

Assessment Of Awareness About Importance Of Millets Amongst Nursing College Students Of Dr. Ram Manohar Lohia Institute Of Medical Sciences In Lucknow City: An Observational Study

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Abstract

Background: Foods like millet are very high in nutrients and non-glutinous. In India, millets usually consist of sorghum, pearl millet, and a range of small millets. Millets are a good source of iron, manganese, phosphorus, antioxidants, magnesium, and vitamin B. They are well-known for their endurance, capacity to cope with high temperatures and deteriorated soils, and minimal need for water, fertilizer, and pesticides. Millets aid in the advancement of the digestive system and help remove issues such as cramps, bloating, constipation, and excessive gas. By controlling the digestive processes, eating millet helps to prevent gastrointestinal disorders like ulcers and colon cancer. Maintaining regular digestion and the removal of harmful components also supports the body's immunological, liver, and kidney systems. Increasing rates of lifestyle disorders such as obesity, diabetes mellitus, hypertension, and micronutrient deficiency disorders are the sheer result of our ignorant behavior toward our nutritional intake.

Objective: To assess awareness about the importance of millets amongst nursing college students at the Dr. Ram Manohar Lohia Institute of Medical Sciences in Lucknow City.

Methodology: This observational study was carried out on 100 nursing students at the Dr. Ram Manohar Lohia Institute of Medical Sciences, Lucknow, India. The data was collected on socio-demographics, millet frequency patterns, and KAP. Direct interviews using the self-structured questionnaire method were used to collect data.

Results: In the present study, the chi-square and Phi's and Cramer's V strengths are used to test the association between the frequency of millet consumption. The findings of the study revealed that not all demographic factors, except a few, influence the consumption pattern of millet.

Conclusion: People can incorporate millet, a very nutrient-dense food, into their everyday diets. Not only does it have a high nutritional content, but it also has many additional advantages, like being gluten-free, helping the body detoxify, being non-acidic, and being easily digested. The consumption pattern of millets is mostly unaffected by demographic considerations. Therefore, it is necessary to search for additional elements to encourage individuals to consume millet.

Keywords: association, millets, consumption, KAP, nursing students.

1. Introduction

“If you want to make some profitable investments for the future, then invest in optimizing the nutritional status of your body because it is the only place you have to live.” This quote reflects the reality of our health, and ironically, this is the most neglected aspect of our health. Increasing rates of lifestyle disorders such as obesity, diabetes mellitus, hypertension, and micronutrient deficiency disorders are the sheer result of our ignorant behavior toward our nutritional intake.

One of the earliest foods people have been known to consume is millet, which may have been the first cereal grain used for domestic purposes. Millets are well-known for their endurance, capacity to cope with high temperatures and deteriorated soils, and minimal need for water, fertilizer, and pesticides. [1]

Foods like millets are very high in nutrients, non-glutinous, and do not cause acidity. One of the significant food groups that has been removed from the food basket in recent years is small millets. Small millets include essential micronutrients including vitamin B, calcium, iron, folic acid, and Sulphur along with dietary fiber, making them an invaluable weapon in the fight against malnutrition, even if cereals are a less expensive source of calories.

The extraordinary efforts of our Honorable Prime Minister Shri Narendra Modi resulted in the Announcement of the year 2023 as “International Millet Year.” In his 92nd Mann Ki Baat, he mentioned that “India is the largest producer of millets

in the world, so the responsibility of making this initiative a huge success also lies on the shoulder of Indians. together we have to make it mass movement and also create awareness among people of our country.” In G-20 millets were the integral part of meetings, investors were given actual experience through tasting millet-based recipes meeting farmers and startups and MSMEs, now millets are termed as “Shree Dhaanya”, “Millet Sahbhoja” are becoming important platforms to showcase very delicious and nutritious recipes of millets.

In India and other Asian and African countries, millets usually consist of sorghum, pearl millet, and a range of small millets.[2] Indian government convincingly suggested to the United Nations for declaring year 2023 as “International Millet Year”. The word “millets” in this paper mentions to all of these crops. A variety of millets, including finger millet, pearl millet, kodo millet, foxtail millet, barnyard millet, proso millet, and tiny millet, are produced and consumed in large quantities in India. India ranks sixth in the world for sorghum production. These grains have historically been used to make a wide variety of dishes and drinks in many different places, and they have been an important staple in the regional cuisine. These days, people ingest minerals like iron, calcium, phosphorus, potassium, and beta-carotene, as well as vital amino acids, carbohydrates, and vitamins like B complex and beta-carotene. Millets provide an abundance of these nutrients.

Millets are composed of 2-7% crude fibre, 9% proteins, 3% fat, and 65% carbs, along with several vitamins and minerals. They are also a good source of iron, manganese, phosphorus, antioxidants, magnesium, and vitamin B. With the exception of lysine and threonine, they are a great source of important amino acids and contain a fair amount of sulphur, which includes the amino acids cysteine and methionine.[3]

The important fatty acids found in millets, such as linoleic, oleic, and palmitic acids, as well as mono galactosyl, diacylglycerols, Di galactosyl diacylglycerols, phosphatidylethanolamine, phosphatidyl serine, and phosphatidyl choline, are all present in good amounts in the bound form. There are trace levels of other fatty acids, such as erucic acid, behenic acid, and arachidic acid. Millets aid in preserving the health of the ears. Magnesium, which is abundant in millets, is a key mineral for lowering blood pressure and the chance of a heart attack or stroke, especially in cases of atherosclerosis. Because millets are high in fibre, they can help lower cholesterol. The dietary fibre in millet helps the body get rid of harmful LDL cholesterol and increases the effects of good cholesterol.

Millets aid in the advancement of the digestive system and are helpful in removing issues such as cramps, bloating, constipation, and excessive gas. By controlling the digestive processes, eating millet helps to prevent gastrointestinal disorders like ulcers and colon cancer. Maintaining regular digestion and removal of harmful components also supports the body's immunological, liver, and kidney systems. Millet contains number of ingredients that help the body eliminate impurities. The millet's antioxidant complexes and nutraceuticals work together to help the body rid itself of toxins and foreign objects. Millet is used to make probiotic and prebiotic drinks that help cleanse the body and eliminate harmful substances. [4,5]

Ecological factors, such as frequent fast-food consumption, have the potential to reverse the negative effects of obesity and undernutrition on children's diet. Fast food and junk food are unhealthy due to their high fat, salt, and saturated fat contents. Additionally, it makes menstruation-related issues including early menarche, irregular menses, dysmenorrhea, and heavy menses more common. [6,7]

2. Materials and Methods

2.1 Study Area and Study Design

The study was conducted in the Nursing College of Dr. Ram Manohar Lohia Institute of Medical Sciences of Lucknow City, Uttar Pradesh, India through an Observational study design.

2.2 Sample size and Study Time Period

A total of 100 nursing students were randomly selected for the study using a purposive sampling method. Direct interview method using self- structured questionnaire was used for collection of data.

2.3 Data Collection

Our questionnaire consisted of questions pertaining to anthropometry (Height, weight, BMI) were considered, socio-demographic and socio-economic factors such as the name, gender, religion, residence, marital status, type of family occupation of the family, total family income was taken into account. Millet consumption pattern of different types of millet was evaluated through frequency of their consumption and their awareness about the importance of millets was observed through KAP study pattern. Preferences of different types of millet products were also recorded.

2.4 Statistical Analysis

Statistical Packages for Social Sciences (SPSS) tool was used to organize, tabulate, and statistically analyse the acquired data. Frequencies and relative percentages were used to depict qualitative data. The Chi square test was performed to calculate the difference between qualitative variables. The Phi's and Cramer's V strength test was performed to check the association of demographic variables and frequency of millets consumption.

3. Results and Discussion

3.1 Socio-demographic and Socio-economic Profile of Nursing Students

Table 1, summarised the data of 100 nursing students, out of which 17% are males and 83% are females. On the basis of religion, 90% are Hindu, 9% Muslim and 1% belong to other religions. Out of 100 nursing students, 64% are hostellers and 36% are day scholar. 94% are unmarried and only 6% are married. While taking in account of Mother's Qualification, 13% are educated till primary level, 9% are secondary educated, 29% are intermediate qualified, 26% are graduates, 12% are post graduates and 11% have other kind of qualifications. On taking account of father's qualification, only 3% are educated till primary level, 13% have secondary level of education, 16% are intermediate, 42% are graduates, 19% are post graduates while 7% have qualification of other kind.

Apart from these, it is evident that most of the mothers are housewives (89%), 10% have some kind pf employment whereas only 1% have entrepreneurship. When talking about the employment of fathers, majority of them were employed (67%) and have some kind of employment, 21% are entrepreneurs, 3% are ex-servicemen and only 9% are unemployed. While surveying the type of family in which they live, 62% live in nuclear set-up, 34% resided in joint family and only 4% live with extended family. The total 100 nursing students are categorised into different family monthly income categories. Only 13% belong to the income level less than 10,000, 24% belong to 10,001-20,000 categories, 13% belong to 20,001-30,000 income level, 30,001-40,000 income have only 16% whereas 34% belong to more than 40,000.

Out of all the 100 nursing students, 14% are underweight, 66% are healthy, 17% are overweight and only 3% are obese on the basis of BMI. 74% students have no health problems where 26% have some kind of health problems such as anaemia, menstrual pain, heavy bleeding, thyroid, etc.

Table 1: Descriptive characteristics of sample on millet consumption

Demographic Characteristics	Frequency	Percentage (%)
Gender		
Male	17	17.0
Female	83	83.0
Religion		
Hindu	90	90.0
Muslim	09	9.0
Others	01	1.0
Residence		
Hosteller	64	64.0
Day scholar	36	36.0
Marital status		
Married	06	6.0
Unmarried	94	94.0
Mother's Qualification		
Graduate	26	26.0
Intermediate	29	29.0
Others	11	11.0
Post Graduation	12	12.0
Primary	13	13.0
Secondary	9	9.0
Father's Qualification		
Graduate	42	42.0
Intermediate	16	16.0
Others	7	7.0
Post Graduation	19	19.0
Primary	3	3.0
Secondary	13	13.0
Mother's Occupation		
Employed	10	10.0
Entrepreneur	1	1.0
Housewife	89	89.0
Father's Occupation		
Retired Pharmacist	1	1.0
Agriculture	1	1.0
Business man	1	1.0
Businessman	1	1.0
Employed	66	66.0
Entrepreneur	8	8.0
Ex service man	1	1.0
Ex Serviceman	1	1.0
Farmer	9	9.0
FARMER	1	1.0
Service man	1	1.0

Unemployed	9	9.0
Type Of family		
Nuclear	62	62.0
Joint	34	34.0
Extended	4	4.0
Family Monthly Income (Rupees)		
<10,000	13	13.0
10,001-20,000	24	24.0
20,001-30,000	13	13.0
30,001-40,000	16	16.0
>40,000	34	34.0
BMI		
Underweight	14	14.0
Healthy	66	66.0
Overweight	17	17.0
Obese	3	3.0
Have Health problem		
Yes	26	26.0
No	74	74.0

3.2 Frequency of Consumption of Millets

Table 2 estimated the frequency of consumption of different types of millet among the 100 nursing students. It is evident that the daily consumption of millet is very low among them like only 5% consume Sama, 4% Jowar, 2% ragi, 3% bajra, 3% Kodo daily whereas the occasional consumption of millets is quite higher among them for example, 56% occasionally consume jowar, 68% occasionally consume ragi, 58% occasionally consume bajra, 61% have occasional consumption of Sama, and 73% have occasional consumption of Kodo. Apart from these, only few students have never consumed the millets like 2% have never eaten jowar, ragi, bajra; 3% never consumed Sama and 5% have never consumed Kodo.

Table 2: Frequency of Consumption of Millets

Millets	Frequency of Consumption										
	Daily	Occasionally	Never	Five times a week	Four times a week	Thrice a week	Twice a week	Once a week	Thrice in a month	Twice in a month	Once in a month
Jowar	4	56	2	3	1	5	3	15	1	3	7
Ragi	2	68	2	2	0	2	0	16	4	2	2
Bajra	3	58	2	2	4	1	3	13	4	2	8
Sama	5	61	3	3	2	6	3	10	3	1	3
Kodo	3	73	5	0	1	0	1	14	1	0	2

3.3 Knowledge on Millets

Table 3 showcased the knowledge of nursing students about millets. Majority of them, 95% considered millets are good for health whereas 5% do not consider millets good for health. 90% of them believe that consumption of millets helps to improve health status. On the contrary part, only 36% consume millets-based products daily whereas 64% were not consuming millet-based product daily. Other than this, 87% believe that millets contain highest nutrients and helps to maintain bodyweight whereas 13% do not believe millets have highest nutrients in them and do not help in maintaining body weight. 89% of them think millets contain fibre whereas 11% think millets are not rich in fibre. Apart from these, when enquired regarding the digestibility of millets, 68% regarded millets are easily digestible whereas 32% regarded them as hard to digest. Other than this, 87% contemplated that millets are rich in magnesium, have nutraceutical and antioxidant properties and cooked millets are highly nutritious and daily consumption of millets control blood sugar/ B.P. levels normal, whereas 13% do not contemplate with these facts. 70% of the total students think that millets help in reducing the risk of breast cancer, while 30% of them do not agreed to this fact. Most of them (75%), prepare different millets recipes while 25% of them do not prepare different types of millets recipes and 62% are making supplementary foods using these millets, whereas 38% do not prepare supplementary food using millets. While 53% agreed that it is easy to process millets but 43% strongly disagreed that millets are not easy to process. 71% of the students think millets can blend easily without any pronounced of flavours. Other than this, 76% believed that millets act as probiotics and helps to improve flavour, texture and acceptability of product.

Table 3: Knowledge on Millets

Questions on Millets	Yes	No
Millets are good for health	95	5
millets containing highest nutrients	87	13
Millets contain high fibre	89	11
Millets are easily digestible foods	68	32
Millets help to maintain body weight	87	13

Daily millets consumption controls blood sugar/ B.P. levels normal	83	17
Millets are rich sources of magnesium	83	17
Millets reduces the risk of colon and breast cancer	70	30
Millets have nutraceutical and antioxidant properties	83	17
Cooked millets are highly nutritious	83	17
Daily you are consuming millet-based foods	36	64
Using millets, you are preparing supplementary foods	62	38
Preparing different millet recipes	75	25
It is easy to process the millets	53	47
Millet's consumption improves health status of you	90	10
Millets can blend very easily with common foods without any pronounced of flavours	71	29
Millets act as probiotics and improve flavour, texture and acceptability of product	76	24

3.4 Attitude questions on Millets

Table 4 illustrated the awareness of millets among nursing students. Most of them strongly agreed to the facts like all types of millets are good (59%), with help of millets we can prepare different foods(81%), they are expensive as compared to wheat and rice (54%), their value-added foods enhance the nutritive value of the product (85%), they are gluten free (64%), have low glycaemic index(60%). Apart from these, 48% strongly disagreed to the fact that we can take only one millet at the time. While, 48% don't know about millets that they contain high phenolic acids, tannins and phytates. The relationship between demographic characteristics and the attitude of farm women toward value added products of finger millet were studied previously [8], wherein it was concluded that when farm women were well-trained, there was a favorable attitude toward value addition of finger millet-based products. This, along with the consumer survey results, suggests the need for training on value addition for traditional smart foods, such as millets [9,10], and that preparing millets in a culturally appropriate manner helps in improving their acceptability.

Table 4: Attitude questions on Millets

Questions on Millets	Agree	Disagree	Don't Know
All type of millets is good	59	18	23
With the help of millets, you can prepare different foods	81	5	14
You can take only one millet at the time	29	48	23
Millets are expensive compared to wheat & rice	54	24	22
Millet's value-added foods enhance the nutritive value of the product	85	5	10
Millets are gluten free foods	64	10	26
Millets have lower glycaemic index	60	13	27
[Millets contain high phenolic acids, tannins and phytates]	40	12	48

3.5 Practice questions on Millets

Table 5 gave the summarised view of the practical use of millet. Millet flour is most consumed millet products among the nursing students (70%), only 5% consume popped millets, flaked millets and germinated millets. Whereas only 2% of them consume all kind of millet products. Roti is the most preferred cooked form of millet (48%) among the nursing students, 8% of them prefer Khichadi, and 7% prefer Dosa / Chilla, 2% of them prefer Idli and only 1% prefer Pulao/ Tehri prepared from millet. Only 7% preferred all type of cooked form of millets. Mathri prepared from millet is the first most preferred snack (29%), Chura is the second most preferred snack (14%), and Namakpare is the third most preferred snack (8%), Sev stood at the fourth place in preference of millet snack whereas only 5% prefer Chakli made of millets. Only 11% of the students prefer all kinds of snacks made of millets. While taking account of sweets preference among nursing students, Laddu is the most preferred sweet (29%), Pua/ Thekua is the second most preferred sweet (15%) and Kheer is the third most preferred sweet (12%). 5% of students prefer millet halwa and only 1% prefer millet raab. Only 11% of the students prefer all kind of sweets made of millets. When the preference of millet-based market product was assessed, it was concluded that, millet biscuits were highly preferred by the students (18%) then, cookies took the second place in preference (14%). 8% students preferred cakes prepared using millets, 7% chose puffed mixtures and only 6% preferred millet breads. 15% students preferred all kind of millet products available in the market. Millets have a preference for its varied nutritional properties. Majority of students (80%) prefer millets as they are good for health, helps in weight reduction and they give strength to the body. Only 3% students were there considered millets are not good for health, do not help in weight reduction and give strength to the body. Similar study [11] was done on knowledge,

perceptions, and practices by 111 diabetes individuals reported that 55% of the participants consumed millets because it was a habit from childhood and only 26% of them reported that they ate it because they liked it.

Table 5: Practice questions on Millets

Millet product consumed		
Types of Products	Frequency	Percentage
Millet flour	70	70.0
Popped millet	5	5.0
Flaked millet	5	5.0
Germinated millet	5	5.0
Two of the above	9	9.0
Three of the above	4	4.0
All of the above	2	2.0
Preferred form of cooked millet		
Roti	48	48.0
Khichadi	8	8.0
Idli	2	2.0
Dosa/ Chilla	7	7.0
Pulao/ Tehri	1	1.0
Two of the above	18	18.0
Three of the above	9	9.0
All of the above	7	7.0
Preferred form of millet Snack		
Mathri	29	29.0
Chakli	5	5.0
Sev	7	7.0
Namakpare	8	8.0
Chura	14	14.0
Two of the above	18	18.0
Three of the above	8	8.0
All of the above	11	11.0
Preferred form of millet Sweets		
Pua/ Thekua	15	15.0
Kheer	12	12.0
Laddu	29	29.0
Raab	1	1.0
Halwa	5	5.0
Two of the above	18	18.0
Three of the above	9	9.0
All of the above	11	11.0
Preferred form of millet based market product		
Bread	6	6.0
Biscuits	18	18.0
Cakes	8	8.0
Cookies	14	14.0
Puffed mixtures	7	7.0
Two of the above	15	15.0
Three of the above	17	17.0
All of the above	15	15.0
Why do you eat millets		
Good for health	13	13.0
Reduces body weight	2	2.0
Body becomes strong	2	2.0
All of the above	80	80.0
None of the above	3	3.0

3.6 Impact of demographic factors on Consumption of Bajra

Table 6 points up the impact, the demographic factors have on the consumption of Bajra. There is a very strong association between gender and the consumption of bajra. Family income also has a very strong association with the consumption pattern of bajra. However, Marital status has a moderate association with consumption pattern. Apart from these, residence has a very weak association with the consumption of bajra. In comparison to all these, religion holds no association with the consumption pattern of bajra.

Table 6: Impact of demographic factors on Consumption of Bajra

Demographic	Value	df	Asymptomatic significance	Phi and Cramer's V strength of relationship
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Gender	16.657	10	.082	.303
Family income	44.774	40	.278	.420
Marital status	13.452	10	.200	.018
Residence	17.214	10	.070	.091
Religion	39.973	20	.005	.000

3.7 Impact of demographic factors on Consumption of Sama

Table 7 elucidates the influence of demographic factors on the Consumption of Bajra.

Gender, family income and residence have a very strong association with the consumption

pattern of bajra. Howsoever, marital status and religion are either very weakly or not associated with the consumption pattern of Sama.

Table 7: Impact of demographic factors on Consumption of Sama

Demographic	Value	df	Asymptomatic significance	Phi and Cramer's V strength of relationship
Gender	12.816	10	.234	.587
Family income	36.172	40	.643	.719
Marital status	15.954	10	.101	.007
Residence	12.684	10	.242	.359
Religion	30.622	20	.060	.000

3.8 Impact of demographic factors on Consumption of Jowar

Table 8 shows the effect of demographic factors on the Consumption of Jowar. It is evident

that Gender and family income are highly associated and have a strong association with the consumption pattern of Jowar. Whereas, residence has a moderately influencing association with the consumption pattern of Jowar. On the other hand, contrary to this, marital status and religion have either very weak or no association with the consumption pattern of Jowar.

Table 8: Impact of demographic factors on Consumption of Jowar

Demographic	Value	df	Asymptomatic significance	Phi and Cramer's V strength of relationship
Gender	16.909	10	.076	.258
Family income	36.888	40	.611	.849
Marital status	16.977	10	.075	.001
Residence	17.970	10	.055	.118
Religion	27.436	20	.123	.000

3.9 Impact of demographic factors on Consumption of Ragi

Table 9 illustrates the impact; demographic factors have on the Consumption of Ragi. From

the table, it is clear that gender and family income greatly influence and have a very strong association with the consumption pattern. Furthermore, residence is strongly associated with

the ragi consumption. In addition to this, religion and marital status are very weakly or we can say that not associated with the consumption of Ragi.

Table 9: Impact of demographic factors on Consumption of Ragi

Demographic	Value	df	Asymptomatic significance	Phi and Cramer's V strength of relationship
Gender	7.275	8	.507	.680
Family income	22.576	32	.891	.959
Marital status	15.367	8	.052	.000
Residence	14.925	8	.061	.158
Religion	17.920	16	.329	.035

3.10 Impact of demographic factors on Consumption of Kodo

Table 10 states the impact of demographic factors such as religion, gender, marital status, residence and family income on the consumption of Kodo. Consumption of Kodo is very strongly associated with religion, marital status, family income and marital status of the students. Howsoever, gender is very weakly or is not associated with the consumption of Kodo.

Table 10: Impact of demographic factors on Consumption of Kodo

Demographic	Value	df	Asymptomatic significance	Phi and Cramer's V strength of relationship
Gender	15.994	7	.025	.035
Family income	19.942	28	.867	.864
Marital status	3.916	7	.789	.937
Residence	9.357	7	.228	.372
Religion	2.815	14	.999	1.00

Conclusion:

In the present observational study, it was observed that the younger students were well aware of the importance of millets and also had knowledge about the various types of millets and their available products. Still the traditional form of millet products normally consumed in Indian society were their first choices. Due to their stay in hostel, they were not able to eat millets on daily basis. If given choice they would prefer eating millets as important ingredient in traditional recipes as well as modern food recipes. Consumption of millets was also influenced by family income as still these are produced in less quantity therefore; they are costly as compared to other grains such as wheat and rice. Gender factor also played important role in millet consumption pattern.

Limitation:

Since students had given consumption pattern of millets when they were at their native residence, therefore through implementation of any national or state policy for providing at least one millet per day in hostel mess then in real sense awareness about millet will reach amongst our youth.

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Credit authorship contribution statement

Bharti Pandey: Writing, review and editing

Mahima: Methodology, Analysis, writing.

Poonam Tiwari: Conceptualization, review, and editing.

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Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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