Food Consumption Trends and Associated Factors in an Agricultural Community in Morocco

Barakat Imane1, Kalili Adil1, Moustakim Rachida1, Elouafi Rachida1, El Mahri Nadia1, Naciri Kaoutar1, Arkoubi Idrissi Loubna1, Sahel Khadija1, Errabahi Naima1, Elfane Houda1, El-Jamal Sanaa1, Chamlal Hamid1, Daif Halima1, Ahaji Azz El Arab1, Mziwira Mohamed2, Elayachi Mohammed1 and Belahsen Rekia1*

1Laboratory of Biotechnology, Biochemistry and Nutrition, School of Sciences, Chouaib Doukkali University, Morocco
2High Normal School, Hassan II University, Morocco

ABSTRACT

Introduction: Morocco is currently experiencing a change in dietary habits, in particular that related to food preparation methods and eating location. The objective of this research was to study the factors associated with food consumption trends in an agricultural community from the province of El Jadida in Morocco.

Methods: A survey was carried out in 2017 on 118 households using a structured questionnaire. We collected information about food practices that are concerning the culinary methods, the time devoted to cooking, the regularity and the location of having meals.

Results: The majority of the study participants are aged of 30 years old and over (86.4%), live in rural area (66.1%) and belong to nuclear families (61.9%). The study data revealed that age is associated with the use of frying foods (p = 0.01), the number of meals taken per day (p = 0.04) and the out-of-home meals (p = 0.02). The area of residence was associated with the use of frying as food preparation method (p =0.01), the time spent in cooking (p = 0.02), the number of meals taken per day (p = 0.01) and the out-of-home meals (p = <0.01) In addition, the family type was associated with out-of-home meals (p = 0.01). Finally, the family as a source of information about food is associated with the reduction of time spent in cooking (p = 0.05) while the media is associated with both the reduction of this time (p = 0.04) and the reduced number of meals taken per day (p = 0.01).

Conclusion and outlook: This research revealed a significant association of food trends with certain factors reported in the literature. The reported data shows the importance of taking steps to promote healthy eating practices, with a particular focus on educating young people.

KEYWORDS: Food consumption trends; Culinary practices; Time spent in food preparation; Eating location; Morocco
INTRODUCTION

The demographic and epidemiological transition ongoing worldwide in the recent decades has been accompanied by changes in the pattern of populations way of life, particularly the dietary pattern [1]. These changes are associated with nutrition transition that occurred in parallel to the combined effects of urbanization and globalization [2-5]. The latter is favored by the development of the free exchange of goods but also of cultures as well as the information conveyed by the media [6]. The shift from the traditional dietary model to a so-called “Western” diet is characterized by intake of foods rich in refined carbohydrates, sugars, salt, saturated fat, trans fat and animal proteins as well as food additives [7]. Unlike the Western diet, the traditional diet in Mediterranean areas characterized by a combination of dietary habits and socio-cultural elements of the populations in Mediterranean countries [7,8], is recognized with beneficial effects for health and a respect of environment. Indeed, the Mediterranean diet (MED) is a model that promotes the consumption of plant foods, rich in dietary fibre, essential fatty acids, and a low intake of red meat and processed foods. In addition, the Mediterranean model advocates intake of adequate food portion avoiding food waste as well as physical activity [8]. However, these multiple advantages of this pattern are no more sustainable today. One of the causes is that in most of the Mediterranean countries the traditional diet is not respected anymore by the young generations [9].

In Morocco as in other countries, there is a marked increase in the consumption of processed foods and out-of-home catering, that become increasingly common, particularly in urban areas, favouring an intake of foods rich in sugar and fat [3]. The strength of the habit and the generation effect to which one belongs is a determining factor of eating behaviours [10]. Adequate eating behaviours are often implemented within an entire family from an early age. In addition, it appears that food choices and dietary habits are conditioned by the way the parent’s function and by their eating habits inherited from their own families [11]. Among the dietary practices that can be influenced by modernization, we can cite the methods of food preparation and intake. In this context, several studies have reported that spending more time in cooking is associated with both a lower Body Mass Index, particularly in women, and better nutritional quality of food preparations. This is due to less use of processed foods known for their high calorie, fat and salt content [12-14]. Among the advises to avoid weight gain as well as a risk of developing diabetes and cardiovascular disease, regular eating is highly recommended [15]. Also, having three main meals is recommended while snacks are not necessary [16]. Finally, having meals away from home has been associated with harmful health effects because of their obesogenic effect linked to the richness of the served meals in fat and high portion sizes of food in continuous intake about the diet and dietary practices, namely culinary methods, time spent in cooking each day, the regularity of having meals and meals taken away-from-home.

The data collected include independent variables that are categorized into two or more classes. These are [18 to 30 years old] and [30 years to 60 years old] for age; urban vs rural areas for the place of residence and the family type as “extended family” vs. “nuclear family”, knowing that the extended family includes in addition to the married couple and children, other family members, including grandparents, aunts, uncles, etc...while the nuclear family is made up of the father, the mother and the children of the couple. The “sources of information about diet” variable was categorized into three classes that are “health professionals”, “media” and “family”.

The data collected include also dependent variables corresponding to information on the culinary practices categorized by type of cooking preparation (“stew”, “tagine”, “steam”, in the “oven”, “frying” and in “grill”). The time per day variable devoted to cooking is classified into two categories: (“maximum one hour” and “more than an hour”), the regularity of eating was categorized as “less than three meals” and “three meal or more”. Finally, the variable “having out-of-home meals” was categorized into “certain meals” and “no meals”.

Statistical Analysis

The statistical analysis is carried out using SPSS software for Windows (statistical software package for social sciences) version 18.6. Descriptive analysis was used to describe the socio-demographic, the sources of information on foods and the dietary practices variables of study population. Univariate analysis was used to examine associations between the independent and the dependent variables.

Ethical Considerations

The fundamental ethical principles governing the ethical conduct of research have been respected. The study women are volunteers, they were informed about the study subject, their right to confidentiality and the protection of their private life and their right to discontinue their participation at any time if they wish. All participants gave their free and informed consent.

RESULTS

Sociodemographic Characteristics

The study was conducted on 118 households in 11 urban and rural localities in the province of El Jadida. The Table 1 shows that...
among the 118 women surveyed from these households, 86.4% were aged 30 and over; 66.1% live in rural areas and that 61.9% of their families are nuclear.

Sources of Food Information

The results show that overall, 57.6% of the women surveyed had as their only source of information on food and nutrition either health professionals (17.8%), the media (27.9%) or the family (11.9%) while 42.4% of them had two or three of these sources of information combined (Table 1).

Table 1: Sociodemographic and dietary characteristics of the study households.

| Characteristics        | N  | %   |
|------------------------|----|-----|
| **Age**                |    |     |
| - 18 à 30 ans          | 16 | 13.6|
| - >= 30 ans            | 102| 86.4|
| **Area of Residence**  |    |     |
| - Urbain               | 40 | 33.9|
| - Rural                | 78 | 66.1|
| **Type of Family**     |    |     |
| - Extended             | 45 | 38.1|
| - Nuclear              | 73 | 61.9|
| **Sources of Food Informations** |    |     |
| - Health Professionals (1) | 21 | 17.8|
| - Medias (2)           | 33 | 27.9|
| - Family (3)           | 14 | 11.9|
| - More than 2 sources: |    |     |
| - 13                   | 18 | 36  |
| - 23                   | 22 | 44  |
| - (1), (2) & (3)       | 10 | 20  |
| **Food Preparation Methods** |    |     |
| - Ragout               |    |     |
| < 1/week               | 4  | 3.4 |
| ≥ 1/week               | 114| 96.6|
| - Tagine               |    |     |
| < 1/week               | 60 | 50.8|
| ≥ 1/week               | 58 | 49.2|
| - Steam                |    |     |
| < 1/week               | 104| 88.1|
| ≥ 1/week               | 14 | 11.9|
| - Oven                 |    |     |
| < 1/week               | 88 | 74.6|
| ≥ 1/week               | 30 | 25.4|
| - Frying               |    |     |
| < 1/week               | 44 | 37.3|
| ≥ 1/week               | 74 | 62.7|
| - Gril                 |    |     |
| < 1/week               | 108| 91.5|
| ≥ 1/week               | 10 | 8.5 |
| **Time Spent in Food Preparation/Day** |    |     |
| < 1 hour               | 47 | 39.8|
| [1 à 3 hours]          | 65 | 55  |
| -> 3 hours             | 6  | 5.2 |
| **Number of Meals Taken/Day** |    |     |
| <3 meals               | 27 | 23  |
| ≥3 meals               | 86 | 73  |
| ->3 meals              | 5  | 4   |
| **Out-of-Home Meals**  |    |     |
| - Yes                  | 39 | 33  |
| - No                   | 79 | 67  |
Food preparation methods and meal location

Food preparation methods

Cooking in a casserole is the most frequently used culinary method by the households studied, followed by frying. In fact, a large proportion of households use them more than once a week (96.6% for stews and 62.7% for frying) (Table 1).

Time spent in food preparation

The Table 1 shows also that 39.8% of the households spend a maximum of one hour while 60.2% of them devote more than one hour to food preparation.

Factors associated with Preparing and Having Meals

Factors associated with food preparation methods

Table 2: Factors associated with dietary trends.

| Characteristics                              | Using frying method at least once a week | Reduced time devoted to cooking | Reduced number of meals taken (<3/day) | Out-of-Home Meals |
|----------------------------------------------|-----------------------------------------|---------------------------------|----------------------------------------|-------------------|
| Variables                                    | OR                                      | CI 95%  | P*      | OR                                      | CI 95%  | P*      | OR | CI 95%  | P*      |
| Age (years)                                  |                                          |        |        |                                          |        |        |     |        |        |
| ≥ 30                                         | -                                       | -      | -      | -                                       | -      | -      | -   | -      | -      |
| - [18 – 29]                                  | 4.77                                    | [3.29-6.80] | 0,01** | 1.88                                    | [0.55-6.44] | 0.21 ns | -   | -      | -      |
| Area of residence                            |                                          |        |        |                                          |        |        |     |        |        |
| Rural                                        | -                                       | -      | -      | -                                       | -      | -      | -   | -      | -      |
| Urban                                        | 2.61                                    | [1,39-4.87] | <0,01** | 2.35                                    | [1,13-10.42] | 0.02** | -   | -      | -      |
| Type of Family                               |                                          |        |        |                                          |        |        |     |        |        |
| Extended                                     | -                                       | -      | -      | -                                       | -      | -      | -   | -      | -      |
| Nuclear                                      | 1,01                                    | [0,98-1,05] | 0,41 ns | 1.12                                    | [0,85-1,48] | 0,06 ns | 1,11 | [0,66-1,91] | 0,68 ns | 1,45 | [1,09-1,93] | 0,01** |
| Sources of Information                       |                                          |        |        |                                          |        |        |     |        |        |
| Health Professionals                         | -                                       | -      | -      | -                                       | -      | -      | -   | -      | -      |
| Family                                       | 1,04                                    | [0,68-1,59] | 0,82 ns | 0,2                                     | [0,13-0,52] | 0,05 ns | 1,19 | [0,93-5,42] | 0,06 ns | 1,12 | [0,80-1,57] | 0,49 ns |
| Media                                        | 3,12                                    | [0,45-5,59] | 0,65 ns | 1,5                                     | [1,14-5,26] | 0,04** | 3,31 | [1,23-7,29] | 0,01** | 1,38 | [0,71-2,68] | 0,33 ns |

OR= Odds Ratio; CI= Confidence Interval; *= Test of univariate analysis: significance level set at p<0.05, ns= not significant.

Diversification of culinary methods to preparing food is recommended, except for frying, of which the frequency of use must be limited. In the present study we investigate the factors associated with the frequency of using frying foods as a misadvised culinary method. The data analysis presented in the Table 2, show that the factors associated with using frying method at least once a week are: age (OR: 4.77, CI [3.29-6.80], p = 0.01) and the urban living environment (OR: 2.61, CI [1.39-4.87], p = <0.01).

Factors associated with time spent in food preparation

The Table 2 shows that the factors associated with the reduced time devoted to cooking per day (duration <1 hour), are the residence in urban environment (OR: 2.35, IC [1.13-10.42], p = 0.02) and the media and family as sources of food information (the media (OR: 1.5, IC [1.14-5.26], p = 0.04); the family (OR: 0.2; IC [0.13-0.52], p = 0.05).

Factors associated with regularity of meal intake

The results analysis presented in Table2 demonstrate that the factors associated with the reduced number (<3) of meals taken per day, are: the age group 18-29 years (OR: 2.29, CI [1, 97 - 5.42], p = 0.04), the urban environment (OR: 3.05, CI [1.23-7.29], p = 0.01), and the media as a source of food information (OR: 3.31, CI [1.23; 7.29], p = 0.01).

Factors associated with out-of-home meals

The factors favoring eating meals away-from-home, are: age (OR: 1.05, CI [1.03-1.07], p = 0.02), the urban environment (OR: 4.47, CI [2.24-8.92], p = <0.01) and the nuclear family type (OR: 1.45, CI [1, 09-1.93], p = 0.01) (Table 2).

DISCUSSION

The present research focused on the description of the trends of the eating practices of 118 households in an agricultural community belonging to urban and rural localities in the province of El Jadida in Morocco. The study data showed a significant association of young age (18 to 29 years) with the reduced number of meals taken per day (<3) (p = 0.04), with out-of-home meals (p = 0.02) and with the use of frying as a culinary method (p = 0.01). These results are consistent with a study on consumption and lifestyles reporting
that it is rather young people, aged 18 to 29, who are motivated to adopt such modern eating behaviours [18]. One of the explanations to these behaviours by the young people is that they grew up in a context of globalization and modernization. A high frequent consumption of out-of-home meals by young people [19,20] associated with sensitivity and predisposition to eating disorders was also reported in the literature [21]. These disorders could be the cause of serious physical and psychosocial problems [22]. Residence in urban environment is also found to be significantly associated with the four eating practices examined in the present study: in particular, the use of frying as a culinary method (p = <0.01), the reduced time spent on cooking (p = 0.02), the reduced number of meals taken (p = 0.01) and out of home meals taken (p = <0.01). This result could be explained by urbanization which constitutes the most important vector of modernization induced by globalization [23]. In reference to urbanization the city remains furthermore, the place for the evolvement of dietary styles towards the adoption of modern or Western dietary practices [6]. Another factor significantly associated with out -of-home meals was the family type. Numerous investigations have been interested in studying the family and have clarified its primordial role in the transmission of good eating practices and healthy lifestyles to their offspring [24-28]. Our study data found also that both the family and the media as sources of information on food are associated with the reduction of the daily time spent in the kitchen and, the media are also associated with taking fewer meals per day. This results could be due to the fact that instead of having precise information on what should be healthy dietary practices and of quality food products for consumers, there are uncontrolled information circulating via the media that could be scientifically unsubstantiated and therefore erroneous [31].

Another explanation is that, in addition to the correlation of the food act with the socio-demographic factors, it is also strongly linked to societies’ socio-cultural specificities. The latters let them having their proper definition of what are good eating practices according to their culture [32]; especially since the differences in the consumption patterns between social groups express differences in dietary styles, themselves, linked to these groups dietary habits [33]. The diet is therefore involved in shaping identity, particularly the social identity [32].

CONCLUSION AND PERSPECTIVE

The data reported here describe the trends in food consumption in relation with some factor’s determinants of the effects of the globalization and modernization of dietary practices that are age, urbanization, family type and media. Thus, the food practices studied are the culinary methods, the time spent in food preparation, the regularity and the diet location. Based on the descriptive and correlational results obtained, it would be wise to carry out actions with a view to promoting healthy eating practices, in particular by developing educational materials that include good eating practices in young people.

ACKNOWLEDGMENT

The authors wish to thank the participants to this study, the Loca Autorities at the El Jadida Province for their cooperation and support. The survey was supported by the Moroccan Ministry of Higher Education and Research.

REFERENCES

1. Ministère de la Santé du Maroc (2011) Stratégie Nationale de la Nutrition 2011-2019: 37.
2. Belahsen R (2014) Nutrition transition and food sustainability. Proc Nutr Soc 73(3): 385-388.
3. Benjelloun S (2011) Profil Nutritionnel du Maroc, Organisation des Nations Unies pour l’alimentation et l’agriculture (FAO) 5(4): 764.
4. Hoddinott JF (2002) Dietary diversity as a food security indicator. Discussion Paper No.136: Yohannes (ed.), International Food Policy Research Institute, Washington, USA.
5. Ruel MT, Haddad L, Garrett II. (1999) Some urban facts of Life: implications for research and policy- Science Direct, pp.1917-38.
6. Mahaney MC, Blanger J, Rainwater DL (1995) A major locus influencing plasma high-density lipoprotein cholesterol levels in the San Antonio family heart study. Segregation and linkage analyses. Arterioscler Thromb Vasc Biol 15(10): 1730-1739.
7. Delgado AM, VazAlmeida, Parisi S (2017) Chemistry of the Mediterranean Diet; Springer: Cham, Switzerland.
8. Bach-Fag A, Berry EM, Lairon D (2011) Mediterranean diet pyramid today. Science and cultural updates. Public Health Nutr 14(12A): 2274-2284.
9. Dernini S, Berry EM, Serra-Majem L (2017) Med Diet 4.0: the Mediterranean diet with four sustainable benefits. Public Health Nutr 20(7): 1322-1330.
10. Expertise scientifique collective-INRA (2010) Comportements Alimentaires, Quels en sont les déterminants? Quelles actions, pour quels effets? - Ministère de l’Alimentation, de l’Agriculture et de la Pêche, pp. 39.
11. Doumont D, Libion Marie F (2003) Santé des familles influences du mode de vie, UCL – RESO, Unité d’Education pour la Santé École de santé Publique-Centre « Recherche en systèmes de santé», pp. 19.
12. Zick CD, Stevens RB, Bryant WK (2011) Time use choices and healthy body weight: a multivariate analysis of data from the American time use survey. Int J Behav Nutr Phys Act 8: 84.
13. Crawford D, Ball K, Mishra G, Salmon J, Timperio A (2007) Which food-related behaviours are associated with healthier intakes of fruits and vegetables among women? Public Health Nutr 10(3): 256-265.
14. Chu YL, Addo OY, Perry CD, Sudo N, Reicks M (2012) Time spent in home meal preparation affects energy and food group intakes among midlife women. Appetite 58(2): 438-443.
15. Timlin MT, Pereira MA (2007) Breakfast frequency and quality in the etiology of adult obesity and chronic diseases. Nutr Rev 65(6 Pt 1): 268-281.
16. Naessens E (2015) Maaltijdien. De in kijker: Nutrines 1:18-23.
17. Crémilleux D, Biez G, Vandewalle S, Charpentier N (2013) Les Nouvelles Pratiques Alimentaires Dans La Restauration Hors foyer: Études Des Tendances, Des Enjeux Économiques et Sanitaires Associés Rennes: 31-43.
18. Bigot R, Piau C (2003) Les jeunes sont aujourd’hui favorables à la mondialisation. Centre de recherche pour l’étude et l’observation des conditions de vie.
19. Lachat C, Nago E, Verstraeten R, Roberfroid M, Van Camp J, et al. (2012) Eating out of home and its association with dietary intake: a systematic review of the evidence. Obesity Reviews: An Official Journal of the International Association for the Study of Obesity 13(4): 329-346.
20. Orfanos P, Naska A, Trichopoulou A (2009) Eating out of home: energy, macro- and micronutrient intakes in 10 European countries. The European Prospective Investigation into Cancer and Nutrition. Eur J Clin Nutr 63: S239-262.
21. Swanson SA, Crow SJ, Grange DL, Swendsen J, Merikangas KR (2011) Prevalence and correlates of eating disorders in adolescents: results from the national comorbidity survey replication adolescent supplement. Arch Gen Psychiatry 68(7): 714-723.
22. Berge JM, Loth K, Hanson C, Croll-Lampert J, Neumark-Sztainer D (2012) Family life cycle transitions and the onset of eating disorders: a retrospective grounded theory approach. J Clin Nurs 21(9-10): 1355-1363.
23. Allali F (2017) Evolution des pratiques alimentaires au Maroc. International Journal of Medicine and Surgery: 71.
24. Miller JR, Janosik EH (1980) Family focused care, McGraw-Hill Book, USA, p. 453.
25. Wright LM, Leahey M (1995) L’infirmière et la famille, Pearson ERPI.
26. Friedman MM (1992) Family nursing: Theory and practice. Appleton & Lange.
27. Feetham SL, Meister S, Bell J, Gilliss CL (1992) The Nursing of Families: Theory/Research/ Education/Practice. SAGE Publications.
28. Hanson SMH, Boyd ST (2014) Family health care nursing: Theory, practice and research. In Davis FA (1996).
29. Van der Horst K, Ferrage A, Rytz A (2014) Involving children in meal preparation. Effects on food intake. Appetite 79: 18-24.
30. Chu YL, Farmer A, Fung C, Kuhle S, Storey KE, Veugelers PJ (2013) Involvement in home meal preparation is associated with food preference and self-efficacy among Canadian children. Public Health Nutr 16(1): 108-112.
31. Larson NI, Story M, Eisenberg ME, Neumark-Sztainer D (2006) Food preparation and purchasing roles among adolescents: associations with sociodemographic characteristics and diet quality. J Am Diet Assoc 106(2): 211-218.
32. Fischler C (2011) Commensality, society and culture. Social Science Information 50(3-4): 528-548.
33. Warin M, Turner K, Moore V, Davies M (2008) Bodies, mothers and identities: rethinking obesity and the BMI. Sociol Health Illn 30(1): 97-111.