



Households' Attitudes Towards Food Safety Guidance in Riyadh, Saudi Arabia

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ABSTRACT

The current study aims to identify the factors influencing households' attitudes towards food safety in the governorates of the Riyadh region (Diriyah, Al-Muzahmiyah, and Thadig). A simple random sampling technique was used to collect data. Results of analysis revealed that nationality and income level had a significant relationship with respondents' attitudes towards food safety. The majority of respondents hold moderate attitudes towards food purchasing, food preparation and food preservation. On the basis of findings, it is suggested that policy makers should understand the barriers to awareness about food safety. Food authorities should create awareness among people through social media campaigns. Food safety programs should be implemented to ensure food safety and educate people about the advantages of the adoption of food safety measures.

Keywords: Attitudes, knowledge, food Safety, Saudi Arabia.

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INTRODUCTION

Food contamination is the penetration of unwanted organisms, stains to food packaging or food environment (BRC, 2015). The major causes of mortalities and morbidities around the world are food borne diseases (Havelaar et al. 2015). In both developing and under developing countries, food borne diseases are expanding public health issues (Bhattacharjya and Reang, 2014) resulting from contamination through microorganism and chemical reactions in food products (Webb and Morancie, 2015). Food infectivity can occur at different levels of the food chain process (World Health Organization, 2015). Food borne diseases caused by consumption of unsafe food. About 2.2 million people including 1.9 million children died by experiencing various diseases spread by contaminated food and water (WHO, 2015). Such casualties are also increasing the economic burden on countries in the form of health care costs. In 2010, food services establishment or catering were responsible for 48.7% of food borne diseases which proved the value of food safety practices (EFSA and ECDC, 2018).

Different reasons behind the food safety issues have been identified, some studies depicted that food restaurants are the major cause of health issues and diseases (DeWaal and Glassman, 2013). Food safety issues initiated by various factors including excessive applications of farm inputs (FORHEAD, 2014). The misuse of farm inputs caused micronutrients deficiency, water pollution, pesticide, growth hormones, antibiotics and anti-parasitic left over in food (Jia and Jukes, 2013) and the food borne diseases resulted from the consumption of fresh, perishable foods sold in informal markets (Grace, 2015).

Food consumers could play a vital role in minimizing the various foodborne infections caused by imperfect food handling (Meysenburg et al. 2014). The change in consumers' attitudes also affect food safety (Daelman, 2013). Consumers underestimate the risk of food borne infection spread by improper food handling at the home (Nesbitt et al. 2014). The European Union Summary Report (EFSA and ECDC, 2015) pointed out that about one in every three cases of sickness occurred by contaminated food at home. Food borne diseases outbreak occurred by the lack of awareness and negative attitudes towards food safety measures, contamination of raw food with prepared food, inappropriate food handling, preparation and storage at home and poor personal and kitchen hygiene (Patil et al. 2005). High health benefits of food safety pushed researchers to investigate families' attitude towards food safety measures in Saudi Arabia.

MATERIALS & METHODS

Current study was conducted in some governorates of the Riyadh region, represented by the governorates of Diriyah, Al-Muzahmiyah. A sample of 379 families was selected and determined using Stephen Thompson's equation (Thompson, 2012).

$$N = \frac{n \times p(1 - p)}{[n - 1 \times (d^2 \div z^2)] + p(1 - p)}$$

Whereas:

N: community size

z: The standard score corresponding to the level of significance (0.95) and equal to (1.96)

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D: Error percentage, equal to (0.05)

P: Ratio of availability of the property and neutrality, equal to (0.05).

A simple random sampling technique was used to collect data. The number of completed questionnaires that met the scientific conditions were 332 (response rate= 84%). The first section of the survey measures socio-economic characteristics of respondents including nationality, age, education, family size, employment and income level. The second section measured knowledge level of food purchasing, food preparation and food preservation. Three-point scale was used to measure the knowledge level (low= 1, medium= 2 and high= 3). The third section measured respondents' attitudes towards food purchasing, food preparation and food preservation. Five-point Likert scale was used to measure respondents' attitudes (strongly agree= 1 (SA), agree= 2 (A), neutral=3 (N), disagree= 4 (DA) and strongly disagree= 5 (SD)). The data was collected through a questionnaire after ensuring its validity and reliability, it turned out to be highly reliable, as the Cronbach's coefficient reached 0.94. Statistical Package for Social Sciences (SPSS) was used to measure descriptors including percentages, Mean and standard deviation. Chi-square analysis was used to measure relationships between socio-economic characteristics and respondents' attitudes.

RESULTS

Socio-economic Characteristics

Table 1 shows that the majority of the surveyed families are Saudi nationals (82%) and 18% are non-Saudi. While 46.5% of the respondents are less than 35 years old. In addition, 37% of the respondents belong to the age group 35 to 50 years and only 16.5% of the respondents belong to the age group more than 50 years.

Regarding the educational level, the majority of the respondents (41.1%) are university education holders. More than 50% of the respondents have family size (more than 10 members). The majority of the respondents, 39.1% and 34.2%, are working in private and government sectors respectively. Majority of the respondents are earning (41.2%) more than 5000 SARs.

Table 2 showed the respondents' attitudes in terms of purchasing. All responses were arranged in descending order by the mean score. The results showed that the mean score ranged from maximum 4.02 to minimum 2.92. The statement "I prefer to quickly put frozen products in the freezer after arriving home to maintain their safety." ranked 1st with a mean score of 4.02. While the statement of "I think there is no difference whether fresh milk from sheep, cows or camels is boiled or not." ranked 7th by the mean score of 2.92.

Table 3 shows respondents' attitudes in terms of food preparation. All responses were arranged in descending order by the mean score. The results showed that the mean score ranged from maximum 3.82 to minimum 3.31. The statement "I prefer to use liquid soap rather than bar soap when washing my hands" ranked 1st with a mean score of 3.82. While the statement of "I prefer to place cooked foods on the top rack and raw foods on the bottom." ranked 7th by the mean score of 3.31.

Table 4 shows the respondents' attitudes towards food preservation. All responses were arranged in descending order by the mean score. The results showed that the mean score ranged from maximum 3.61 to minimum 2.39. The statement "I think the best way to protect leftover canned food and milk after opening it is to put it in the refrigerator" ranked 1st with a mean score of 3.61. While the statement

of "I prefer to put packages of flour in more durable and practical bags than to leave it in shopping packages" ranked 8th by the mean score of 2.39.

Table 1: Distribution of respondents according to socio-economic characteristics

Properties	Categories	%
Nationality	Saudi	82
	Non-Saudi	18
Age	Less than 35 years	46.5
	35-50 years	37
	More than 50 years	16.5
Educational level	Illiterate	1.2
	primary	3
	middle	9.4
	secondary	39.9
	University	41.1
Family members	Postgraduate	5.4
	Less than 6	35
	6-10	56.3
Employment	More than 10	8.7
	Private sector	39.1
	Government sector	34.2
Income level	retired	8.8
	does not work	17.9
	Less than 5000	41.2
	5000-10000	31
	10000-15000	16.2
	More than 15,000	11.6

Fig. 1 indicates that 40.4% of the respondents hold high knowledge about how to apply the food safety guidance during purchasing, while 52.1% hold medium knowledge. Only 7.5% hold low knowledge about how to apply food safety guidance to shopping and purchasing.

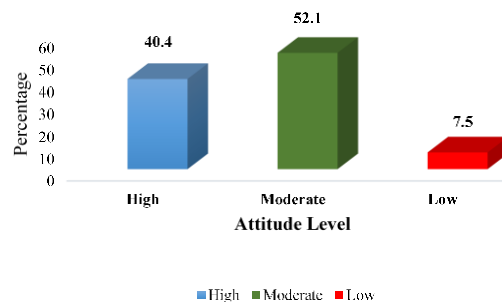


Fig. 1: Respondents attitudes towards food purchasing.

Fig. 2 indicates the distribution of respondents according to their knowledge about preparing food. 40.1% of the respondents hold high knowledge about how to apply guidance in food preparation. While 52.4% hold moderate knowledge and only 7.5% hold a low knowledge about how to apply food safety guidance in food preparation.

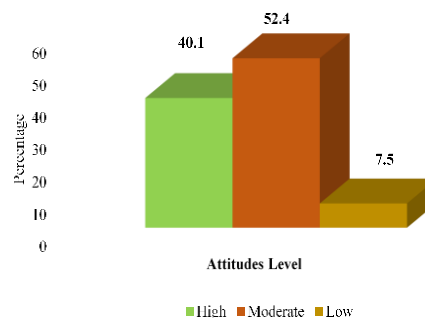


Fig. 2: Respondents attitudes towards food preparation.

Table 2: Distribution of respondents according to their attitudes towards food purchasing

Statements	SA %	A %	N %	D %	SD %	Mean	SD	Rank
I prefer to frozen products in the freezer after arriving home to maintain safety.	45.2	29.2	13.3	7.2	5.1	4.02	1.15	1 st
I prefer to use a cutting board designed for meat, fruits and vegetables to prevent the spread of food contamination.	46.4	23.2	12.7	9.3	8.4	3.90	1.31	2 nd
I do not care about the appearance of the package because the content inside is not affected.	36.7	28	21.1	8.7	5.4	3.82	1.17	3 rd
I think that the best time to buy frozen and refrigerated products to reduce their melting period is at the end of the shopping period.	40.4	26.2	13.6	9	10.8	3.76	1.35	4 ^{rh}
I don't care much about the expiry date of food products as long as the product looks fresh.	39.2	21.4	11.1	8.7	19.6	3.52	1.54	5 th
I don't pay much attention to checking the fish because the effect of heat during grilling or frying the fish preserves it.	22	26.2	16	14.5	21.4	3.13	1.35	6 th
I think there is no difference whether fresh milk from sheep, cows or camels is boiled or not.	16.3	22.9	19.9	18.1	22.9	2.92	1.40	7 th

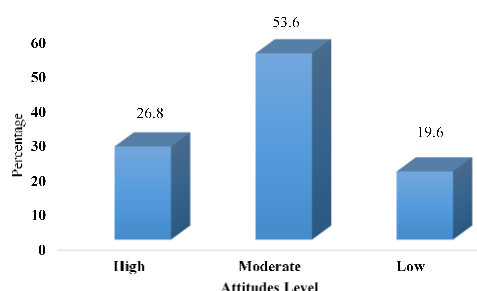
Table 3: Distribution of respondents according to their attitudes towards food preparation

Statements	SA %	A %	N %	DA %	SD %	Mean	SD	Rank
I prefer to use liquid soap rather than bar soap when washing my hands.	32.5	37	15.7	9	5.7	3.82	1.15	1 st
I think there is no need to wash hands with soap and water before preparing food as long as the food will be exposed to heat.	41	24.7	9.6	11.7	13	3.69	1.43	2 nd
I don't want to use the same vegetable oil to fry foods multiple times	32.8	29	14.5	15.4	8.1	3.63	1.30	3 rd
I think that using the knife that was used to cut meat directly to cut vegetables causes contamination.	33.1	27.4	14.8	15.1	9.6	3.59	1.33	4 ^{rh}
I think all cold and hot foods can be placed in plastic plates.	33.7	28	11.4	14.2	12.7	3.56	1.40	5 th
I think if dirty utensils are washed in a large bowl, it increases the chances of contamination occurring.	29.2	28.6	16	15.4	11.7	3.49	1.35	6 th
I prefer to place cooked foods on the top rack and raw foods on the bottom.	24.7	27.1	16.9	17.5	13.9	3.31	1.37	7 th

Table 4: Distribution of respondents according to their attitudes towards food preservation

Statements	SA %	A %	N %	DA %	SD %	Mean	SD	Rank
I think the best way to protect leftover canned food and milk after opening it is to put it in the refrigerator.	31.6	28.6	15.7	17.2	6.9	3.61	1.27	1 st
The best way to increase people's motivation to eat green salad is to prepare a large amount of it and use it for several days.	21.7	34.3	19.6	14.8	9.6	3.44	1.24	2 nd
I think there is no need to worry about where the grains are stored; Because it is very durable and can therefore be stored anywhere.	20.2	36.1	14.5	18.4	10.8	3.36	1.28	3 rd
I prefer to broil chicken at room temperature rather than in the refrigerator.	19.6	27.7	13.9	24.7	14.2	3.14	1.36	4 ^{rh}
I think that putting a layer of oil on the surface of the sauce container can help it spoil quickly.	13.6	31.9	21.7	19.9	13	3.13	1.25	5 th
I prefer to shift the flour and reseal it to avoid insects.	18.1	18.4	16.9	24.1	26.6	2.85	1.42	6 th
I believe that washing fruits and vegetables before putting them in the refrigerator maintains the integrity of the produce.	10.8	19.6	17.5	20.2	31.9	2.57	1.39	7 th
I prefer to put packages of flour in more durable and practical bags than to leave it in shopping packages.	7.5	13.9	17.5	31.9	29.2	2.39	1.24	8 th

Fig. 3 indicates that only 26.8% of the respondents hold high knowledge about how to apply the food safety guidance during food preservation, while 53.6% hold moderate knowledge about how to apply the food safety guidance during food preservation, while 19.6% of them indicate that they hold a low knowledge about how to apply the food safety guidance during food preservation.

**Fig. 3:** Respondents attitudes towards food preservation.

The findings given in Table 5 indicates that nationality and income level of the respondents have a significant relationship with respondents' attitudes towards food safety.

DISCUSSION

Regarding nationality of the respondents, current findings are aligned with Siau et al. (2015) who found that nationality of the food handlers has significant relationships with food safety. A study was conducted to investigate the attitudes towards food safety among different nationalities. The Arab food handlers showed positive attitudes towards food safety measures as compared to other nationalities (Al-Shabib et al. 2016). Our findings are consistent with Alhashim et al. (2022) who found that the Saudi population holds positive attitudes towards food safety measures. In the same fashion, our findings are aligned with Muhammad et al. (2010) who reported that nationality of the respondents have significant relationship with food safety concerns. Relationship of attitude of Saudi nationals may

Table 5: The relationship of personal and social characteristics to respondents' attitudes toward food safety (n=332).

Variables	Low %	Medium %	High %	Chi square	p-value
Area					
Thadq	8.4	14.9	32.4	0.0521	0.770
Diriyah	75.7	62.3	51.4		
Al-Muzahmiyah	15.9	22.8	16.5		
Nationality					
Saudi	82.1	75.2	88.3	6.434	0.040
Non-Saudi	17.9	24.8	11.7		
Age					
Below than 35 years	52	47.3	40.2	4.045	0.400
35-50 years	36.3	35.5	39.4		
More than 50 years	11.8	17.3	20.2		
Family size					
Less than 6 people	28	34.6	41.9	8.288	0.082
6-10	58	57.7	53.3		
More than 10	14	7.7	4.8		
Employment					
Private sector	49.1	39.8	28.8	11.227	0.082
Government sector	32.1	32.7	37.8		
retired	4.7	9.7	11.7		
does not work	14.2	17.7	21.6		
Income level					
Less than 5000	46	45.7	32.4	14.427	0.025
5000-10000	23	36.2	33.3		
10000-15000	15	10.5	22.9		
More than 15,000	16	7.6	11.4		

exist due to their lifestyle or high income as Arab Center for Nutrition (2009) reported that increase in income brought huge changes in terms of socio-economic status, food preference, consumption patterns, lifestyle and health status of population of Gulf countries including Bahrain, Kuwait, Oman, Qatar, Saudi Arabia and United Arab Emirates from past four decades. Similarly, our findings also revealed that the income level of the respondents has a significant relationship with attitudes towards food safety. Our findings are consistent with Muhammad et al. (2010) who reported that individuals with higher income were more interested in reading information about food safety. More interest in reading about food safety may positively affect their attitudes. As Isoni Auad et al. (2019) stated that higher income improved affordability to buy food frequency; therefore, higher income may improve their attentions towards food safety. Improvement in attention black towards food safety may improve their attitude (Valente et al. 2019). Furthermore, our findings are in accordance with Haidari et al. (2022) who reported that higher income of the respondent has significant relationship with food safety practices.

Conclusion

The current study aims to identify the relationship of demographic characteristics of the respondents and their attitudes towards food safety. Findings show that nationality and income level have a significant relationship with attitudes towards food safety. The findings can be implied that policy makers should understand the barriers to adoption of food safety measures. Furthermore, food and drug authority could further improve people's knowledge about food safety, by implementing food safety programs and social media campaigns. Training in food safety could be arranged to improve the food safety knowledge and attitude of those involved in preparing food. The limitation of the study; pretesting was not conducted due to shortage of time. Current study was limited to three areas of the Riyadh

region. Current findings cannot be generalizable to other people who live in other regions of Saudi Arabia. So, further research is suggested to identify barriers to adoption of food safety measures on other regions of Saudi Arabia.

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