ORIGINAL ARTICLE

Individuals' Knowledge, Attitude and Practices on Millets

K Prasanthi[1] and Dr. G Sireesha[2]

[1]Master of Science in Integrated Food technology, Department of Home Science, Sri Padmavathi Mahila Visvavidyalayam, Tirupati, Andhra Pradesh, India. E-mail: prasanthkattaa@gmail.com
[2]Assistant Professor, Department of Home Science, Sri Padmavati Mahila Visvavidyalayam, Tirupati, Andhra Pradesh, India. E-mail: sireeshaguttapalam@gmail.com

ABSTRACT Millet is an important global food crop with a significant economic impact in developing countries. Millets are considered nutritious, energy-efficient foods that help fight malnutrition. Millet-based foods are considered potential prebiotics and probiotics with potential health benefits. Due to this, the research study was conducted among various group of individuals in various regions to know the knowledge, attitude and practices of millets. Around 105 samples were selected for the study. The study established general information on millets and millets knowledge, attitude and practices among different age group of individuals. General information includes consumption of millets and frequency consumption of millets, types of dishes preparing using millets. The study data was collected using a Google form questionnaire. The results of the study reveal that 80% individuals participated in this session having age group between 15 to 25 years. 80% individuals had good knowledge, attitude and practices regarding millets but 20% of individuals having poor KAP levels.

Keywords: Millets, Significant economic important, Nourishing foods, Malnutrition, Potential prebiotic and probiotics, Knowledge, Attitude and practice

Address for correspondence: Dr G. Sireesha, Assistant Professor, Department of Home Science, Sri Padmavati Mahila Visvavidyalayam, Tirupati, Andhra Pradesh, India. E-mail: sireeshaguttapalam@gmail.com

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INTRODUCTION

India is the largest producer of many types of millet, which are often called coarse grains. Millet is considered a food security crop due to its stability under adverse agricultural conditions (Ushakumari *et al.*, 2004). However, realizing the nutrient richness of these grains, they are now considered nutritious cereals. Millets are considered the least allergenic and digestible grain. Compared to paddy rice, especially polished paddy rice, millets release a lower percentage of glucose and over a longer period of time (Stanley Joseph Michaelraj, 2013). Millet's richness in calcium, dietary fiber, polyphenols, and protein content makes it unique among cereals. Generally, millet shows significant amounts of amino acids like methionine and cystine and is also higher in fat content than rice and corn. Millets have nutraceutical properties in the form of antioxidants that prevent the deterioration of human health, such as lowering blood pressure, risk of heart disease, prevention of cancer and cardiovascular diseases, diabetes, reduction of tumor cases, etc. (Sujata Bhat, 2018).

Millet is one of the oldest foods known to mankind. They are nutrient-dense and rich in plant-based nutrients (phytonutrients). The phytonutrient lignans in millet can help reduce the risk of heart disease. Pearl Millets Pearl millet is a great source of bioactive compounds and contains phytates and polyphenols (Sneh Punia, 2020). Pearl millet is good in nutritional quality and is also rich in phytochemicals such as antioxidants (Mild Rathore, 2016). Foxtail millets are not only high in magnesium which helps in controlling blood pressure levels, they are also high in iron and calcium and help to boost the immunity. Sorghum, on the other hand, is a gluten-free variant that is beneficial for people with celiac disease. Overall, millets are nutritious foods with little energy

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(Smita Verma, 2019). Millet foods are classified as potential prebiotics and increase the viability or activity of probiotics with significant health benefits (Issoufou Amado *et al*., 2013). Pearl millet can be recommended in the treatment of cervical diseases, constipation and many non-infectious diseases. Pearl millet has 8-15 times more-amylase activity compared to wheat and has a lower glycemic index (Vanisha Nambiar, 2011).

Millet is rich in phenolic compounds, especially folic acid and catechins. Millet grains are rich in phytochemicals, especially phenolic compounds. Phenolic compounds in millets appear in both soluble and insoluble-bound forms (Shahidi and Chandrasekara, 2013). These molecules act as antioxidants to protect your body from harmful oxidative stress. Millet is rich in fiber and non-starchy polysaccharides, two types of digestible carbohydrates that help regulate blood sugar levels. This cereal also has a low glycemic index. Millet contains soluble fiber, which produces a viscous substance in your gut. In turn, it traps fats and helps lower cholesterol levels. Adiponectin is a hormone with anti-inflammatory effect that supports heart health and stimulates fatty acid oxidation. Its levels are generally lower in those with esophagus and type 2 diabetes. Millet is a gluten-free grain, a viable option for those with celiac disease or those who follow a gluten-free diet. Gluten is a protein found naturally in grains such as wheat, barley and rye. People with celiac disease or gluten intolerance must avoid it as it triggers harmful digestive symptoms such as celiac disease or nutrient malabsorption (Ariane Long, 2020). Communities that regularly feed finger millet have been found to have lower cancer prevalence (Amadou *et al*., 2011).

Millets are nutritious and occupy an important place in the diet of people in many parts of the world. Although millets are nutritionally superior to cereals, their consumption as food is still largely limited to traditional consumers and the population of lower economic groups. However, in many Asian and African countries, millet is the staple food of the people in the millet producing areas and is used to make various traditional foods and beverages such as idli, dosa, papad, chukli, porridge, breads, baby and snack foods (Chandrasekhara and Shahidi, 2011).

In developed countries, organic farmers and specialty food companies are turning millets into niche products. A good example is Tef agriculture in the US state of Idaho. Millets have the ability to include type in our diet and have healthy promotional properties, especially antioxidant action. Significant innovations have been made in the development of millet processing technology and food production. Millet oil is a good source of linoleic acid and tocopherols. Millet is an alkaline food. Alkaline based diet is often recommended to achieve optimal health (Ekta Singh, 2016).

Based on the above benefits of the millets Indians also consuming the millets and its byproducts. Number of studies was conducted on the benefits and its nutritional facts, very limited studies conducted on the knowledge, attitude and practices (KAP) on millets. Hence, the present study was planned to study the millets KAP on selected subjects.

2. MATERIALS AND METHODS

2.1 Sample Selection

The study was conducted among different people in Andhra Pradesh and Telangana States in India. A total of 150 subjects (different ages) were selected through a deliberate sampling method to participate in the study.

2.2 Data Collection

Data were collected through questioner with the help of Google Form Questionnaire. The millets KAP Questionnaire consists of three parts: Knowledge, Attitude and Practice. The first part of the questions is to test the knowledge on millets, the 2nd and 3rd is to test the attitude and practice on millets.

2.3 Millets Knowledge, Attitude and Practices

Knowledge, Attitude and Learning (KAP) surveys are widely used to gather information for planning public health programs. However, there is rarely any discussion about the use of KAP surveys in providing relevant data for project planning Annika Louniala (2009).

2.3.1 Knowledge

Proper knowledge and attitude are important factors of dietary patterns and potential goals for proper planning of nutritional care programs for vulnerable individuals (Sakhile *et al*., 2014). The first part consists of 10 close end questions with the answer yes or no. Yes indicating that the person has good eating habits does not indicate that the person has less practice on millets. Each yes response in this section received a score of 1, but no received a score of 0. Therefore the respondent can score a maximum of 10 and a minimum of 0 in this section.

2.3.2 Attitude

The questions included in the Attitude section are designed and beliefs in matters of attitude towards nutrition. There were total 10 attitude related questions in this section to know the attitude of the respondents towards millets. These statements have an overall nutritional attitude towards millets. In the Attitude section, numerical values are assigned to each choice given by the respondent. Those who disagreed were given a score of 0, 1 was given to don't know and 2 were

Table 1: Scoring and Classification of Nutritional KAP

Scoring	Knowledge	Attitude	Practices	KAP
	Positive questions 0 = No, 1 = Yes	Positive questions 0 = disagree, 1 = don't know, 2 = agree	Positive questions 1 = Yes, 0 = no	Knowledge score+ attitude score+ Practice score
Range	0-10	10-20	0-10	20-40

given a score to agree. In the attitude section the total score of respondents were a maximum of 20 and a minimum of 0.

2.3.3 Practices

The question included in the practice section was designed to assess the diet of the population in relation to millets. There are 10 close end questions with the answer yes or no. Yes, it does not mean that the person has good eating habits, it does not indicate that the person has less practices on millets. Each yes response in this section received a score of 1, but not everyone received a score of 0. Therefore the respondent can score a maximum of 10 and a minimum of 0 in this section. This section contains questions on practices of subjects on millets, diet, cooking and millet consumption. The score range used as shown in Table 1.

2.4 Statistical Analysis

The correlation between nutritional KAP and other variables (socioeconomic and BMI) was assessed by Pearson's analysis.

3 RESULTS AND DISCUSSION

It is evident that before going to millets knowledge, attitude and practices among subjects were tabulated, the general information of studies who participated in this survey i.e., Gender of subjects, how much percent of male and female are involved, respondents occupation status and monthly income.

3.1 General Information of Subjects

It is evident that before going to millets knowledge, attitude and practices among subjects we tabulated the general information of studies who participated in this survey i.e., Gender of subjects, how much percent of male and female are involved, studies occupation status and monthly income of studies.

3.2. General Information on Millets by Subjects

Before knowing the knowledge, attitude and practices of millets, this study's main aim is to know up to what extent studies are aware of millets and the consumption pattern of millets. General information on millets like are individuals consuming millets, frequency of consumption of millets, types of millets consuming, reasons for consuming millets, dishes prepared using millets, listed in below tabulated forms.

Table 2: Age of the Selected Subjects

Age in Years	N = 105	(%)
15 – 20	52	49.5
21 – 25	34	32.3
26 – 30	7	6.6
31 – 35	1	0.9
36 – 40	5	4.7
41 – 45	2	1.9
46 – 50	1	0.9

Table 3: Distribution of Subject According to Gender

Male		Female	
N = 105	(%)	N = 105	(%)
24	22.8	81	77

Table 4: Occupation of Selected Subjects

Occupation	N = 105	(%)
Employ	11	10.4
Daily wagers	4	3.8
Home makers	3	2.8
Student	86	81.9

Table 5: Income Levels of Subjects

Income Levels	Number	(%)
Less than 20,000	85	80.9
20,000 - 50,000	13	12.3
50,000 - 75,000	3	2.8
75,000 - 1,00,000	1	0.9
Above one lakh	3	2.8

Majority of the subjects we selected are in the age group between 15-20 years i.e., 52 in number and second majority of subjects are in the age group between 21-25 years i.e., 34 in number.

Majority of the subjects are female because most of the subjects selected from our university

Majority of the subjects are students because subjects are selected from college and university level.

As most of the subjects are students and daily wagers, income levels of subjects are less than 20,000.

Majority of the subjects i.e., around 86.6% of subjects are consuming millets and 13% of subjects are not consuming millets because of their economic background.

In frequency consumption of millets most of the subjects i.e., 42.8% are consuming millets 2- 3 times a week and 29.5% of subjects are consuming millets once a week.

Table 6: Consumption of Millets

Question	Answer Choices			
	Yes		No	
	N = 105	%	N = 105	%
Are you consuming millets	91	86.6	14	13.3

Table 7: Frequency of Consumption of Millets

Question	Answer Choices									
If yes how regularly you are consuming	Daily		2-3 Times a Week		Once a Week		Once a Month		Less Often	
	N = 105	%	N = 105	%	N = 105	%	N = 105	%	N = 105	%
	11	10.4	45	42.8	31	29.5	7	6.6	8	7.6

Table 8: Reasons of Consuming Millets in Selected Subjects

Question	Answer Choices	N= 105	(%) Value
Reasons for consuming millets at home	Good for health	43	40.9
	Reduces body weight	7	6.6
	Body becomes strong	0	0
	Gives good nutrients	9	8.5
	Makes stronger bones	1	0.9
	Only 1, 2 and 3	1	0.9
	Only 1, 3 and 4 are correct	5	4.7
	All the above	26	24.7
	None of the above	13	12.3

Table 9: Types of Millets Consuming by Selected Subjects

Question	Type of Millet You are Consuming								
Answer Choices	Any Millet	Finger Millet	Pearl Millet	Foxtail Millet	Kodo Millet	Little Millet	Barnyard Millet	Sorghum Millet	Combination of Two are Three Millets
N= 105	57	10	0	8	4	2	0	2	20
(%) Value	59.4	15.6	5.2	11.5	4.2	8.3	4.2	11.5	24

Table 10: Period of Usage of Millets

Question	Period of Usage of Millets			
Answer Choice	Since the Last One Year	Between 0-2 Years	More than 6 Years	Since Childhood
N= 105	27	19	13	36
(%) value	25.7	18	12	34

Table 11: Dishes Preparing Using Millets

Question	Which type of dishes are preparing by the millet which was consumed in the house						
Answer Choice	Roti/Chapathi	Suji/Ravva	Sevai/Kheer	Halwa	Sweet Paratha	Ragi Ball/Upma	Dosa/Idly
N = 105	52	1	1	0	0	14	21
(%) Value	49.5	0.9	0.9	0	0	13.3	20

Table 12: Millets Knowledge Among Selected Respondents

Question	Answer Choices N = 105			
	Yes		No	
	N	(%)	N	(%)
Millets are good for health	103	98	2	1.9
Millets containing highest nutrients	97	92.3	8	7.6
Millets contain high fiber	96	91.4	9	8.5
Millets are easily digestible foods	99	94.2	6	5.7
Millets help to maintain body weight	95	90.4	10	9.5
Daily millets consumption controls blood sugar/ B.P. levels normal	97	92.3	15	14.2
Millets are rich sources of magnesium	86	81.9	19	18
Millets reduces the risk of colon and breast cancer	82	78	23	21.9
Millets have nutraceutical and antioxidant properties	90	85.7	15	14.2

Table 13: Millets Attitude Among Selected Respondents

Questions	Answer Choices N = 105					
	Agree		Disagree		Don't Know	
	N	(%)	N	(%)	N	(%)
All type of millets are good	64	60.9	4	3.8	37	35
With the help of millets you can prepare different foods	95	90.4	1	0.9	9	8.5
You can take only one millet at the time	32	30.4	48	45.7	25	23.8
Millets are expensive compared to rice	58	55	0	0	47	44.7
Millets value added foods enhance the nutritive value of the product	94	89.5	0	0	11	10.4
Millets are gluten free foods	66	62.8	8	7.6	31	29.5
Millets have lower glycemic index	61	58	5	4.76	39	37
Millets contain high phenolic acids, tannins and phytates	52	49.5	9	8.5	44	41.9

Table 14: Millets Practices Among Studies

Question	Answer Choices N = 105			
	Yes		No	
	N	(%)	N	(%)
Cooked millets are highly nutritious	87	82.8	18	17
Daily you are consuming millet based foods	59	56	46	43.8
Using millets you are preparing supplementary foods	79	75.2	26	24.7
Preparing different millet recipes	78	74.2	27	25.7
It is easy to process the millets	69	65.7	36	34.2
Millets consumption improve health status of you	97	92.3	8	7.6
Millets can blend very easily with common foods without any pronounced of flavours	83	79	22	20.9
Millets act as probiotics and improve flavour, texture and acceptability of product	90	85.7	15	14.2

Majority of the subjects are consuming the millets because millets are good for health and 24% of the people are consuming millets to reduce their body weight, become their body strong, make stronger bones, get good nutrients and good for health.

Most subjects i.e., 59.4% are consuming any type of millet instead of selecting a single type of millet and 24% of subjects are consuming a combination of three varieties of millet.

In this period of usage of millets 34% of subjects have been using the millets since their childhood and some subjects started eating the millets last year due to the health benefits of millets.

Majority of the subjects are preparing roti/chapathi using millets, 20% of subjects are preparing idli/dosa and 13.3% of subjects are preparing ragi ball/upma.

3.2 Millets Knowledge

The investigation was carried out to assess the knowledge, attitude and practice of millets among subjects. Data related to millet knowledge has been given in Table 2 From the collected data of the present study it was clear that majority of the selected subjects had excellent knowledge on millets. Around 93% of the subjects had knowledge on millets that are an excellent source of fibre and all aspects of millets that have high biological values. Only around 6% of the subjects found to have poor knowledge on millets.

3.3 Millets Attitude

Three pointer scale (agree, disagree and don't know) was used to assess the response of the millet's attitude related questions and the results are shown in Table 3. The overall attitude score ranged between 1 to 10. Around 64% of subjects have a good attitude on millets, usage of millets. Whereas 9% of subjects have average attitude and 26% of subjects have poor attitude on millets.

3.4 Practices

Data related to millets practices has been given in Table 4. From the collected data of the present study it was clear that the majority of the selected subjects had excellent knowledge on millets. Around 80% of the subjects had knowledge on millets that are an excellent source of nutrition and all aspects of millets include health, cooking, and consumption practices. Only around 19% of the subjects found to have poor practice on millets.

CONCLUSION

The study concludes that daily intake of millets leads to good health and improves immunity levels. Millets increase the digestion capacity and decrease constipation conditions. From the responses received from studies we conclude that age groups between 19 to 22 participated actively in this survey compared to other age group individuals.

Around 80% of the individuals were female. Females participated more compared to male. Regular consumption of millets leads to positive effects for individuals. We can prepare many items using millets. From the responses we receive, on an average all studies have 60 to 80% knowledge in all aspects of millets.

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