Original Article

IMPACT OF MEDIA AND EDUCATION ON FOOD PRACTICES IN URBAN AREA OF VARANASI

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ABSTRACT

Background: Currently food malpractices are increasing in various metro cities of India and all the measures taken by agencies are failed to detect rapidly and many times it becomes late when the adulteration is detected. Worst scenario is the adulteration of some branded items of the children's and in the women's use such as milk cheese, ghee and oils. Therefore, Study for food practices and safety measures was done in selected area of Varanasi which was also validated by the wetlab methods.

Methods: For this objective, questionnaire was prepared and distributed among selected people depending on their age group, sex and educational background. Statistical test were carried out on the basis of frequency of male and female respondents obtained in total respondents (n = 300). Chi square test were done and the calculated value were compared with value of t test (0.05) and on this basis, conclusion were drawn.

Results: Result shows that regardless of the age income and religion, all of the groups are well aware the food adulteration and educated people are less prone to the effect. In terms of adulteration any how all the stores contains adulterated food however branded items contains less %age of adulteration than local item. This may be caused due to inactive agencies or longer process of legal system

Conclusions: Study show that there is lag in following the food practices by all the ages in spite of having good media awareness program and knowledge of food practices.

Keywords: Food choice, food adulteration, food practices.

INTRODUCTION

Now a days several reports were accounted in various food items such as milk, spices, ghee oil. Adulteration in food is normally present in its most crude form, prohibited substances are either added or partly or wholly substituted. In India normally the contamination/adulteration in food is done either for financial gain or due to carelessness and lack in proper hygienic condition of processing, storing, transportation and marketing. This ultimately results that the consumer is either cheated or often become victim of diseases. According to Howes et al. [1,] Attitudes, is also an important factor besides knowledge in following good practices [1,2] have indicated that although training may bring about an increased knowledge of food safety; this does not always result in a positive change in food handling behavior. It has been suggested that this disparity between knowledge and practice occurs because of lack of attitude. Recently KAP model was designed[3] which

assumes that an individual's behavior or Practice (P) is dependent on their Knowledge (K) and suggested that the mere provision of proper information may lead to a change in Attitude (A) and consequently a change in the practices. It has been suggested that this model has flaw in its assumption that knowledge is the main precursor to behavioral change[4]. According to Nidhi and Priti[5] education, family income and occupation are other major factor that effect extent of awareness and overall education shows highest impact. In term of socioeconomic impact. Turrell[6] reported that there is approximately 10% of the socioeconomic variability in healthy food purchasing behavior. Structural and economic barriers to the procurement of these foods, and sub-culturally specific beliefs, values, meanings, etc. sometime other barriers also operates such as Cost and quality of food items for purchasing healthy foods at the shops[7].

The present study was planned to find out food adulteration practices followed and awareness in Varanasi city of Uttar Pradesh (urban area). Therefore, factors affecting purchasing decisions like their religion culture[8] and the perception about food quality may reduce the malpractices of food adulteration. Nutrition and lifestyle interventions can promote healthy diets and improve health outcomes population[7].

Objective of the study:

1-Effect of age group, education, marital status, mode of family, economic status and religion; 2-Buying practice of different food items in term of choice of labeled mark, local verses branded, retailer verses supermarket; 3-Extent of awareness of food adulteration in various items including spices (coriander red chilli etc) and milk items such as ghee and oil either through TV or other sources.

MATERIALS AND METHODS

Research design

Survey method was used in the present study with a structured type questionnaire (by the schedule cum interview method) as the data-collecting instrument. A stratified sampling was done from May, 2007 to June 2008 on food adulteration, safety knowledge and practices of urban consumers in the Varanasi districts of Uttar Pradesh. Before finalizing the questionnaire, the questionnaire was pilot tested on 30 participants (10% of 300 respondents) and minor modifications were made to the questions. A pilot or preliminary samples are generally drawn from the population and the statistics computed from this sample are used in determination of the sample size.

The sampling included 130-160 female and 140 male respondents. Respondents were basically from household related to kitchen activity. Each questionnaire took 50 min to administer. Data were collected on weekends and weekday afternoons when a member of the particular target group would most likely be at home. Answers were graded by giving the tick mark on schedule for the right answers.

Data analysis

Based on literature survey, a list of relevant variables was prepared. A questionnaire was prepared to capture the relevant variables, which was initially pre-tested data was collected from 300 respondents in Varanasi, Uttar Pradesh. The data obtained were feed in the master chart and then analysis was done with the help of Excel add-in statistic solver and XL stat 9.0. XLSTAT 9.0 software (XLSTAT Version 2009 Addinsoft USA 1995-2009). Mean responses SD, and percentages of responses in each category were calculated and presented in a tabular form. Pearson chi square was used in the evaluation of the hypothesis. The data were then analyzed by chi square test, student t-test. Croncbach alpha coefficient of internal consistency was used to estimate the reliability of the questionnaire. Alpha coefficients of 0.76 are considered to be acceptable. Validation of the result were done by the testing various food materials collected from three selected regions in the laboratory by physical and chemical method. All sample testing were done by researcher herself and every sample were taken from three different area-orderly bazaar, Sigara and Lanka area and testing was done in triplicate

RESULT AND DISCUSSION

Observations are shown in table 1 and food adulteration and food buying practices are shown in table 2. Demographic profile & socioeconomic status of respondents (Table 1) show that Hindu is present in the majority and is 85% of total populations while Muslims are 12% and other represents only 2.3 %. Contributions of other religion such as Muslims are low in total populations while others are

only less than 3% (P>0.05). Statistically observed chi ($\chi 2<5.99$) on the basis null hypothesis is accepted that majority of population in selected area belongs to Hindu. Data in Table 1 shows majority of the age group (35%) are age range 26—35 (one third) while people of age range >35 are 21% (p>0.05) Statistically observed chi ($\chi 2<$ 9.48 at DF4) on the basis null hypothesis is accepted which proves the hypothesis that majority of population in urban area is young. Young Male population makes major contributions in buying the food from market[9]. In over 90% of households in India, it is the women who are involved in the preparation of meals[10]. Earlier studies conducted on adults have indicated that food safety knowledge tends to increase with age and practice[11,12].

Table 1: Respondents characteristics

Respondents	Male	Female	Total	DF and P Value
Religion				
Hindu	123 (87.8)	133 (83.1)	256 (85.3)	DF 2, P=0.432*
Muslim	15 (10.7)	12 (13.7)	37 (12.3)	
Other	2 (1.4)	5 (3.1)	7 (2.3)	
Age group				
16-25	26 (18.5)	44 (27.5)	70 (23.3)	DF 4, P=0.199*
26-35	55 (39.2)	50 (31.2)	105 (35)	
36-45	32 (22.8)	31 (19.3)	63 (21)	
46-55	18 (12.8)	28 (17.5)	46 (15.3)	
56 &above	9 (6.4)	7 (4.3)	16 (23.3)	
Education				
Illiterate	8 (5.7)	11 (6.8)	19 (6.3)	DF 4, P=0.52*
> High school	26 (18.5)	42 (26.2)	68 (22.6)	
Intermediate	20 (14.3)	21 (13.1)	41 (13.6)	
Graduate	67 (47.8	64 (40)	131 (43)	
Post graduate	19 (13.5	22 (13.7	41 (13.6)	
Marital status				
Married	134 (95.7	78 (48.7)	212 (70.6)	DF 1, P=0.0001#
Unmarried	6 (4.3)	82 (51.2)	88 (29.3)	
Mode of family				
Nuclear	114 (81.4)	112 (70)	226 (75.3)	DF 1, P=0.022#
Joint	26 (18.5)	48 (30)	74 (24.6)	
Economical status				
LIG (<1000)	7 (5.0)	21 (13.1)	28 (9.3)	DF 2, P=0.0001#
MIG (1000-3000)	89 (63.5)	121 (75.6)	210 (70)	
HIG (>3000)	44 (31.4)	18 (11.2)	62 (20.6)	
Action against shopkeeper for adulteration				
Returns the food to customer	16 (11.46)	19 (11.9)	35 (11.6)	*DF 3, P=0.164**
Took other food in exchange	109 (77.9)	129 (80.6)	238 (79.3	
Gives the warning	3 (2.1)	7 (4.4)	10 (3.3)	
Took legal action	12 (8.6)	5 (3.1)	17 (5.6)	
Effect of watching "Jago Grahak Jago" program				
Get knowledge of consumer rights/ protection	17 (12.1)	25 (15.5)	42 (14.0)	*DF 3, P=0.496**
Motivation to Take action	7 (5.0)	13 (8.12)	213 (6.6)	
All above	96 (68.57)	98 (61.25)	34 (64.7)	
Nothing	20 (14.28)	24 (15)	11 (14.6)	

Numbers in parentheses indicate percentage; *Not significant; #Significant, DF degree of freedom

Data in Table 1 shows majority of the educated people (44%) were graduate out of which male are approx. 48% and female 40%. Percentages of post graduate and intermediate are low (almost similar 13-14% in both male and female). Statistically observed chi ($\chi 2<$ 9.48) on the basis null hypothesis is accepted that majority of the female are educated.

In one study it is found that well-educated people are generally belong to high income Group[13,14]. In many societies women are more

informed about appropriate methods of food handling and storage than men. Better educated consumers often recognize the importance of food safety and younger respondents have shown the greatest need for additional education on food safety[15,16]. Baker[17] found that women, having higher education level and members of households with young children were the most likely to have an extreme risk avoidance response. Food mishandling is thought to be more acute for young adult men and individuals with an educational level beyond high school than other groups[18,19] (Altekruse, Yang, Timbo, & Angulo, 1999). It was observed that women, more so those with higher educational levels, were more likely to check food labels than men (FSAI[20]; Yang et al[19]). In a previous study of the food-handling practices and food safety knowledge of 4th- and 5th-grade students in west-central Illinois, a need for education in safe food handling in the primary grades was identified (Barclay et al[21]).

Table 1 shows (71%) were married (<0.05) and observed chi χ2<3.84) on the basis null

hypothesis is rejected that most of the female get married at early stages. The data of family structure table 1 show (75%) belong to nuclear family. Percentage of joint family was low (only 25%) (p<0.05) and observed chi χ2 < 3.84 while total observed value are greater than expected on the basis null hypothesis is rejected that food practices changes with family structure.

Economical status

Table 1 shows (70%) were belonged to MIG; (20%) belong to HIG. (p<0.05) observed chi (χ2> 5.99) on the basis null hypothesis is rejected that income have indirect effect over following good food practices. According **to Zugarramurdi[22],** people are increasingly concerned about nutrition, food safety at a reasonable cost According to **Nidhi and Priti[5],** education, family income and occupation are major factor that effect extent of awareness but overall education has highest impact. **Kathy Hamilton**[23] concluded that there are connections between the poverty narrative and the family decision making individual control in purchasing and budgeting decisions.

Food choice and practices

Food choice

Data of the essential in food like tasty food, healthy food, unadulterated food or the every essential attribute in the food are shown in table 2. Which show (36.3%) like tasty food (p<0.05) and total observed chi (χ2) > expected on the basis null hypothesis was rejected that tasty food are always healthy. There are reports of foodborne illness associated with the consumption of fruit juices at several places in India and elsewhere [24,25,26]. A study conducted during the period September 2002 to August 2003 in Hyderabad, India, revealed that a total of 42 outbreaks were reported with 1,008 people being affected. Some of the foods involved were kheer, lemon rice and khoa, and the organisms involved [26].

Purchasing Behavior of food materials

Table 2 depicts data of purchasing Behavior of respondents regarding food materials. Data shows 42% like to purchase from stockiest (p>0.05) Chi (χ2) observed < exp 7.8) which means that buying practices of food material from stockiest is followed by both neglecting good food practices which is reflected by chi (χ2) total (14.6) > chi expected on the basis null hypothesis was rejected that stockiest provide adulterated free products.

Causes of choice for food quality

Table 2 shows 56% like to include all the factors for better food quality (p>0.05) observed chi (χ2)< 9.48) on the basis null hypothesis was accepted that people need good quality food products. Their choice of good quality food products may be due to spread of food born disease at mass scale or as the case of dropsy.

Studies of adulteration in different food commodities

a. Cereals

Data in Table 2, shows 57% found all type of adulterations in cereals (p>0.05) observed chi (χ2) < 7.8) reveals that hypothesis is accepted that majority of the cereal available in the market are fortified with all type of adulteration which has direct linked with people's health. Similar observation has been done by Neelkanta and Anand[27] which commented sadly that people prefer to absorb and endure the wrong done to them rather than fight against injustice. Buyer has to find out the desired qualities of goods sold at satisfactory prices. Effective buying requires a specialized knowledge of content of goods, their resources and their use[28] **(Kotler, 1990).** Though government has passed several acts and laws to protect consumers and

seek re-addresal of their grievances they are not in a position to utilize their knowledge or are simply ignorant of these[29]. Validation result show different type of rice was adulterated with stone in the entire sample tested.

Table 2: Food behavior of respondents

Food Behavior & Traits	% observation	Food Behavior & Traits	% observation
Food selection		**Adulteration in pure ghee**	
Unadulterated	5	Vegetable	62.5
Healthy	32	Animal fat	34.5
Tasty	36	Others	3
All choice	27	**Adulterants in coriander**	
Food purchasing		Leaf	24
From own farm	24	Horse dung	58
From retailer	26	Soil	5
From stock market	42	Other	13
Based on availability	8	**Adulterants in chili**	
Causes of food quality		Brick	85
For cleanness	10	Sand	6.8
For better quality	24	Nothing	8.2
Safety from adulterants	10	**Adulterants in turmeric**	
All of above	56	Yellow color	76
Cereal adulterants		Ararote	9.5
Stone	18	Soil	8.5
Bad cereal in good	21	Nothing	6
Worst polishing	4	**Action against shopkeeper**	
All of above	57	Return the food	11.5
Adulterants in pulses		Took another food	80.5
Bad pulses in good pulses	16	Only warning	2.8
Lathyrus mixing	29	Took legal action	5.2
Presence of yellow color	20	**Effect of watching Jago Grahak Jago**	
All of above	35	Motivation to take action	7
Adulterants in edible oil		Get knowledge of consumers right	14
Pure ghee	27	No effect	15
Mustered oil	41	All of above	64
Vegetable/refined oil	5		
All of above	27		

b. Pulses

Our survey show there is heavy demands of some specific pulses. Table 2 show presence of various type adulterants in pulses (Arhar dal) such as mixing of lathyrous or artificial yellow color (>0.05) individually observed chi ($\chi 2$) < 7.8 and total observed value (7.23) expected on the basis null hypothesis was accepted that adulteration is directly related with choice of consumer and heavy demand and less availability may be one factor that directly effecting the practices of shopkeeper. Validation result show pulses contain inferior pulses, synthetic colour, lathyrous and stone.

c. Edible oils

Some worker reported that edible oils are sold with argemone (*Argemone Mexicana*) oil leading to deaths of hundreds of people (Singh et al., 2000). (41%) (Table 2) observed adulteration inn mustard oil (>0.05). This may be linked with heavy use of edible oil or choice of people for buying cheap products which for making profit often fortified with other inferior oil having same color or physical property. Statistically observed chi ($\chi 2$) < 7.8) on the basis null hypothesis was accepted that there are malpractices in edible oil and almost every oil was found to be adulterated with inferior quality oil.

Table 2 shows 62% observed that Vegetable oil are mostly mixed with ghee while other feels that animal fat are mixed 35%. (>0.05) observed chi ($\chi 2$) < 5.99) on the basis null hypothesis was accepted that difference is not significant and fact that ghee is adulterated with many type of adulterants and directly effecting the health of the peoples. Validation result displayed show Deshi ghee adulterated with vegetable oil. Test also shows vegetable oil contains castor oil and argemone in all samples. Another test shows adulteration of starch in Paneer in all samples

d. Spices

Adulterants in spices were included in the survey and results shows that 98% of the people feel there is adulterants in spices, (>0.05) observed chi ($\chi 2$) < 3.84) on the basis null hypothesis was accepted that there is adulteration in the spices. Table 2 shows result of adulterants in coriander powder with horse dung, leaf powder, soil as adulterants. (>0.05) statistically observed chi ($\chi 2$) < 7.8) on the basis null hypothesis was accepted that coriander are adulterated. Table 2 shows 85% observed there was brick powder as adulterants in red chili powder while sand was observed by 6% respondent's (<0.05) observed chi ($\chi 2$) < 7.8) on the basis null hypothesis was rejected that only few component of the spices may be adulterated. Table 2 shows 99% observed that there is adulterants in turmeric powder (>0.05) observed chi ($\chi 2$)<3.84) expected on the basis null hypothesis was accepted that there is adulterants in all type of item present in shop. There was addition of yellow colour or ararote in turmeric powder, soil in the turmeric powder (>0.05) observed chi ($\chi 2$) <7.8) on the basis null hypothesis was accepted that there is synthetic colour used in the turmeric . The variety of synthetic colours, developed in the middle of the nineteenth century,[30,31]. Turmeric may be adulterated with, Lead chromate which can cause anemia, paralyses, mental retardation and brain damage in children and abortion in pregnant women (Wikipedia). Validation result show adulteration of horse dung; or synthetic colour in red chili in were all samples while Ararote and synthetic colour were present in Turmeric in all samples.

e. Impact on health

Bad food practices often linked with various food borne diseases. Those at greatest risk for food borne illnesses are the elderly, pregnant women, infants and young children, and those with compromised immune systems [32,33]. One in every five individuals in the U.S.A. falls into one of these at-risk categories. The elderly are a group particularly vulnerable to foodborne illnesses and death[34], such as morbidity and mortality from foodborne-induced gastroenteritis. Many elderly live in assisted living facilities where food is provided by caregivers. As described by Linton et al[35], there are many food handling errors that can cause food borne illness in food retail establishments, including poor personal hygiene and cross-contamination.

According to Howes et al[36,37], Attitudes, is an important factor besides knowledge, which ensures trend of food borne illnesses. A number of studies[38,2] have indicated that although training may bring about an increased knowledge of food safety this does not always result in a positive change in food handling behavior. It has been suggested that this disparity between knowledge and practice occurs because much of the existing training, particularly formal certificated training, is designed using the KAP model[3]. This approach assumes that an individual's behavior or practice (P) is dependent on their knowledge (K) and suggests that the mere provision of information will lead directly to a change in attitude (A) and consequently a change in behavior. It has been suggested that this model is flawed in its assumption that knowledge is the main precursor to behavioral change [4].

f. Role of media

Table 2 and fig. 2 show 83% see TV program "JAGO GRAHAK JAGO" (>0.05) observed chi ($\chi 2$) < exp 3.84 on the basis null hypothesis was accepted that people are watching TV program "JAGO GRAHAK JAGO". According to Kishtwaria, et al[38] which concluded that mass media can effectively be used to promote information and awareness especially to educated respondents belonging to middle income group. Mass- media can also play an effective role for masses belonging to different socio- economic categories also. Parameshwar[39] analyzed that unless consumer awareness' is created, the efforts of the government and voluntary organizations can't achieve the desired results[40].

h. Food standards

Survey show 83% know about food standards (>0.05) such as ISI , FAO , AGMARK (<0.05). Statistically observed chi ($\chi 2$) > expected on the basis null hypothesis was rejected that people have good understanding about the food standards.

CONCLUSION

The urban people of Varanasi where people in majority are Hindu mostly have income range medium and lives in nuclear family and male and female have 40-50% education. The young

people are there in majority and linked with mostly buying of food materials not directly linked with handling of food materials but like tasty food, healthy choice in food comes next, and like to purchase it from stockiest. Majority of people used to see TV program "JAGO GRAHAK JAGO" and are well aware of food standards ISI FAO & AGMARK, but never taken any action against them whenever they found adulterants in food. Test show all type of adulterations in cereals and pulses with mixing of lathyrous, or yellow color in Arahar dal and also adulteration in mustard oil, ghee and in spices, sand in red chili powder or there was addition of yellow colour or mixing of ararote in turmeric powder. Majority of the people agreed that they can complain against adulteration and accept that they never filed any complaint against the shopkeeper & never took action against shopkeeper.

LIMITATION & RECOMMENDATIONS

Researchers was unable to tell the quantities of adulterants present beyond prescribed limit or beyond toxicity level in different food products so that people can avoid such food products. And this could be done by government authorities before supply in public.

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