

Effect of Acculturation on Nutritional Dietary Habits of Arab Women Living in Ireland

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Abstract: This study was conducted to investigate the influence of acculturation on food practices, habit changes, food preferences, and nutritional awareness among Arabic women living in Ireland compared with their original behaviour in their own countries. Arabic adult females aged of eighteen years or older who had lived in Ireland for at least six months were personally interviewed to fill a specially designed questionnaire sheet. The questionnaire sheet concerned with females' personal and demographic data and information related to their nutritional attitudes. Data included age, weight, height, country of origin, marital status, number of children, employment status, and length of residence in Ireland of the participants, nutritional awareness and changes occurred in their dietary and eating habits after living in Ireland. The collected data revealed that high percentage of the women (70%) came from African Arabic countries with average body mass index (BMI) of 26.587 that considered as an overweight indicator. About half (47.5%) of the females finished high education and tended to decrease their meals from three to only two meals per day by skipping the dinner meal. About three quarter of the sample (72.5%) changed their dietary habits in different manners such as decreasing the number of meals per day (47.5%) and the timing of the meals to be earlier (60%). Also, about 40% of the Arabic women residing in Ireland get used to have the Irish breakfast, especially in week days, while most of them preferred to eat Arabic breakfast during weekends. Meanwhile, 77.5% of them reported that their consumption of snacks increased because these kinds of foods are more affordable and accessible in Ireland. The statistical analysis using chi-square (χ^2) test indicated that there was significant differences in the nutritional knowledge score among women of different educational levels with $\chi^2=10.416$ ($P \geq 0.033$) and in women with different length of residence in Ireland as $\chi^2=10.867$ ($P \geq 0.028$).

Keywords: Arab women, Ireland, Acculturation, Nutrition knowledge, habits, education.

INTRODUCTION

The consumption of a healthy and nutritionally balanced diet is not only essential for active life but also for avoiding health-related diseases such as micronutrient deficiencies, malnutrition, or even obesity-emerging diseases. In addition to recommendations for specific nutrients, many countries recommended that people should eat a healthy balanced diet containing a various types of food such as fruits, vegetables, cereals, dairy foods and some protein-rich foods including meat, fish, eggs and lentils (FSA, 2008). However, food consumption patterns and dietary habits in the Middle East region have remarkably changed during the past four decades especially the dietary habits of young adults that are affected by fast-food products (Yahia, 2008). At the same time, nutrition inequalities within specific societies, e.g. within Europe, show great variation in migrant populations and the mechanisms through which populations with a different cultural background adopt prevailing food based-dietary guidelines are generally poorly understood (Landman and Cruickshank, 2001).

Outside the Arab countries, the largest Arab communities are recently living in Europe and North America with about twelve million people with respectable professions and establishments are currently inhabited in Europe and the United States (Al-Gazali *et al.*, 2006). Culturally adapted efforts in health promotion take into account language, culture and health beliefs. Therefore, acculturation is defined as the process that underlies the changes in the immigrants' culture beliefs and values toward those of the host

country cultural, psychological, social, economic, and political changes are also involved (Satia *et al.*, 2001).

Although acculturation is a convenient way to capture some components of culture change, the generation of explicit hypotheses about how culture interacts and affects dietary change might be an approach that will help clarify aspects of the energy balance equation (Himmelgreen *et al.*, 2004). Moreover, multiculturalism holds that a multitude of cultures that can coexist within a given environment, retaining some (if not all) of their original/minority-cultural heritage while functioning within and acquiring traits corresponding to the larger host culture (Tadmor and Tetlock, 2006).

It remains unclear to what extent mobile migrant populations such as international students cope with the different food and dietary environment, how they perceive dietary changes made during their stay, and what the main determinants are of their dietary habits in their host environment (Perez-Cueto *et al.*, 2009). When addressing mobile populations, factors such as coping mechanisms, socio-cultural constructs (religion, food traditions), support networks, and transitional stress have also been recognized as determinants of nutritional behaviour (Ramsay *et al.*, 2007).

The most significant differences in food habits are dietary restrictions due to religion and geographical locations because Arab people moved to a new host country are usually adhered by their original habits controlled by their customs and religion. In fact, it is not too distant past that the media played an important role in promoting consumption of certain kinds of foods and

encouraging weight gain in the Arab countries, quite the opposite of what taken place in the western countries (Nasser, 1988). Therefore, over weight among the Arab populations is not always perceived as a health risk. It is very likely that cultural preference for female plumpness added to physical and cultural barriers to physical activity contribute to the very high prevalence of obesity among adult Arab women. An active lifestyle for both men and women is not easy to promote to those of Middle Eastern decent particularly in the context of health benefits. So far, little attention has been given to this problem (Galal, 2003). The question that should be answered is to what extent these habits would be affected in the new living environment.

Over the last three decades, the Mediterranean region has witnessed significant social, economic, demographic and political changes that have greatly influenced the nature, scope and magnitude of health and nutrition problems and the burden of disease and related risk factors in most countries in this region as a whole. Accordingly, the main aim of this research is to gain insight into environmental influences of diet and habits in Arabic women living in the republic of Ireland in order to promote the development of nutrition health promotion activities among them. The detailed objectives were:

- To describe the nutritional awareness among Arab women living in the capital of republic of Ireland (Dublin city).
- To describe the Arab women's food habits in their own countries and Ireland.
- To analyse the relationship between food habits and meal patterns and lifestyle factors.
- To relate food habits and meal patterns of the females under study to their socioeconomic conditions.

MATERIAL AND METHODS

Population sample:

Participants involved in this study were female residents aged 18 years or older who were born in one of the Arab countries and they had resided in Dublin, Ireland for at least 6 months before carrying out the study. These subject females have been selected in this study because they are considered the main cooks of all meals of the Arab families. In addition, they are the main providers of informal health care for their families (Diaz *et al.*, 2009). Thus, nutrition knowledge, attitudes, and practices of women influence the current health of family members and that of the next generation (Kawar, 2009). Therefore, the current study concerned with females' awareness and the potential changes occurred in the nutritional dietary habits of Arab families by especially designed questionnaire sheet used to collect data from a random 80 Arab females living in the capital of Ireland (Dublin city) to assess the influence of acculturation on their conventional nutritional habits.

Questionnaire sheet:

A questionnaire included three-parts by using a multiple choice and fill in the blank format was designed with a purpose for collecting the relevant

information regarding the food quality awareness as well as food habits of the interviewed sample. The first part included ten questions that elicited data on the independent variables such as age, weight, height, length of residence in Ireland, marital status, number of children, employment status, country of origin, a special diet (if a women had any) and the level of education. The second part consisted of eleven questions that tapped their nutritional awareness (sources of carbohydrate, portions of fruit and vegetables that should be eaten daily, type of bread supplies, the most dietary fibre, dietary target that help to prevent high blood pressure, cooking methods that retain vitamins, reasons for a pregnant woman to need folic acid, sources of fat, type of fish that follow the dietary target to "eat more oily fish", sources of protein for a vegetarian, sources of calcium, increased nutrients required for teenagers). The third part was designed to figure out the change(s) in women's dietary habits after being lived in Ireland. Therefore, the last part composed of 19 questions and each question was asked twice one in the country of origin and the other in Ireland (e.g. number of meals consumed per day, commonly skipped meal, the main meal, time for the meals, type of meal usually eaten at breakfast, lunch and dinner in, types of fats used for cooking, serving method at home, herbs and spices commonly used for cooking, items of snacks between meals, number of times for eating outside at restaurant or fast food stores, the nationality of the shopping supermarket, the feeling about the overall diet they had in Ireland compared to country of origin, information about healthy foods and eating habits changed since women arrived Ireland, and this kind of information was collected by 'yes' or 'no' type of questions. If such a change occurred, a question of the most prominent factors that caused these change was asked.

To examine the knowledge awareness, an equally weighted scoring system was developed for the knowledge part of the interview schedule. The highest score that could be attained for each question (only one answer is correct) was 10 points for a correct answer and zero point for an incorrect answer. A score of five point means that one answer is correct and the other is incorrect. Therefore, the highest total score that could be attained for the whole test of this section was 110 points (11 questions \times 10 points). To measure the correlations between the independent and dependent variables, women whose score was less than 50% of the total score was classified as having poor knowledge. Scores of 55-82.5 (50-75% of the total score) were classified as moderate knowledge, and scores of 82.5-110 (75-100% of the total score) were classified as good knowledge.

Statistical Analysis:

Statistical analysis was carried out using the Statistical Package for Social Sciences (SPSS) software package. Frequency distribution, mean, and standard deviation as well as the analysis of variance and Chi-square (χ^2) tests were performed for comparisons between examined women samples and their corresponding answers (Hinkelmann, 2012).

RESULTS AND DISCUSSION

Sample characteristics:

The personal and socio demographic characteristics of the female respondents to the questionnaire are summarized in Table (1). It could be noticed that most of participants (42.5%) were aged between 35 and 44 years and the majority of them (87.5%) were married. The majority of the married participants (82.5%) were married to Arabic spouses and the rest were married to un-Arab spouses. The average duration of residency in Ireland was up to 5 years (40 %).

More than two thirds of the females (70%) came from African Arab countries; while the rest (30%) originated from Asian Arab countries. Twenty per cent of mothers had 1-2 children, 32.5 % had 3-4 children and 27.5 % had more than four children. It is obvious that high percentage of Arab females (32.5+27.5 = 60 %) tended to have more than two children that might be attributed either to the cultural nature of their original country or unrestricted regulations in Ireland for birth control. Very high percentage of the interviewed females was unemployed due to a harsh restriction for obtaining a work permit and/or language constraints. Fortunately, more than 60% of participants were highly educated and the remaining subjects finished either secondary school (15%) or primary school education.

Changes of eating patterns:

The overall alterations in eating habits of the interviewed females are shown in Figure (1). Numbers associated with the figure show the percentage of females who positively changed their dietary and eating habits and each change should be read independently from the figure. It could be noticed that number of

meals decreased since arriving to Ireland with about 47.5 % of females decreased their meals from 3 to only 2 meals. In this respect, Pan *et al.* (1999) found that the number of meals consumed per day by Asian students decreased after immigrating to the United States. Concerning the most commonly skipped meals by participants, half of them (50%) reported that they skipped dinner (Figure 1), meanwhile 25% females skipped the breakfast.

High percentage of females (60%) changed their meals timing to be earlier especially for lunch and dinner in Ireland. The result also showed that the 45% females changed their main meal from lunch in the country of origin to dinner in Ireland. This might be attributed to the work schedule in Ireland which finished at 5:00- 6:00PM instead of the middle of the day (2:00 - 3:00 PM) in their countries of origin. Similar results were reported by Obeidat (2002) who noted that most of Arab students living in the United States tended to take lunch meal as the main meal in the country of origin (71%) while dinner was the main meal after living in the United States. However, Tami (2012) reported that the dietary pattern changes have reached the main meal of the mothers after moving to USA and all of them noted that the time of their main meal (lunch) has been changed in their home countries to be latter after the return of their children from school so the whole family members get together. At the same time, about 40% of the Arab females residing in Ireland get used to consume Irish breakfast (Irish brown bread, beverage, eggs, fruit, yogurt and milk with cereals) especially during week days but 17% of them preferred to eat Arabic breakfast during weekends.

Table (1): Personal and demographic information collected via questionnaire from interviewed females living in Ireland.

Variable	n	%	Variable	n	%
Age			Education status		
18-24 years	6	7.5	Primary school	4	5
25-34 years	16	20	Secondary school	12	15
35-44 years	34	42.5	High school	14	17.5
45-54 years	18	22.5	College	40	50
55-64 years	6	7.5	Postgraduate studies	10	12.5
>65 years	-	0			
Marital status			Number of children		
Never married	4	5	No children	16	20
Married	70	87.5	1-2 child	16	20
Divorced	6	7.5	3-4 child	26	32.5
			>4 child	22	27.5
Spouse nationality			Continent of origin		
Arab	66	82.5	Africa	56	70
Irish	8	10	Asia	24	30
Other	6	7.5			
Employed status			Length of residency		
Full time	4	5	0-5 years	32	40
Part time	8	10	6-10 years	14	17.5
Unemployed	68	85	11-15 years	20	25
			>15 years	14	17.5

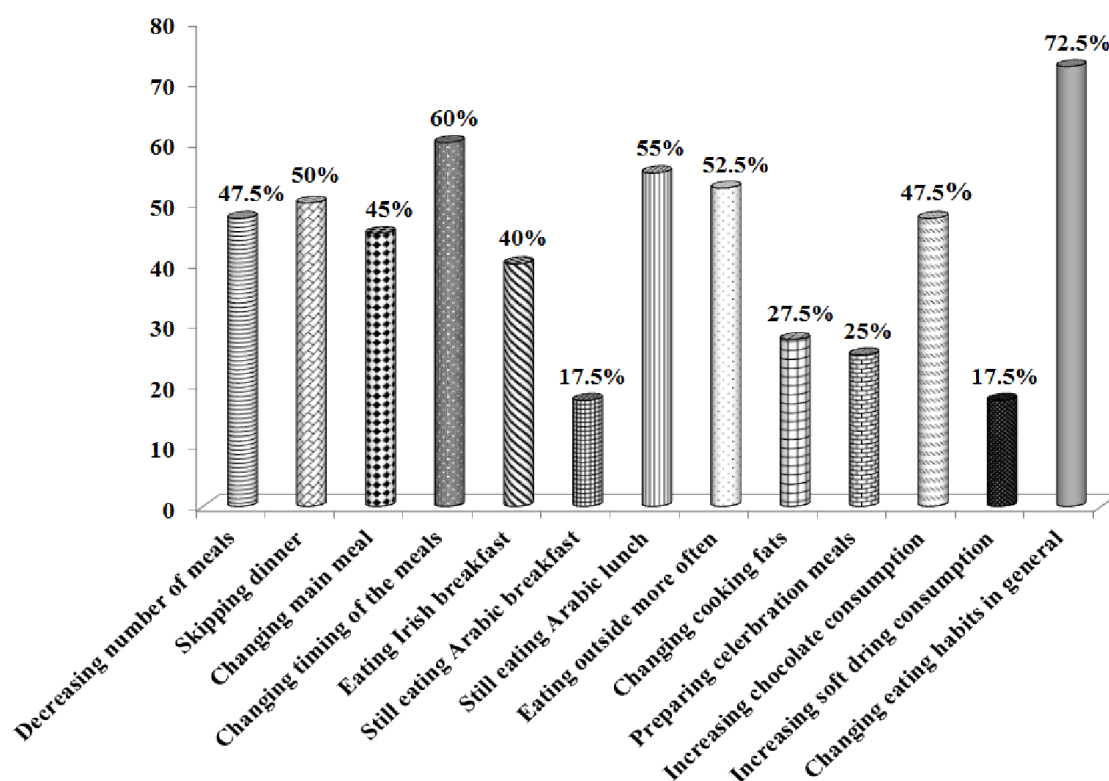


Figure (1): Percentage of females who changed their dietary and eating patterns in Ireland under acculturation effect.

Concerning food preferences, 55% continue eating traditional Arabic dishes (meat, fish, or poultry usually cooked with vegetables and sauce, often tomato sauce, salad, rice, and bread) in their lunch. This could happen to any immigrants who preferred to eat their traditional dishes in the host country as stated by Chau *et al.* (1990) who found that mix of American and Chinese foods were consumed at breakfast whereas afternoon and evening meals were predominantly composed of traditional Chinese food. All of the participants believed that traditional Arabic foods are an important component of their culture. The Arab females exhibited a strong preference for traditional Arabic dishes that are prepared in a traditional way either at home or eating out as well (i.e. meat, fish, or poultry cooked with vegetables, salad, rice, bread, Kebab, Shish kebabs, Shawarma and Kofta). At the same time, 27.5% of females changed the used cooking fats from shortening and margarine as they used to do in their original country to vegetable and olive oil in Ireland as declared in Figure (1). The same trend was noticed by Obeidat (2002) indicating that fewer immigrants used olive oil than those immigrants who used other vegetable oil in the United States. As many Arab females were using more oil and less other animal fat in Ireland than they used to do in their original country. Similar results were reported by Tami (2012) in his study on Arab mothers who changed their food habits and tended to use more oil and less animal fat for preparing different dishes.

The use and consumption of some spices and green fresh herbs such as mint leaves has decreased due to unavailability. Since immigration to Ireland, the participants have started to increase their consumption of fruit juice (47.5%), their consumption of chocolate

(37.5%) and 17.5% get used to drink more soft drinks because all of these products are available with good quality and cheap prices in Ireland. Moreover, about 77.5% of females reported that they consume snacks in an increased amount in Ireland because these kinds of foods are more affordable and accessible in Ireland. The majority of females (85%) get used to purchase most of their foods at Irish supermarkets; while some of them still prefer to buy their own food from oriental Arabic stores.

As shown in Figure (1), about half of the interviewed females (52.5%) get used to eat outside homes in restaurants more often in Ireland than they used to do in their original countries. Generally speaking, eating outside home in restaurants has become a familiar phenomenon all over the world. This might be due in part to the fact that these women were in the workforce and thus their time for food preparation activities appeared to be limited. The same findings were reported by French *et al.* (2001) who reported that the percentage of meals and snacks eaten at fast-food restaurants reached 200%. Surprisingly, all females participated in this study when they ate outside they prefer to eat in restaurants that offer Arabic foods. About 40% of them said they started to cook some Irish meals because they are more economic, but about 32% noted that Arabic meals are more economic than Irish meals. For some occasional events such as Thanksgiving and Christmas, Irish people used to prepare special meals to celebrate such events. Also, most of the participated females (75%) reported that they do not generally serve these meals during these events but they have not reported the reasons behind this attitude.

With regard to changing the conception of healthy foods, about half of the females noted that the Irish meal seemed to be healthier for its low fat content and containing more fruits, vegetables and/or whole grain bread. Similar finding is found by Tami (2012) who reported that Arab mothers believed that finding healthy food choices in the USA would be easy, and who became more aware of healthy food choices, consuming organic foods, less meat and more vegetables and not consuming “fatty or greasy foods”. It is believed that cultural changes are associated with negative influences of nutrition and physical activity for some individuals (Mainous *et al.*, 2008; Fitzgerald *et al.*, 2006) and positive effects for others (Gray *et al.*, 2005; Reyes-Ortiz *et al.*, 2009). In case of negative changes, the slight increased intake of fast foods, snacks, and dessert was among Arab females in this research. Greater acculturation to the way of life was sometimes associated with less healthful dietary intake and dietary behaviours (Ayala *et al.*, 2008). About 60% of respondents believed that their eating habits had been changed after their arrival to Ireland due to some influencing factors included limited time for preparing traditional foods, the ease and quick preparation of Irish foods, the easier and more convenient way to shop of Irish foods than for Arabic foods, unavailability of Arabic foods, the relative expensive cost of Arabic foods, the reasonable price of some essential foods in Ireland and the good quality of some foods. For such reasons, females found themselves dissolved in the Irish cultures and started to follow some vital eating habits in daily life. These findings are in agreement with those reported by Betts *et al.* (1994) who focused their study in a group of young adults aged 18 to 24 years old. The group indicated that convenience, lack of time to cook, cost, quality of food, taste, health concern and the availability of food were the most common factors influencing food choices.

These changes in the females’ eating habits were noticeable in the 62.5% of females who had resided in Ireland for more than two years. The results indicated that the dietary changes were related to length of stay in Ireland. These findings were in the same line with those reported by Pan *et al.* (1999) who found that the dietary changes were related to length of stay in the country that could be related to social interaction with people in the new culture and involvement in extracurricular activities. They also mentioned that the younger immigrants tended to change their habits more ready than the elder people.

Data collected from the interviewed females indicated that the average weight and height for these females were 71.4 kg and 163.75 cm, respectively. The results of body mass index (BMI), calculated as weight in kilograms per height in squared meter (kg/m²) shown in Table (2), indicated that 42.5% of the interviewed females were overweight ($25 \leq \text{BMI} < 30$) and 20% of females were obese ($\text{BMI} \geq 30$) as the ideal BMI range for healthy adults is 18.5 to 24.9 kg/m², which reflects a healthy weight for the corresponding height (Deyoung, 2000). However, a small percentage (22.5%) was on a special diet for weight losses in their countries of origin, but stopping doing so since they arrived to Ireland.

Actually, very little information has been known regarding the physical activities of Arabs and Arab immigrants whether in their home countries or in any other hosting countries (Chatterjee, 2005).

Table (2): Body mass index (BMI) of the participated females living in Ireland.

Category of BMI	n	%
18.5-25.0 (Normal)	30	37.5
25.0-30.0 (Overweight)	34	42.5
>30.0 (Obese)	16	20

However, a recent report issued by the World Health Organization (WHO) showed that obesity rates have increased globally including the Middle East area (WHO, 2005). Lack of physical activity among Arabs may be contributing to the increasing prevalence of obesity especially among women (Galal, 2003). The prevalence of overweight and obesity ($\text{BMI} \geq 25 \text{ kg/m}^2$) among Arab men ranged from 30% to 60%, while the ration among Arab women ranged from 35% to 75% (Musaiger, 2004). Changes in lifestyle and socioeconomic status in the Middle East region have had a significant effect on physical activity (Musaiger, 2004). In addition, sedentary lifestyle and the increased intake of fat, greater than recommended amounts have added to the increasing prevalence of obesity and its metabolic complications (Galal, 2003). With the availability of cars, the increase in electrical home appliances and more involvement in office work, life has become more sedentary, and the habit of exercise has diminished steeply in most countries. In Egypt, it was found that exercise is the activity least done during leisure time in a typical day (Musaiger, 2004). Only 2% of adults (20–70 years) were reported as exercising in a typical day, 8.5% exercised during the weekend, and 2.5% exercised during their vacation.

Nutrition knowledge:

Table (3) shows the mean score obtained for each of participants on the eleven questions related to nutrition knowledge. As may be seen, the females had moderate knowledge scores concerning dietary target to prevent high blood pressure with the highest mean score (82.5%). This is of particular concern because high sodium intakes are known to increase the risk of hypertension, which is a known risk factor for stroke (HMSO, U. 1994). According to Hooper *et al.*, (2002), in a systematic review, advice on reducing salt may help people on antihypertensive drugs to stop medication at the same time as maintaining good blood pressure control. At the same time, nutrition knowledge and good dietary habits were not strongly correlated because knowledge about health does not lead to direct action when individuals are unsure of how to apply their knowledge (de Almeida *et al.*, 1997). Several studies concluded that the prevalence of hypertension among Arab Americans appeared among 13-20% (Jamil *et al.*, 2008; Dallo and Borrell, 2006). Awareness about good source of protein for a vegetarian and folic acid intake of pregnant women (to prevent anaemia, obesity, spina bifida, varicose veins, and constipation) showed the lowest mean scores.

Table (3): Mean score of nutrition knowledge of the Arab females living in Ireland.

Question	Good knowledge (10 points)		Moderate knowledge (5 points)		Poor knowledge (0 points)	
	No.	%	No.	%	No.	%
1. Choose two sources of carbohydrate from the list (Fish, Cream, Flour, Butter, Rice)	40	50	28	35	12	15
2. How many portions of fruit and vegetables should be eaten daily? (One, Three, Five)	34	42.5	38	47.5	8	10
3. Which type of bread supplies the most dietary fibre? (White, Brown, Wholemeal)	32	40	40	50	8	10
4. Which dietary target helps to prevent high blood pressure? "Eat less sugar", "Eat more bread", "Eat less salt", "Eat more oily fish"	66	82.5	0	0	14	17.5
5. Which one of the following cooking methods helps to retain vitamins? (Grilling , Microwaving, Baking, Frying)	56	70	0	0	24	30
6. Why a pregnant woman needs folic acid?(To prevent anaemia, To prevent obesity , To prevent spina bifida, To prevent varicose veins , To prevent constipation)	36	45	0	0	44	55
7. Choose two sources of fat from the list: (Tomato Cream, Flour, Chips, Grapes)	62	77.5	4	5	14	17.5
8. What type of fish helps you to follow the dietary target to "eat more oily fish"? (Cod, Salmon, Haddock, Prawns)	48	60	0	0	32	40
9. Which two foods are good source of protein for a vegetarian? (Potatoes, Banana, Lentils, Chicken, Nuts)	24	30	44	55	12	15
10. Choose two sources of calcium from the list: (Cheese, Spaghetti, Apples, Yogurt, Honey)	60	75	12	15	8	10
11. What nutrients should teenagers increase in their diet? (Carbohydrate, Fat, Iron, Sodium, Protein)	36	45	38	47.5	6	7.5

In practical terms, future predictions for nutritional education have emphasised that the consumption of fruit and vegetables should increase from a daily average of 2.5 to at least 5 servings (Alcock, 1995), although reported intakes of fruit and vegetables were higher compared to the findings from government surveys (Henderson *et al.*, 2003). Acculturation was determined with questions related to the number of fruit and vegetables should be eaten daily, only 42.5% females got high score. Close result was reported by (Earland *et al.*, 2010) who said that the only 31% of adults consume five portions of fruit and vegetables a day. If the answers of all eleven questions collected altogether to classify females according to their nutritional knowledge, a meaningful figure is obtained. Figure (2) show the percentage of women who has different background nutritional knowledge. It was very optimistic to find that more than half of the interviewed Arab females (56.14%) have good nutritional knowledge that is reflected in their responses to the acculturation factors. Generally speaking, the length of residence in Ireland had a significant effect, on nutrition knowledge. Statistical analysis using Chi-square as shown in Table (4) indicated that when the length of residence in Ireland increased the nutrition knowledge among females increased significantly (P-value = 0.028 and $\chi^2=10.87$). However, like all other immigrant

groups, increasing length of stay is associated with some adaptation to new diets with traditional foods eaten on special occasions or as part of the main meal (Chatterjee, 2005).

A study by Obeidat (2002) conducted to investigate the dietary patterns of Arab students living in the USA reported that the consumption frequency and liking of American foods were related to age, age when entered USA, length of residence in the states, and degree of acculturation.

Studies in adults suggest that nutrition knowledge influences dietary behaviour (Wardle *et al.*, 2000; Dallongeville *et al.*, 2000). In current study, more educated females had higher knowledge scores. As shown in Table (3), the value of chi-square for the effect of education on knowledge was significant ($p \leq 0.033$) indicating a direct relationship between the educational level and knowledge scores. Similar results were reported by Mansour and Hassan (1994) who studied the factors that influence women's nutrition knowledge in Saudi Arabia and found that the educated mothers had higher knowledge scores. In fact, the power of education can be immensely helpful in the pursuit of better understanding by consumers regarding healthy eating and may occur within the home, school and social environments (Alcock, 1995).

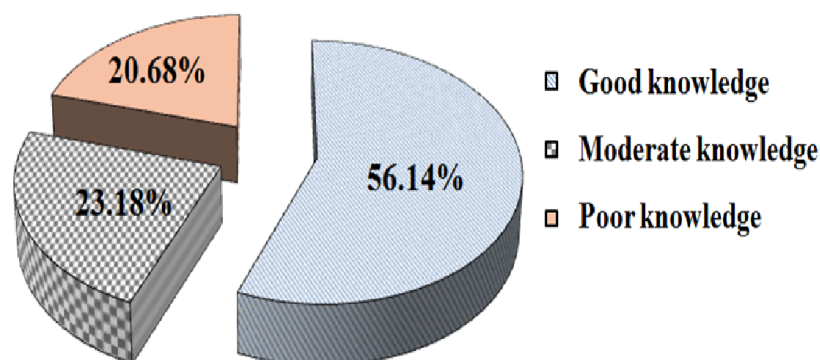


Figure (2): Classification of interviewed females based on their nutritional knowledge.

Table (4): Chi-square analyses for the relationship between age, residency, education and body mass index (BMI) and nutritional knowledge of the interviewed females.

Parameters	p-value	χ^2
Age	0.008*	13.78
Length of Residency	0.028*	10.87
Education	0.033*	10.42
BMI	0.188	6.15

* Significant difference ($p \leq 0.05$).

The present results also indicated that several factors proved to influence knowledge level. Significant relation was found between level of education and nutritional knowledge. These results are in harmony with those reported by Rahn and Sabry (1984) in their study conducted among 210 urban women in Canada and indicated that educational level was positively correlated with nutrition knowledge. These results demonstrated that more educated people tend to be more knowledgeable and up to date on health-related matters, because of their ability to get information by reading. Similar results were reported in a survey conducted by Perez-Cueto *et al.* (2009) at Ghent University, Belgium, assessing international students' knowledge and attitudes related to nutrition, their perceived changes in dietary habits, their main perceived constraints to healthy eating, and the determinants of dietary changes.

Chi-square value for the effect of age on nutrition knowledge was also significant ($p \leq 0.008$ and $\chi^2 = 13.78$). Similar result was reported by Tepper and Rosenzweig, (1999) who indicated there is a positive relationship between age and fruit and vegetable consumption and a negative relationship between age and sugar and sweets consumption. These results are different from those reported by Mansour and Hassan (1994) who reported that the chi square value for the effect of age on knowledge was insignificant in Saudi Arabia.

At the same time Perez-Cueto *et al.* (2009) found that there were no significant effects of gender, age, and continent of origin regarding knowledge of healthy eating on each of the items listed (reduction in the intake of salt, sugar, confectionary, refined as well as fatty and fried foods, increase in the consumption of fruits, vegetables, starchy foods, fibre rich products and

wholegrain cereals). Overall, these findings confirm the hypothesis of this study that age is correlated with more adherences to specific dietary guidelines. Despite the intuitive appeal of education as a means of improving diet, many studies in this area have failed to find significant associations between nutritional knowledge and dietary behaviour (Parmenter and Wardle, 1999).

Since the way in which nutrition knowledge transforms into dietary behaviour and nutrient intake may vary among populations, it appears important to assess whether nutrition knowledge is associated with particular food choices and nutrient intakes before any nutrition intervention is initiated in a given population. Therefore, nutritional status was assessed by comparing values for body mass index (BMI) determined as the ration between height and weight (WHO, 2000) of the interviewed females in relation to their nutritional knowledge. Statistical analysis shown in Table (4) revealed that there was no significant relation between score knowledge and BMI ($p \geq 0.188$). The same result was reported by Höglund (1998) who studied food habits in adolescents in relation to socioeconomic conditions and found that knowledge did not show any significant relationship to weight, height or BMI as an indication of nutritional habits. This finding confirms that there no relationship between BMI and education or score knowledge.

CONCLUSION

Arabic females' nutrition dietary habits have drastically changes such as changing the meals timing to be earlier. Many Arab women get used to prepare some healthy recipes such as using more oil and less other animal fat in Ireland than their own original counties and increased consumption frequency of fruit juice as snacks. Most of eating habits had changed positively since their arrival to Ireland. Overall, regarding food practices and consumption, Arab females in this study seem to be adapting well nutritionally. Study outcomes could be used by dietetics professionals in counselling, dietary assessment, and nutrition education of Arabic females in Ireland and in multicultural education.

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تأثير التفاعل الثقافي على العادات الغذائية للمرأة العربية المقيمة في جمهورية أيرلندا

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أجريت هذه الدراسة لمعرفة تأثير التفاعل الثقافي (Acculturation) على الممارسات الغذائية، وتغير العادات الغذائية، والتفضيل الغذائي، ومدى الوعي الغذائي بين السيدات ذوى الأصول العربية اللاتي يعشن في جمهورية أيرلندا مقارنة مع سلوكياتهن الغذائية في بلدانهم الأصلية. وشملت الدراسة سيدات بالغات من سن الثامنة عشرة أو أكثر، و اللاتي عشن بأيرلندا لمدة ستة أشهر على الأقل. حيث تم أخذ بيانات عن طريق المقابلة الشخصية للإجابة على الأسئلة المتعلقة بحالتهم الغذائية باستخدام إستمارات الإستبيان. وقد إشتمل الإستبيان على ثلاثة أجزاء:، الجزء الأول معلومات حول البيانات الشخصية و الديمغرافية للسيدات (العمر، الوزن، الطول، بلد المنشأ، الحالة الاجتماعية، عدد الأطفال، الوضع الوظيفي، طول فترة الإقامة بأيرلندا)، والجزء الثانى شمل مدى الوعي الغذائي، والثالث تضمن معلومات عن التغيرات الحادثة فى عاداتهن الغذائية بعد أن إقامتهن في أيرلندا. وأظهرت البيانات التي تم جمعها أن معظم السيدات (٧٠٪) جنن من بلدان عربية بقارة إفريقيا وكان متوسط مؤشر كتلة الجسم (BMI) هو ٢٦.٥٨٧ والذي يعتبر مؤشراً لزيادة الوزن. وكان حوالي ٤٧.٥٪ من السيدات حاصلين على التعليم الجامعى. ولقد أشارت الدراسة أن غالبية السيدات اللاتي تمت مقابلتهن (٧٢.٥٪) قد طراً عليهن تغييراً ما بعاداتهن الغذائية بصور مختلفة مثل تقليل وجباتهن من ثلاث وجبات إلى وجبتين فقط في اليوم الواحد بالتخلي عن وجبة العشاء. وفي نفس الوقت فإن (٦٠٪) قد قمن بتغيير توقيت وجبات الطعام لتكون في وقت مبكر عما إعتدن عليه في بلدانهم الأصلية. كذلك فإن حوالي ٤٠٪ من السيدات العربيات في أيرلندا قد إعتدن بالفعل على تناول الإفطار الأيرلندى خاصة خلال أيام الأسبوع ولكن تقريبا جميع النساء يفضلن تناول وجبة الفطور العربية خلال عطلة نهاية الأسبوع. ومع ذلك فإن حوالي ٧٧.٥٪ من السيدات ذكرن أن إستهلاكهن من الوجبات الخفيفة قد زاد، وذلك لأن هذه النوعية من الأطعمة هي أكثر إنتشاراً وبأسعاراً معقولة وسهولة الحصول عليها في أيرلندا. وعلاوة على ذلك، فقد أشار التحليل الإحصائي باستخدام إختبار توزيع مربع كاي (χ^2) أن هناك فروقاً ذات دلالة إحصائية معنوية في درجة المعرفة التغذوية بين السيدات ذوى المستويات التعليمية المختلفة ($\chi^2 = 10.42$ و $P = 0.033$) وكذلك بين السيدات ذوى مدة الإقامة المختلفة في أيرلندا ($\chi^2 = 10.87$ و $P = 0.028$).