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Behavioural and Socio-Economic Determinants of Consumer Expenditure on Organic Millets: Evidence from Hyderabad, India

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Authors' contributions

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

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ABSTRACT

The study investigated the behavioural and socio-economic variables influencing consumer expenditure on organic millets in Hyderabad, India. As the demand for organic foods has grown, understanding the drivers of consumer behaviour has become vital for promoting sustainable

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consumption. Primary data from 120 organic millet consumers were collected from various retail outlets, through personal interview, and was analysed using Likert scale analysis, Chi-square test, and Ordinary Least Squares (OLS) regression. The analysis was done using Python in Jupyter Notebook. The Likert scale results indicated that consumers are aware of the health and nutritional benefits of organic millets, while moderate agreement was observed regarding availability and price concerns. The Chi-square test revealed that consumer preference varied significantly between certified and non-certified products, highlighting the importance of official certification in influencing purchasing decisions. The OLS regression further showed that availability (β = 239.75***), education (β = 29.61***), and monthly household income (β = 43.47**) had a significant positive effect on organic millet consumption expenditure, whereas certification preference (β = −71.18**) had a negative effect, suggesting that those who prefer certified millets may spend less, possibly due to limited availability or higher prices. The findings underscored the need to improve product availability, enhance consumer awareness, and strengthen certification trust to broaden the consumer base for organic millets in urban India.

Keywords: Organic millets; consumer behaviour; nutritional awareness; certification preference.

1. INTRODUCTION

In recent years, increasing awareness of health, nutrition, and environmental sustainability has shifted consumer preferences toward organic foods. Among these, organic millets have emerged as nutrient-rich climate resilient grains with potential health benefits such as improved digestion, enhanced nutritional intake, and reduced exposure to chemical residues (Choudhury *et al*., 2024). Despite their advantages, the consumption of organic millets in urban India remains limited, largely due to factors such as unavailability, price, lack of awareness, and insufficient consumer familiarity with different millet varieties.

The Government of India has recognized the role of millets in strengthening nutritional security and has undertaken several initiatives to promote them. These include declaring millets as "Nutri-Cereals," celebrating 2018 as the National Year of Millets, and proposing the International Year of Millets at the United Nations General Assembly. Following this, 2023 was designated as the International Year of Millets (IYM 2023) to raise awareness and promote millets as future-ready crops suitable for changing climatic conditions. The initiative aimed to expand millet cultivation, improve production and processing technologies, and cater to diverse domestic and international markets (Rao *et al*., 2021).

Numerous studies have shown that demographic, behavioural, and economic factors significantly shape organic food consumption patterns. Socio-demographic variables such as age, income, education level, and urban–rural residence have a notable influence on consumption behaviour (Amirnejad and Tonakbar, 2015). Urban consumers tend to prefer organic foods primarily to maintain a healthy lifestyle (Shukla, 2025), whereas traditional dietary practices and cultural familiarity with millets promote their acceptance among rural and semi-urban households (Ankitha and Seth, 2025; Shanker, 2024). Moreover, factors such as health, safety, taste, and environmental concerns play a crucial role in shaping consumers' attitudes and preferences toward organic food products (Munaqib et al.,2025). Consumers' attitudes and knowledge further determine their purchasing behaviour, thereby contributing to the expansion of the organic food market (Sangeetha and Rajakrishnan, 2022). However, barriers such as limited availability, low consumer preference, and restricted market reach continue to constrain the growth of organic food consumption (Thanki et al., 2024).

In recent years, millets have gained renewed attention as highly nutritious (Reddy and Patel, 2023) and climate-resilient grains that contribute to both human and environmental health (Reddy et al., 2023; Vaswani et al., 2024). Several studies have demonstrated a significant association between consumer awareness and the consumption patterns of millets and millet-based products (Pathak et al., 2023). Likewise, consumers' health consciousness, environmental concern, perceived value, price sensitivity, and social status have been found to significantly influence their purchase intentions toward millet products (Shirahatti et al., 2022). Despite these positive attributes, millet consumption continues to face several barriers, including inadequate availability in local markets, the time-consuming

nature of preparation, lack of trust in health and safety claims, and the perception that millets are difficult to digest (Shah et al., 2024). Furthermore, limited marketing initiatives and weak value chain linkages often constrain millet promotion and accessibility, particularly in modern retail formats (Reddy et al., 2018).

Although organic millets offer both nutritional and environmental advantages, their market presence remains limited. Consumers are generally motivated to purchase organic foods because of their perceived superior quality and environmentally friendly nature. According to Raju and Rukmani (2022), food safety concerns significantly influence consumer buying behaviour. However, the lack of trust and the limited availability of organic millets in the market discourage potential buyers.

Empirical research exploring the behavioural and socio-economic factors influencing organic millet consumption in urban India is limited. To address this gap, the present study focuses on Hyderabad, a major urban centre where organic food markets are emerging. The study targets a niche consumer segment that is health-conscious and sustainability-oriented, enabling a detailed examination of factors influencing purchase behaviour. The study investigates how socio-economic characteristics (such as income, education, and gender) and behavioural factors (such as perceived availability, certification preference, and trust) affect expenditure on organic millets. The findings aim to provide actionable insights for policymakers, marketers, and value chain actors to improve product availability, build consumer trust, and enhance awareness, ultimately facilitating the expansion of the organic millet market in urban India.

2. METHODOLOGY

The study was carried out during 2024 in Hyderabad city, Telangana, which represents one of the urban markets for organic food products in southern India. The study sample consists of 120 consumers of organic millets selected through purposive sampling. Primary data was collected through personal interviews using a paper-based pre-tested structured questionnaire. The respondents were chosen from major organic outlets across the city, such as specialized organic stores and supermarkets that stock certified organic products. This approach ensured that the sample represented consumers who actively engage in the organic food market. The analysis was done using Python in Jupyter Notebook.

2.1 Likert Scale Technique

A Likert-scale survey was carried out to assess the consumer perceptions, awareness and attitude towards organic millets across various dimensions, including health and nutritional awareness, sensory attributes, convenience, trust, price, and availability. Ten statements rated on a 5-point Likert scale, with scores ranging from 1 (strongly disagree) to 5 (strongly agree). The Likert scale, (Likert, 1932), is one of the most widely used tools for measuring attitudes, opinions, and perceptions in social science research (Zeynalova and Namazova, 2022; Mishra et al., 2023). It provides a quantitative method to capture the degree of agreement or disagreement with a given set of statements. Weighted average Likert score was obtained using the formula,

$$\text{Likert scale score} = \frac{\sum fx}{\sum f}$$

Where,

‘f’ is the no. of respondents under each option
‘x’ is the value assigned to each option

2.2 Chi Square Tests

To examine whether there is a statistically significant difference in consumer preference between certified and non-certified organic products, a Chi-square test of independence was conducted (Das et al.,2022). The analysis was based on categorical data collected from respondents regarding their willingness to purchase certified and non-certified organic millets. A 2×2 contingency table was constructed, categorizing responses as either "Yes" or "No" for both certified and non-certified products. The Chi-square test compared the observed frequencies of responses with the expected frequencies under the assumption, H_o: There is no association between product certification status and consumer preference.

The formula for chi square statistic is given as,

$$X^2 = \sum \frac{(O_{ij}-E_{ij})^2}{E_{ij}}$$

Where,

'O_{ij}' is the Observed frequency in cell i, j
' E_{ij} ' is the expected frequency in cell i, j, calculated as

$$E_{ij} = \frac{\text{(Row total)x (Column total)}}{\text{Grand total}}$$

A p-value less than 0.05 indicates that the association is statistically significant, implying that product certification status influences consumer preference.

2.3 Multiple Regression Analysis

To identify the factors influencing monthly consumption expenditure on organic millets Ordinary Least Squares multiple regression analysis was employed. Multiple regression analysis estimates the relationship between a dependent variable and multiple independent variables by minimizing the sum of squared residuals. This method is widely used in behavioural and consumer economics research to examine how various factors simultaneously influence a particular outcome (Tandon and Verma, 2023; Bas et al.,2024; Sandra and Saric, 2025). A stepwise regression procedure was employed to identify the most statistically significant predictors. The final model was selected based on diagnostic criteria including R^2, Akaike Information Criterion (AIC), and Bayesian Information Criterion (BIC) to ensure optimal model fit and parsimony.

The final multiple regression model was structured as,

$$Y = \beta_o + \beta_1 x_{1,i} + \ldots\ldots\ldots\ldots\ldots + \beta_k x_{k,i} + \varepsilon_i$$

Where,

'Y' is the monthly expenditure on organic millets (in ₹)
'X_1' is the gender of respondent (binary dummy; female = 1, male = 0)
'X_2' is education in terms of years of schooling
'X_3' is the perceived availability of organic millets (ordinal scale)
'X_4' is the preference for certified organic products (binary dummy; yes = 1, no = 0)
'X_5' is the monthly household income in lakh ₹
β_1, β_2, β_3 ----- β_i - Regression coefficients
'ε_i' denotes error term

3. RESULTS AND DISCUSSION

3.1 Consumer Behaviour Towards Purchasing Organic Millets - Likert Scale Analysis

The Likert scores provide understanding of both the strengths and perceived barriers to organic millet consumption. The results are presented in Table 2.

The results show that nutritional awareness factor recorded the highest Likert score of 4.28, indicating strong consumer agreement. A significant 51.67 percent agreed and 39.17 percent strongly agreed that they are aware of the nutritional benefits of organic millets. This suggests that organic millet consumers in Hyderabad are well-informed about their nutritional superiority, making this the most positively perceived factor in the study. Conversely, the lowest-scoring factor was the ability to identify millet varieties, with a score of 2.21. A majority of respondents (35 percent) expressed difficulty in distinguishing different millets. This suggests a significant knowledge gap in millet literacy and points to the need for clearer labelling and consumer education campaigns.

The trust in certification labels factor scored 3.91 and over 75 percent of respondents trust the authenticity of organic certification marks. Such trust is crucial in building long-term consumer confidence and justifying price premiums for certified products. The health motivation factor (consumption driven by health benefits) had a score of 3.78, supported by 40 percent agreement and 28.33 percent strong agreement. This indicates that health remains a major driver of organic millet consumption, with nearly 69 percent of consumers choosing millets primarily for their perceived health advantages.

The digestive health factor received a moderate score of 3.59, with 50.83 percent agreeing. Although a majority believe in the digestive benefits of organic millets, the high neutrality suggests that more awareness is needed to convince the undecided segment. The price perception factor had a neutral average of 3.03. While 51.67 percent responded neutral, 22.50 percent disagreed and 25.83 percent agreed that organic millets are too expensive. This view suggests that price is a moderate concern and not a strong limitation for most consumers, though it may influence lower-income groups.

The availability factor scored 2.78, indicating a perception of limited access. This reveals significant room for improvement in supply chains and retail distribution, especially in underserved regions. The regular use factor received a low score of 2.74, only 6.67 percent strongly agreed that they regularly include organic millets in their meals. There is a gap between awareness and consistent consumption indicating that awareness does not always translate into habitual dietary change.

The ease of cooking factor also scored low at 2.58, with 55 percent neutral and 40.83 percent disagreeing. This reflects that many consumers find millets difficult or inconvenient to prepare. The taste and texture preference factor had a low score of 2.57, only 7.50 percent agreed and 1.67 percent strongly agreed that they enjoy the taste and texture. Since taste is a critical factor for continued consumption, this recommends a need for culinary innovation to improve flavour and palatability in order to attract more consumers.

3.2 Awareness of Benefits of Organic Millets

To assess consumer awareness regarding the benefits of consuming organic millets, respondents were asked to rank four key attributes such as health benefits, nutritional benefits, environmental sustainability, and taste and purity in the order of importance. The data collected was ordinal in nature and was analysed using descriptive statistics to compute mean ranks. The results are shown in Table 2. The findings Indicate that the factor with the highest preference among respondents is health benefits, which recorded the lowest mean rank of 1.38. A significant proportion of respondents (85 out of 120) assigned it rank 1, highlighting that improved health outcomes are the primary motivation for purchasing organic millets. In contrast, the factor with the lowest preference is taste and texture, with the highest mean rank of 3.84. Nutritional benefits emerged as the second most important factor, with a mean rank of 1.96, suggesting that consumers view nutritional value as a key driver in their purchasing behaviour. Environmental sustainability ranked third, with a mean score of 2.82.

Overall, these results underscore that health and nutritional benefits are the dominant factors influencing consumer decisions to purchase organic millets. In comparison, environmental concerns hold moderate influence, while taste and purity are deemed least important, reflecting

Table 1. Consumer behaviour towards purchasing organic millets in Hyderabad city.

Consumer perception	Consumer responses					Likert score
	Strongly disagree	Disagree	Neutral	Agree	Strongly agree	
I am aware of the nutritional benefits of organic millets.	0 (0.00)	3 (2.50)	8 (6.67)	62 (51.67)	47 (39.17)	4.28
I trust organic certification labels for millets.	0 (0.00)	9 (7.50)	20 (16.67)	64 (53.33)	27 (22.50)	3.91
I consume organic millets for their health benefits.	1 (0.83)	20 (16.67)	17 (14.17)	48 (40.00)	34 (28.33)	3.78
I believe organic millets improve digestion and gut health.	0 (0.00)	2 (1.67)	51 (42.50)	61 (50.83)	6 (5.00)	3.59
Organic millets are too expensive. (Reverse Scoring)	0 (0.00)	27 (22.50)	62 (51.67)	31 (25.83)	0 (0.00)	3.03
Organic millets are easily available in my area.	9 (7.50)	43 (35.83)	43 (35.83)	15 (12.50)	10 (8.33)	2.78
I regularly include organic millets in my meals.	0 (0.00)	50 (41.67)	59 (49.17)	3 (2.50)	8 (6.67)	2.74
I find it easy to cook and incorporate organic millets into my diet.	3 (2.50)	49 (40.83)	66 (55.00)	0 (0.00)	2 (1.67)	2.58
I enjoy the taste and texture of organic millets.	3 (2.50)	59 (49.17)	47 (39.17)	9 (7.50)	2 (1.67)	2.57
I can easily identify different types of organic millets.	42 (35.00)	29 (24.17)	33 (27.50)	14 (11.67)	2 (1.67)	2.21

Note: Figures given in parenthesis indicate percentage to the total respondents.

Table 2. Ranking of perceived benefits of organic millets

Perceived benefits	Consumer responses				Mean Rank
	Rank 1	Rank 2	Rank 3	Rank 4	
Health benefits	85 (70.8)	24 (20.0)	11 (9.2)	0 (0.0)	1.38
Nutritional benefits	21 (17.5)	77 (64.2)	19 (15.8)	3 (2.5)	1.96
Environmental sustainability	12 (10.0)	16 (13.3)	70 (58.3)	22 (18.3)	2.82
Taste and texture	2 (1.7)	3 (2.5)	20 (16.7)	95 (79.2)	3.84

Note: Figures given in parenthesis indicate percentage to the total respondents.

the perception that health advantages outweigh sensory appeal in driving consumer choices. Reddy *et al*., (2023) and Vaswani et al. (2024) also reported the influence of nutritional value on consumption of millets.

3.3 Familiarity with Millet Types

To understand consumer familiarity, usage patterns, and the ability to identify different millet types, ranking-based question was asked, participants were asked to rank five millet types such as, finger millet, sorghum, pearl millet, foxtail millet, and little millet on a scale from 1 (most familiar/used/recognized) to 5 (least familiar/used/recognized). The mean ranks were then calculated to determine the relative familiarity and usage levels across millet varieties. Results are shown in Table 3.

Among the five millet types, finger millet has the highest level of familiarity and usage among respondents, as shown by its lowest mean rank of 1.38. This suggests that most people are well-acquainted with finger millet, can easily identify it, and have likely consumed it before. Sorghum is the next most familiar millet, with a mean rank of 2.10. Pearl millet holds a middle position, with a mean rank of 2.58. Foxtail millet, with a mean rank of 4.40, reflects low familiarity and limited exposure. It is likely that many respondents have neither used it regularly nor can confidently identify it. Little millet is the least familiar among all, with the highest mean rank of 4.55. The results showed the need for educating consumers regarding the variety and types of millets.

3.4 Consumption Pattern of Organic Millets in Hyderabad

Consumption pattern refers to the manner in which individuals or households consume goods and services, and includes aspects such as frequency, quantity, form, timing, and source of consumption. In the present study, key aspects of organic millet consumption, including frequency, duration of use, preferred forms of product and meal times during which millets are commonly consumed were evaluated using descriptive statistics.

3.4.1 Frequency of consumption of organic foods and organic millets

The frequency of consumption of organic foods and millets are shown in Fig. 1. The data reveals that the frequency of consumption of organic millets are less than that of organic foods among consumers. A notable 28 percent of respondents consume organic foods daily, while only 11 percent consume organic millets at the same frequency. The majority of consumers (48 percent) consume organic foods weekly (1–3 times), compared to 43 percent for organic millets. Among the respondents, 18 percent consume millets occasionally, and 8 percent rarely, showing that for some, millet consumption remains limited. This contrast suggests that while organic foods have become a part of regular diets for many, organic millets are still in the transitional or exploratory phase for a significant portion of the population.

Table 3. Ranking of millets based on familiarity

Millet type	Frequency of ranking					Mean rank
	Rank 1	Rank 2	Rank 3	Rank 4	Rank 5	
Finger millet	87 (72.50)	27 (22.50)	0 (0.00)	6 (5.00)	0 (0.00)	1.38
Sorghum	33 (27.50)	42 (35.00)	45 (37.50)	0 (0.00)	0 (0.00)	2.10
Pearl millet	0 (0.00)	51 (42.50)	69 (57.50)	0 (0.00)	0 (0.00)	2.58
Foxtail millet	0 (0.00)	0 (0.00)	6 (5.00)	60 (50.00)	54 (45.00)	4.40
Little millet	0 (0.00)	0 (0.00)	0 (0.00)	54 (45.00)	66 (55.00)	4.55

Note: Figures given in parenthesis indicate percentage to the total respondents.

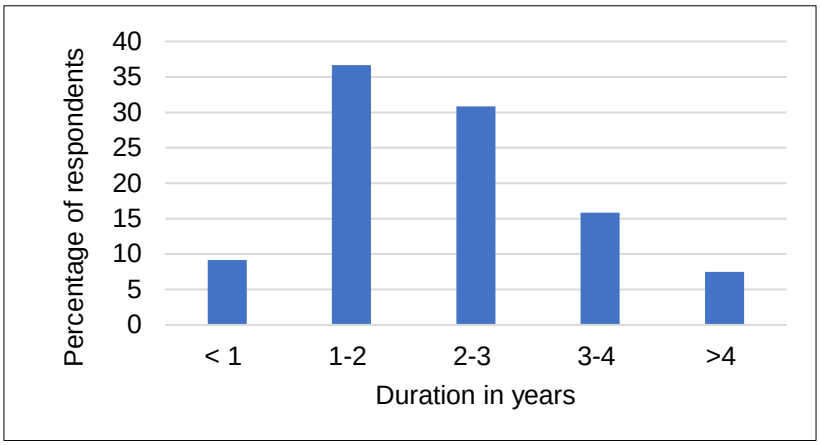

Fig. 1. Frequency of consumption of organic foods and organic millets

3.4.2 Duration of consumption of organic millets

The number of years of consumption varied from 0.5 to 7 years among the organic millet consumers of Hyderabad. The mean duration of organic millet consumption was calculated as 1.91 years. This indicate that most consumers have only recently adopted millets into their diets. The classification of respondents according to the number of years of consumption has been presented in Fig. 2. Majority of consumers (37 percent) have adopted organic millets recently, within the last two years. This reflects a recent shift in dietary preferences, possibly driven by increased health awareness and market availability. Approximately nine percent are very new adopters, suggesting that awareness and interest are growing and attracting new consumers. Nearly 16 percent have been consuming millets for a period of 3-4 years, and eight percent for more than four years, indicating a growing and stabilizing consumer base for organic millets in Hyderabad. Targeted awareness programs and consistent availability could help retain new users and grow this base further.

3.4.3 Form of consumption of organic millets

The data on the form of consumption of organic millets is given in Fig. 3, reveals that consumers predominantly prefer convenient options. The most common form in which organic millets were eaten in Hyderabad city was as ready to eat food and snacks, as reported by 33 percent of the respondents, indicating a strong inclination toward instant and easy-to-consume millet-based foods. This is followed by porridge and whole grain consumption at 29 percent, reflecting a

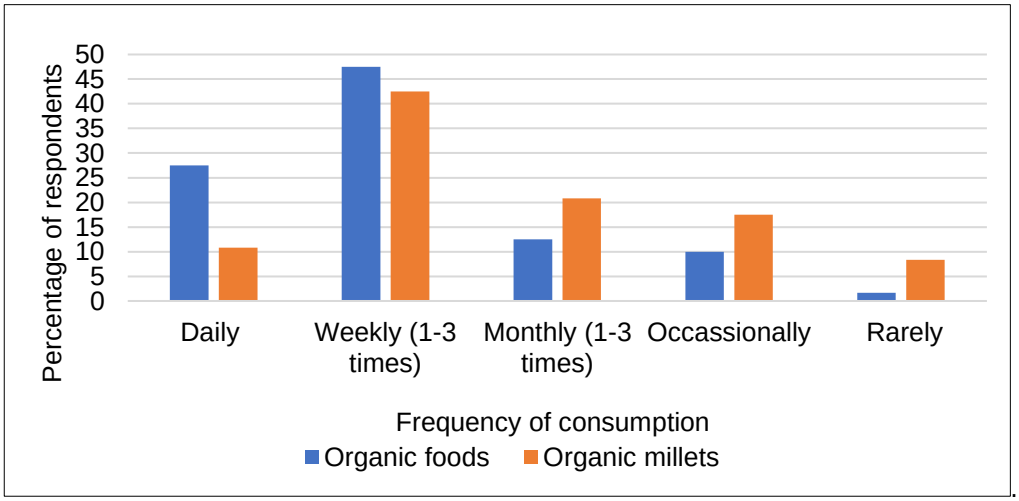

Fig. 2. distribution of respondents based on no. of years of consumption of organic millets

Fig. 3. Distribution of respondents based on form of consuming organic millets

considerable preference for traditional and nutritious preparations. Ready-to-cook products, such as instant mixes, were chosen by 19 percent of respondents, roti and bread made from millet flour were consumed by 13 percent of respondents, implying regional eating habits. A small segment of five percent reported consuming millets in other forms, which included dosa, soups, beverages etc. Overall, the findings highlight a dual trend where consumers balance health-conscious traditional choices with the convenience of modern food formats.

3.5 Purchase Behaviour of Organic Millet Consumers in Hyderabad City

Understanding the purchase behaviour of organic millet consumers in Hyderabad is essential for identifying market trends, consumer preferences, and potential barriers to adoption. In the present study, key factors such as sources of purchase, expenditure on organic millets, deciding factors of purchase, barriers to purchase and certification studies are discussed.

3.5.1 Source of purchase of organic millets

The respondents were asked to rank various sources of purchase based on their preference, such as specialised organic stores, retail stores (a larger, formal outlet or chain store or organic sections in supermarkets), online platforms, and direct-from-farm purchases on a scale from 1 (most preferred) to 4 (least preferred). The rankings helped in identifying dominant channels and understanding consumer priorities. The results are presented in Table 4.

The results revealed that specialised organic stores are the most preferred option among organic millet consumers of Hyderabad. With a mean rank of 1.43 and 61.67 percent of respondents ranking them first, these stores are perceived as the most reliable and desirable source. Retail stores follow with a mean rank of 2.12, indicating moderate preference likely due to accessibility and brand familiarity. E-commerce platforms have a higher mean rank of 2.80, suggesting that while online shopping is convenient, it may not yet fully satisfy consumer expectations for organic products and they prefer in store purchases more. Direct purchase from farmers is the least preferred, with the highest mean rank of 3.29 and 65.83 percent of respondents ranking it last, reflecting concerns around certification, availability, or ease of purchase.

Table 4. Preferred point of purchase of organic millets

Point of Purchase	Consumer responses				Mean Rank
	1	2	3	4	
Direct from farmer	19 (15.83)	6 (5.00)	16 (13.33)	79 (65.83)	3.29
Specialised Store	74 (61.67)	41 (34.17)	5 (4.17)	0 (0.00)	1.43
Retail store	28 (23.33)	54 (45.00)	34 (28.33)	4 (3.33)	2.12
Online platforms	1 (0.83)	44 (36.67)	53 (44.17)	22 (18.33)	2.8

Note: Figures given in parenthesis indicate percentage to the total respondents.

3.5.2 Monthly expenditure on organic millets

The monthly expense data on organic millets among consumers in Hyderabad is shown in Fig. 4. which reveals a clear trend of moderate spending. A majority of consumers (53 percent) spend between ₹500 and ₹1000 per month on organic millets, indicating a steady but budget-conscious interest in these products. Around 18 percent of consumers spend less than ₹500, representing either occasional users or those new to the concept of organic foods. Meanwhile, 24 percent of consumers fall into the ₹1000–₹1500 range, showing a deeper commitment to organic millet consumption. Only six percent of consumers spend more than ₹1500 monthly, highlighting that high-end demand is still limited. Overall, the data suggests that while there is a growing market for organic millets, the majority of consumers operate within a moderate budget, and strategies to enhance awareness, accessibility, and perceived benefits could help expand consumption across higher spending categories.

3.5.3 Factors preventing purchase of organic millets

The major factors preventing the purchase of organic millets among consumers of Hyderabad was analysed, and presented in Fig. 5. Limited availability of millet products emerged as the most significant barrier, reported by 37 percent of respondents. This indicates that access to organic millets remains a major challenge, possibly due to supply chain limitations or restricted retail presence. The higher relative price was the second most cited reason, affecting 21 percent of respondents, showing a moderate level of price sensitivity among consumers.

About 19 percent of respondents mentioned that organic millets are not preferred by their family members, suggesting that household preferences and acceptance play an important role in shaping purchase decisions. Doubts about the authenticity of organic labels were expressed by 13% percent of respondents, pointing to concerns over the credibility and transparency of certification processes. Almost 10 percent of the respondents indicated lack of information as a barrier, highlighting the need for better consumer education and awareness campaigns. Similar to these findings, Shah et al. (2024) identified barriers to purchase millets as inaccessibility, lack of trust, and misconceptions about quality taste or nutritional value.

3.6 Consumer Preference for Certified Vs Non-Certified Organic Millets: CHI-square Test

A Chi-square test of independence was conducted to examine the statistical significance of difference in consumer preference between certified and non-certified organic millets. The results shown in Table 5 revealed a statistically significant difference in consumer preferences. The value of Chi-square statistic was 6.67 with 1 degree of freedom. Since the p-value ($p = 0.00$) is less than the conventional significance level of 0.05, the null hypothesis of no difference in preference was rejected. This indicates that consumer preference varies between certified and non-certified products, highlighting the importance of official certification in influencing purchasing decisions.

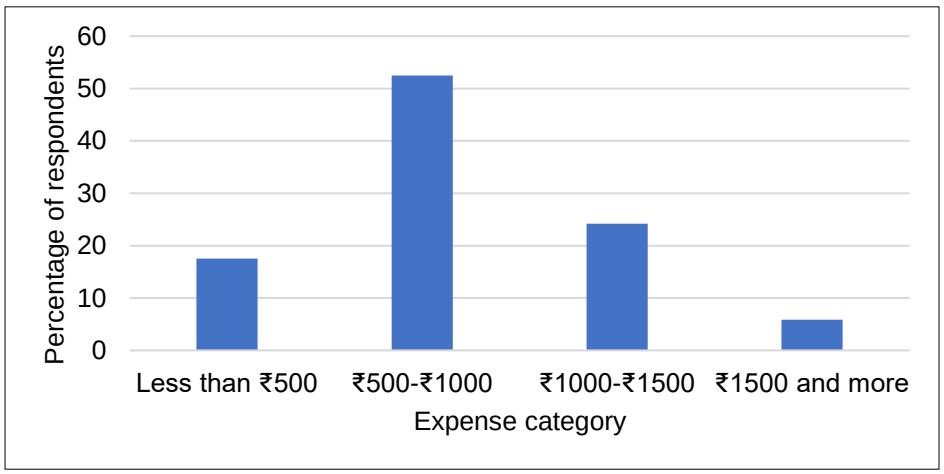

Fig. 4. Distribution of respondents based on monthly expenditure on organic millets

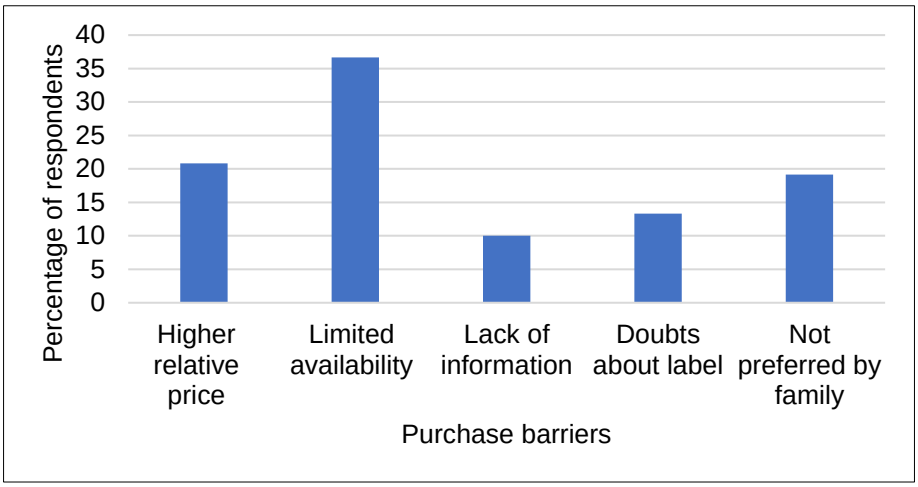

Fig. 5. Key factors preventing purchase of organic millet products

Table 5. Results of Chi-Square Test for significance of organic certification

Statistic	Value
Chi-square value (χ^2)	6.67
Degrees of freedom (df)	1
P-value	0.00
Significance level (α)	0.05

3.7 Factors Influencing Organic Millet Consumption Expenditure - OLS Regression Analysis

Ordinary Least Squares (OLS) regression was conducted to examine the influence of socio-demographic and perception-based factors on monthly millet consumption expenditure. Descriptive statistics of variables included in the estimation is given in Table 6.

The model demonstrates a strong explanatory power, with an R^2 value of 0.80 and an adjusted R^2 of 0.79, indicating that approximately 79 percent of the variation in monthly organic millet expenditure is explained by the included socio-demographic and perception-based variables. The F-statistic is highly significant ($p < 0.01$), confirming the overall validity of the model.

The results are presented in Table 7. The results indicate that among the predictors, the perceived availability of organic millets is positively and highly significant. A one-unit improvement in perceived availability increases monthly millet expenditure by ₹239.75, holding other factors constant. This finding suggests that improving the distribution and shelf presence of organic millets could directly stimulate consumer spending, as easy access reduces search costs and increases purchase frequency. The positive coefficient for household income highlights that organic millet consumption is income elastic, implying that higher-income consumers are more likely to allocate a portion of their budget to premium, health-oriented products.

Table 6. Descriptive statistics of variables included in the estimation

Variable	Mean (n = 120)	Standard deviation
Monthly household expenditure on OM (₹) *	807.25	337.54
Perceived availability (ordinal)	2.25	1.06
Gender (female = 1, male = 0)	0.41	0.49
Monthly household income (in lakh ₹)	1.14	0.98
Education (years)	11.05	1.83
Certification Preference (yes = 1, no = 0)	0.48	0.5

Note: Dependent variable

Table 7. Organic millet consumption expenditure and socio-economic determinants: OLS regression estimates

Predictor	Coefficient (β)	Standard Error	p-Value
Availability	239.75***	15.98	0.00
Gender	14.60	28.67	0.61
Monthly household income	43.47**	0.00	0.01
Education	29.61***	9.12	0.00
Certification Preference	-71.18**	28.73	0.01
Constant	-80.99	91.58	0.37
R-squared	0.80		
Adjusted r squared	0.79		
F-statistic	92.72		
Prob(F-statistic)	0.00		

*Note: *** and ** indicate statistically significant at 1 percent and 5 percent respectively*

Education also shows a positive and significant effect, underscoring the role of nutritional awareness and informed decision-making in promoting millet consumption. In contrast, the preference for certified products exhibits a significant negative association, indicating that consumers who prefer certified products may actually spend less, possibly due to the limited availability or higher prices of certified millets. Gender was not found to have a significant effect, suggesting that millet consumption expenditure is relatively uniform across male and female consumers, reflecting household-level rather than individual-level purchase decisions.

Overall, the findings underscore the importance of improving market availability, enhancing consumer awareness, and addressing certification-related barriers to expand demand and strengthen the organic millet market. These results are consistent with Kalra et al. (2020), who identified income, education, and availability as key drivers of organic product demand in India, and with Pathak et al. (2023), who reported the influence of demographic factors on millet consumption behaviour. Collectively, the results reaffirm that socio-economic capacity and product accessibility are central determinants of organic millet consumption patterns. The insights from this analysis provide a valuable foundation for designing targeted interventions that integrate consumer behaviour with market development strategies, thereby promoting the sustainable growth of the organic millet sector.

4. CONCLUSION

The analysis of organic millet consumption in Hyderabad shows that health and nutritional benefits are the main drivers of consumer choice, while taste, ease of cooking, and regular use remain lower priorities. Likert-scale results indicate strong awareness of nutritional advantages, moderate trust in certification, and perceived limited availability. Finger millet and sorghum are the most familiar types, whereas foxtail and little millet are less known. Consumption patterns reveal that most consumers are recent adopters, prefer convenient forms such as ready-to-eat foods and snacks, and spend moderately on organic millets. Key barriers include limited availability, higher prices, household preferences, and doubts about certification. Chi-square analysis confirms a significant preference for certified millets, and OLS regression shows that perceived availability, income, and education positively influence expenditure, while preference for certification negatively affects spending, and gender has no significant impact. Overall, socio-economic capacity, accessibility, and consumer perceptions jointly shape organic millet consumption.

5. POLICY IMPLICATIONS

To promote the organic millet market, strategies should focus on improving distribution and retail presence, particularly through specialized stores and supermarkets, to enhance accessibility. Consumer education campaigns highlighting nutritional benefits, health advantages, and millet variety literacy can encourage informed and habitual consumption. Enhancing the affordability and transparency of certified products through streamlined certification and clear labelling will reduce barriers and build trust. Additionally, promoting convenient product formats, such as ready-to-cook meals and millet-based snacks, can align traditional dietary habits with modern lifestyles, supporting wider adoption and sustainable growth of the sector.

DISCLAIMER (ARTIFICIAL INTELLIGENCE)

Author(s) hereby declare that NO generative AI technologies such as Large Language Models (ChatGPT, COPILOT, etc) and text-to-image generators have been used during writing or editing of this manuscript.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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