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Millet Mania: Exploring Awareness and Consumption Patterns among College Students

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Authors Contribution

Poonam Lakra : Writing of research paper; Indu Nashier Gahlawat : Collection of data and review of literature; Areeba Hussain : Collection of data

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Abstract

Though millets are nutritionally superior to popular cereals like rice and wheat in terms of various nutrients, the consumption of rice and wheat is higher than that of millets. The present study was undertaken to understand the attitude, preference and consumption patterns of millets among young adults. The study participants were young adults between the ages of 17 and 24 years pursuing studies in various disciplines in Delhi and Haryana. Data regarding the preference, attitude, reasons for consumption, frequency and forms of millet consumption among young adults were collected using a Google questionnaire through WhatsApp and 700 responses were received. It was found that 82 per cent of the participants were aware of millet products available in the market and approximately 66 per cent considered millet superior to wheat and rice. Bajra, jowar and ragi were the most popular millets among them. The majority of respondents considered millets to be good for health and were aware of their nutritional benefits. Lack of knowledge about the preparation methods, being the only one in the household consuming millets, unacceptable taste and long preparation time were identified as factors responsible for not consuming millets. Roti/bread, khichadi, porridge, dosa, ready-to-eat foods and beverages were some of the popular preparations consumed by the respondents. Additionally, the majority of respondents considered millets to be environmentally sustainable.

Keywords : Rice, Wheat, Millets, Nutritional benefits, Consumption pattern

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Millet is a collective term that encompasses several types of small-grained cereal grasses. They are classified in two groups: 'large millets' consisting of sorghum and pearl millet and 'small millets' including finger millet, pearl millet, foxtail millet, barnyard millet, kodo millet and little millet. They are often called 'smart food' because they are nutritious, healthy, environmentally sustainable and resilient crops. They have the capacity to overcome unfavourable climatic conditions and grow in nutritionally poor soils and demand less quantities of water, pesticides and fertilizers (Saleh *et al*., 2013). Farming procedure of minor millets leave a lower carbon footprint compared to other commonly grown major staples. It is reported that out of 14,000 plants, only three crops wheat, rice and maize, contribute to 60 per cent of the calorie intake. The sustainable development goals (SDGs) 2030 aim to eliminate malnutrition by the year 2030 (Kane-Potaka *et al*., 2021). To achieve this, interventions are required to substitute wheat, rice and maize with nutrient-rich millet. India is the leading producer and consumer of several millets. Earlier many preparations were developed from millets in different regions of the country, which contributed significantly as a staple food. However, over the years, their presence in the Indian food basket has reduced due to government policies favouring the production and consumption of cereals like rice and wheat (Kane-Potaka, 2021). Other reasons of decline of millets include low

productivity, high labour intensity, inadequate investment product development and the easy availability of rice and wheat in the public distribution system.

Millets are store house of nutrition and possess several health benefits. They contain approximately 60-70 per cent carbohydrates, 7-11 per cent protein, 1.5-5 per cent fat and 2-7 per cent crude fibre (Himanshu *et al.,* 2018). Millets complement well with commonly used pulses regarding amino acid content to form a complete protein (Anitha *et al*., 2019). They are an excellent source of B-group vitamins and minerals like manganese, magnesium, phosphorus, calcium and iron. Ragi contains the highest calcium content among food grains. Pearl millet is a good iron, zinc and folic acid source. Millets provide phytochemicals that have several health benefits. Millets possess several nutraceutical properties that help to reduce lifestyle related health problems such as obesity, diabetes cardiovascular diseases and cancer. As whole grains, each millet also has different types and amounts of fibre, essential in regulating bowel function, blood sugar and body lipids. Due to their alkaline nature, they help to maintain an optimum pH balance in the body. Millets are gluten free, thus offering an excellent option for gluten sensitive people. Incorporating millet into our daily diets can provide healthy alternatives to the usual refined grains in the food market. Besides, to strengthen our fight against malnutrition in young adults, millet consumption can help for foster immunity and health (Saini *et al*., 2021).

Recently, the interest in millets in India has been reviving due to their nutritional benefits and ability to survive in extreme climatic conditions. Also, the International Year of Millets 2023 provides a unique opportunity to increase the global production of millets and improve food sector linkages to improve the presence of millets in the food basket. This transition phase, during which there is a change in perception of millets and increased health awareness, is the right stage to assess knowledge, attitude and practices (KAP) regarding millets. Understanding the knowledge, attitude and patterns of millet consumption will help researchers and food manufactures to develop millet-based products, to improve the population's nutritional status. This study was planned to assess the knowledge, attitude and practices regarding the use of millet among college-going students.

Material and Methods

The study was carried out in Delhi and Haryana. The study participants were college students, both girls, and boys, between the ages of 17 to 24 years. They were pursuing their graduation and post-graduation in various disciplines. A questionnaire in the form of a Google form was circulated among young adults to gather information about their background, attitudes, consumption patterns, benefits and trends in the usage of millet. Seven hundred responses were received. The received responses were tabulated and the results were expressed in percentages.

Results and Discussion

Demographic Profile of the Respondents

The majority of the respondents were female students and the age distribution pattern of the respondents were between the ages of 17 and 24 years, with most of them falling into the 17-20 age group (Table 1). Sixty-three per cent of the participants were vegetarian, 32.1 per cent were non-vegetarian and the rest followed a vegan diet (Table 2). The majority of the respondents belonged to the family income of less than Rs.50,000 per month (Table 3).

Table 1

Age group of the respondents

(n=700)

Particulars	Percentage
17-18 years	35.9%
18-19 years	31.7%
19-20 years	9.7%
Above 20 years	22.7%

TABLE 2

Diet Preferences of the respondents

(n=700)

Particulars	Percentage
Vegetarian	63.0 %
Non vegetarian	32.1 %
Vegan	4.9 %

TABLE 3

Family income of the respondents

(n=700)

Particulars	Percentage
Less than Rs.50,000 per month	61.3 %
Between 50,000- 1,00,0000 per month	28.7 %
More than 1,00,000 per month	10.0 %

Awareness About Millets

The study examined the respondents' awareness regarding the availability of millet-based food products in the market. It was found that 82 per cent of the respondents were aware of the various millet products available in the market (Fig. 1). This indicated that the young adults are interested in the food products available in the market. However, only 37 per cent of the students were aware that 2023 is being celebrated as the International Year of Millets.

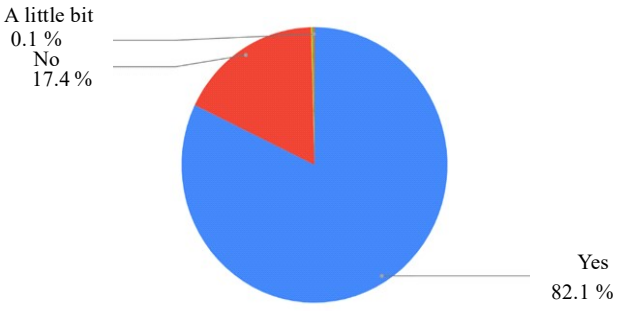

Fig. 1: Awareness about millets

Comparison of Millets with Wheat and Rice

Millets are rich in essential nutrients, and their protein levels are at par with or even surpass those found in grains like wheat (*Triticum aestivum*), rice (*Oryza sativa*), maize (*Zea mays*) and sorghum (*Sorghum bicolor*) (Kumar *et al*., 2018 and Anbukkani *et al*., 2018). Studies have shown that millets have higher nutritional content than other commonly consumed cereals. This is particularly true when comparing them to polished rice, refined wheat flour, and maize, which became popular after the green revolution (Longvah *et al.,* 2017). Most students (66%) considered millet superior to wheat and rice, even though rice and wheat are popular staples among them (Fig. 2).

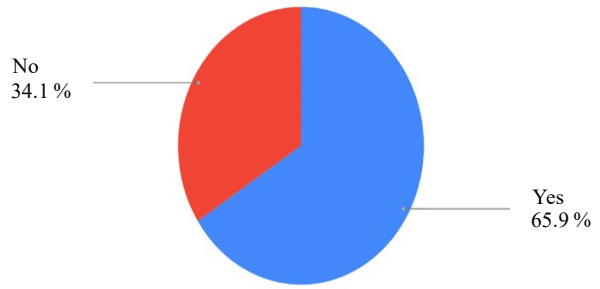

Fig. 2: Comparison of awareness on nutrient content of millets with wheat and rice

Use of Millets in College Canteen

The students reported that millets are not commonly used in college canteen preparations. Only 17 per cent of the canteen served dishes made from millet (Fig. 3). This shows a lack of initiatives from the institutions to promote millet dishes.

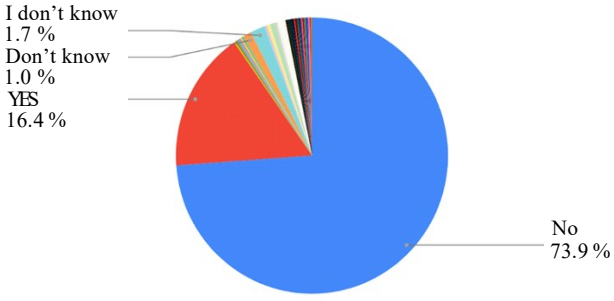

Fig. 3: Use of millets in college canteen

Popularity of Millets

Various millets are grown in India to suit different agro-climatic regions. These include sorghum, pearl

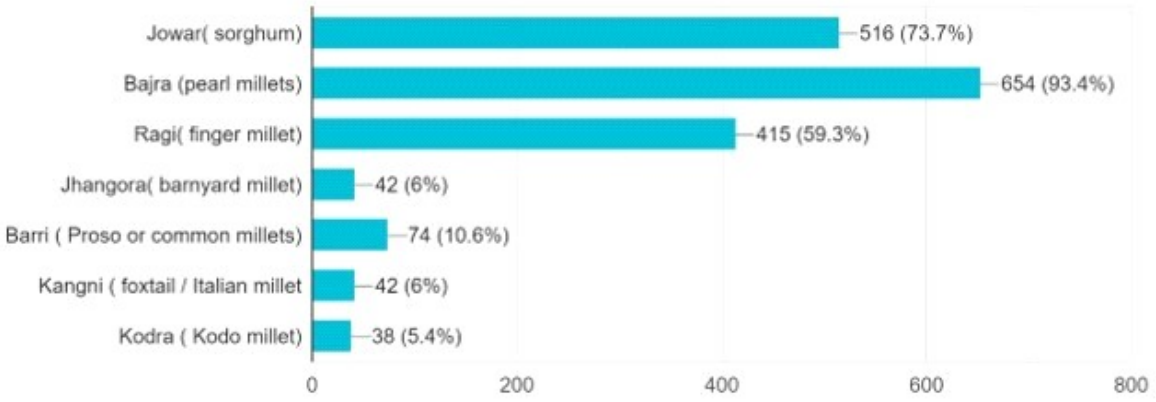

Fig. 4 : Popularity of millets

millet, finger millet and small millets such as barnyard millet, proso millet, kodo millet, little millet and foxtail millet (Sukumaran Sreekala *et al*., 2022).

Among these, bajra (pearl millet) was the most popular millet among college students, with a popularity rate of 93.4 per cent. It was followed by jowar (sorghum millet) at 73.4 per cent and ragi (finger millet) at 59.5 per cent. Jhangora (barnyard millet), barri (proso millet), kangini (foxtail millet) and kodra (kodo millet) were less popular among college students (Fig. 4).

Frequency of Millet Consumption

Fifty percent of the students occasionally include millet in their meals. 16.6 per cent of the respondents have millet preparations weekly, while 15.6 per cent were consuming once in a month. As depicted by Fig. 5 a very small percentage of students have millet daily. The study conducted by Sangeetha *et al*., 2022 indicated that most millets were consumed only once in a month and also suggested that millets are not popular staples among young adults.

Reasons for Millet Consumption

Among the respondents who consume millet, were further asked about reasons to consume. They expressed consumption of millets for 'good health' and 'good in taste' were the primary reasons for that consumption (Fig. 6). Students were aware of the health benefits of millet, which was the main reason

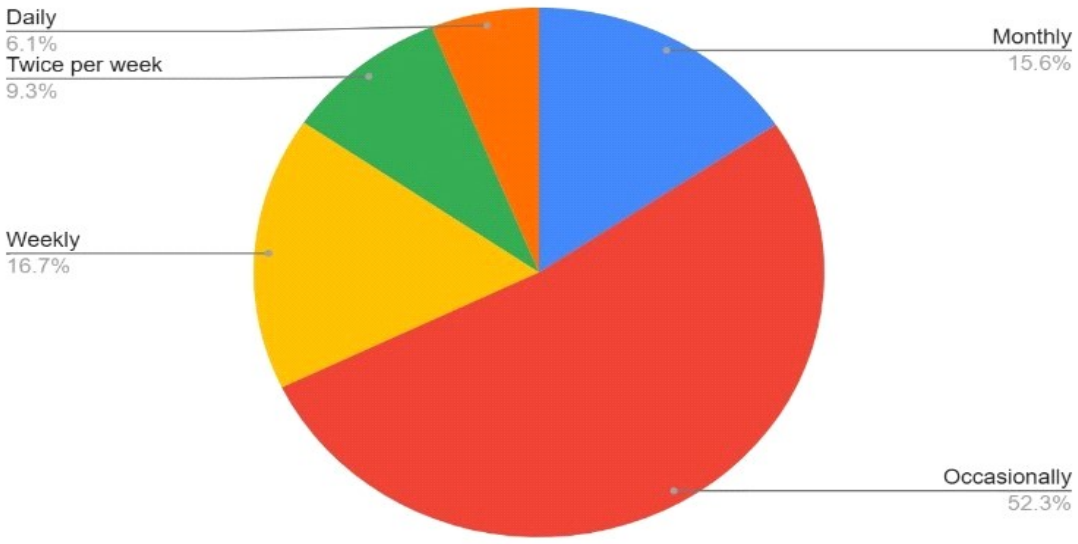

Fig. 5 : Frequency of millet consumption

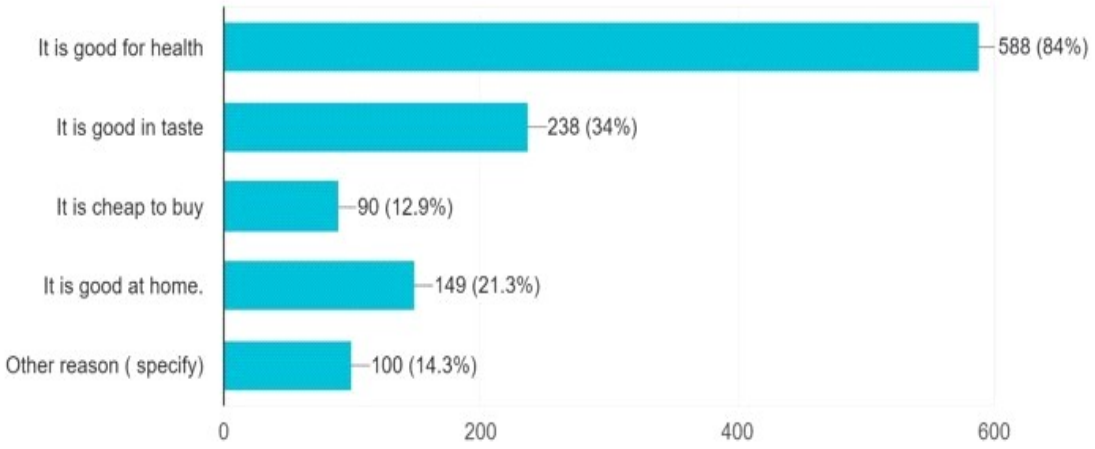

Fig. 6 : Reasons for millet consumption

for their consumption. Additionally, some students found it economical to purchase. The most prevalent reasons for consuming millet include weight loss, skin health and hair growth (Kane-Potaka *et al.,* 2021).

Nutritional Benefits of Millet Consumption

The students were well-informed about the nutritional benefits of millet. Most respondents knew millets have several advantages for maintaining heart health, controlling diabetes and promoting good digestion (Fig. 7). Respondents knew that millets are rich in calcium, iron and fibre sources. Additionally, a few students were aware of other added advantages of millets, such as richness in antioxidants and gluten-free nature.

Millets possess several important nutritional benefits, including hypolipidemic and low-glycaemic index properties and antioxidative properties (Sharma & Bhatia, 2021 and Asrani *et al.,* 2022). Several studies have also reported that gluten-free millet can help to alleviate irritation caused by other cereal grains (Hoshino *et al.,* 2010 and Saleh *et al.,* 2013). Moreover, millets serve as notable magnesium source, a mineral recognized for its potential in decreasing the likelihood of experiencing heart attacks. They

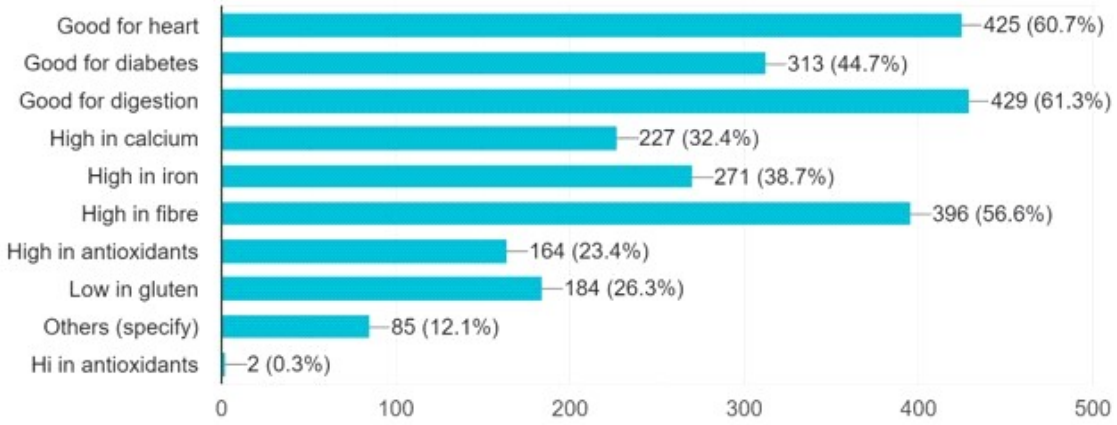

Fig. 7 : Nutritional benefits of millet consumption

contain phytochemicals that include phytic acid, which aids in reducing cholesterol levels and preventing heart related disease by lowering plasma triglycerides (Lee *et al.,* 2010). Research suggests that regular consumption of whole millet grains can lower the risk of cardiovascular disease. Consumption of millets help to manage hyperglycaemia due to their high dietary fibre content, making millets a perfect food for diabetic patients (Nainwal *et al*., 2018).

Reasons for not Consuming Millet

Lack of preparation knowledge and no one else eating at home were the main reasons for not consuming millet, followed by unacceptable taste and long preparation time (Fig. 8). Some studies reported that taste and family dietary customs as reasons for not consuming millet (Kane-Potaka *et al.,* 2021). The data shows that young adults are aware of millet's nutritional benefits but are not regularly consuming them in practice.

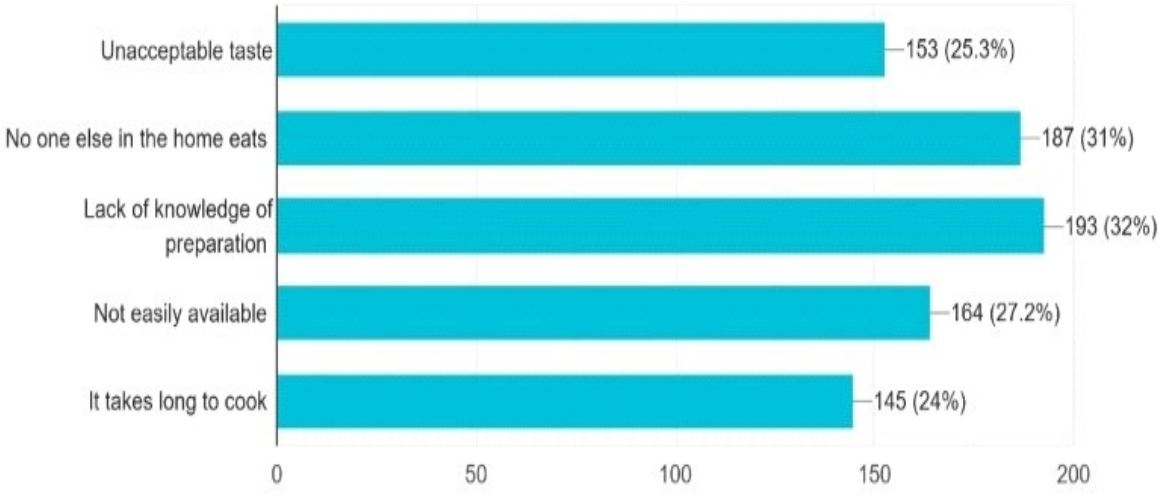

Fig. 8: Reasons for not consuming millet

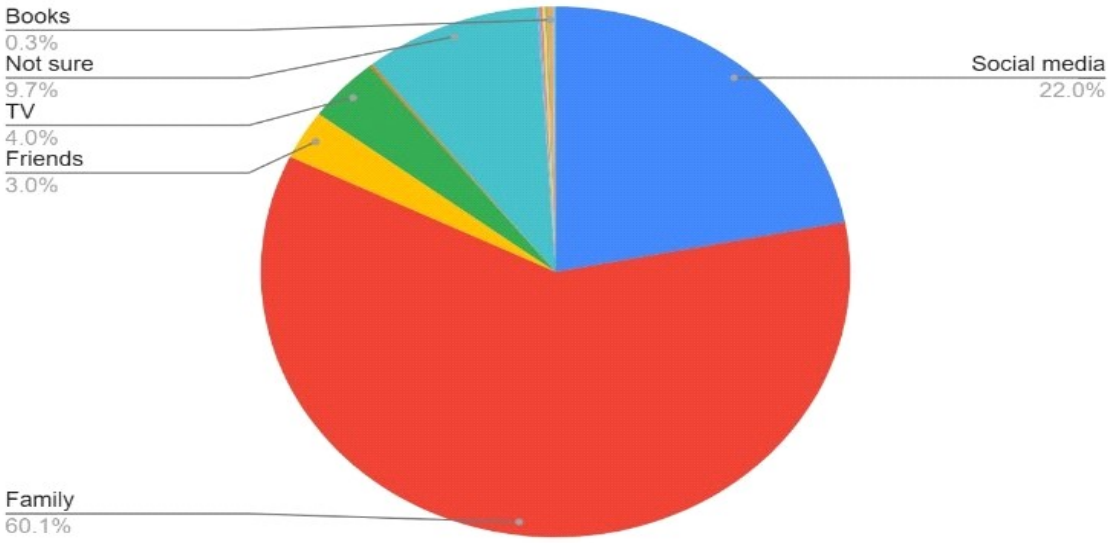

Fig. 9 : Source of information about millets

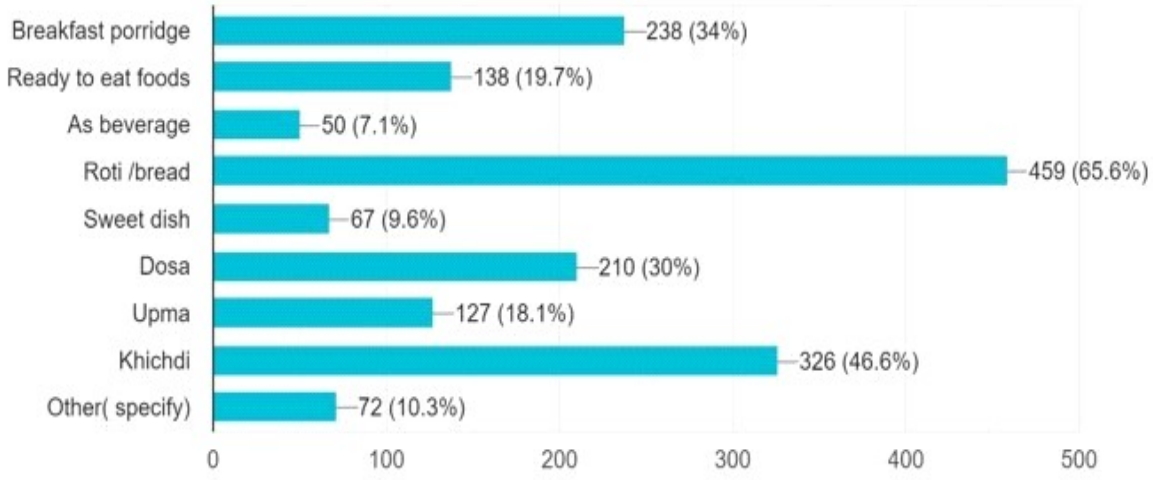

Fig. 10 : Ways of millet consumption

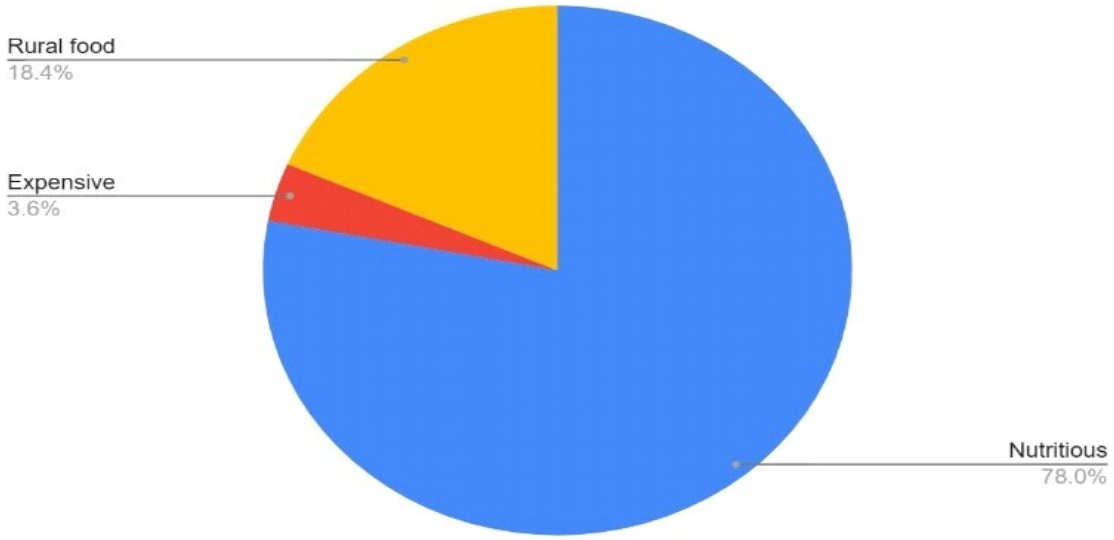

Fig. 11: Attitude towards millet consumption

Source of Information about Millets

The primary source of awareness by the respondents regarding various types of millets was family, followed by social media (Fig. 9).

Ways of Millet Consumption

Approximately 65 per cent of the students preferred to eat millet as roti/bread. Khichri, porridge, dosa, ready-to-eat foods and beverages were some of the other preparations consumed by the respondents (Fig. 10). The findings are in line with study conducted by Kane-Potaka *et al.,* 2021 which reported that millets were mostly eaten as ready-to-eat food, breakfast porridge, roti, bread, snacks, traditional sweets and dosa/adai.

Attitude Towards Millet Consumption

Based on the data presented in the Fig. 11 it is evident that among the total respondents, 78 per cent of them considered millet as nutritious, 18.4 per cent perceived millet as rural food and the remaining participants considered as expensive food.

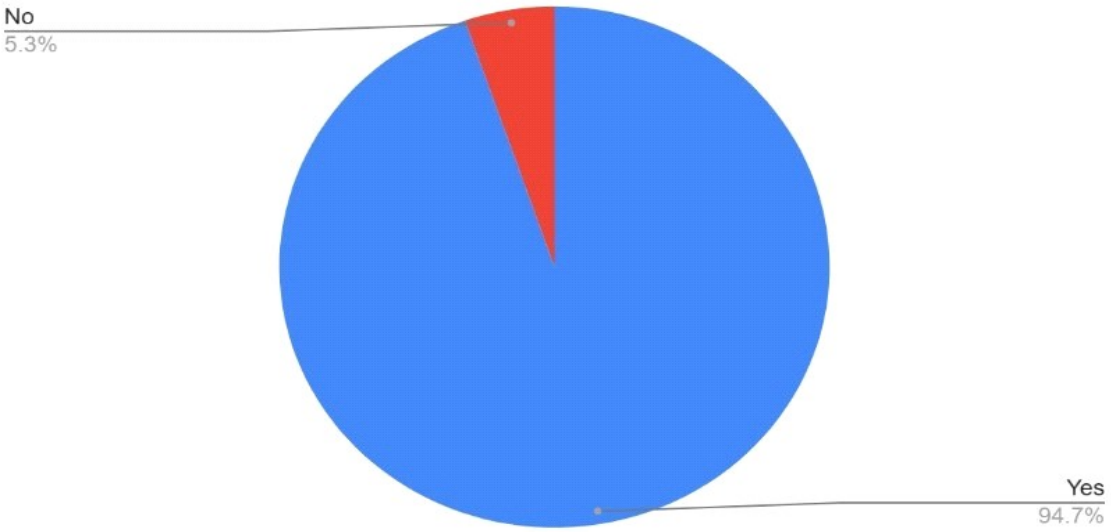

Fig. 12 : Millets as environmentally sustainable

Millets as Environmentally Sustainable

Most students consider millets as environmentally sustainable (Fig. 12). Millets flourish in nutrient-deficient soils with a pH range spanning from acidic to alkaline conditions. They require less water and can be grown even under extreme climate conditions, such as high temperatures and low rainfall (Srinivasan *et al*., 2019). Millets are resistant to drought and pests, requiring minimal care. They are C4 plants that can efficiently convert CO_2 into carbohydrates through photosynthesis, exhibiting higher photosynthetic efficiency than C_3 plants (Sood *et al.,* 2015).

The present study aimed to investigate young adults' knowledge, attitude and consumption patterns. It revealed that the participants knew the nutritional and health benefits of millet, yet they did not regularly incorporated it in their diets. Additionally, they recognized millets as environmentally sustainable. Utilizing social media platforms can be an effective way to increase awareness and consumption of millet. It is important to provide easy recipes explicitly targeting young adults. Furthermore, like major cereals such as rice and wheat, millets could also be included in the Public Distribution System.

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