Sex wise comparison of associating factors of knowledge regarding food adulteration in urban Jaipur: A cross-sectional analytic study

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Abstract— *Adulteration of food is an old age problem though out the world. It is a major problem in developing world like India. There are many acts for preventing adulteration of food and consumers are assumed to know their responsibilities regarding food adulteration. So this observational study was conducted to know the awareness status of male and females regarding food adulteration and the factors associating this knowledge in males and females. For this 150 males and 150 females were interrogated and significance of difference in proportion of male and females were inferred by Chi-square test. It was found that only 10% subjects have good knowledge regarding adulteration. On sex wise comparison of this knowledge, 6% males's scored good marks in comparison to 14% females. So females were having better knowledge than males regarding food adulteration. Association of knowledge score of males was found to be associated with educational qualification, occupation and eating habits are small ($p<0.05$) whereas in females it was found to associated with monthly family income, educational qualification and occupation are small ($p<0.05$). So demographic variables which have statistically significant association with knowledge regarding food adulteration and consumer protection were more of less similar in males and females i.e. Educational qualification and occupation. In Females monthly income whereas in males eating habits was addition associated factor found to be associated with knowledge food adulteration and consumer protection.*

Keywords: Food Adulteration, Knowledge, Sex wise Comparison, Association factors.

I. INTRODUCTION

Adulteration means when the quality of the food is lowered or affected by the addition of substances which are injurious to health or by the removal of substances which are nutritious. It is defined as the act of intentionally debasing the quality of food offered for sale either by the admixture or substitution of inferior substances or by the removal of some valuable ingredient.[1]

Adulteration of food is an old age problem. It consists of a large number of practices, e.g., mixing, substitution, concealing the quality, putting up decomposed food for sale, misbranding or giving false labels and addition of toxicants. Adulteration results in two disadvantages for the consumer: first, he is paying more money for a food stuff of lower quality: secondly, some forms of adulteration are injurious to health, even resulting in death. [1,2]

The main purpose of adulteration is the tendency to make more money on the part of some selfish traders by using unfair means. Adulteration on a commercial scale plays with people's health for petty profit. The antisocial elements responsible for adulteration use newer techniques each time, to throw dust in the eyes of the community and the administration.[1,2]

Health hazards related to foods and food products are considered to be a major problem particularly in developing and less-developed countries. [1,2, 3] In India, adulteration and contamination are encountered in food consumed at the household level, in the food service establishments and business firms, and also when sold as street foods. Non-permitted colors are the most common additives to foods. So food should be without or only with acceptable and safe levels of adulterants, contaminants or any other substances that may make food hazardous to health. Also, such food can deprive nutrients essential for proper body growth and development.[3]

A study reported that about 70% of deaths are supposed to be of food-borne origin.[4] Recently, the Safe Food International gathered limited data on food poisoning reported during 2007-11.[5] This report showed that major sources of contamination are the daily meals (57%), sweets (13%) and mid-day meals in schools (11%). Besides, feeds used in animal husbandry and fish farming when contaminated with mycotoxins resulted in the carry-over of toxins to consumers through milk and meat. Eventually, the effects of food adulterants and contaminants had to be determined in the context of their effects on human health and detection in daily foods.[1,6,7] In another survey, 70% of milk samples did not confirm to prescribed standards; i.e., 46% were with low solid not fat due to dilution with water, and 8% were with detergents.[8]

However, consumers do not have knowledge/information probably because impact of the contamination on human health is apparent only after prolonged exposure.

One article regarding comparison of status of knowledge regarding food adulteration has already been published now present study was conducted with the aim to find out the sex wise comparison of factors associating with knowledge regarding food adulteration.

II. METHODOLOGY

A descriptive analysis type of observational study was conducted on 300 subjects at Maharaja Vinayak Global University, Dhand, Amer, Jaipur (Rajasthan) India in year 2014.

For this purpose For this purpose 18-35 years 150 males and 150 females were selected by non probability convenient sampling from a urban area i.e. Nangal Jaisa Bohra of Jaipur city.

After the self introduction by the investigator, the objectives of the study was briefly explained to the participants and confidently was assured. The subjects were made comfortable and a predesigned semi structured performa was administrator to gather information. This performa contains socio-demographic variables as well as questions regarding food adulteration. There were 30 questions regarding food adulteration, each question was assigned one score on right response. Thus total 30 scores were there on correct answers of each question. Knowledge status was graded into three as per scores obtained by subject i.e. poor status if scores are between 0 to 10, average if scores are between 11 to 20 and good if scores are between 21 to 30.

The tool was pretested by interviewing it to 24 candidates. 12 males and 12 females from urban area who met the sampling criteria. All items were clearly understood and the response was found appropriate. The item taken by investigator to complete tool was appropriate 20-30 minutes for each sample. Content validity and reliability was also tested by six experts four from the community health nursing department and two from the medical expert (doctor of community health). The evaluator was requested to give their opinion on the relevant, not relevant, relevant to some extent and relevant of the

item in the tool. The expert has given little suggestion which were incorporate by researcher view. Regarding the reliability was estimated by co efficient split half method following Spearman Brown Prophecy formula was used. The reliability of knowledge questionnaire r-0.08 which were statistically significant.

Statistical analysis: Data thus collected were analysed with Primer (version 6) statistical software. Continuous data were presented as mean ± standard deviation, while categorical data as number and percentage. Student's t-test was used to compare difference in means. Ssignificance level was accepted p <0.05 as significant.

III. RESULTS

Out of total 300 subjects included in this study, 150 were males and 150 were females. Both male and female groups were comparable as per age, sex, religion, type of family and monthly income. (Table 1). these two groups were having significant difference as per education, occupation and eating habits. There was significant variation in males and females in source of information of knowledge regarding food adulteration. (Table 1)

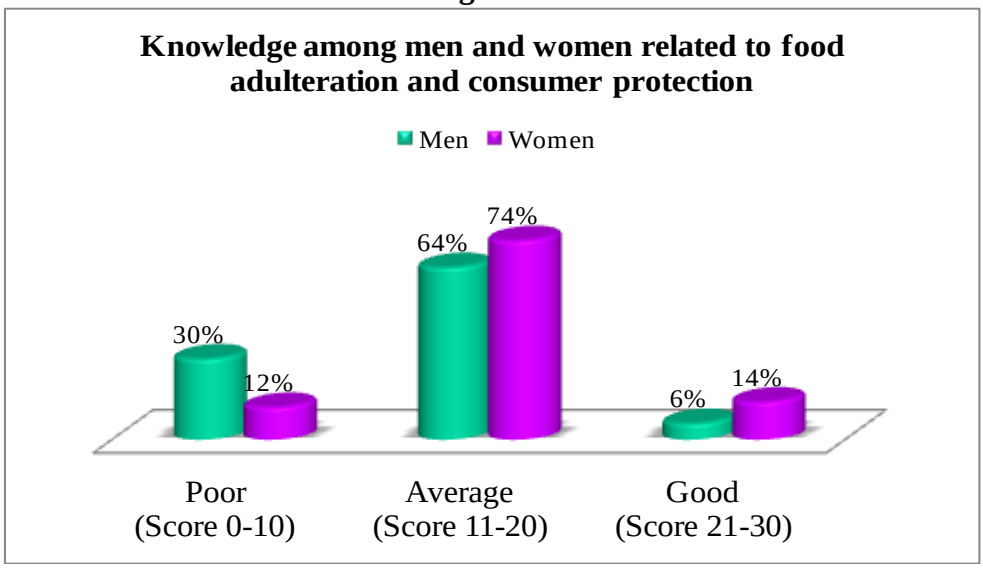
Table 1
Comparison of Characteristics of males and females

S. No	Demographic variable	Category	Males (N=150)		Females (N=150)		P Value LS
			Freq	%	Freq	%	
1	Age	18-20 Years	15	10%	9	6%	0.604 NS
		21-25 Years	45	30%	51	34%	
		26-30 Years	51	34%	45	30%	
		30-35 Years	39	26%	45	30%	
2	Religion	Hindu	114	76%	114	76%	1 NS
		Muslim	21	14%	21	14%	
		Christian	12	8%	12	8%	
		Others	3	2%	3	2%	
3	Family type	Nuclear	45	30%	45	30%	1 NS
		Joint	105	70%	105	70%	
4	Monthly family income	<3000 Rs.	27	18%	27	18%	1 NS
		Rs. 3001-5000	42	28%	42	28%	
		Rs. 5001-7000	36	24%	36	24%	
		>7000 Rs.	45	30%	45	30%	
5	Educational qualification	10th	15	10%	36	24%	<0.001 S
		12th	54	36%	51	34%	
		Graduate	45	30%	48	32%	
		Professional	36	24%	15	10%	
6	Occupation	Employed	78	52%	33	22%	<0.001 S
		Unemployed	72	48%	0	0%	
		Housewife	0	0%	117	78%	
7	Source of Information	Friend	30	20%	24	16%	0.002 S
		Relatives	15	10%	30	20%	
		Parents	30	20%	48	32%	
		Mass -media	75	50%	48	32%	
8	Eating habits	Veg.	105	70%	123	82%	0.022 S
		Non-veg.	45	30%	27	18%	

Out of 300 subjects, only 30 (10%) were having good knowledge about adulteration. When knowledge of male and female were compared it was found that only 6% males having good knowledge regarding food adulteration and consumer protection whereas 14% females had good knowledge. Females were having significantly more ($p<0.001$) knowledge regarding food adulteration and consumer protection than males. (Figure 1).

It is also observed that 30% of males have poor knowledge regarding food adulteration and consumer protection compared to 12% of females. And 6% males having good knowledge regarding food adulteration and consumer protection compared to 14% females. Majority have average knowledge about food adulteration. Females have more knowledge compare to males. (Figure 1)

Figure 1



When associating factors were discovered with the knowledge of males and females it was revealed that that educational qualification, occupation and eating habits are the demographic variables which have statistically significant association with knowledge of males regarding food adulteration and consumer protection. (Table 2)

Table 2

Associating factors of knowledge of the males regarding food adulteration and consumer protection

S. No.	Demographic variable	*F	P	**LS	Association
1	Age	2.1	0.116	**NS**	**No**
2	Religion	0.5	0.708	**NS**	**No**
3	Family type	1.8	0.182	**NS**	**No**
4	Monthly family income	1.9	0.146	**NS**	**No**
5	Educational qualification	29.1	0.000	**S**	**Yes**
6	Occupation	41.8	0.000	**S**	**Yes**
7	Source of Information	0.3	0.828	**NS**	**No**
8	Eating habits	7.6	0.008	**S**	**Yes**

**ANOVA test ** LS= Level of Significance which is at significant difference (p value<0.05)*

When associating factors were discovered with the knowledge of females it was revealed that that educational qualification, occupation and monthly income are the demographic variables which have

statistically significant association with knowledge of females regarding food adulteration and consumer protection. (Table 3)

Table 3
Associating factors of knowledge of the females regarding food adulteration and consumer protection

S. No.	Demographic variable	*F	P	**LS	Association
1	Age	0.2	0.897	**NS**	**No**
2	Religion	2.3	0.093	**NS**	**No**
3	Family type	1.8	0.184	**NS**	**No**
4	Monthly family income	3.2	0.033	**S**	**Yes**
5	Educational qualification	79.2	0.000	**S**	**Yes**
6	Occupation	30.1	0.000	**S**	**Yes**
7	Source of Information	0.3	0.795	**NS**	**No**
8	Eating habits	2.2	0.141	**NS**	**No**

**ANOVA test ** LS= Level of Significance which is at significant difference (p value<0.05)*

When comparison of associating factors in males and females were discovered with the knowledge of males and females it was revealed that that educational qualification and occupation were common in both but eating habits was additional demographic variables associating with knowledge of males regarding food adulteration and consumer protection in males whereas it was monthly income in females. (Table 4)

Table 4
Comparison of Associating factors of knowledge of the males and females regarding food adulteration

S. No.	Demographic variable	Males (N=150)	Females (N=150)
		Association (Yes/No)	Association (Yes/No)
1	Age	**No**	**No**
2	Religion	**No**	**No**
3	Family type	**No**	**No**
4	Monthly family income	**No**	**Yes**
5	Educational qualification	**Yes**	**Yes**
6	Occupation	**Yes**	**Yes**
7	Source of Information	**No**	**No**
8	Eating habits	**Yes**	**No**

IV. DISCUSSION

This study was aimed to compare associating factors knowledge of males and females regarding food adulteration and consumer act. It was depicted from this study that only 10% were having good knowledge about adulteration. When knowledge of male and female were compared it was found that only 6% males having good knowledge regarding food adulteration and consumer protection whereas 14% females had good knowledge. Females were having significantly more ($p<0.001$) knowledge regarding food adulteration and consumer protection than males. And when comparison of associating factors in males and females were discovered with the knowledge of males and females it was revealed that that educational qualification and occupation were common in both but eating habits was additional

demographic variables associating with knowledge of males regarding food adulteration and consumer protection in males whereas it was monthly income in females.

A cross sectional survey was under taken among 75 families using structured knowledge questionnaire and observation technique by Abidfaheem T.K et all in karnataka. They found that majority (60%) of the subjects had moderate knowledge on food adulteration. Among 75 participants, 14 (18.7%) had poor knowledge(0-8), 45 (60%) had average knowledge (9-16) and 16 (21.3%) had good knowledge(17-24) on food adulteration. There was significant association of knowledge score on food adulteration with age (χ =8.627 p= (2) , 2 0.013) and educational status (χ =9.876, p= 0.043) of the respondents. The study concludes that the food adulteration even though (4) low, still it is existing. However awareness of the public in relation to food adulteration should be ongoing especially to the general public with lower level of education.[9]

An experimental study was conducted on extent of awareness and food adulteration detection in selected food items purchased by home makers in Mahadev area. A total of 60 families were selected from the sample population on the basis of stratified systematic sampling. Questionnaire cum interview schedule was adopted to collect data. Study revealed that respondent's awareness related to rights and responsibilities was good but poor related to food adulteration. Education, family income and occupation had an effect on extent of awareness. Age and awareness has no correlation while a positive correlation was found between family income and awareness. The results also revealed that almost all loose products were found adulterated.[10]

The present study findings were supported by another study conducted by Bhatt, and Anita Singh on impact analysis of knowledge and practice for food Safety. Study revealed that age and awareness were not interlinked which contradictory to the present study is finding, while education was interlinked with good 6 practices which supporting the findings of present study.

V. CONCLUSION

It can be concluded from this present study that only 10% were having good knowledge about adulteration. Only 6% males having good knowledge regarding food adulteration and consumer protection in comparison of 14% females. Females were more knowledgeable regarding food adulteration and consumer protection than males. And when comparison of associating factors in males and females were discovered with the knowledge of males and females it was revealed that that educational qualification and occupation were common in both but eating habits was additional demographic variables associating with knowledge of males regarding food adulteration and consumer protection in males whereas it was monthly income in females.

CONFLICT OF INTEREST

None declared till now.

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