Assessment of Knowledge, Attitude and Practice (KAP) of Millet Usage Among Low and High Socioeconomic Status Households in Mumbai City, Maharashtra

Shanti Nadar[1], Dr. Jagmeet Madan[2], Dr. Rajeshree Shinde[3]

[1] Student, MSc. Specialized Dietetics, Sir Vithaldas Thackersey College of Home Science, Maharashtra, India.
[2] Principal, Food Nutrition and Dietetics, Sir Vithaldas Thackersey College of Home Science, Maharashtra, India.
[3] Assistant Professor, Science Department, Sir Vithaldas Thackersey College of Home Science, Maharashtra, India.

ABSTRACT

Millets are the world's seventh most important cereal grains which are the general category for several species of small-grained cereal crops. They are important from the point of food security at household and regional level with superior nutritional value and health benefits. A cross-sectional study was conducted among 400 families residing in Mumbai City recruited to assess knowledge, attitude and practice (KAP) of millet usage among low and high socioeconomic status households. Data regarding the socio-demographic characteristics, level of knowledge, attitude and practice towards millet was collected using the developed questionnaire. The study found good content validity for the instrument used, with overall I-CVI scores of 0.84 for relevance and 0.86 for clarity. There was a significant association between age and knowledge scores (p-value=0.012), with females demonstrating more knowledge about millets than males. Significant differences in knowledge, attitude, and practice scores were found between low and high socioeconomic status (SES) households. It can be concluded that a validated questionnaire was successfully developed to assess the knowledge, attitude, and practice of millet usage among households in Mumbai city, Maharashtra.

Keywords: *Socio-economic status, Millets, Knowledge, Attitude, Practice, KAP survey, Development and validation, Validity, Households.*

1. INTRODUCTION

Millets are one of the oldest cereal grains which have been consumed by humans. Since ancient times, they have been the major staples which are widely consumed in Asia and India. These crops are primarily grown in agro-ecologies areas subjected to low rainfall and drought. Millets are known for their resilience, low requirements of water, pesticides and fertilizers and ability to survive under high temperatures and in degraded soils (Saleh et al., 2013). Due to some special set of characteristics millets are unique amongst cereals. They are highly nutritious grains with advantages of mature quickly, good storage capacity and are less susceptible to pests and diseases. They are quite important from the point of food security at household and regional level, still occupy relatively a lower position among food crops in Indian agriculture. They are traditional crops with both superior nutritional value and health benefits (Stanley Joseph, et al., 2013). They are considered as ideal food to human beings because of their high nutritional value. As they contain high levels of proteins, minerals, vitamins, antioxidants with non-glutinous and non-acid forming properties compared to other cereals and therefore called as ‘nutritious millets’ or ‘nutri-cereals’ which provides health benefits to every age group and gender (Muthamilarasan et al. 2015). When compared with similar nutritional value of the post-green revolution major staples like polished rice, maize and refined wheat flour, millets have high nutritional content (Longvah et al., 2017). Millet are considered as food of the future for health and food security (Veena et al., 2004). In recent years, they have been recognized as an important alternative to address global food shortages and meet the needs of growing populations in both developing and developed countries (Veena et al., 2004). Age, gender and level of education can influence the nutritional knowledge, attitudes and practices (KAP) of millet. Inappropriate nutritional knowledge is the utmost cause of nutritional problems which can affect the practice of healthy diet and cause complications. It has been recommended that food choices and dietary behaviors can be improved by knowledge about diet (Kristal AR, Bowen DJ wt al., 1990). However, there is a lack of validated and reliable knowledge, attitude and practice questionnaire focusing on millet usage among low and high socioeconomic status households in India. Thus, there is a need to assess the knowledge, attitude and practice (KAP) of millet usage among low and high socioeconomic status households in Mumbai City, Maharashtra.

1.1 Aim

To assess knowledge, attitude and practice of consumption of millets in low and high socioeconomic status households in Mumbai city, Maharashtra.

1.2 Objectives

1. To develop a validated instrument to measure the knowledge, attitude and practice on consumption of millets in households of different socioeconomic strata.
2. To assess the knowledge, attitude and practice of consumption of millets using the validated KAP Questionnaire in the Low and High Socio-Economic Strata households of Mumbai City.
3. To compare the KAP of Low and High SES households.

2. METHODS

The development and validation of the KAP questionnaire involved several sequential steps. Firstly, item generation and questionnaire design were based on a comprehensive literature review. Then, content validity was ensured through input from a panel of experts. Face validity and pilot testing were conducted to refine the questionnaire. The final questionnaire was developed based on the results obtained from these steps (see Figure 1).

2.1 Item generation and questionnaire design

To structure the study format, a thorough review of literature was conducted on the KAP survey instrument, employing systematic review techniques. After identifying relevant items, a new self-administered KAP questionnaire was generated. The initial version of the instrument comprised of two main sections: the first section focusing on socio-demographic characteristics (such as sex, age, native place, etc.) and socio-economic status (according to the Modified Kuppuswamy Scale 2022), while the second section focused on the knowledge, attitude, and practice of millets. A total of 69 KAP questions were formulated and divided into three categories: 22 knowledge questions (consisting of single or multiple-choice selection), 30 attitude questions (utilizing a 0-4 Likert Scale), and 17 practice questions (again, consisting of single or multiple-choice selection).

Content validity

To ensure content validity of the questionnaire, a panel of six experts was assembled, consisting of one academician, one researcher, two dietitians, and two statisticians. Each expert individually reviewed the questionnaire and rated each item for its relevance and clarity using a four-point ordinal scale (0 = not relevant/unclear, 1 = item needs revision, 2 = relevant/clear with minor revisions, and 3 = very relevant/very clear). The item-wise content validity index (I-CVI) was then calculated by dividing the number of experts who scored each item as 2 or 3 for relevance and clarity by the total number of experts. This calculation was performed following established guidelines (Polit & Beck, 2006; Polit et al., 2007; Lynn, 1986; Zamanzadeh et al., 2015). Based on the I-CVI, the items were retained, revised, or deleted as deemed necessary.

Face validity and pilot testing

To evaluate face validity, a sample of six individuals was selected, with three individuals from the lower socioeconomic status (SES) and three from the upper SES. Participants were encouraged to seek clarification, provide feedback, and identify any questions or instructions they found difficult to understand. The feedback obtained was carefully evaluated, and appropriate modifications were made to the questionnaire, including changes to language, the order of questions, and the wording of items. Subsequently, a pilot test was conducted on a sample of 30 individuals, comprising 15 individuals from each socioeconomic class, to assess the flow of the questions and the ease of administration for the principal investigator. All necessary changes were incorporated in the questionnaire based on the pilot test results. The approximate time required to complete the questionnaire was also noted.

Final Questionnaire

The final version of the questionnaire comprised a total of 43 items, including 13 knowledge questions (single or multiple-choice selection), 16 attitude questions (0-4 Likert scale), and 14 practice questions (single or multiple-choice selection). The questionnaire was translated into English as well as local languages such as Hindi and Marathi. For the actual study, 431 individuals were recruited, as described earlier. Of these, 31 individuals did not meet the inclusion criteria and were excluded from the study. A total of 400 individuals, including 200 from lower and 200 from upper socioeconomic status, were included in the study. An equal number of millet eaters and non-millet eaters were also recruited for the study.

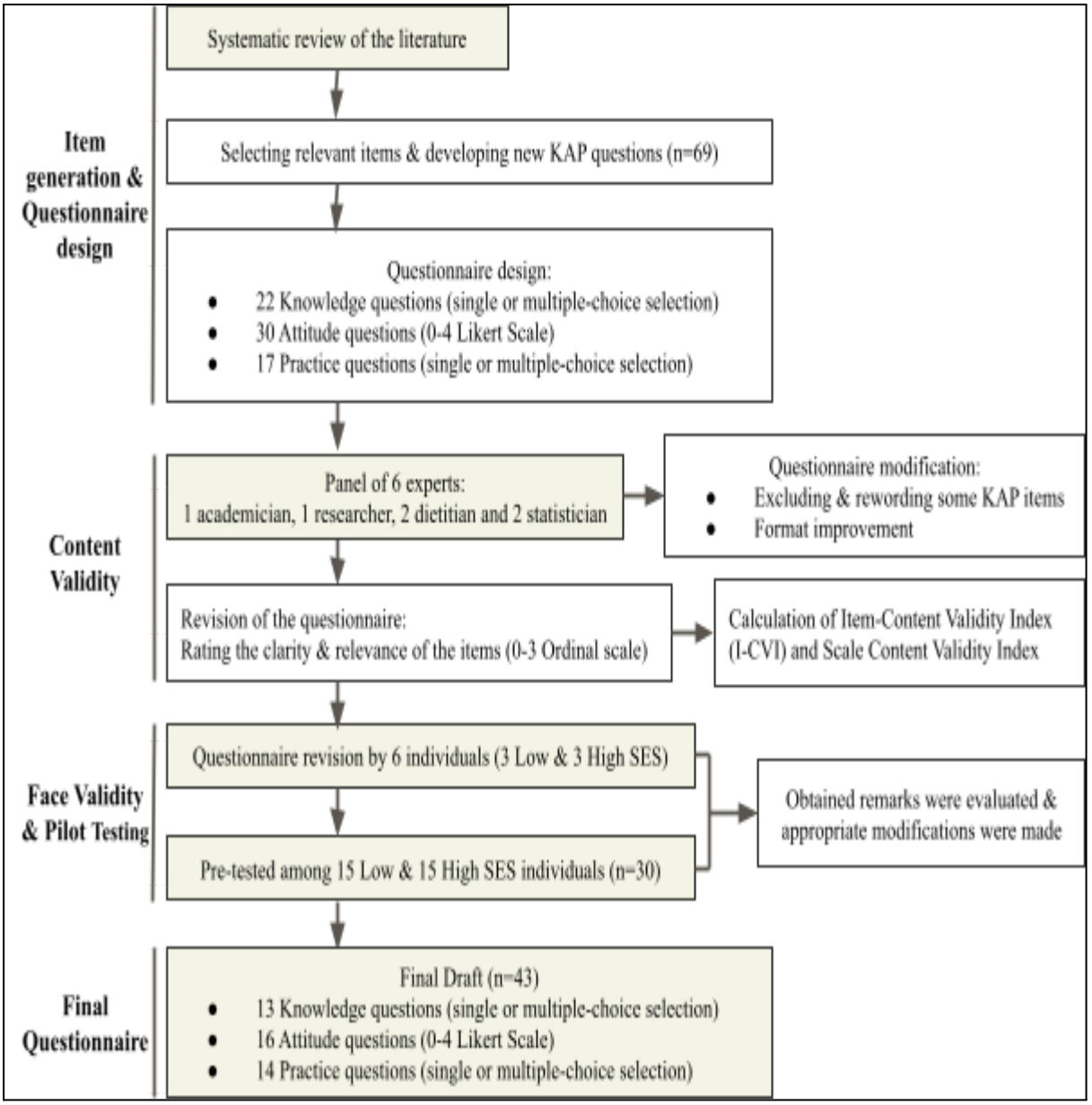

Figure 1. Steps involved in development and validation of knowledge, attitude and practice (KAP) of millets usage questionnaire.

2.2 Research Tools Used For Data Collection

A case record form was administered for data collection using face to face interview technique. The following sections were included:

1. Socio-demographic characteristics
2. Knowledge, attitude and practice questionnaire of millets usage among households

Socio-Demographic characteristics

Demographic details such as age, gender and socioeconomic status (using Kuppuswamy Socioeconomic Scale) were recorded in the case record form. For recruitment of families in the study, they were screened on the basis of the Modified Kuppuswamy socioeconomic scale updated for the year 2022. (Kumar et al., 2022)

Knowledge, attitude and practice questionnaire of millets usage among households

The KAP questionnaire for the data collection was developed.

A. Knowledge of millets: The knowledge section of the questionnaire aimed to assess the level of knowledge of participants about millets, covering various subdomains such as recognition (K1), nutritional composition and health benefits (K2 to K9), comparison with major staples (K10 to K12), and cultivation knowledge (K13). The

section included 13 knowledge items, with one point awarded for each correct response of "yes" and a zero score for incorrect or uncertain responses of "no/not sure." A higher total score indicated better knowledge of millets, with a possible score range of 0 to 13 points. The score range of 0-3 was classified as poor, 4-8 as fair, and 9-13 as good knowledge towards millets, based on methods used in previous studies (Rad et al., 2014; Vivi et al., 2019).

B. Attitude of millets: The questions in this section helps to understand the attitude, beliefs, perception, barriers and willingness to apply millets in their practice. Questions like cooking practices associated with millets (A1 to A4), consumption of millets (A5 to A11), Attitude towards comparison of millets with wheat (A12 to A14) and attitude towards health benefits of millets (A15 to A16) were reported. A total of 16 attitude questions were assessed based on the degree of approval using a 5-point Likert scale (Strongly agree, Agree, Neutral, Disagree and Strongly disagree). There were a total of 13 positive attitude and 3 negative attitude related questions. For positive attitude questions (A1, A2, A3, A5, A6, A7, A8, A9, A10, A12, A13, A15 and A16) to the scoring was done as "4 for strongly agree, 3 for agree, 2 for neutral, 1 for disagree and 0 point for strongly disagree". For negative attitude questions (A4, A11 and A14) the scoring was done as "4 for strongly disagree, 3 for disagree, 2 for neutral, 1 for agree and 0 point for strongly agree". Higher scores in the attitude section indicate more positive attitude on millets with a possible minimum score of 0 points and a possible maximum score of 64 points. A score range 0-20 indicates as poor, 21-42 as fair and 43-64 as good attitude towards millets. The levels of attitude were analyzed by using methods adopted from (Rad et al., 2014, Vivi et al., 2019).

C. Practice of millets: The practices followed by the participant while purchasing millets was analyzed in this section. The Practice based question on frequency of consumption of millets (P1 and P2), period of usage (P3), type of dishes (P4), reasons for consuming millets (P5), outlets millets of purchased (P6 to P13) and reason for not consuming millets (P14) was reported in this section. A total of 14 practice questions were developed with one point for each correct answer and a zero point for each incorrect answer. A higher total practice score will indicate better practice on millets. Therefore, a possible score range for the practice section will be a minimum score of 0 and a maximum score of 55 points. A score range 0-17 indicates as poor, 18-36 as fair and 37-55 as good practice towards millets. The levels of practice were analyzed by using methods adopted from (Rad et al., 2014, Vivi et al., 2019).

The total knowledge, attitude and practice (KAP) scores were grouped into categories: Poor KAP (0-43 scores), Fair KAP (44-87 scores) and Good KAP (88-132 scores) as shown in Table 1.

Table 1. Scoring of the KAP Questionnaire

Scoring	Minimum Score	Maximum Score	Range
Knowledge	0	13	0-13
Attitude	0	64	0-64
Practice	0	55	0-55
Total knowledge + attitude + practice (KAP) scores	**0**	132	**0-132**
Poor KAP (0-43), Fair KAP (44-87) and Good KAP (88-132) scores			

Statistical Analysis

Data analysis was performed using SPSS (Statistical Package for Social Sciences) software (version 20). Data was generated in the form of tables and figures. Descriptive statistics such as frequency and percentage were used to analyze socio demographic variables. Inferential statistics such as the t-test and one way ANOVA was performed to determine the association between two variables where p-value <0.05 will be considered as a significant association.

3. RESULTS

Based on several relevant reviews of literature, a 69-item questionnaire was developed which was divided into two sections. Overall, 6 individuals and 6 panel experts completed the survey to determine the face and content validity.

3.1 Development and validation of the KAP questionnaire

Table 2. Validation of the KAP questionnaire

	For Relevance		For Clarity	
	S-CVI/AVE	**S-CVI/UA**	**S-CVI/AVE**	**S-CVI/UA**
Knowledge	0.86	1	0.85	1
Attitude	0.81	1	0.86	1
Practice	0.86	1	0.85	1
Overall I-CVI Scores	**0.84**	**1**	**0.86**	**1**

I-CVI, item-level content validity index; S-CVI/Ave, scale-level content validity index based on the average method; S-CVI/UA, scale-level content validity index based on the universal agreement method

As shown in Table 2. the overall I-CVI scores for relevance and clarity in the instrument were 0.84 and 0.86, respectively, whereas it ranged from 0.86 to 0.85 for knowledge items, from 0.81 to 0.86 for attitude items and from 0.86 to 0.85 for practice items. Out of 22 knowledge items in the first draft, 3 questions were excluded based on I-CVI at least 0.83. As suggested in similar studies, we used I-CVIs at least of 0.83 to determine the content validity (Polit & Beck, 2006; Polit et al., 2007; Lynn, 1986). Post face validity 6 questions were reworded or merged to improve clarity and comprehension. Similar revisions were made for attitude and practice items. At the end of the content and face validity, a total of 43 items KAP of millets instrument was generated which comprised 13 knowledge, 16 attitude and 14 practice questions. Thereafter, a pilot study was performed among 30 respondents (15=LES and 15=HES) consisting of the target groups. In the pilot test no item was deleted, only one item was rephrased and then revised for any wording or grammatical errors to present the final questionnaire. During the pilot tests, the time to complete the questionnaire was noted. The average time to complete the survey was 5-10 minutes.

3.2 Socio-demographic characteristics

The collected data represents out of 400 participants, the majority 46.75% (n=187) were young, ranging between 18-30 years of age followed by 33.75% (n=135) belonging to 31-50 years of age and 19.5% (n=78) belonged to age group between 51-75 years respectively. The majority were 60% were females and 40% were males.

3.3 Knowledge of millet usage among the study population

Knowledge towards recognition of millets: Out of 400 participants, 59.3% (n=237) of them recognized finger millet (ragi/ nachni), 55% (n=220) correctly identified pearl millet (bajra) and 39.8% (n=159) identified sorghum millet (jowar) respectively. It was found that the majority of participants 88.3% (n=353), 86.3% (n=345) and 76% (n=304) were not aware about proso/ broomcorn millet (chena), buckwheat (kuttu) and amaranth (rajgira/ ramdana) millets.

Knowledge towards nutritional composition & health benefits of millets: It was seen that majority of all the participants, 64.3% (n=257), 64.8% (n=259), 60.5% (n=242), 53.3% (n=213), 59% (n=236) and 52.8% (n=211) had good knowledge towards questions related to the nutritional composition & health benefits of millets. While 57.8% (n=231) and 52.5% (n=210) of them gave incorrect responses on questions related to millets on reducing the risk of breast and colorectal cancer and whether millets are easily digestible foods due to lack of awareness.

Knowledge towards comparison of millets with major staples and cultivation of millets: 61% (n=244), 62.5% (n=250) and 54% (n=216) of the participants correctly answered the questions on comparison of millets with major staples which showed good knowledge. Whereas 58.5% (n=234) of them had poor knowledge on question related to cultivation of millets.

3.4 Attitude Of Millet Usage Among The Study Population

Attitude towards cooking practices associated with millets: Majority of the participants 30% (n=120), 34.8% (n=139) and 30% (n=120) agreed to the questions on cooking practices associated with millets. However, 39.5%

(n=158) of them also agreed to a negative attitude question which shows that the participants think that addition of millets in the diet deteriorates/ suppresses taste.

Attitude towards consumption of millets: It was seen that the majority of the participants, 28% (n=112) agreed that it is easy for them to add millets into their diet which showed a positive attitude. 27.3% (n=109) had a neutral attitude on less consumption of millets due to lack of availability. It was observed that 26.5% (n=106) strongly agreed that their consumption of millets is less due to lack of knowledge on preparations. Among the participants 26.8% (n=107), 31.8% (n=127) and 27.3% (n=109) agreed to the questions on consumption of millets which showed a positive attitude. While 33.3% (n=133) of them disagreed to consume millet as they are still healthy.

Attitude towards comparison of millets with wheat: Majority of the participants 31.3% (n=125) and 26.3% (n=105) had a positive attitude towards comparison of millets with wheat. However, some of them 26.5% (n=106) showed a neutral attitude when asked to switch from whole grains to millets.

Attitude towards health benefits of millets: 29.5% (n=118) of the participants strongly agreed that inculcating millets will improve their diet/health which showed a positive attitude. While, 27.8% (n=111) of them strongly agreed that they will consume millets if informed about the benefits.

3.5 Practice of millet usage among the study population

Table 3. Consumption and frequency of millets in the study population

Which types of millets do you consume and how often?							
		Every day	Always (1-6 times a week)	Fortnightly (Once every 2 weeks)	Sometimes (Once in a month)	Never	**Total**
Finger Millet (ragi/ nachni)	N	**74**	59	11	41	4	**189**
	%	**39.2**	31.2	5.8	21.7	2.1	**47.3**
Pearl Millet (bajra)	N	18	**79**	10	53	6	**166**
	%	10.8	**47.6**	6	31.9	3.6	**41.5**
Foxtail Millet (kangni/kakum)	N	32	22	17	33	**42**	**146**
	%	21.9	15.1	11.6	22.6	**28.8**	**36.5**
Kodo Millet (kodon)	N	4	44	15	32	**46**	**141**
	%	2.8	31.2	10.6	22.7	**32.6**	**35.3**
Little Millet (moraiya/ kutki/ shavan/ sama)	N	27	20	8	36	**48**	**139**
	%	19.4	14.4	5.8	25.9	**34.5**	**34.8**
Barnyard Millet (samvat ke chawal/ sanwa)	N	12	36	4	39	**46**	**137**
	%	8.8	26.3	2.9	28.5	**33.6**	**34.3**
Sorghum Millet (jowar)	N	28	36	15	**53**	21	**153**
	%	18.3	23.5	9.8	**34.6**	13.7	**38.3**
Amaranth (rajgira/ ramdana)	N	12	42	12	**46**	35	**147**
	%	8.2	28.6	8.2	**31.3**	23.8	**36.8**
Buckwheat	N	18	40	9	23	**53**	**143**

(kuttu)	%	12.6	28	6.3	16.1	**37.1**	**35.8**
Proso/ broomcorn millet (chena)	N	18	36	10	32	**46**	**142**
	%	12.7	25.4	7	22.5	**32.4**	**35.5**

Data are presented in frequency and percentage

Table 3. represents the total number of millets eating participants (n=200) and frequency of millets consumption. It was observed that in the frequency of millet consumption, Finger millet was consumed everyday by 39.2% (n=74), Pearl Millet was consumed by 47.6% (n=79) respectively. Foxtail, Kodo, Little, Barnyard, Buckwheat and Proso Millet were never consumed by the majority of the participants 28.8% (n=42), 32.6% (n=46), 34.5% (n=48), 33.6% (n=46), 37.1% (n=53) and 32.4% (n=46). Whereas, Sorghum and Amaranth were only consumed once a month by the participants 34.6% (n=53) and 31.3% (n=46).

Period of usage of millets: Out of the study sample of 200 millets eating participants, almost half of them 45% (n=90) consume millets from their childhood. Whereas, some of the participants 23.5% (n=47), 15.5% (n=31) and 16% (n=32) started to inculcate millets from more than 5 years, between 2-5 years and between 0-2 years.

Type of dishes prepared using millets: Out of 200 millet eating participants 79% (n=158) consume millets in the form of Roti/Chapathi followed by 46% (n=92) as Dosa/Idli and 37.5% (n=75) as Upma. Other forms of millet recipes were halwa, ragi ball, khichdi, porridge, sevai/kheer, paratha and noodles. The least consumption of millet recipes were in the form of bajri sweet khajur 0.5% (n=1), papad 1% (n=2) and bhajiya 0.5% (n=1) respectively.

Reasons for consuming millets: Majority of the participants 61.5% (n=123) stated that they consume millets because it is good for health. Out of the total 200 millet eating participants, 50.5% (n=101) claimed that millets are easily available which was the main reason for consumption. Almost half of them 47% (n=94) liked the taste of millets. Small percentage of participants 10.5% (n=21) took advice from doctors and dietitians which created awareness among them about millet consumption.

Practice regarding purchase of millets: It was seen that 78.5% (n=157) make a conscious effort to pick millet products over refined grain products, whereas 73% (n=146) of the respondents mix different millet flour instead of using refined wheat flour (maida) at home. Among the total millet eating participants (n=200), almost half of them 55% (n=110) snack on millet products, 62.5% (n=125) try to prepare different millet recipes at their home. It can be said that practice regarding purchase of millets in the millet eating participants had positive perception towards millets.

Use of millets and source preferred while purchasing: 49% (n=196) agreed to the question which is a good indicator as at least half of them were aware that millets can be used as complementary feed which is more nutritious compared to commercial feeds. 62.3% (n=249) of the respondents claimed that their parents/grandparents eat or used to eat millets. Most respondents 31.5% (n=126) purchased millets from local grocery stores followed by 24.3% (n=97) from local chakki. In summary it can be said that "Local grocery store", followed by "Local chakki" and "Speciality natural store" were the top three outlets of millets purchased by the participants.

Reason for not consuming millets: The main reason for not consuming millets among the non-millets eaters was due to limited availability by 53.5% (n=107). This alone can be taken as a sign by the policy makers that at grassroots level, individual families do not have a lot of resources available for millets. 53.5% (n=107) of the respondents said that millets require longer cooking time, 42.5% (n=85) don't like the taste, 33% (n=66) of them said they do not have a family custom of not eating millets and 29.5% (n=59) said that high price is the reason they do not inculcate millets in their diet.

3.6 Age wise association with the KAP score

Table 4. Different age range and KAP score association in the study population

Scores	**18-30 years (n=187)**	**31-50 years (n=135)**	**51-75 years (n=78)**	**p-value**
	Mean ± SD			
Knowledge score	19.99 ± 3.40	**21.11 ± 3.30**	20.80 ± 3.61	**0.012***

Attitude score	**53.86 ± 7.74**	52.92 ± 8.35	53.15 ± 9.05	0.575
Practice score	**28.81 ± 20.15**	26.77 ± 20.49	25.87 ± 19.96	0.481
Total KAP score	**102.66 ± 23.22**	100.80 ± 23.75	99.83 ± 23.82	0.616

Data are presented in Mean ± SD. p-value (* <0.05) is significant

Among the KAP scores only knowledge has a statistically significant association (p-value=0.012) with different age groups. The age group 51 to 70 years may be consuming millets for many years but still may or may not be aware about the benefits of it. But the age group 31 to 50 years had better knowledge which could be due to more exposure to technology and social media which results in a lot of awareness about millets.

3.7 Gender association with knowledge, attitude and practice score

Table 5. Gender association with Knowledge, Attitude And Practice score in the study population

Scores	**Male (n=160)**	**Female (n=240)**	**t-value, p-value**
	Mean ± SD		
Knowledge score	**21.37 ± 3.73**	19.96 ± 3.11	**4.084, 0.000***
Attitude score	51.10 ± 8.29	**54.94 ± 7.80**	**-4.710, 0.000***
Practice score	24.81 ± 19.82	**29.37 ± 20.31**	**-2.222, 0.027***

Data are presented in Mean ± SD and t-value. p-value (* <0.05) is significant

The applicability of knowledge regarding millets was seen more in females than in males. As per the gender, there was a statistically significant difference in the knowledge, attitude and practice score among the males and females because the p-value was less than 0.050.

3.8 Socioeconomic status association with the knowledge, attitude and practice score

Table 6. Upper and Lower SES association with Knowledge, Attitude and Practice score in the study population

Frequency (n=400) N (%)		**Poor**	**Fair**	**Good**
Knowledge score	**Upper SES**	4 (2)	89 (44.5)	107 (53.5)
	Lower SES	9 (4.5)	**130 (65)**	61 (30.5)
Attitude score	**Upper SES**	1 (0.5)	129 (64.5)	70 (35)
	Lower SES	4 (2)	**152 (76)**	44 (22)
Practice score	**Upper SES**	114 (57)	59 (29.5)	27 (13.5)
	Lower SES	**145 (72.5)**	43 (21.5)	12 (6)

Data are presented in frequency and percentage

Table 6. shows the association of knowledge, attitude and practice score with the Upper and Lower socioeconomic status. The knowledge section shows that the majority 130 (65%) from the lower SES had fair knowledge towards millets followed by upper SES with good knowledge 107 (53.5%). In the attitude section, it is evident that 152 (76%) from the lower SES showed a fair attitude, and 129 (64.5%) from the upper SES showed a fair attitude towards millets. Poor practice of millets was seen majorly 145 (72.5%) in the lower SES. Even the upper SES showed poor practice towards millets.

3.9. Upper and Lower SES association with Total KAP score

Table 7. Upper and Lower SES association with Total KAP score in study population

Scores	Upper SES (n=200)	Lower SES (n=200)	t-value, p-value
	Mean ± SD		
Knowledge score	19.98 ± 3.31	**21.08 ± 3.49**	**-3.231, 0.001***
Attitude score	**55.17 ± 7.55**	51.64 ± 8.48	**4.390, 0.000***
Practice score	**32.81 ± 20.43**	22.29 ± 18.61	**5.383, 0.000***
Total KAP score	**107.96 ± 23.32**	95.01 ± 21.87	**5.726, 0.000***

Data are presented in Mean ± SD and t-value. p-value (* <0.05) is significant

The knowledge towards millets was seen more in the upper SES than in lower SES. Even though the knowledge of lower SES was good regarding millet, the consumption was less because millets are not affordable as they are slightly costly as compared to major staples like rice and wheat. The knowledge of upper socioeconomic status households was less because they are not aware of the benefits of millet consumption but still have a good attitude and practice that maybe it is a trend or inherited from their parents or grandparents. As per the Socioeconomic status, there is a statistically significant difference in the knowledge, attitude and practice score among the upper and lower SES because the p-value was less than 0.050.

4. DISCUSSION

In this study, different measures of validity such as the face and content validity were employed to develop the KAP questionnaire. Although we could not find any similar studies that had described the methods of validating KAP instruments among low and high socioeconomic households in India. A study published in the Journal of the Pakistan Medical Association used a KAP questionnaire to assess knowledge, attitudes, and practices related to breast cancer among women in Pakistan. The questionnaire was developed through expert consultation, and face and content validity were assessed through a pilot study with women. The authors calculated the CVI for each item in the questionnaire separately for relevance and clarity, and reported high CVI scores (0.92-1.0) for all items, indicating good content validity (Siddiqui S, Jooma R., 2016).

The continuous downfall in the global area of millets may be due to the assured irrigation facilities, area shifting for other crops and changed food habits. However, in recent years, they are becoming popular in urban areas due to their nutraceutical properties. According to an estimate, there has been a decline of 25.7% in the global area under millet cultivation from 1961 to 2018 (FAOSTAT 2018). Several studies have found that consuming millets can have positive health benefits, and people with good knowledge of millets may be more likely to make them a regular part of their diet. Several studies have shown that there are populations with good knowledge of millets and their benefits. For instance, a study published in the Journal of Ethnic Foods found that people in the Kumaon region of India had a good understanding of the nutritional benefits of millets and considered them to be an important part of their traditional diet (Rawat et al., 2017). Another study published in the Journal of Food Science and Technology found that people in rural areas of Tamil Nadu, India had a high level of knowledge and consumption of millets, including their use in traditional foods such as dosa and idli (Anitha, S., & Nithya, R., 2016).

Research has shown that attitudes towards cooking with millets vary widely among consumers, but there is a growing interest in incorporating millets into traditional and modern cooking practices. For example, a study found that people in rural areas of Tamil Nadu, India had a high level of knowledge and consumption of millets, including their use in traditional foods such as dosa and idli (Sudha et al., 2019). Research has also shown that attitudes towards millet consumption can vary depending on factors such as age, gender, and education. A study conducted in India found that younger people were less likely to consume millets compared to older generations (Srinivasan et al., 2020). These findings suggest that there may be cultural and demographic differences in attitudes towards millet consumption that should be taken into account when promoting the consumption of millets.

However, studies have also shown a decline in the consumption and frequency of millets in some regions, especially in urban areas. For instance, a study conducted in India found that the consumption of millets had declined in urban areas due to the availability and convenience of other grains such as rice and wheat, and the perception that millets were associated with poverty and lack of sophistication (Bhavya et al., 2019). Similarly, a study conducted in the United States found that the consumption of millets was low due to the lack of

availability and awareness of millet-based products (Zhu et al., 2019). These findings suggest that there is a need to raise awareness and promote the consumption of millets in urban areas. In conclusion, research on the practices towards consumption and frequency of millets has shown that they are an important part of the traditional diet and food culture in many regions, but are also facing challenges in some areas due to the availability and perception of other grains. In some cases, the use of millets may also be associated with lower socioeconomic status or rural traditions, which may deter urban consumers from purchasing them (Chopra et al., 2020). Furthermore, the lack of processing technologies and market access for millets has also been identified as a barrier to their adoption in many countries (Kumar et al., 2020). These barriers suggest that there is a need for policy and market interventions to promote the consumption of millets.

5. CONCLUSION

In conclusion it can be said that the developed KAP questionnaire helped to assess the level of knowledge, attitude and practice of millets among low and high socioeconomic status households. The study found that households in both low and high socioeconomic classes exhibited a generally positive attitude and good knowledge regarding millets. However, a lack of practice was observed among both groups, with a significant proportion (72.5%) of low SES households showing poor practice of millets. This implies that the tool developed can be used to assess the knowledge, attitude, and practice (KAP) of millet usage in the community. With an increase in the level of awareness towards millet we can bring a positive change in the willingness to purchase and consume millet among the households across all socioeconomic classes. This tool can be further used to carry out intervention studies to significantly bring change in knowledge, attitude, and practice (KAP) of millet usage among the households across all socioeconomic categories.

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