Zagazig J. Agric. Res., Vol. 43 No. (3) 2016

http:/www.journals.zu.edu.eg/journalDisplay.aspx?JournalId=1&queryType=Master

A STUDY ON NUTRITIONAL AWARENESS OF MOTHERS ABOUT FOOD ADDITIVES

Sara N. Moselhy[1*], M. Ragab[2], Manal M.E.M. Shehata[1] and Hanan S.T. Shalaby[1]

1. Food Sci. Dept., (Rural of Home Econ.), Fac. Agric., Zagazig Univ., Egypt

2. Food Sci. Dept., Fac. Agric., Zagazig Univ., Egypt

ABSTRACT

The present study aimed to evaluate mother's awareness about food additives and healthy and unhealthy nutritional habits. Sources of information about food additives were also evaluated. Data was collected using a questionnaire that was distributed to 600 randomly selected mothers from Sharkia Governorate (urban and rural) and Matrouh Governorate (Bedouin). The results showed that the highest percentage of mothers age was obtained in Bedouin area 62.35%, representing age between 18 and 32 years old, followed by 49% in rural area and 41.30% in urban area of mothers age between 33 and 47 years old. The housewives represented the highest percentage and valued 88.24% of mothers in Bedouin area. The results indicated that the highest percentage of academic mothers was cleared in urban area and amounted 52.17%. Also, the highest percentage of familys income (4000 LE < per month) was 34.78% in urban area compared to rural and Bedouin area. Furthermore, the results revealed that the highest values of mothers awareness about food additives, healthy and unhealthy nutritional habits were recorded in urban area, whereas, the lowest value was obtained in Bedouin. The highest sources of information about food additives were friends and relatives (82.5%) of mothers in rural area. From the results it could be recommended to increase education level of mothers in Bedouin area.

Key word: Awareness, nutritional habits, food additives, socioeconomic status.

INTRODUCTION

Nutritional awareness was defined as self-perception of the importance assigned to eating balanced meals, and classified as high, moderate, or of little importance (Alkerwi *et al.,* 2015)

Food safety, an important global public health issue to ensure sound health, refers to addressing "all those hazards, whether chronic or acute, that may make food injurious to the health of the consumer" (FAO/WHO, 2003).

Identified food additives are organic substances that are intentionally added to food in small quantities during production or processing to improve the organoleptic quality (colour, flavour, appearance, taste and texture) of the food. Food preservative is a class of food additives that help to prevent food spoilage by preventing the growth and proliferation of pathogenic microorganisms like Clostridium spp, *Bacillus cereus* and *Staphylococcus aureus* (Inetianbor *et al*., 2015).

Food additives perform a variety of useful functions in foods that are often taken for granted. Since most people no longer live on farms, additives help keep food wholesome and appealing while en-route to markets sometimes thousands of miles away from where it is grown or manufactured (Inetianbor *et al*., 2015).

Additives also improve the nutritional value of certain foods and can make them more appealing by improving their taste, texture, consistency or colour (Houghton, 2002).

Parents influence children's eating habits through their implicit and explicit modeling of food consumption behavior (Fisher and Birch, 1995).

[*] **Corresponding author: Tel. :** +201276395500
E-mail address: saranaiim@yahoo.com

This study aimed to determine mother‘s nutritional awareness about food additives, healthy and unhealthy nutritional habits. Respondents were selected from diverse communities at urban, rural and Bedouin areas.

MATERIALS AND METHODS

The present study was conducted throughout questionnaire at different areas for mothers at urban and rural of Sharkia Governorate and mothers at Bedouin area of Matrouh Governorate. A total of 600 mothers out of 630 mothers participated in the questionnaire and participation percentage was 95%. The participated and interviewed mothers were 230 in urban and 200 in rural areas at Sharkia Governorate, whereas, 170 mother from Bedouin area at Matrouh Governorate were participated. The questionnaire was done directly in targeted communities at urban, rural and Bedouin areas during the period between February and October, 2015. The participated mothers were divided in the three different age categories *i.e.,* 18-32 years, 33-47 years and over than 48 years old.

Interview included the main points as following: (1) Socioeconomic status of mothers included their age, educational level, job and family income in relation to area pattern. (2) Mother‘s awareness around food additives included 9 questions. (3) Interview also included 27 questions in two parts about healthy and unhealthy nutritional habits. (4) Source of mother‘s information about food additives. The questions for knowledge about food additives were scored as follows, (I know) answer was scored (3), (To some extent) answer was scored (2) and (I don't know) answer was scored (1) and other question about healthy nutritional habits were scored as follows, always, sometimes and never answers valued as 3, 2 and 1, respectively. Also, the questions about unhealthy nutritional habits were scored as same as abovmentioned characters.

Statistical Analysis

The statistical package for Social Sciences for Windows (SPSS Inc. Version 22. 2012) was used to analyze the collected questionnaire data. Descriptive analysis was conducted to identify the mother‘s awareness and the source of their information about food additives, healthy and unhealthy nutritional habits. Cross tabulation and Chi-square tests were performed to determine the participated mother's awareness about food additives. Also, contingency coefficient test was used for all of the data. Statistical significance of $P < 0.01$ was used for all tests.

RESULTS AND DISCUSSION

Socioeconomic Status of the Mothers

Mother‘s age

Data indicated the number and percentage distribution of mother's age in relation to area pattern are shown in Table 1. Its clear that the highest percentage of mother's age was obtained in Bedouin area where it reached to 62.35% in age class (18 -32 years) and its followed by 49.00% and 41.30% in mothers age (33-47 years) in rural and urban areas, respectively. It is clear from the present results that there were significant differences in urban, rural and Bedouin areas of mother's age. Soon-Mi *et al*. (2011) noticed that about age of selected sample that, 17% of the selected were in their 20’s, 23% in their 30’s, 23% in their 40’s, 20% in their 50’s, and 14% were older than 60 years.

Mother's job

The number and percentage distribution of mother's job in relation to area pattern are given in Table 2. The results indicate that the highest percentage of mothers was 88.24% in Bedouin area for housewife followed by 64% in rural area. While, 70.87% of mothers were employee in urban area. It is clear from the results that were significant differences in urban, rural and Bedouin area of mother's job. Mother's job effects spending on children because it increases the family income. The increase in family‘s income leads to increase the purchasing power of candy and other food items containing food additives.

Mohamed (1999) noticed that all most of students mothers for public and private school (69.14 and 50.25%) were housewife, respectively.

Mother's education level

Table 3 describes the number and percentage distribution of mother's education level in relation

Table 1. Number and percentage distribution of selected mothers according to their age and area

Mother's age	Urban		Rural		Bedouin		Total	
	No.	(%)	No.	(%)	No.	(%)	No.	(%)
18 – 32 years	53	23.04	80	40.00	106	62.35	239	39.83
33- 47 years	95	41.30	98	49.00	40	23.53	233	38.83
48 years and over	82	35.65	22	11.00	24	14.12	128	21.33
Total	230	100.00	200	100.00	170	100.00	600	100.00

Chi-square= 90.124, DF = 4 and P= .000 - Contingency coefficient = 0.361 and P= 0.000

Table 2. Number and percentage distribution of selected mothers according to their job and area

Mother's job	Urban		Rural		Bedouin		Total	
	No.	(%)	No.	(%)	No.	(%)	No.	(%)
Employee	163	70.87	72	36.00	20	11.76	255	42.50
Housewife	67	29.13	128	64.00	150	88.24	345	57.50
Total	230	100.00	200	100.00	170	100.00	600	100.00

Chi-Square= 144.922, DF = 2 and P=0.000 - Contingency coefficient= 0.441 and P= 0.000

Table 3. Number and percentage distribution of selected mothers according to their level of education and area

Level of mother's education	Urban		Rural		Bedouin		Total	
	No.	(%)	No.	(%)	No.	(%)	No.	(%)
Illiterate	4	1.74	19	9.50	129	75.88	152	25.33
Read and write	2	0.87	2	1.00	1	0.59	5	0.83
Primary school	4	1.74	20	10.00	40	23.53	64	10.67
Secondary school	90	39.13	86	43.00	0	0.00	176	29.33
Academic University	120	52.17	70	35.00	0	0.00	190	31.67
(M.Sc. /Ph.D.) degree	10	4.35	3	1.50	0	0.00	13	2.17
Total	230	100.00	200	100.00	170	100.00	600	100.00

Chi-square= 449.982, DF = 10 and P= 0.000 - Contingency coefficient= 0.655 and P= 0.000

to area pattern. These data show that the highest percentage of mother's education (75.88%) was illiterate in Bedouin area. While, the highest percentage of mother's education level (43%) was secondary school in rural area. In addition, the highest percentage of high education mothers were cleared in urban area and it was 52.17%. On the other hand mothers who had (M.Sc. / Ph.D.) were existed in urban area (4.35%). The results indicated that there were significant differences in urban, rural and Bedouin area of mother's education. Mahgoub *et al.* (2014) indicated that mother's education; in Alriyad up to 71.7% of mothers have either university or above level of education, whereas in Gebra and Alremela only 36.7% and 26%, respectively of this level of education.

Family's income

The data which cleared the number and percentage distribution of family's income per month in relation to area pattern are given in Table 4. The highest percentage of family's income per month (>2000 LE) was 73.53% in Bedouin area followed by 54% in rural area and 20.87% urban area. While, the highest percentage of family's income per month (2000-4000 LE) was 44.35% in urban area followed by 34.5% in rural area and 24.71% in Bedouin area. On the other hand the highest percentage of family's income per month (4000 LE <) was 34.78% in urban area. It is clear from these results that there were significant differences in urban, rural and Bedouin area of family's income. Mahgoub *et al.* (2014) noticed that family's monthly income; in Alriyad only (4.2%) of families earn less than 301$, while in Gebra and Alremela up to 93.3% and 95% of families, earn monthly this amount of money.

Mother's Awareness about Food Additives

The results of number and percentage distribution of mother's awareness about food additives in relation to area pattern are shown in Table 5. It has been classified into nine questions. It is clear from the results that the mother's knowledge regarding the materials added to processed food in order to improve the flavour, texture and extend preservation period as shown in question (1) about 82.20% of mothers in urban area were aware of this knowledge followed by rural area (63.50%).

Results of mother's knowledge regarding to question (2) "Food additives to processed foods, including natural and industrial additives". The data shows percentage of knowledge in urban area was (62.60%) and it was higher than rural area (12.50%).

Mother's knowledge regarding question (3) showed that about 71.30% of mothers in urban area were aware of the fact of natural additives are less dangerous to the health than synthetic additives than rural area (39%).

Table 4. Number and percentage distribution of selected mothers according to level of family's income per month and area

Family's income	Urban		Rural		Bedouin		Total	
	No.	(%)	No.	(%)	No.	(%)	No.	(%)
>2000 LE	48	20.87	108	54.00	125	73.53	281	46.83
2000-4000 LE	102	44.35	69	34.50	42	24.71	213	35.50
4000 LE<	80	34.78	23	11.50	3	1.76	106	17.67
Total	230	100.00	200	100.00	170	100.00	600	100.00

Chi-square= 138.654, DF = 4 and P= 0.000 - Contingency coefficient= 0.433 and P= 0.000

Table 5. Number and percentage distribution of selected mothers according to mother's awareness about food additives and area

No.	Question	Response	Urban		Rural		Bedouin		Chi-square	Contingency coefficient
			No.	(%)	No.	(%)	No.	(%)		
1	There are materials added to processed food in order to improve the flavour, texture and extend preservation period	I know	189	82.20	127	63.50	0	0.00	358.341**	0.611**
		To some extent	34	14.80	71	35.50	80	47.10		
		I don't know	7	3.00	2	1.00	90	52.90		
2	Food Additives to processed foods, including natural and industrial additives	I know	144	62.60	25	12.50	0	0.00	680.378**	0.729**
		To some extent	79	34.30	165	82.50	0	0.00		
		I don't know	7	3.00	10	5.00	170	100.00		
3	Natural additives are less dangerous to the health than synthetic additives	I know	164	71.30	78	39.00	0	0.00	451.891**	0.655**
		To some extent	46	20.00	87	43.50	0	0.00		
		I don't know	20	8.70	35	17.50	170	100.00		
4	The types of additives in foods are preservatives , colouring agents, and antioxidants, Emulsifiers…*etc.*	I know	70	30.40	14	7.00	0	0.00	209.206**	0.508**
		To some extent	71	30.90	15	7.50	0	0.00		
		I don't know	89	38.70	171	85.50	170	100.00		
5	There are limits permitted substances added to food	I know	99	43.00	19	9.50	0	0.00	245.727**	0.539**
		To some extent	65	28.30	24	12.00	0	0.00		
		I don't know	66	28.70	157	78.50	170	100.00		
6	The kind of food additives be written in the guidance card on the package and symbolized by the letter E	I know	10	4.30	0	0.00	0	0.00	76.876**	0.337**
		To some extent	44	19.10	6	3.00	0	0.00		
		I don't know	176	76.50	194	97.00	170	100.00		
7	Whenever food is closer to its natural image and high quality is less containment of the additive	I know	151	65.70	52	26.00	0	0.00	311.945**	0.585**
		To some extent	45	19.60	51	25.50	0	0.00		
		I don't know	34	14.80	97	48.50	170	100.00		
8	There are many food products containing additives permitted food in the markets	I know	160	69.60	87	43.50	0	0.00	372.698**	0.619**
		To some extent	53	23.00	54	27.00	0	0.00		
		I don't know	17	7.40	59	29.50	170	100.00		
9	Foods must be kept at the appropriate temperature and ventilation conditions, according to the type of food so do not accustomed to expose corruption	I know	211	91.70	150	75.00	170	100.00	62.969**	0.308**
		To some extent	17	7.40	49	24.50	0	0.00		
		I don't know	2	0.90	1	0.50	0	0.00		
Total			230	100	200	100	170	100	532.449**	0.686**

** P<0.001

Table 5 also indicates that the percentage of mothers who have high level of awareness regarding question (4)" The types of additives in foods are preservatives, colouring agents, antioxidants, emulsifiers… *etc.,*" were in urban area (30.40%), then in rural area it was (7%). While, Bedouin weren't aware of it. (Soon-Mi *et al*., 2011) reported that the respondents were asked to provide their awareness of certain food additives, colourants, flavour enhancers, artificial sweeteners, and preservatives were the best known food additives in processed foods.

Mothers in urban area (43%) were found to be aware about information in question 5 "There are limits permitted for food additives which added to foods" than those in rural area (9.50%).

It is clear that only 4.30% of mothers were aware as shown in question (6) of "The kind of food additives be written in the guidance card on the package and symbolized by the letter E" in urban area, but in both rural and Bedouin area awareness percentage was (0.00%). Viktória (2014) noticed that participants from Hungary (61.8%) and Romania (66.8%) answered correctly in the highest rate the statement that every food additives can be linked to an 'E-number', while, Spanish ones answered the less correctly (39.4%).

Mothers response showed that about (65.70%) of mothers in urban area were aware of "Whenever food is closer to its natural image and high quality is less containment of the food additives ", than in rural area (26%) as shown in question (7).

Results of mother's knowledge showed that about (69.60%) of mothers in urban area were aware of "There are many food products containing additives permitted food in the markets", than rural area (43.50%) as shown in question (8) while Bedouin weren't aware of it.

Abdulmumeen *et al.* (2012) found that more than 3000 additives and preservatives are available in the market, which are used as antioxidants and antimicrobial agents. Salt and sugar are the most commonly used additives.

Mother's knowledge as cleared in question (9) showed that about (100%) of mothers in Bedouin area were aware of " Foods must be kept at the appropriate temperature and ventilation conditions, according to the type of food so not accustomed to expose corruption" than urban and rural areas (91.70, 75%), respectively. In addition to storing the basic food items, many people choose to supplement their food storage with frozen or preserved garden-grown fruits and vegetables and freeze-dried or canned products (Abdulmumeen *et al.*, 2012).

It is clear from the results that there were significant mothers differences in urban, rural and Bedouin areas of mother's awareness about food additives. The present results indicated that Bedouin weren't aware about food additives questions in this questionnaire except question (9), this is maybe due to their low education level.

Level of mother's awareness about food additives

The data clear the percentage distribution of selected mothers according to total level of mother's awareness about food additives in relation to area pattern are given in Fig. 1. The present study showed that majority of the respondents (68.7%) had high level of awareness (21-27 degree) in urban area, while mothers who had moderate awareness (15-20 degree) was in rural area (60.5%). On the other hand all mothers had low awareness (9-14 degree) in Bedouin area (100%). This may be due to low education level of mothers in Bedouin area. It is clear from the results that there were significant differences in urban, rural and Bedouin area of mother's awareness levels about food additives (Chi-Square = 532.449, DF =4 and P = 0.000 - Contingency Coefficient = 0.686 and P= 0.000).

Healthy and Unhealthy Nutritional Habits

The healthy nutritional habits

Data of number and percentage distribution of selected mothers according to the healthy food in relation to area pattern are shown in Table 6. The results showed that about (68.26, 89.50 and 98.24%) of mothers in urban, rural and Bedouin area, respectively, answered always stay away from fast food and they prefer to make diets at home as shown in question (1).

The data in question (2) showed that about 50.00, 15.50 and 1.2% of mothers in urban, rural and Bedouin area, respectively, always read the components of food products, the date of production, expiry date and conditions of storage on the guiding card of food product.

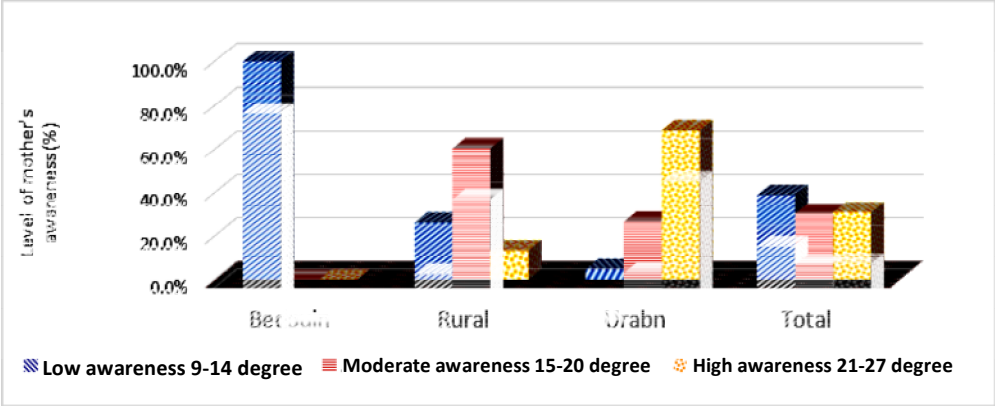

Fig. 1. Level of mother's awareness about food additives

Mother's response as shown in question (3) showed that about (44.78, 57.50 and 60.00%) of mothers in urban, rural and Bedouin area; respectively, sometimes avoid food products that contain artificial sweeteners.

The results indicated that 55.65, 73.50 and 41.18% of mothers in urban, rural and Bedouin area sometimes make some food products in the home instead of buying it ready such as (biscuits - potato chips - popcorn - ice cream - cake - lolita) as shown in question (4).

The results in question (5) showed that 90.87 and 96.50% of mothers in urban and rural area, respectively; while only 0.59% of mothers in Bedouin area were always prefer to buy fresh meat and chicken continuously.

Mothers response as shown in question (6) about 33.04, 6.50 and 1.18% of mothers in urban, rural and Bedouin area, respectively, always replace sweets with fresh fruit and vegetables.

Regarding to question (7) the results indicated that about (88.26, 86.00 and 99.41%) of mothers in urban, rural and Bedouin area in respective order always use moderate percentage of salt when preparing food.

The data that are given in question (8) showed that 79.13, 55.00 and 74.71% of mothers in urban, rural and Bedouin area, respectively, always prefer to add natural spices (black pepper - nigella sativa - cardamom-nutmeg - turmeric) when making various foods.

Mother's response as shown in question (9) was about 33.04, 18.50 and 46.47% of mothers in urban, rural and Bedouin area, respectively, always avoid buy foods that contain additives.

These data cleared that about 66.09, 56.50 and 12.35% of mothers in urban, rural and Bedouin area in respective order always make sure that children take there food from home to eat it during the school day as shown in question (10).

The results in question (11) indicate that the most (75.22 and 54.00%) of mothers in urban and rural area, respectively, while only 19.41% of mothers in Bedouin area always ready to pay more money in order to get food containing a lower percentage of additive.

It is clear from the results that there were significant differences in urban and rural and Bedouin area of mother's awareness about the healthy nutritional habits.

Level of mother's awareness about healthy food habits

Fig. 2 illustrates the percentage distribution of selected according to level of mother's awareness about healthy food habits in relation to area pattern. The present study showed that 76.09% of the mothers had high level of awareness (26-33 degree) in urban area followed by 53.5% in rural area. While, the majority of respondents (98.8%) had moderate awareness (18-25 degree) in Bedouin area followed by (46.50%) in rural area. The study also revealed that there were significant differences in urban, rural and Bedouin area of mother's awareness about the healthy nutritional habits (Chi-Square = 229.529, Df =4 and P= 0.000 Contingency Coefficient = 0.526 and P= 0.000).

Table 6. Number and percentage distribution of selected mother's according to the healthy nutritional habits and area

No.	Question	Response	Urban		Rural		Bedouin		Chi-square	Contingency coefficient
			No.	(%)	No.	(%)	No.	(%)		
1	I stay away from fast food and prefer to make diets at home	Always	157	68.26	179	89.50	167	98.24	76.053***	0.335***
		Sometimes	69	30.00	18	9.00	1	0.59		
		Never	4	1.74	3	1.50	2	1.18		
2	I read the components of food product, the date of production, expiry date and conditions of storage on the guiding card of food product	Always	115	50.00	31	15.50	2	1.2	252.760***	0.545***
		Sometimes	66	28.70	51	25.50	1	0.6		
		Never	49	21.30	118	59.00	166	98.2		
3	I avoid food products that contain artificial sweeteners	Always	89	38.70	61	30.50	67	39.41	32.176***	0. 226***
		Sometimes	103	44.78	115	57.50	102	60.00		
		Never	38	16.52	24	12.00	1	0.59		
4	I make some food products in the home instead of buying it ready (such as biscuits - potato chips - popcorn - ice cream - cake -lolita)	Always	85	36.96	50	25.00	1	0.59	252.928***	0.545***
		Sometimes	128	55.65	147	73.50	70	41.18		
		Never	17	7.39	3	1.50	99	58.24		
5	I prefer to buy fresh meat and chickens continuously	Always	209	90.87	193	96.50	1	0.59	485.299***	0.669***
		Sometimes	14	6.09	6	3.00	63	37.06		
		Never	7	3.04	1	0.50	106	62.35		
6	I replace sweets with fresh fruit and vegetables	Always	76	33.04	13	6.50	2	1.18	296.811***	0.575***
		Sometimes	91	39.57	124	62.00	1	0.59		
		Never	63	27.39	63	31.50	167	98.24		
7	I use moderate percentage of salt when preparing food	Always	203	88.26	172	86.00	169	99.41	22.646***	0.191***
		Sometimes	21	9.13	23	11.50	0	0.00		
		Never	6	2.61	5	2.50	1	0.59		
8	I prefer to add natural spices (black pepper - nigella sativa – cardamom- nutmeg - turmeric) when making various foods	Always	182	79.13	110	55.00	127	74.71	34.320***	0. 233***
		Sometimes	45	19.57	86	43.00	43	25.29		
		Never	3	1.30	4	2.00	0	0.00		
9	I avoid buy foods that contain additives	Always	76	33.04	37	18.50	79	46.47	70.002***	0.323***
		Sometimes	97	42.17	112	56.00	91	53.53		
		Never	57	24.78	51	25.50	0	0.00		
10	I make sure that my children take their food from home to eat it during the school day	Always	152	66.09	113	56.50	21	12.35	185.476***	0.486***
		Sometimes	68	29.57	79	39.50	79	46.47		
		Never	10	4.35	8	4.00	70	41.18		
11	I ready to pay more money in order to get food containing a lower percentage of additive	Always	173	75.22	108	54.00	33	19.41	187.689***	0.488***
		Sometimes	27	11.74	15	7.50	0	0.00		
		Never	30	13.04	77	38.50	137	80.59		
	Total		230	100	200	100	170	100	229.529***	0.526***

*** P <0.0001

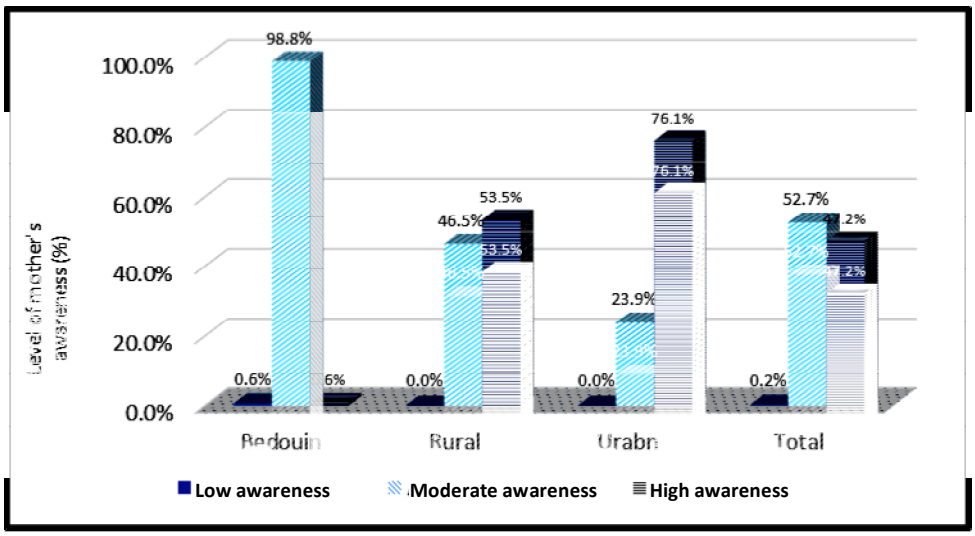

Fig. 2. Level of mother's awareness about healthy nutritional habits

Unhealthy Nutritional Habits

Table 7 describes the number and percentage distribution of selected mothers according to the unhealthy food in relation to area pattern. The results indicate that only (5.65, 1.00, 1.18%) of the respondents in urban, rural and Bedouin area, respectively, always drink soft drink during eating instead of water as shown in question (1).

Mothers response in question (2) demonstrated that almost half of participants (51.74%) in urban area and 35% of mothers in rural area sometimes consume food semi- finished and ready-made regularly, while, the most (99.41%) of mothers in Bedouin area their answer was never.

The results of this study show that (37.83, 17.50, and 0.59%) of participants in urban, rural and Bedouin area, respectively, affirmed that their kids sometimes take brightly coloured foods such as popsicles and lolita continuously (question 3). This result may be due to the lack of these food products in Bedouin area.

The data in question (4) show that 26.09% of mothers in urban area and 31% of mothers in rural area, and only 0.59% of mothers in Bedouin area always use chicken stock when preparing foods frequently.

Mothers response in question (5) show that almost half (50.43%) of mothers in urban area, 32.50% of mother in rural area and 2.94% of mothers in Bedouin area sometimes use processed meats such as burgers and hot dogs (sausage) frequently, but the majority (97.06%) of mothers in Bedouin area never use those product.

The results in question (6) reveal that (43.48, 58.00 and 31.76%) of mothers in urban, rural and Bedouin area, respectively, sometimes consume drinks that contain artificial sweeteners frequently.

While the data in question (7) indicate that about (54.35, 56.50 and only 0.59%) of mothers in urban, rural and Bedouin area, in respective order sometimes take delicious foods although it may be not healthy.

The data of question (8) show that 11.74% of mothers in urban area, 1% of mothers in rural area and 1.76% of mothers in Bedouin area always interested in buying products and food commodities when there are discounts on prices regardless of the components and type and ratios of additive and its expire date.

Furthermore, the results in question (9) indicate that about (28.70, 22.00 and 0.59%) of mothers in urban, rural and Bedouin area, respectively sometimes consume indomie continuously.

Table 7. Number and percentage distribution of selected mothers according to the unhealthy nutritional habits and area

No.	Questions	Response	Urban		Rural		Bedouin		Chi-square	Contingency coefficient
			No.	(%)	No.	(%)	No.	(%)		
1	I drink soft drink during eating instead of water	Always	13	5.65	2	1.00	2	1.18		
		Sometimes	71	30.87	62	31.00	0	0.00	81.294***	0.345***
		Never	146	63.48	136	68.00	168	98.82		
2	I consume food semi- finished and ready-made regularly	Always	16	6.96	10	5.00	0	0.00		
		Sometimes	119	51.74	70	35.00	1	0.59	145.362***	0.442***
		Never	95	41.30	120	60.00	169	99.41		
3	My kids take brightly coloured foods such as popsicles and lolita continuously	Always	37	16.09	55	27.50	0	0.00		
		Sometimes	87	37.83	35	17.50	1	0.59	160.143***	0.459***
		Never	106	46.09	110	55.00	169	99.41		
4	I use chicken stock when preparing foods frequently	Always	60	26.09	62	31.00	1	0.59		
		Sometimes	105	45.65	119	59.50	0	0.00	334.468***	0.598***
		Never	65	28.26	19	9.50	169	99.41		
5	I use processed meats such as burgers and hot dogs (sausage) frequently	Always	12	5.22	9	4.50	0	0.00		
		Sometimes	116	50.43	65	32.50	5	2.94	121.554***	0.410***
		Never	102	44.35	126	63.00	165	97.06		
6	I consume drinks that contain artificial sweeteners frequently	Always	33	14.35	13	6.50	0	0.00		
		Sometimes	100	43.48	116	58.00	54	31.76	63.928***	0. 310***
		Never	97	42.17	71	35.50	116	68.24		
7	We take delicious foods although it's maybe not healthy	Always	32	13.91	8	4.00	0	0.00		
		Sometimes	125	54.35	113	56.50	1	0.59	218.090***	0.516***
		Never	73	31.74	79	39.50	169	99.41		
8	I am interested in buying products and food commodities when there are discounts on prices regardless of the components and type and ratios of additive and its expire date	Always	27	11.74	2	1.00	3	1.76		
		Sometimes	70	30.43	153	76.50	5	2.94		
		Never	133	57.83	45	22.50	162	95.29	251.279***	0.543***
9	I consume indomie continuously	Always	21	9.13	24	12.00	0	0.00		
		Sometimes	66	28.70	44	22.00	1	0.59	83.607***	0.350***
		Never	143	62.17	132	66.00	169	99.41		
10	I use pickles substitute of green salad as aperitifs	Always	32	13.91	6	3.00	108	63.53		
		Sometimes	152	66.09	168	84.00	42	24.71	215.986***	0.514***
		Never	46	20.00	26	13.00	20	11.76		
11	I consume processed juices frequently	Always	32	13.91	33	16.50	4	2.35		
		Sometimes	101	43.91	99	49.50	54	31.76	46.449***	0. 268***
		Never	97	42.17	68	34.00	112	65.88		
12	I consume chips and crackers frequently	Always	95	41.30	87	43.50	54	31.76		
		Sometimes	87	37.83	93	46.50	101	59.41	26.758***	0. 207***
		Never	48	20.87	20	10.00	15	8.82		
13	I use mayonnaise, mustard and ketchup continuously	Always	25	10.87	4	2.00	0	0.00		
		Sometimes	104	45.22	58	29.00	0	0.00	148.484***	0. 445***
		Never	101	43.91	138	69.00	170	100.00		
14	I consume canned foods such as sardines and tuna continuously	Always	29	12.61	4	2.00	0	0.00		
		Sometimes	151	65.65	139	69.50	1	0.59	295.711***	0.575***
		Never	50	21.74	57	28.50	169	99.41		
15	I consume the coated pastry such as cake and croissant continuously	Always	55	23.91	116	58.00	167	98.24		
		Sometimes	136	59.13	73	36.50	3	1.76	223.770***	0.521***
		Never	39	16.96	11	5.50	0	0.00		
16	I use of industrial flavouring agents such as mono sodium glutamate (Chinese salt) in food preparation	Always	0	.0%	1	0.5%	1	0.6%		
		Sometimes	1	0.4%	0	.0%	3	1.8%	5.902***	0.099***
		No	229	99.6%	199	99.5%	166	97.6%		
	Total		230	100	200	100	170	100	186.105***	0.487***

*** P< 0.0001

Also, the present study show that about (13.91, 3.00 and 63.53%) of mothers in urban, rural and Bedouin area, respectively always use pickles substitute of green salad as aperitifs (question 10).

The data that are given in question (11) show that 13.91% of mothers in urban area, 16.50% of mothers in rural area and 2.35% of mothers in Bedouin area always consume processed juices frequently.

Mothers response in question (12) clear that about (41.30, 43.50 and 31.76%) of mothers in urban, rural and Bedouin area, respectively, always consume chips and crackers frequently.

The percentage of mother's response in question (13) indicated that (10.87 and 2.00%) of mothers in urban and rural area, respectively, always use mayonnaise, mustard and ketchup continuously. While, all of mothers (100%) in Bedouin area were never use those products.

In addition, 65.65% of mothers in urban area, 69.50% of mothers in rural area and 0.59% of mothers in Bedouin area sometimes consume canned foods such as sardines and tuna continuously as shown in question (14).

The results shown in question (15) reveal that about (23.91, 58.00 and 98, 24%) of mothers in urban, rural and Bedouin area, respectively, always consume the coated pastry such as cake and croissant continuously.

The percentage of mother's response in question (16) indicate that (0.5 and 0.6%) of mothers in rural and Bedouin areas, respectively, always use Chinese salt.

From the results about unhealthy nutritional habits, could be found that the majority of Bedouin never use artificial foods and this may be due to the lack of this food products in Bedouin area and low family's income per month.

Level of mother‘s awareness about unhealthy nutritional habits

Fig. 3 describes the percentage distribution of selected according to level of mother's awareness about unhealthy nutritional habits in relation to area pattern. The results demonstrate that the mothers in Bedouin, urban and rural area had high degree of awareness (38-48 degree) by the ratio of 99.41, 40.87 and 37%, respectively. Furthermore, the percentage of mothers who had moderate awareness (27-37 degree) in rural and urban areas were 63.00 and 57.4%, respectively. It is clear from the results that there were significant differences in urban, rural and Bedouin areas of mother's awareness about unhealthy nutritional habits.

Source of Mother’s Information about Food Additives

Fig. 4 illustrates the percentage distribution of selected mothers according to source of mother‘s information about food additives in relation to area pattern. The highest sources of information about food additives were friends and relatives (82.5%) of mothers in rural area, followed by 66.1% and 43.53% of mothers in urban and Bedouin area, respectively. Also, the results show that 77.0, 55.50 and 62.94%, respectively, of mothers in urban, rural and Bedouin areas got their information about food additives from Television. While, 25.22% of mothers in urban area got the information about food additives from (Different educational levels). In addition, the results indicate that 53.04, 79.00 and 65.88%, respectively, of mothers in urban, rural and Bedouin area obtained the information about food additives from (experiment and gain experience). Furthermore, about 37% of mothers in urban obtained the information about food additives from internet. Kim *et al.* (2007) found that 61% of participants obtained the information about food additives through mass media such as TV, radio, and newspaper.

Response of mothers to the sources of information about food additives

The results of percentage distribution of selected mothers according to their response to the sources of information about food additive in relation to area pattern are given in Fig. 5. The mothers who respond to sources of information (sometimes) were 62.17, 57.50 and 58.82% in urban, rural and Bedouin areas, respectively. On the other hand the mothers who respond to sources of information (once hear) were 24.78, 26.00 and 33.53% in urban, rural and Bedouin area, respectively.

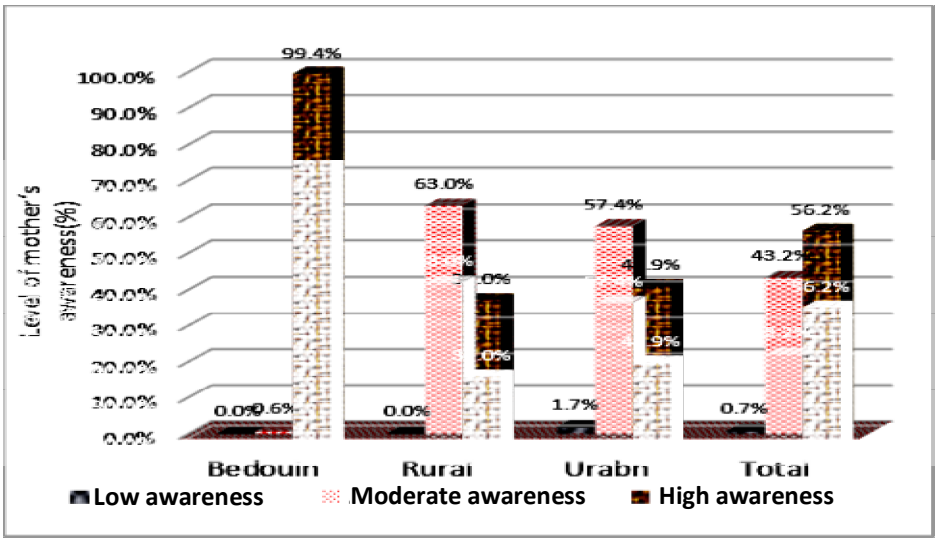

Fig. 3. Level of mother's awareness about unhealthy nutritional habits

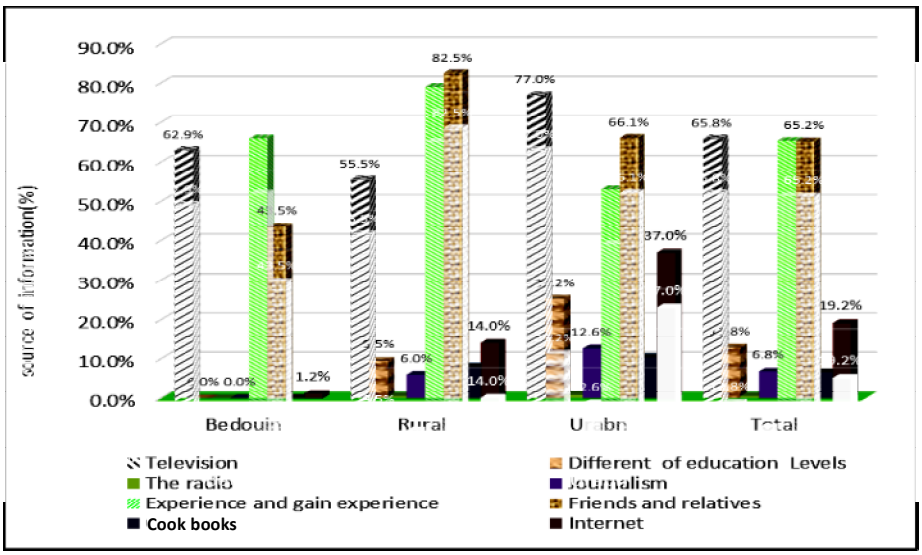

Fig. 4. Source of mother's information about food additives

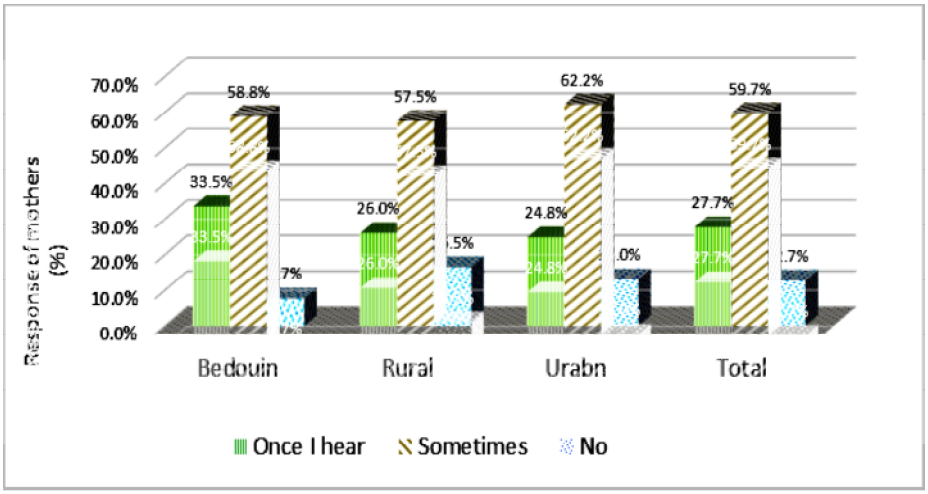

Fig. 5. Response of mothers to the sources of information about food additives

Conclusion and Recommendations

The results obtained from this study revealed that the highest values of mother‘s awareness about food additives, healthy and unhealthy nutritional habits were recorded in urban. Whereas, the lowest values were obtained in the Bedouin area about awareness of food additives it is may be due to the low education level of the Bedouin mothers compared to urban and rural area. It is important to increase education of Bedouin mothers and provide them by all sources of awareness and knowledge about food additives by health units and schools and advertising in television.

REFERENCES

Abdulmumeen H.A., A.N. Risikat and A.R. Sururah (2012). Food: Its preservatives, additives and applications. Int. J. Chem. and Bioch. Sci., 1 : 36-47.

Alkerwi, A., N. Sauvageot, L. Malan, N. Shivappa and J.R. Hébert (2015). Association between nutritional awareness and diet quality: evidence from the observation of cardiovascular risk factors in Luxembourg (ORISCAV-LUX) study. Nuty., (7) : 2823-2838.

FAO/WHO (2003). Assuring food safety and quality: Guidelines for strengthening national food control systems. 28 (FAO Food and Nut. Paper, 76.

Fisher, J.O. and L.L. Birch (1995). Fat preferences and fat consumption of 3-to 5-year-old children are related to parental adiposity. J. Am. Dietetic Ass., 95 (7): 759–764.

Houghton, M. (2002). The American Heritage Food Science Dictionary. http://www. amazon. com/American-Heritage%C2%AE-Student-Science Dictionary/dp/061818919X (Retrieved 14-12-2011).

Inetianbor, J.E., J.M. Yakubu and S.C. Ezeonu (2015). Effects of food additives and preservatives on Man- A Review. Asian J. Sci. and Technol., 6 (2): 1118-1135.

Kim, E.J., H.J., Na and U.N. Kim (2007). Awareness on food additives and purchase of processed foods containing food additives in middle school students. Korean J. Human Ecol., 16 (1): 205 - 218.

Mahgoub, A.T., M.Y. Elkhalifa, K.A. Medani and W.M. Abdalla (2014). Mother''s health awareness and nutritional status of children in Khartoum State-Sudan. Medical J. Islamic World Acad. Sci., 22 (2): 61-68.

Mohamed, O.M.E. (1999). Studies on food coloring agents and their uses in candy. Ph.D. Thesis. Dept. Home Econ. Nutr. and Food Sci., Monofia Univ.

Soon-Mi, S., S.H. Seo, Y. Lee, G. Moon, M. Kim and J. Park (2011). Consumers knowledge and safety perceptions of food additives: Evaluation on the effectiveness of transmitting information on preservatives. Food Control, 22 (7) : 1054-1060.

Viktória, S. (2014).Consumer risk perception of food additives Budapest. Ph.D. Thesis. Corvinus University of Budapest Doctoral School of Landscape Architecture and Landscape Ecol.

دراســـــة عـــن الـــوعـــي الغـــذائـــي للأمهـــــات بالمـــضـــافـــات الغـــذائيـــة

سارة نعيم مصلحى[٢] – محمد رجب عبد المجيد[١] – منال محمد السيد محمد شحاتة[٢] – حنان سعيد توفيق شلبى[٢]

١- قسم علوم الأغذية - كلية الزراعة – جامعة الزقازيق – مصر

٢- قسم علوم الأغذية (الاقتصاد المنزلي الريفي) – كلية الزراعة – جامعة الزقازيق – مصر

تُعتبر الدراسة الحالية دراسة وصفية تهدف إلى دراسة وعى الأمهات بالمضافات الغذائية وكذلك العادات الغذائية الصحية وغير الصحية، كما اهتمت الدراسة أيضا بتقييم مصادر المعلومات الغذائية عن المضافات الغذائية، وقد تم جمع البيانات باستخدام الاستبيان الذى تم توزيعه على عينه عشوائية من الأمهات تُقدر بحوالي ٦٠٠ من حضر وريف محافظه الشرقية وبدو محافظه مطروح، وأظهرت النتائج أن أعلى نسبه لعمر الأمهات كانت فى البدو حيث كانت النسبة ٦٢,٣٥% فى عمر (١٨-٣٢ سنه) يليها الريف بنسبه ٤٩% والحضر بنسبه ٤١,٣% فى عمر (٣٣-٤٧ سنه)، وكانت أعلى نسبة لربات البيوت ٨٨,٢٤% فى البدو، وأظهرت النتائج أن الأمهات فى الحضر كانت تتمتع بأعلى نسبه من التعليم الجامعى حيث كانت ٥٢,١٧% وكن أيضا يُحصلن على أعلى نسبه من الدخل الأكثر من ٤ آلاف جنيها شهريا (٣٤,٧٨%) بالمقارنة بالريف والبدو بالإضافة إلى ذلك سُجلت أعلى قيمه لوعى الأمهات بالمواد المضافة للأغذية والعادات الغذائية الصحية وغير الصحية فى الحضر بينما سجلت أقل قيمه للوعى بالمواد المضافة للأغذية فى البدو.وكان أعلى مصدر للحصول على معلومات عن المضافات الغذائية للأمهات هو الأصدقاء والأقارب فى الريف بنسبة ٨٢,٥% ومن النتائج المتحصل عليها نُوصى بزيادة المستوى التعليمى للأمهات فى البدو.

المحكمـــــون:

١- أ.د. عبدالرحمن محمد عطية أستاذ علوم وتكنولوجيا الأغذية – كلية الزراعة – جامعة حلوان.

٢- أ.د. حسن إبراهيم صليحـــة أستاذ علوم الأغذية المتفرغ – كلية الزراعة – جامعة الزقازيق.