



Exploring the Consumption Pattern of Millets among Rural Women of Udham Singh Nagar District of Uttarakhand, India

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Authors' contributions

This work was carried out in collaboration between both authors. Both authors read and approved the final manuscript.

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ABSTRACT

The cultural traditions and customs of the rural communities are profoundly ingrained with the production and diverse uses as well as benefits of millets. The production of millets follows the principle of minimum input and maximum output and known as poor men's food. Therefore, present study was conceptualized with main objective to know the consumption pattern and knowledge related to millet among rural women. Hence, in-person interviews were conducted among 120 rural women of Pantnagar, Uttarakhand. Majority of rural women (48%) were young (< 27 years of age),

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educated and had nuclear family (68%). They reported that Ragi (32%), Bajra (25%), Jowar (22%), Chaulai (16%) and Jhangora (5%) were highly consumed millets among them. Majority preferred to make chapatti of millet flour and that to only during winter season. They also liked to eat millets as whole grain (81.9%) and in puffed form (20.48%). Further, study revealed that more than half percent had poor knowledge about environmental benefits and consumption benefits of millets. The study suggested that more small steps should be taken to disseminate accurate knowledge and conduct demonstration sessions in communities to promote the millet consumption and production as well.

Keywords: Millets; rural women; consumption pattern; nutritional benefit.

1. INTRODUCTION

Millets are back in our thalias one of the superfood. Having being disregarded for many years and viewed as animal feed, millets have gained back their lost recognition. In present day fast moving societies with majority of Indians having a busy and hectic life in both rural and urban areas it is of utmost importance to pay an attention on their diet and food choices which has a direct impact on their health. Concern over convenience and processed food is growing in relation to fitness and health. To minimize the health risks, the World Health Organization (WHO) advises a nutritious balanced diet along with daily exercise. In India, although rice and wheat account for the majority of processed food intake but with this gaining importance of millets since international year of millets 2023, Millets will be replacing rice and wheat as it has have five times higher nutritional value [1,2].

Around fifty years ago, millets were the major crop consumed in India and many other countries but unfortunately the plate share of millets has dramatically decreased. (National Council of Applied Economic Research (NCAER) report 2014). It can be regarded as a result of government initiatives and support for the cultivation and consumption of high-quality grains like wheat and rice [3]. A comparable downfall has been seen in the per capita consumption of millets in both rural and urban areas, with reports of reductions of 68 and 70% from 19.1 to 5.2 and 8.5 to 2.7 kg annually, respectively [4]. However, in some parts of India, a variety of millets, including finger millet, pearl millet, kodo millet, foxtail millet, barnyard millet, proso millet, and little millet, are produced and consumed in large quantities (www.superfood.org). Further, It is believed that millets are the only crop capable of addressing future major issues like fuel, food, malnutrition, health, and climate change as it is considered as a hardy crop for production which requires

minimum irrigation practices [5] and at the same time full of nutrition to combat the diseases. Thus, the relevance of millets cannot be neglected. It is becoming more and more clear from past studies that millets should be a part of healthier, more affordable, and easily accessible diets in light of India's rising malnutrition crisis, which includes both under-nutrition (deficits in vitamins, minerals, and proteins) and over-nutrition (obesity, metabolic syndrome, and lifestyle diseases). These have been linked to the high consumption of refined grains, specifically refined white rice [6,7,8]. As a result, eating whole grains is becoming more and more important on a global scale Edge et al., [9], highlighting the significance of mainstreaming nutrient-dense smart food crops and promoting them as staple food. According to Agricultural and Processed Food Products Export Development Authority APEDA report [10] due to the constant efforts, India became one of the largest producers and suppliers of millets. Now people's diet is shifting towards millets mainly due to health-related concerns [11,12,13 and 8].

In Uttarakhand as years ago these grains have been used to make a wide variety of dishes and drinks and serving as a core in the regional cuisine in various locales of state. In both hill and plain areas of Uttarakhand women have high participation in agricultural workforce and other tasks which has detrimental effect on their health Rizwana et. al. [14]. Therefore, present study was undertaken to study the knowledge and consuming behavior of millets among rural women [15].

2. METHODOLOGY

Locale- This exploratory research study was conducted at Nagla Dairy Hydel Community, Pantnagar located at Udham Singh Nagar district of Uttarakhand which was selected purposively. The primary focus was on rural women of communities who were fully involved in growing

crops, vegetables and fruits in surrounded lands. The total population of women was 176 thus for true representation 120 rural women were selected randomly as the sample of study. The interview schedule was administered to the subjects and appropriate statistical tools were used to analyze the collected data using Microsoft Excel.

3. RESULTS AND DISCUSSION

3.1 Profile Characteristics of Rural Women

Data regarding profile characteristics of women respondents depicted that most of them (48%) were below 27 years of age followed by 33 percent belonged to middle age category i.e. between 27-37 years and remaining (were under old age category. In the

community, majority (62%) of respondents belonged to nuclear family whereas remaining 38 percent were from joint families. Regarding literacy level, most of women were educated while only few of them were illiterate. Moreover, some rural women do not possess any formal degree but they can read and write.

Among the respondents (Table 2), more than two third of women (74.17%) said that millet is the traditional crop and half of them (52.90%) had knowledge different types of millets grown in India. The women respondents also told that millets are helpful in maintaining weight, blood sugar level and boosting immunity. Therefore, it can be clearly seen from their responses that majority (66.19%) of women had knowledge regarding nutritional benefits of including millets in daily diets.

Table 1. Profile characteristics of rural women

(n=120)			
Sr.	Age	f	%
1	Young (<27 years)	57	48
2	Middle(27-37years)	39	33
3	Old (> 37 years)	24	20
Sr	Type of Family	f	%
1	Nuclear	74	62
2	Joint	46	38
Sr.	Educational Status	f	%
1	Illiterate	5	4.2
2	Can Read only	2	1.67
3	Can Read and write	8	6.66
4	Primary (till 5)	15	12.5
5	Middle (till 8)	25	20.83
6	High school (10 th)	16	13.32
7	Intermediate(12 th)	26	21.66
8	Graduation	20	16.67
9	Post-graduation	3	2.5

Table 2. Knowledge on millets among rural women

(n=120)			
Sr.	Statements	Yes (%)	No (%)
1	Is millet your traditional crop?	74.17	25.83
2	Do you know about different types of millets?	52.90	47.10
3	Do you have knowledge about the environmental significance of growing millets?	48.36	51.64
4	Do you know about the nutritional benefits of including millets in daily diets?	66.19	33.81
5	Do you know that millets are considered as “Poor Men’s Superfood” due its multiple benefits?	43.87	56.13

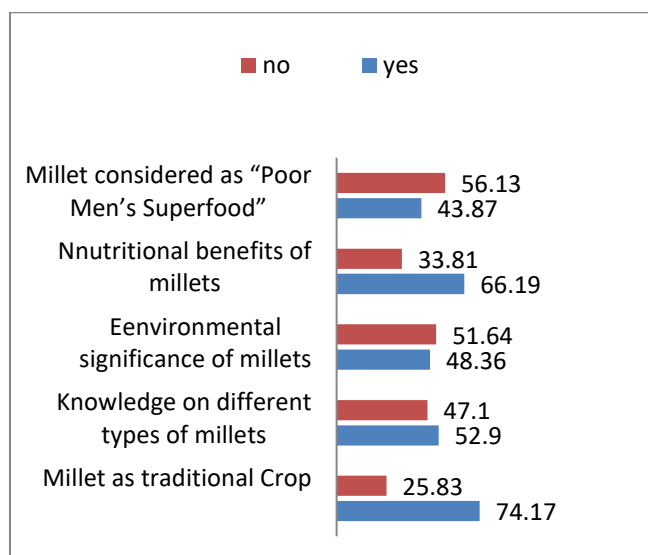


Fig. 1. Knowledge regarding millets among rural women

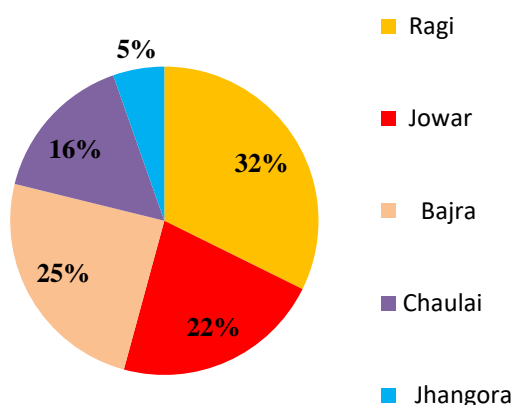


Fig. 2. Highly consumed millets

It was also reflected in the responses of rural women that more than half of them had lack of knowledge about the environmental significance of growing millets and it is considered as Poor man's Superfood".

Thus, despite having basic knowledge about the millets, most of rural women were not aware about the scientific facts of cultivating millet crops as well as not having in-depth knowledge about their multiple benefits.

3.2 Consumption Behavior of Millets among Rural Women

Perusals of Table 3 reveals that millet products were consumed by majority of women (69.16%)

and the frequency of taking millets on diet was 2-3 times a week (50.60%) followed by once a week, daily, less often and once a month (20.48%, 13.25%, 10.85% and 4.82% respectively). As per their perspective, winter is suitable weather to eat millets especially ragi and bajra reported by more than half of respondents while remaining said in both season summers and winters they consumed millets.

Additionally, during interviews, women respondents reported that they mostly cook millet chapati, puri, halwa and also make daal-baati. Hence, majority (100%) consumed millets in flour form followed by whole millet form (81.93%), in puffed form (20.48%), ready to eat products (15.66%) like biscuits, namkeen, papad etc.

Table 3. Distribution of respondents according to millets' consumption behavior

		n=120	
Sr.	Statement	Yes	No
1	Do you consume millets and millet based products?	83 (69.16%)	37 (30.83%)
2	If Yes, frequency of consuming millets-	f (n=83)	%
	1) Daily	11	13.25
	2) 2-3 times a week	42	50.60
	3) Once a week	17	20.48
	4) Once a month	4	4.82
	5) Less Often	9	10.85
3	In which season, you consume the millets -	f	%
	a) Winter	51	61.45
	b) Summer	-	-
	c) In both	32	38.55
4	In which form, millets are consumed mostly (multiple answers)-		
	1) Flour	83	100
	2) Whole millet	68	81.93
	3) Rawa Form	-	-
	4) Puffed	17	20.48
	5) Ready to eat products	13	15.66

From the Fig. 2 it is clear that Ragi/maduwa ((32%) was highly preferable millet among them followed by Bajra (25%), Jowar (Sorghum, 22%), Chaulai (16%) and Jhangora (5%). They also reported that to BPL families ragi/maduwa was provided by government on their rashan cards which might be one of the reasons of high consumption of ragi among other millets. On the other hand, the climate and soil of Uttarakhand is also suitable for growing millet crops.

4. CONCLUSION

In agriculture, the significance of millet crops waned with the emergence of more high yielding cereal crops. In many regions of India, millet was associated with poverty and subsistence farming. There might be several factors contributed to decline in cultivation, promotion and favoritism towards millets. According to present findings, although most of women were consuming millet products but they were lacking in the scientific knowledge and its potential to combat hunger and poverty. Moreover, millet based cuisines were disliked by their family members especially young because of the taste and texture. It might be due to lack of awareness, knowledge and skills of making different types of items/cuisines by using millets in their diets. Thus, it can be suggested that conduct educational and awareness campaigns and use effective media to fulfill these gaps regarding consumption of "Shree Anna" (Millets). Integrating millets into mainstream and increasing the knowledge of public about the various culinary uses of millets

and recipes through exhibitions, demonstrations, cooking competitions, meetings, simulated games etc can be crucial to improve eating behaviour among people. Additionally, to attain zero hunger, malnutrition and economic empowerment, improved varieties, adequate support and market facility should be provided to the farmers. Creating an enabling policy environment and strengthening extension services for disseminating information, modern millet farming techniques and facilitating their access to resources are crucial to overcome these problems.

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 manuscripts.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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