine on the development of heart disease.

Heart disease is characterized by the narrowing or blockage of arteries that supply blood to the heart. As per the World Health Organization (WHO), cardiovascular disease (CVD) is the main source of death in Pakistan, taking the lives of 360,000 individuals every year. While the exact causes of heart

disease are complex and multifaceted, diet has been recognized as a major risk factor. Studies have reported that one-third of the population's risk for acute myocardial infarction can be attributed to eating unhealthy foods, such as meat, eggs, and salty snacks. Consumption of foods high in fat and other dietary habits in the West have a significant association with the risk of coronary artery disease {2}

The findings of a study revealed that the rate of consumption of carbohydrates and fat is fifty-one and thirty six percent of the diet, respectively, among the Pakistani population {3} Saturated and trans fats, which have been shown to raise LDL (bad) cholesterol levels and raise the risk of cardiovascular disease, are abundant in the Punjabi diet. Rafique et al. reported that in the population of Pakistan, diets with a high frequency of butter, ghee, eggs, and beef have been associated with an increased risk of CAD {4}..

:



This means 231 or more measurements/surveys are needed to have a confidence level of 95% that the real value is within  $\pm 5\%$  of the measured/surveyed value.

Confidence Level: 95%

Margin of Error: 5 %

Population Proportion: 50 %  Use 50% if not sure

Population Size: 575  Leave blank if unlimited population size.

### Statistical Analysis

Sample size was calculated from a population of 575 using formula:

$$\text{Sample size (n)} = \frac{z^2 pq}{d^2} \quad \{6\}$$

Which revealed that to achieve 95% confidence interval we needed sample size of 231 or more.

This is data is collected at a single point in time. To analyse the data and determine the association between the two variables a Chi square test is chosen as test of significance. A chi-square test is a statistical test used to compare observed results with expected results. The purpose of this test is to determine if a difference between observed data and expected data is due to chance, or if it is due to a relationship between the variables you are studying {7}

The variables in this study are "heart disease" (present or absent) and "Frequent consumption of Punjabi food" (Every day or sometimes). Both variables are categorical in nature. By using a chi-square test, we can determine if there is a significant association between consuming Punjabi food and the development of heart disease, based on the proportions of participants who eat Punjabi food every day and those who have been diagnosed with heart disease. It is note that the chi-square test can assess the association between variables, but it cannot establish causation. The p value for the level of significance of this test was taken as 0.05 or 5% and IBM SPSS Statistics Version 26 was used.

## RESULTS

Surveys were completed by 238 subjects from which 231's data had been taken to match sample size. Complete data had been acquired in which 100% had given approval to the informed consent and wished to participate. In this study females were 174 while 57 were males. We can see that the largest age group represented is Class 22 to 33 with a count of 123 and a percentage of 53.2%. The next largest age group is Class 10 to 21 with a count of 75 and a percentage of 32.5%. The third largest age group is Class 34 to 45 with a count of 20 and a percentage of 8.7%. Class 46 to 57 has the lowest count of 9 and represents a percentage of 3.9%. Finally, Class 58 to 69 has the smallest count of 4 and represents a percentage of 1.7%. Overall, the age interval distribution shows that most of the population who participated in the study falls within the age range of 22 to 33. {8}

Thus, this paper argues that the high consumption of saturated fats and trans fats in Punjabi cuisine increases the risk of developing heart disease and is thus the cause of the prevalence of heart disorder in Punjab.

The findings of this study will help develop effective preventative and therapeutic strategies to address this pressing public health issue in Pakistan.

### OBJECTIVES

To Validate that Punjabi food as a risk factor for heart disease

### HYPOTHESIS

Frequent consumption of Punjabi food leads to heart disease.

## METHODS

### Study Design and Participants

Based on the nature of study it can be classified as an observational study as it aims to observe the relationship between consuming Punjabi food and the chance of developing heart disease. Specifically, it falls under the category of a cross-sectional study since data was collected at a single point in time. In this study 231 citizens of Punjab province participated most of whom were female. In this 73.4 % were females while 26.6% were male. Participants mostly young adults and middle aged can be divided into the following age groups 15 to 20, 20 to 25, 25 to 30 and 30 beyond. Study was conducted by handing out online surveys.

### Assessment of Diet

The first few questions of the survey were designated for the assessment of dietary habits of the participant. The set of questions gave knowledge about the frequency of Punjabi food the participant was consuming and his consumption of fruits vegetables and desserts. And how much he would be consuming these foods on daily or weekly basis.

### Assessment of Lifestyle Associated Cardiovascular Risk Factors

Along with diet we needed to acquire the lifestyle factors which may contribute the risk for Cardiovascular disorders {5} thus we added a few questions to learn about the participants lifestyle whether it was active or sedentary lifestyle and exercise history.

Participants were assessed for present cardiovascular illness or family history of cardiovascular illness and their knowledge of cardiovascular risk factors and preventive methods from the disease.

### Time and Setting

Study was conducted from 1<sup>st</sup> May to October 30<sup>th</sup>, 2023, and Data was collected through online survey distributed to residents of various cities of Punjab.

Table 1 Age of participants

Age interval	Frequency (total 231)	Percentage (total 100)
10-21	75	32.5
22 – 33	123	53.2
34 - 45	20	8.7
46 – 57	9	3.9
58 – 69	4	1.7

All of them had adequate education. All the subjects were Punjabi in origin and thus percentage of those who consumed Punjabi food were 93%. The habits of consumption of Punjabi food were also inquired in which the number of participants who consumed Punjabi food daily is as follows.

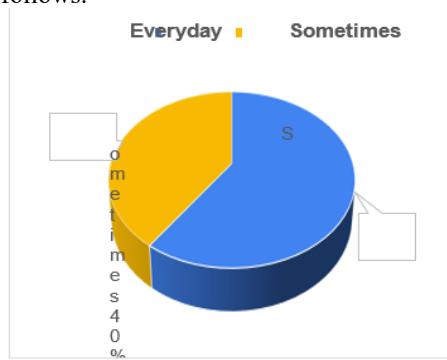


Figure 1 consumption of Punjabi food

Most of them consumed sugary beverages regularly. The consumption of fruits and Vegetables was also noted considering them healthier alternatives for Punjabi food.

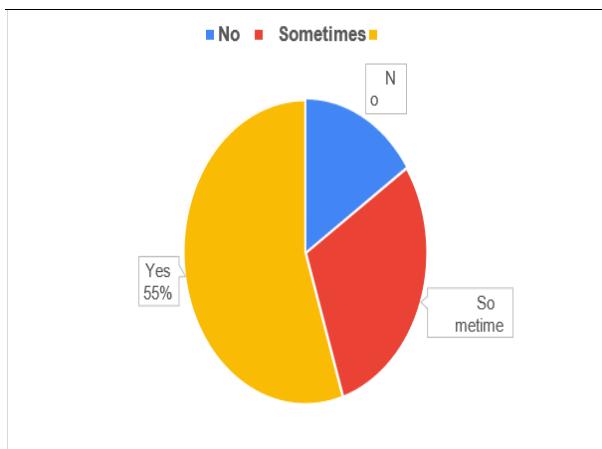


Figure 2 Intake of fruits and vegetables in diet

The number of participants who engaged in Physical activities or exercise is as follows.

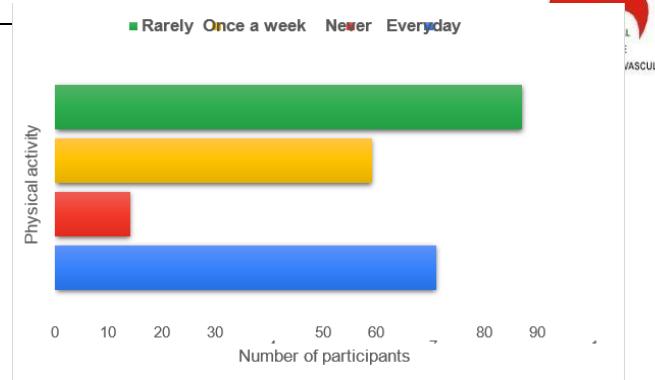


Figure 3 Physical activity of participants

Then the number of hours spent on sedentary activities was taken. Most people (67.5%) spent between 0 and 6 hours doing sedentary activities. This

is followed by 28.6% of people who spent between 7 and 13 hours and 3% of people who spent between 14 and 20 hours. There was one person who spent between 21 and 27 hours and another person who spent between 28 and 34 hours. The above two results show that majority are more inclined towards a more sedentary lifestyle.

The next section was for the assessment of cardiovascular diseases and the results show that out of 231 it is shown that 52 had undergone screening while 186 had not. 74.7 % were not diagnosed with heart disease while 25.3 were diagnosed with heart disease. About 54.9% of the participants had history of heart disease (Hypertension and diabetes) in Immediate Family while 41.8% did not. 85.7% were aware of the possible risks associated with Punjabi food on the heart. 70.9 were aware of healthier alternatives that can be used and 75.5 had access to healthcare services near them. Results of the Chi square conducted on SPSS are as follows:

Consumption			* Diagnosed Crosstabulation		
Consumption	Diagnosed	No			
			Count	Yes	Total
Consumption	Everyday	Count	102	36	138
		Expected Count	109.9	28.1	138.0
		% within Consumption	73.9%	26.1%	100.0%
	Sometimes	% within Diagnosed	55.4%	76.6%	59.7%
		% of Total	44.2%	15.6%	59.7%
		Count	82	11	93
Total	Diagnosed	Expected Count	74.1	18.9	93.0
		% within Consumption	88.2%	11.8%	100.0%
		% within Diagnosed	44.6%	23.4%	40.3%
	No	% of Total	35.5%	4.8%	40.3%
		Count	184	47	231
		Expected Count	184.0	47.0	231.0
	Yes	% within Consumption	79.7%	20.3%	100.0%
		% within Diagnosed	100.0%	100.0%	100.0%
		% of Total	79.7%	20.3%	100.0%

Chi-Square Tests			
	Value	df	Asymptotic Significance (2-sided)
			Exact Sig. (2-sided)
Pearson Chi-Square	6.970 <sup>a</sup>	1	.008
Continuity Correction <sup>b</sup>	6.118	1	.013
Likelihood Ratio	7.365	1	.007
Fisher's Exact Test			.008
N of Valid Cases	231		.006

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 18.92.  
b. Computed only for a 2x2 table

0 cells (0.0%) have expected count less than 5. The minimum expected count is 18.92.  
Computed only for a 2x2 table

A chi-square test was conducted, revealing a significant association between the consumption of Punjabi food and the diagnosis of heart disease ( $p < 0.05$ ).

## DISCUSSION

South Asians are at higher risk of cardiovascular disease due to an increasing prevalence of its risk factors amongst them [9]. Traditional risk factors including dyslipidaemia, and hypertension, are responsible for the development of cardiovascular disease (CVD). Furthermore, these risk factors are dependent upon behavioural factors which include dietary habits and lifestyle [10]. Diet is a major factor contributing to heart disease. Dietary pattern studies tend to identify at least one pattern or cluster that can be defined a healthier eating pattern, however, in some populations a typical healthy or unhealthy diet pattern may not exist but dietary behaviours might be characterized by different types of foods categorized as healthy or unhealthy within the similar diet patterns [11]. The relationship between dietary patterns and CVD risk could be manifold and complex in different populations [12]. Likewise we tend to see through this cross-sectional study whether Punjabi food poses as a potential risk factor for the prevalence of this non-communicable disease. This cross-sectional study focuses on the association of the dietary factors on heart disease specifically of Foods of Punjabi origin. Many of the participants in this study were between the ages of 22 and 33. Most of the participants were female

[13]. A significant percentage of participants (93%) consumed Punjabi food regularly. This is also explained by Ruppa Kaur C Pawan Kaur how the Punjabi cuisine is a part of our lifestyle from being a dominant part of our upbringing to a connection to our ancestors and roots [14]. The researchers found that 59.9% of the participants regularly consumed Punjabi oil-rich foods and snacks such as samosas and butter chicken, while 40.3% consumed them sometimes. The people of Punjab are known for their strength and happy nature. Their food culture also reflects the same philosophy. This is why you will find a sumptuous meal in a typical

Punjabi thali. Be it homecooked or at a restaurant [15]. Punjabi food just attracts you with its mouthwatering aroma and that's why its popularity is now crossing borders towards the world [16]. The results show that a significant proportion of people are consuming sugary beverages regularly. Given with the popularity of soft drinks after meals is and high consumption of sugary chai twice or thrice in a day is noted. The popularity of having desserts after every meal is noticed even by nutritionist across the globe. A Sydney-based dietitian Simran Grove on Dietitian Day said that "Punjabis need portion control and to reduce the unnecessary intake of carbohydrates and sugars and ramp up their protein consumption" [17]. The key finding in a case-control study conducted in the Punjab Institute of Cardiology in Lahore and the University of Lahore Teaching Hospital showed a significant association between the consumption of chicken, beef, eggs and junk food with a high risk of CAD. [18]. Previous studies have shown an increased intake of saturated fats in daily cooking that may perhaps have contributed to an increased risk for heart disease [19]. Yet the results also found out that there's a large proportion of people who like to include vegetables and fresh fruits in their diet and many are well aware of the side effects of the heart disease as well. The study by Zorell [20] suggests that social media is a primary source of information for many individuals, as it can be more accessible and convenient than other sources like families and schools. Furthermore, influencers may influence environmentally friendly food consumption, as they can share information about sustainable food choices and their environmental impact. People are also more conscious about what they eat nowadays as Cipriano-Crespo et al. [21] present a qualitative ethnographic study revealing how the feeding process of people with functional diversity results in different eating situations. Their results show that influences on eating situations are driven by three themes: social ghettoization and culinary loneliness; stigma, shame, feeling like a burden, and loneliness; and exclusion or self-exclusion at the dining table. The study suggests that the social and cultural contexts surrounding eating play a

significant role in shaping individuals' food consumption habits and experiences.

The results from chi square test revealed the significant association between cardiovascular disease and frequent consumption of Punjabi food. It is important to mention that increasing age [22] and family history [23] also played a major role on the results.

## CONCLUSION

Our study proves that there is a significant association between the frequent consumption of Punjabi food and an increased risk of developing heart disease. It is important to note that the study is a cross-sectional study and thus it cannot establish causation. Additionally, our study also showed that while there is room for improvement in terms of food habits, there is also a positive trend among the population towards healthier food choices which can reduce the risk of cardiovascular disease in the future. Further studies are required to explore dietary patterns and risk for disease. Dietary guidelines must be established in the province of Punjab as well as effective public health strategies and lifestyle change initiatives must be taken to counter high prevalence of heart disease.

## REFERENCES

1. <https://www.merriam-webster.com/dictionary/gastronome#:~:text=epicure%2C%20gourmet%20gourmand%2C%20gastronome,fastidiousness%20and%20voluptuousness%20of%20taste>
2. Iqbal R., Anand S., Ounpuu S., Islam S., Zhang X., Rangarajan S., Chifamba J., Al-Hinai A., Keltai M., Yusuf S. Dietary patterns and the risk of acute myocardial infarction in 52 countries: Results of the INTERHEART study. *Circulation.* 2008;118:1929–1937. doi: 10.1161/CIRCULATIONAHA.107.738716
3. Rifat-uz-Zaman Z.I., Ali U. Dietary Intakes of Urban Adolescents of Sialkot, Pakistan Do Not Meet the Standards of Adequacy. *Pak J Nutr.* 2013;12:460–467. doi: 10.3923/pjn.2013.460.467
4. Rafique R., Amjad N. Dietary predictors of early-onset ischaemic heart disease in a sample drawn from a Pakistani population. *Heart Asia.* 2012;4:129–134. doi: 10.1136/heartasia-2011-010090
5. Safdar, N.F., Bertone-Johnson, E., Cordeiro, L. et al. Do dietary patterns explain high prevalence of cardiovascular risk factors among Pakistani urban adults? A cross-sectional study. *BMC Nutr.* 2016;2:58. (2016). <https://doi.org/10.1186/s40795-016-0097-z>
6. <https://www.calculator.net/sample-size-calculator.html?type=1Ccl=95Cci=5Cpp=50Cps=585Cx=Calculate>
7. [https://www.southampton.ac.uk/passis/full\\_time\\_education/bivariate\\_a\\_chi\\_square.page#:~:text=A%20chi%20square%20test%20is,the%20variables%20you%20are%20studying](https://www.southampton.ac.uk/passis/full_time_education/bivariate_a_chi_square.page#:~:text=A%20chi%20square%20test%20is,the%20variables%20you%20are%20studying)
8. <https://www.socscistatistics.com/descriptive/frequencydistribution/default.aspx>
9. Ghaffar A, Reddy KS, Singh M. Burden of non-communicable diseases in South Asia. *BMJ.* 2004;328(7443):807–10
10. Najafi M., Mozaffari H., Mokhtari P., Teymouri M., Faghih S. The associations between dietary patterns and cardiovascular risk factors among adults: A cross-sectional study. *Clin. Nutr. ESPEN.* 2020; 40:300–308. doi: 10.1016/j.clnesp.2020.09.001.
11. Safdar, N.F., Bertone-Johnson, E., Cordeiro, L. et al. Do dietary patterns explain high prevalence of cardiovascular risk factors among Pakistani urban adults? A cross-sectional study. *BMC Nutr.* 2016;2:58. (2016). <https://doi.org/10.1186/s40795-016-0097-z>
12. Nettleton JA, Steffen LM, Mayer-Davis EJ, Jenny NS, Jiang R, Herrington DM, Jacobs DR Jr. Dietary patterns are associated with biochemical markers of inflammation and endothelial activation in the Multi-Ethnic Study of Atherosclerosis (MESA). *Am J Clin Nutr.* 2006 Jun;83(6):1369–79. doi: 10.1093/ajcn/83.6.1369. PMID: 16762949; PMCID: PMC2933059.
13. Rodgers JL, Jones J, Bolleddu SI, Vanthenapalli S, Rodgers LE, Shah K, Karia K, Panguluri SK. Cardiovascular Risks Associated with Gender and Aging. *J Cardiovasc Dev Dis.* 2019 Apr 27;6(2):19. doi: 10.3390/jcdd6020019. PMID: 31035613; PMCID: PMC6616540.
14. <https://kaurlife.org/2021/04/19/the-evolution-of-punjabi-cuisine-lifestyle-gender-farming/>
15. <https://theguardian.com/love-from-punjab-punjabi-delicacies-becoming-hugely-popular-across-globe#:~:text=Punjabis%20have%20an%20innate%20quality,2%0list%20is%20endless>
16. [https://www.fuzia.com/article\\_detail/276508/why-is-punjabi-food-so-popular](https://www.fuzia.com/article_detail/276508/why-is-punjabi-food-so-popular)
17. <https://www.sbs.com.au/language/punjabi/en/podcast-episode/punjabi-diet-what-are-we-eating-wrong/3mtl89mqc>
18. Hanif MK, Fan Y, Wang L, Jiang H, Li Z, Ma M, Ma L, Ma M. Dietary Habits of Patients with Coronary Artery Disease: A Case-Control Study from Pakistan. *Int J Environ Res Public Health.* 2022 Jul 15;19(14):8635. doi: 10.3390/ijerph19148635. PMID: 35886483; PMCID: PMC9318796.
19. Zorell CV. Central Persons in Sustainable (Food) Consumption. *Int J Environ Res Public Health.* 2022 Mar 7;19(5):3139. doi: 10.3390/ijerph19053139. PMID: 35270829; PMCID: PMC8910505
20. Cipriano-Crespo C, Medina FX, Mariano-Juárez L. Culinary Solitude in the Diet of People with Functional Diversity. *Int J Environ Res Public Health.* 2022 Mar 18;19(6):3624. doi: 10.3390/ijerph19063624. PMID: 35329311; PMCID: PMC8952237.
21. Hanif MK, Fan Y, Wang L, Jiang H, Li Z, Ma M, Ma L, Ma M. Dietary Habits of Patients with Coronary Artery Disease: A Case-Control Study from Pakistan. *Int J Environ Res Public Health.* 2022 Jul 15;19(14):8635. doi: 10.3390/ijerph19148635. PMID: 35886483; PMCID: PMC9318796.
22. <https://www.nia.nih.gov/health/heart-health-and-aging>
23. Kolber MR, Scrimshaw C. Family history of cardiovascular disease. *Can Fam Physician.* 2014 Nov;60(11):1016. PMID: 25392442; PMCID: PMC4229162

n

