

## SHORT ARTICLE

# Awareness, acceptance, and consumption pattern of millets among ever-married women in an urban area of Delhi: A cross-sectional observational study

Priya Arora, Vikram Singh

Department of Community Medicine, Army College of Medical Sciences, Delhi Cantt, New Delhi

### CORRESPONDING AUTHOR

Dr Priya Arora, Department of Community Medicine, Army College of Medical Science, Delhi Cantt, New Delhi-110010

Email: [docpriarora@gmail.com](mailto:docpriarora@gmail.com)

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### ARTICLE CYCLE

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### ABSTRACT

**Background:** Millets are a great source of fiber, minerals, and vitamins and are well-known for their excellent nutritional value. They have been part of traditional diets in India. **Aims & Objectives:** The study was conducted to assess millet awareness, acceptance, and consumption among married women in an urban area of Delhi. **Methodology:** A community-based cross-sectional study was conducted using a semi-structured questionnaire to collect information on a sample of 262 married women residing in the Tilak Nagar urban area of Delhi. **Results:** It was found that 78.9% of middle-class women consume millets at least once a month, compared to 64.9% of lower-class women ( $P$  value 0.044,  $\chi^2=4.053$ ). 70.9% of the women who were aware of millet significantly consumed it. **Conclusion:** The findings showed that consuming millet is strongly linked to both socioeconomic status and awareness about millet.

### KEYWORDS

Millets, Awareness, Nutrition, Consumption Pattern, Health, Married Women.

### INTRODUCTION

Millets are crops that have existed in our culture from the very beginning. India is home to many millet varieties, including the more common Ragi (finger millet), Jowar (sorghum), and Bajra (pearl millet). However, during the last few decades, their proportion of India's food basket has gradually decreased.(1)

Millet consumption by the average Indian declined from 32.9 kg to 4.2 kg between 1962 and 2010. Nevertheless, India's wheat consumption almost doubled, rising from 27 kg to 52 kg.(2) Millets were renamed "nutri-

cereals" because they have important nutrients like protein, fiber, vitamins, and minerals.

It is essential for researchers, nutrition volunteers, and food manufacturers to understand awareness, consumption patterns, and preferences to plan products and interventions effectively. This aids in enhancing the grain's profile in the market and improving the population's nutritional status and overall health. Understanding the mindset of women in the community regarding superfoods is essential, as educated women are key

to family dietary choices. Thus, the current study was conducted with the following aims & objectives:

- 1) To assess millet awareness, acceptance, and consumption among married women in an urban area of Delhi.
- 2) To find the association between various factors and the consumption pattern of millets.

## MATERIAL & METHODS

**Study type & design:** The current cross-sectional study was conducted among married women.

**Study population:** All the married women who gave consent to participate in the study.

**Study setting & duration:** The study was conducted in the urban area of Tilak Nagar, Delhi, for a duration of 3 months, from September 2023 to November 2023. The study had ethical approval and required informed consent from participants.

**Sample size calculation:** The sample size was determined based on a previous study in 2022 in Coimbatore, India, which found millet consumption to be around 89%.<sup>(3)</sup>

The desired sample size was determined by using the formula:

$$n = Z^2 p(1-p) / d^2,$$

where,  $Z = 1.96$ ,  $p = 89\%$ , and  $d = 0.05$ .

$$n = (1.96)^2 \times 0.89(1-0.89) / (0.05)^2 = 150.44 \approx 150.$$

The calculated sample size was 150, and after accounting for a non-response rate of 10%, we have a minimum sample size of 165.

### Data Collection

A random sampling method was used for selecting the subjects and a semi-structured, pre-tested questionnaire was created to collect data.

**Statistical analytical method:** The collected data was entered in MS Excel. After that, data was imported into Statistical Package for the Social Sciences (SPSS) version 23 for analysis. Data with normal distribution were expressed as mean with SD and data with non-normal distribution was expressed as median with inter-quartile range (IQR). Categorical data were expressed in terms of percentages and proportions. Chi-squared test/ Fischer exact was used to test the statistical significance of

qualitative variables.  $P$  value less than 0.05 was considered significant.

## RESULTS

**Socio-demographic details:** In a survey of 262 women, most were aged 35-44 years (32.1%) and 45-64 years (37%), averaging 42.5 years. As per the modified Kuppuswamy scale, many fell in the upper lower class (64.5%) or lower class (13.7%).<sup>(4)</sup>

**Aware of millets:** It was found that 237 women (90.5%) were aware of millets, with only 25 being unaware. Out of the 90% of women aware of millets, 83.6% recognized Pearl Millet, 76% Sorghum, 52.3% finger millets, and 50.4% Buckwheat. Few familiar with Amaranthus, Foxtail Millet, and Barnyard Millet. The majority (83.2%) learned from family, friends, or relatives; only some from newspapers or social media. 73.3% believed millets are more nutritious than regular cereals. Women acknowledged millets' health benefits: preventing obesity (57.3%), diabetes (55.3%), hypertension (49.6%), malnutrition (39.3%), anemia (30.9%). 74.7% of women were unaware of government millet initiatives.

**Attitude towards Millets:** About 77.7% of women support promoting millets. 70.6% think awareness will increase millet acceptance, 72.9% believe introducing millets to children will help cultivate a liking. 87% agreed eating more millets is good for health, while 53.8% found millets affordable and 45% easy to cook.

**Consumption Pattern of Millets:** 8.4% of women ate millets > 3 times a week, 20.6% consumed them 1-3 times a week, 38.9% ate them monthly, and 32.1% didn't consume millets at all. Roti was the preferred form (48.9%), followed by porridge/khichdi (31.3%), boiled form (7.6%), and chilla/dosa (6.9%). In the past month, 59.2% had pearl millets, 42.4% had sorghum, 35.1% had buckwheat, and 25.6% had finger millets. Reasons for not consuming millets included family disliking the taste (39.7%), cooking challenges (37.4%), cost (31.3%), and limited availability (25.6%).

Table 1 revealed that education level and socio-economic status were significantly linked to millet awareness. Educated women (i.e., school-educated and graduates) were more

aware compared to uneducated women. The association between education and millet awareness was statistically significant. Additionally, middle-class women were more aware than lower-class women. However, age did not show a significant association with millet awareness.

**Table 1 Association between socio-demographic profile & awareness of millets.**

Variables		Awareness of Millets n (%)		P value, $\chi^2$
		Yes	No	
<b>Educational Status of Women</b>	Illiterate	60 (80.2)	15 (20.8)	0.001, 13.793
	School level	158(95.2)	8(4.8)	
	Graduate or above	19(90.5)	2(9.5)	
<b>SES</b>	Lower	181(88.3)	24(11.7)	0.024, 5.119
	Middle	56(98.2)	1(1.8)	

Table 2 demonstrates that middle-class women consume more millets monthly than lower-class women, and the association was statistically significant. Education status did not influence consumption, but millet awareness did significantly. As we can see from the table, a higher number of aware women consumed millet as compared to unaware women. Surprisingly, some of the unaware women still consumed millets. This relationship was statistically significant, highlighting the impact of awareness on consumption. The study underlines the importance of economic status and millet awareness in determining consumption patterns.

**Table 2: Profile characteristics and millet consumption**

Variables		Frequency of consumption n (%)		P value, $\chi^2$
		At least once a month	Not at all	
<b>Educational Status of Women</b>	Illiterate	46 (61.3)	29 (38.7)	0.195, 3.272
	School level	115 (69.3)	55 (30.7)	
	Graduate or above	17 (81)	4(19)	
<b>SES</b>	Middle	45(78.9)	12(21.1)	0.044, 4.053
	Lower	133(64.9)	72(35.1)	
<b>Awareness of Millets</b>	Yes	168(70.9)	69(29.1)	0.002, 9.904
	No	10(40)	15(60)	

## DISCUSSION

**Awareness:** According to our study, 90.5% of women were aware of millets, and the majority were familiar with four crops: pearl millets (Bajra), sorghum (jowar), finger millets (Ragi), and buckwheat (kuttu). Similar findings were seen in a study conducted by Padmalini S et al. among south Indian urban women in 2021.(5)

In our study, we found a significant association between women's education and millet awareness. Similar findings were seen in a study conducted by Kalaiselvi A et al. among women in Coimbatore in 2016.(6)

**Attitude:** 77.7% of women support marketing millets to the general public, 70.6% find it acceptable, and 87% believe eating more millets is healthy. Overall, women show a positive attitude towards millets. Similar findings were reported in the studies done by K Prasanthi and Dr. G Sireesha in Andhra Pradesh (2022) and Sangeetha MU et al. in Tirupati, where attitudes toward millets were good.(7,8)

**Consumption:** In our survey, we found that two-thirds of the women consumed millet. Similar findings were observed in a survey conducted in Coimbatore by Girijavallabhan A et al., where 89% of women consumed millet.(3) However, Padmalini S et al. reported that only 38% of urban women in Bangalore consumed millet in the same year.(5)

Women avoid consuming millets due to taste preferences (39.7%), cooking challenges (37.4%), cost concerns (31.3%), and limited availability (25.6%). These reasons were also highlighted in Padmalini S's study on South Indian urban women.(5) In our study, literate women eat more millet but the association isn't statistically significant. Yet, Umanath M. et al.'s research in India suggests that higher education correlates with lower millet consumption.(9) This could be due to the social status associated with rice and wheat.

In addition, higher-income groups show a significant association with increased millet consumption, as millets are now viewed as a healthy choice among urban populations. On the contrary, Umanath et al. observed that income levels did not impact millet consumption, suggesting that millets have long

served as dietary staples among low-income individuals.(9)

In our study, we observed that 70.9% of women who were aware of millets significantly consumed millets. Interestingly, 10 (40%) of women not familiar with millets consumed millets, while 15 (60%) did not. Similar findings were observed in a study conducted on urban and rural populations in Telangana by Prashanthi A *et al.*, who found that educating people about millets increased their consumption.(10)

### CONCLUSION

Our study indicated that a significant number of women hold a positive attitude towards millets, but factors limiting consumption encompass taste preferences, pricing concerns, and difficulties in preparation. Educational level demonstrated minimal influence on millet consumption, however, individuals from higher socioeconomic groups exhibit a tendency to consume higher quantities of millet for health-related reasons. Despite being aware of the nutritional and health benefits of millet, only one-third of women consume it weekly.

### RECOMMENDATION

The study indicates that educated women tend to have higher awareness of millet, and those with better awareness also tend to consume more millets. Therefore, we should advocate for girls' education. Accessibility and the effort to supply millet through the Public Distribution System (PDS) are also essential for their consumption. It is also necessary to run awareness-raising campaigns to promote the nutritional benefits of millet and dispel the common belief that they are the food of the past.

### LIMITATION OF THE STUDY

Since this is a cross-sectional study, associations between factors and consumption patterns cannot be established over a period of time.

### RELEVANCE OF THE STUDY

As observed in the study, educating women about millets can enhance awareness and

boost millet consumption among them and their families. This insight may be beneficial for researchers and the government aiming to advocate millet consumption and enhance nutritional well-being and overall health in the population.

### AUTHORS CONTRIBUTION

All authors have contributed equally.

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Nil.

### CONFLICT OF INTEREST

There is no conflict of interest.

### DECLARATION OF GENERATIVE AI AND AI ASSISTED TECHNOLOGIES IN THE WRITING PROCESS

The authors haven't used any generative AI/AI assisted technologies in the writing process.

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