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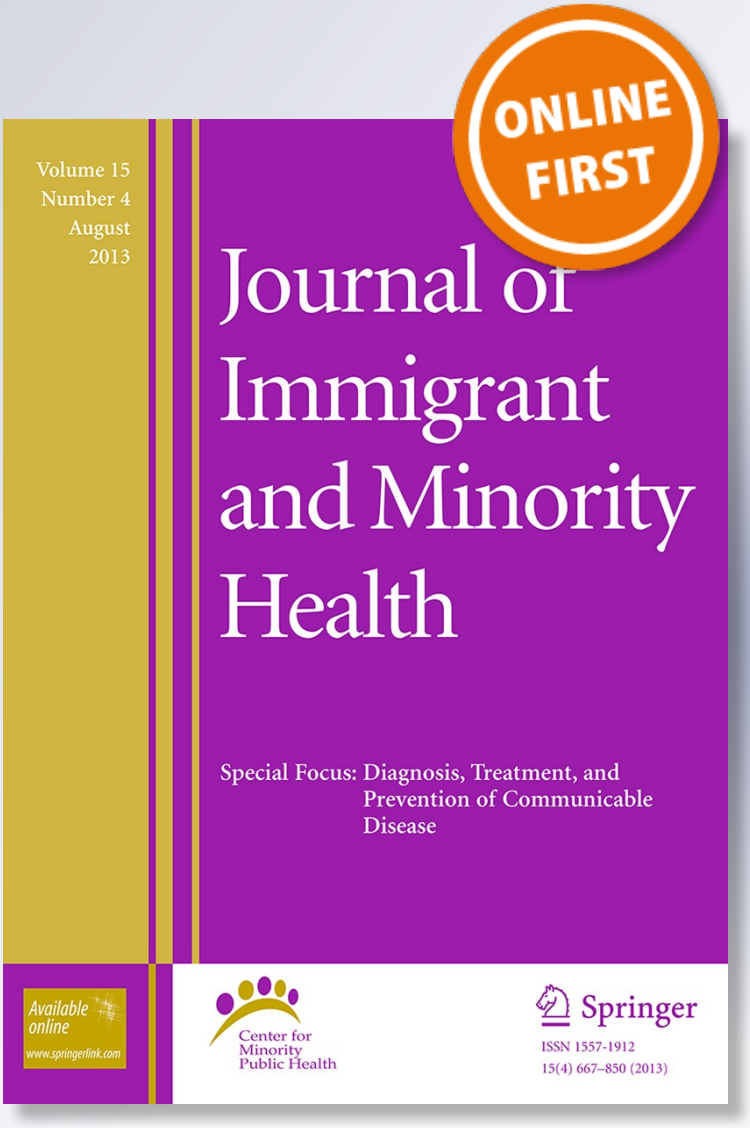

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ORIGINAL PAPER

A Review on Changes in Food Habits Among Immigrant Women and Implications for Health

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Abstract The present article covers the range of various factors that impact dietary change among immigrant women, the consequences for health as well as suggestions for an improved intervention. The factors like: busier lifestyle, lack of social relations, higher level of stress, children's preferences, taste, food insecurity, lack of traditional foods and others can result in high fat and sugar diets, low consumption of fruits/vegetables, greater portions, consumption of convenience food and inactivity. These unfavorable dietary changes can in turn cause chronic diseases including cardiovascular diseases, hypertension, type 2 diabetes and others. These negative impacts increase with the time spent in a foreign country, especially in USA and Canada, whereas cases in Europe show minor negative or even positive impacts. For a successful intervention a better understanding of the whole process is needed with a special focus on low-income females due to their double discrimination and their influence towards the health of all family members.

Keywords Immigrant women · Dietary acculturation · Eating habits · Nutrition-related diseases

Introduction

Migration has always been a natural human process—from ancient times into the future—hence, people will always continue moving either permanently or temporarily. In the past decades processes of globalization including new communication technologies and modern transportation have transformed the material and cultural practices associated with migration. Nowadays, as before, immigration is determined by push and pull factors [1]. One of the main push/pull factors is connected with economic reasons which tend to move people from low human development to high human development. There are three key areas of movement: to Europe from Asia, to North America from Asia, to North America from Latin America. According to the database of The Organization for Economic Co-operation and Development (OECD) analyzing six main receiving countries (United States, Canada, Australia, United Kingdom, Germany and France), which represent 77 % of overall immigrant populations, the total number of international migrants has increased from 20 million in 1975 to over 44 million in 2000 [2]. If this number continues to grow, at the same pace as during the last 20 years, it could reach 405 million migrants by 2050 [3].

Process of migration is connected with the so-called acculturation—"a process through which migrants and their children acquire the values, behavioral norms and attitudes of the host society" [4]. One of the most important aspects of acculturation is dietary acculturation. Immigrant groups usually bring their own traditional beliefs and practices related to food and nutrition, since an attitude to food and food preferences is one component of cultural identity [5]. Hence, food habits are often the last that are adapted to the new culture and play an important symbolic, religious and social role in their everyday lives [6].

Dietary acculturation in Western countries is connected with worse dietary choices: like high fat and high sugar diets, low consumption of fruits and vegetables, lower physical activity, higher BMI as well as an increase in portion size, in going to the restaurants and other

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unfavorable habits [7–20]. Such changes in dietary practices can result in some chronic diseases including obesity, hypertension, cardiovascular diseases, type 2 diabetes mellitus, metabolic syndrome, mental diseases and even cancer [21–24].

Particularly female migrants, who are the main focus of this paper, are negatively affected by migration and dietary acculturation due to their double marginalization both as being women and as being a migrant [25]. It is, therefore, crucial to understand in which way gender interacts with other determinants, in order to explain why this health patterns deteriorate and how this problem can be solved. Overall, health promotion interventions targeting immigrant women should not only address the population determinants of health, but also consider the specific determinants of women's health. In 2005, the share of female migrants represented approximately 50 % of all 190 million people worldwide international migrants [26].

Methods

The review included papers which consider issues related to migration, women migration, dietary patterns and health. The relevant literature was identified using key informants/experts, health databases and health websites, websites with demographic data.

Three lists were created with different keywords: first one related to the health and nutrition-related diseases (e.g. life expectancy, mortality, weight etc.), second one related to the process of migration (e.g. migration, female immigrants, acculturation etc.) and the last one related to the food habits (e.g. dietary changes, overweight, food patterns etc.).

The following electronic databases were searched using combinations of the above listed search terms. Each health term was in turn combined with each migration and food habits term keywords searches on each database. There was no year restriction, but only articles published in English were used. The databases searched were following: Web of Science, Geobase, Pubmed, Medline, Embase, Science direct, WHO and Health Economics. In addition journals like "International Journal of Migration Studies", "Journal of Immigrant Health", "Journal of Immigrant and Minority Health", "Maternal and Child Health Journal", "Journal of Epidemiology and Community Health", "Frontiers of Health Services management", "Journal of Health Economics" have been searched.

In summary, 179 articles have been included. The majority of the articles were studies originating from Canada, USA, UK, Sweden, Germany and Netherlands.

The following approach was used in the present articles:

- Reading-through of paper titles and abstracts;
- Selection of papers focusing on human migration and health outcomes;
- Focus on the studies conducted about nutrition-related diseases caused by migration especially in women;
- Grouping—each paper was grouped and given a narrative summary.

The criteria for studies′ selection are based mainly on the gender of migrants. Hence, studies analyzing female migrants were selected without any other demographical and psychographic limitations. The majority of studies analyzed had a comparison group, i.e. they were comparing migrants to either the host population or the population in the country or region from which they migrated.

Summary of Evidence

This review tries to answer five questions:

What are the Barriers for Female Immigrants to Maintain Healthy Eating Habits?

Most studies confirmed that female immigrants have incorporated high fat and sugar snacks, drinks, and more fast foods into their traditional diet. Many women argued that they gained weight much faster compared to the time that they lived in their home country. The main reasons for this negative side effect of acculturation are different cultural, economic and social barriers especially those resulting from the new "dailylife" practices. The most common barriers are connected with:

- High prices of healthy food, which caused higher purchase of unhealthy cheap products (e.g. high fat and sugar snacks, sweetened beverages, etc.) [12, 27];
- Unavailability of traditional foods and ingredients, e.g. certain types of vegetables or spices [12, 28, 29];
- Children's preferences stay as one of the most important reasons due to mothers' wish to satisfy the needs of her children [12, 29–31];
- Uncertainty and unfamiliarity towards new foods and new preparation practices caused by language or other barriers [12, 30];
- Busier work schedule and lifestyle of all family members prevents women from maintaining healthy dietary habits [29, 30];
- Stress, loneliness, feeling of exclusion, unemployment, boredom resulting in higher intake of tasty and unhealthy food combined with physical inactivity [29, 30];
- Digestion problems connected with the consumption of unknown products [30];

- Pleasant taste of unhealthy food e.g. sweets, snacks, beverages etc. [28, 32, 33];
- Convenience and affordability of fast food restaurants and pre-packaged dinners [32, 33].

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Which Factors May have Caused Dietary Changes in Female Immigrants?

Process of dietary acculturation seems to be very complex, where various characteristics predict the degree to which new immigrants may change their attitudes and beliefs about food. The Satia′s model explains the whole picture of dietary acculturation (Fig. 1) [31]: This model assumes that every migrant has a unique background

- Before coming to the foreign country, which is influenced by (a) socio-economic and demographic factors (gender, age, country of origin, education, employment, household composition etc.), and (b) cultural factors (religion, beliefs, values, attitudes etc.);
- The second part of the model explains the consequences of the exposure to the new country after arrival, which can result in (a) changes in psychological factors and taste preference, and (b) changes in environmental factors leading to changes in food procurement and preparation.

Apart from Satia′s model, there is another model of changing food habits created by Koctürk [34] which is even nowadays applicable and used in many recent studies that are dealing with the process of dietary acculturation. Koctürk explains that when the new foods are incorporated into the diet, the taste has a priority. Hence, the accessory foods (sweets, fruits, snacks, drinks) are usually adopted first. The substitution of basic "real" foods (potatoes, wheat, and rice) takes place over a much longer period of time and the staples may remain the same for generations.

Items such as language proficiency, length of residence in the host country, generation level, are considered the most important factors when considering dietary acculturation. In addition the following characteristics contributed to the higher grade of acculturation: a higher education and

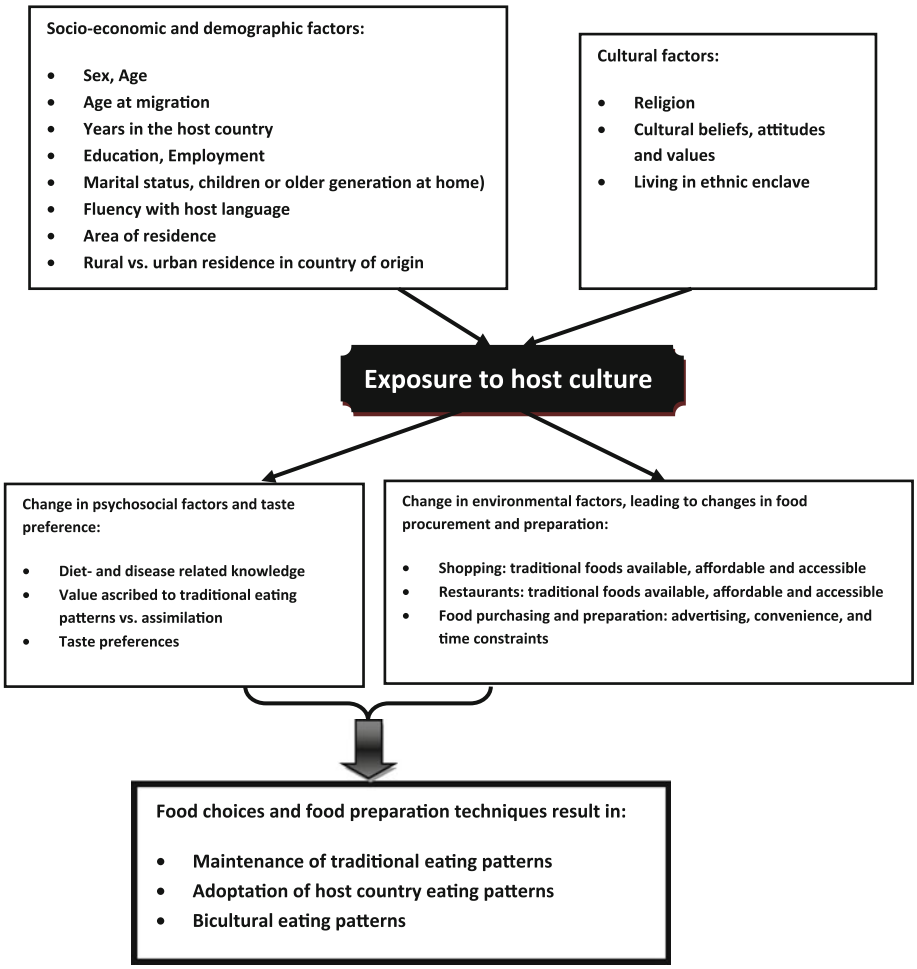

Fig. 1 Proposed model of dietary acculturation modified from Satia, 2003 [31]

income, employment outside the home, being married, having young children, greater exposure to the mainstream culture through television, radio, books, magazines, and advertisements [31, 35].

However, there are some factors that aggravate dietary acculturation, namely, the older age of immigrants, the availability of traditional foods (e.g. Chinese migrants living in China town), stronger ethnic identities and/or great difference between the original and host cultures [36–40].

What Nutrition-Related Diseases are Caused by the Dietary Change of Female Immigrants?

Migrants do not necessarily always demonstrate worse cardiovascular, mental and overall health conditions when compared to non-migrants. However, migrants generally have a more unfavorable risk factor profile as well as more frequently type 2 diabetes, hypertension, chronic conditions, and obesity [8, 41–53]. There is a need to give specific attention especially to female migrants due to their reproductive role and since they usually purchase and prepare the meals [12]. Hence, women have a great influence on the nutrition and health behavior of all members of the family [31].

Is There Any Relation Between Health of Female Immigrants and the Duration of Stay in the Foreign Country?

The observations made on immigrants both living in USA, Canada and Europe forced us to reflect upon the reliability of the concept of *"healthy migrant effect"*, which in other words described the phenomenon when foreigners upon arrival in the new host country have better health profile (overall lower mortality rates, less mental illness, fewer chronic diseases, fewer disabilities overnight hospitalization) than the native population [54–62].In addition, when comparing male and female immigrants, the majority of studies showed that immigrant women were less healthy upon the arrival and lost their health advantage at a faster rate [63].

Different studies especially those conducted in the US and Canada have explained that healthy migrant effect is location-based as well as rather temporary. The results have shown positive correlation between mortality rate and duration of stay in a foreign country, meaning that health of migrants deteriorates with time due to changed health-related behaviors of immigrants (e.g. dietary practices, lifestyles) explained in previous chapters [11, 64].

Prevalence of overweight and obesity increased with duration of residence in the United States in immigrant women and are associated with an increased risk of CVD, hypertension, and diabetes type 2. Furthermore, the greatest increase can be noticed among those immigrants who arrived at younger age e.g. before 20th birthday [65].

All in all, the studies have shown that the longer immigrants live in a USA and Canada, the worse their health becomes; however, even the highest mortality rates of immigrants remain significantly lower than those of the native population. Beside such a critical health situation of immigrants living in North America, some European immigrants may even enjoy some positive aspects by living in more beneficial environments [66].

How Social Economic Factors Coincide With the Health of Female Immigrants?

"It is relatively inexpensive to become obese" said a theory from Drewnowski and Spector [67]. For someone, a family with a restricted household budget cannot logically be overweight and obese; however, this relationship between poverty and obesity is becoming more noticeable in the past decade. Many studies showed a strong relationship between social economic status (SES) indicators and health condition (dietary practice, chronic diseases, obesity, physical inactivity etc.) of immigrants living in Europe, USA, Canada and other countries [68, 69]. The reasons for such a trend are various: high market prices for healthier products, insecurity about food, lack of information about food, different attitudes towards health, stress, physical activity, the promotion of cheaper, energy dense, micronutrient-poor foods and beverages and other factors [27]. Specifically for women this trend is dangerous due to their female reproductive role and influence on the whole family as well as due to their double burden discrimination for both being poor and being a woman. Moreover, low SES indicators of pre-pregnant women can influence the health condition and overweight/obesity risk of the current as well as of the next generations [70].

However, many studies have noticed a so-called *"Hispanic paradox"*, which showed that certain immigrant groups like Latinos living in the USA (but also other minority groups living in Canada, Europe and other countries) have better health conditions than native born American despite lower SES indicators [57, 71–75].

The majority of research studies analyzed the situation of Latin American immigrants that moved to the USA. One example of this phenomenon is shown on a recent statistics on Fig. 2 [76]. The same "advantage" in health, when compared to the native-born US population, has been found also among other immigrant groups despite their higher rates of poverty.

Discussion

The aim of this review was to analyze the changes in dietary habits among immigrant women after migration

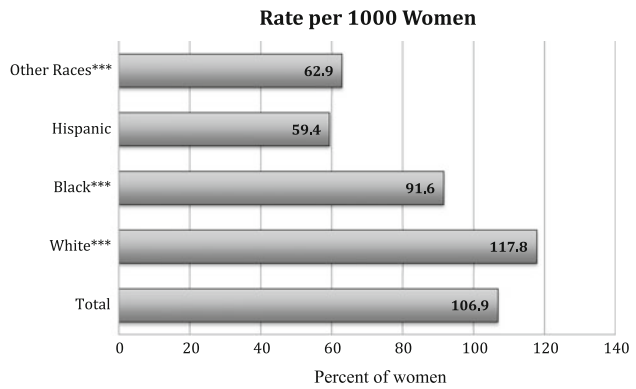

Fig. 2 Women ages 18 and over with Heart diseases by race/ethnicity 2012, modified from Center for Diseases Control and Prevention, NCHS [76]. *Asterisk* denotes non Hispanic includes Asian/Pacific Islander, American Indian, Alaska Native and persons of more than one race

process and, thus, try to understand the reasons for this change, the drivers for new eating behaviors, different impacts that this change has on immigrants as well as implication for health. Immigration and especially the resulting lifestyle acculturation have a strong impact on the dietary practices of all groups of immigrants and especially women. This change can bring either positive or negative nutritional and social consequences for migrants; however, the majority of cases presented negative impacts associated with this migration [15]. Even minor changes (e.g. child preference, lack of availability and access to traditional food) have forced a dietary acculturation even if strong efforts were put into maintaining the traditional eating habits [7, 9, 14, 16, 18]. The main reason for this change is connected to the westernization of processes connected with purchasing and preparing meals. In other words, introduction of deserts, cakes, candies, cookies, savory snacks while consuming less fresh fruits, vegetables, nuts and seeds has led to high energy food consumption. This trend has become very dangerous especially in USA and Canada, where deterioration of health among immigrants have been the most notable. Hence, there is a crucial need of improving the situation and searching for solutions to the already global epidemic. The probability of emigrating is greatly influenced by gender as well as by other individual factors (e.g. age, birth order, race/ethnicity, marital status, urban/rural origin, education, work experience professional training, class position and other), family factors (e.g. structure, size, reproductive situation, family role and position, composition and family relationships and other) and, last but not least, the social factors (e.g. cultural norms and values influencing if, how and with whom to emigrate). These factors certainly affect both men and women; however the impact on female immigrants is greater, due to their reproductive role, which creates unique nutrition needs (e.g. higher need for calcium and iron); as well as due to their role in the purchasing and preparing of meals, which can affect the health of all family members [77].

United States and Canada

In the beginning upon arrival many studies have proven the so-called healthy migrant effect, where despite the worse socio-economic conditions, migrants can show lower mortality rates, better mental health and other positive results. However, after more time spent in the foreign country, migrants tend to lose this health advantage and their health condition deteriorates.

In the United States, wrong dietary practices and other nutritional factors have been associated with 6 of the 10 leading causes of death, which are: hypertension, cancer, coronary and cardiovascular disease, chronic liver disease, and type 2 diabetes mellitus [78]. Moreover, dietary practices with high saturated fat and cholesterol consumption can contribute to atherosclerotic disease as well as can result in an increased incidence of breast, colon, and prostate cancers [79]. According to Centers for Diseases Control and Prevention US, obesity and overweight has been noticed among all immigrant groups: the highest prevalence among African-American [80, 81] followed by Hispanic population. The changes in dietary practices of Hispanics include a decreased consumption of many traditional dishes rich in vegetables; a decreased consumption of corn tortillas substituting it with "flour" tortillas, which results in higher fat consumption; a decreased use of lard substituting it with butter, oil, salad dressing, mayonnaise and sour cream, an increased consumption of white bread, sweetened beverages, ready-to-eat cereals and fast food meals [9]. The similar tendency has been noticed among Asian immigrants due to a great difference between a typical Asian diet consisting of rice, vegetables, and noodles and North American diet mainly animal protein, fats, and sugar [35]. This shift in diet can result apart from greater body weight also in different diseases like: coronary heart disease, strokes, and cancer [19, 42, 76]. Due to the great difference between dietary practices of North American and Asians, there has been an increased mortality rate from heart disease as well as a higher prevalence of diseases like: type 2 diabetes, hypertension, breast cancer noticed among Asian Americans [41, 82].

Europe

In Europe this tendency is similar; however, the impacts are less dangerous and severe. The most recent study conducted by Huijts [83] analyzed the health of immigrants living in 31 European countries made on almost 20,000

immigrants coming from 123 countries. The study presented mixed results: it ranges from almost no and minor to significant negative impacts that dietary acculturation has on immigrant′s health. A great contrary has been analyzed on German cases. Many studies described migrants living in Germany as a *high risk population group,* due to the higher prevalence of high cholesterol, overweight, and decreased use of preventive services [84]. Immigrant women from Turkey, Eastern Europe and German emigrants from the former Soviet Union have the highest cardiovascular disease risk (≥3 CVD risk factors) compared to German residents [85]. In England due to the raised waist–hip ratio of Indian and Bangladeshi women there is a higher risk from being overweight and obese. The prevalence of type 2 diabetes in Bangladeshi and Indian immigrants is 2–3 times greater compared to the general population [51]. Both the first and second generation Bangladeshi women in the UK are generally more overweight and obese compared to women of similar age in Bangladesh [86]. In Sweden the prevalence of chronic diseases is higher among immigrants than among Swedish locals [87]. The amount of overweight and obese immigrants is increasing especially among women from Chile, Finland, Hungary, Southern Europe, the former Yugoslavia, and the Middle East compared to Swedish women [66]. One more study supporting the same tendency was conducted by Kumar et al. (2004) and found out that Middle Eastern boys and Eastern European girls had the highest average BMI [88]. Immigrant women from Iran and Turkey have a higher risk for developing diabetes and cardiovascular diseases [44, 89]. However, other studies from the University of Heidelberg have stated that another random sample of migrants living in Germany have considerably lower overall mortality rates when compared to the local German population [90]. In summary generalization is not quite possible due to different individual, family, social and economic factors affecting the immigrants before and upon the arrival to the host country.

Future Action

A variety of studies can be used as a basis for designing culturally appropriate nutrition education program where immigrant women need to be taught on preparing and cooking canned foods, frozen products and other unfamiliar foods as well as to read nutrition labels and to lower the intake of fat and sugar-modified products [22, 35, 91–94]. This might help them in adapting to a changed food supply without sacrificing their own cultural identity. Additionally, an increase of physical activity would be a positive contribution for preventing nutrition related diseases and the prevalence of obesity, but always in accordance with immigrants' cultural and religious background. All these policies need the support and involvement of the whole society and a well-functioning concordance between food and beverage industry, facilities for physical activity and in general health controlling across all stages of the lifespan.

Limitations

During this whole review several limitation issues have been faced: homogeneity issues (the majority of studies analyzed immigrants as homogenous population within themselves), gender issues (the greater part of studies and papers analyzed were associated with the whole population of immigrants and not specifically for women), legal issues (nonexistent documentations from undocumented migrants), response rate issues *(*due to language barriers) and last but not least database limitation issues (cases from Russia and Australia, which are also high in number of international immigration, were not taken into the main paper due to the insufficient number of studies).

Conclusions

For this, public health programs for the prevention of nutrition-related chronic disease have to analyze the prior knowledge of the food culture in immigrant groups. The information provided needs to be adjusted to the dietary and lifestyle habits as well as cultural origin of immigrants in order to properly inform these minority groups about their possibilities and potential offers. Knowing that migrants are often poorer, this is especially important for female migrants, since in general they are poorer than men, and, as a result, the socio-economic factors are likely to influence them to the greater extent. Hence, these interventions into the diets have to be done as a part of complete health care due to many health factors that it can influence. Furthermore, these interventions have to be done effectively and this can only be done if dietitians and physicians are sensitive to women's cultural origin, values, attitudes, behaviors, feelings and preferences.

Conflict of interest None.

References

1. Castles S. Migration and community formation under conditions of globalization. Int Migr Rev. 2006;36(4):1143–68.
2. Defoort C. Long-term trends in international migration an analysis of six main receiving countries. Population (English Edition). 2008;63:285–317.

3. World Migration Report 2010. http://publications.iom.int/bookstore/free/WMR_2010_ENGLISH.pdf.
4. Rissel C. The development and application of a scale of acculturation. Aust N Z J Public Health. 1997;21(6):606–13.
5. Bhugra D. Migration, distress and cultural identity. British Med Bull. 2004;69(1):129–41.
6. Helman CG. Culture, health, and illness. 2nd edition London Write: CRC Press; 1990. p. 344.
7. Darmon N, Khlat M. An overview of the health status of migrants in France in relation to their dietary practices. Pub Health Nutr. 2001;4:163–72.
8. Frisbie WP, Cho Y, Hummer RA. Immigration and the health of Asian and Pacific Islander Adults in the United States. Am J Epidemiol. 2001;153(4):372–80.
9. Gordon-Larsen P, Harris KM, Ward DS, Popkin BM. Acculturation and overweight-related behaviors among hispanic immigrants to the US: national Longitudinal Study of Adolescent Health. Soc Sci Med. 2003;57:2023–34.
10. Hassoun R. Arab-American health and the process of coming to America. In: Suleiman M, editor. Arabs in America: building a new future; 1999.
11. Himmelgreen DA, Pérez-Escamilla R, Martinez D, Bretnall A, Eells B, Peng Y, Bermúdez A. The longer you stay, the bigger you get: length of time and language use in the U.S. are associated with obesity in Puertorican women. Am J Phys Anth. 2004;125(1):90–6.
12. Koçtürk OT. Food habit changes in a group of immigrant Iranian women in uppsala family medicine stockholm. Int Interdisciplinary J. 2004;3(2):27–33.
13. Kin K, Lee JH, Kushida K, Sartoris DJ, Ohmura A, Clopton PL, Inoue T. Bone density and body composition on the Pacific rim: a comparison between Japan-born and U.S.-born Japanese-American women. J Bone Miner Res. 1993;8(7):861–9.
14. Mejean C, Traissac P, Eymard-Duvernay S, El Ati J, Delpeuch F, Maire B. Diet quality of North African migrants in France partly explains their lower prevalence of diet-related chronic conditions relative to their native French peers. J Nutr. 2007;137:2106–13.
15. Ngo J, Gurinovic M, Frost-Andersen L, Serra-Majem L. How dietary intake methodology is adapted for use in European immigrant population groups-a review. Br J Nutr. 2009;101(2):86–94.
16. Pérez-Escamilla R, Putnik P. The role of acculturation in nutrition, lifestyle and incidence of type 2 diabetes among latinos. J Nutr. 2007;137:860–70.
17. Rosenmöller DL, Gasevic D, Seidell J, Lear SA. Determinants of changes in dietary patterns among Chinese immigrants: a cross-sectional analysis. Int J Behav Nutr Phys Act. 2011;8:42.
18. Satia JA. Dietary acculturation and the nutrition transition: an overview. Appl Physiol Nutr Met. 2010;35(2):219–23.
19. Ziegler RG, Hoover RN, Pike MD, Hildesheim A, Nomura AMY, West DW, Wu-Williams AH. Migration patterns and breast cancer risk in Asian American women. J Natl Cancer Inst. 1993;85:1819–27.
20. Zheng W, Schimmele MC. The healthy migrant effect on depression: variation over time? Can Studies in Popul. 2005;32(2):271–95.
21. Dekker LH, Snijder MB, Beukers MH, de Vries JH, Brants HA, de Boer EJ, et al. A prospective cohort study of dietary patterns of non-western migrants in the Netherlands in relation to risk factors for cardiovascular diseases: helius-dietary patterns. BMC Public Health. 2011;11:441.
22. Hyman I, Guruge S, Makarchuk M, Cameron J, Micevski V. Promotion of healthy eating among new immigrant women in Ontario. Can J Diet Pract Res. 2002;63(3):125–9.
23. Wandel M. Nutrition-related diseases and dietary change among third world immigrants in Northern Europe. Nutr Health. 1993;9(2):117–33.
24. WHO Obesity. Preventing and managing the global epidemic. Geneva: WHO; 2000 http://libdoc.who.int/trs/WHO_TRS_894.pdf.
25. Carballo M, Grocutt M, Hadzihasanovic A. Women and migration: a public health issue. World Health Stat Q. 1996;49(2):158–64.
26. Llácer A, Zunzunegui MV, del Amo J, Mazarrasa L, Bolůmar F. The contribution of a gender perspective to the understanding of migrants' health. J Epidemiol Community Health. 2007;61:4–10.
27. Lehmuskoski M, Reinecke S. Eating, drinking and smoking. Comparative price levels in EU, EFTA and Candidate countries for 2003. Eurostat Statistics in Focus. 2004;No.30.
28. Harbottle L. Taste and food preferences of Iranians in Britain. Food preferences & taste. Oxford: Berghahn Books; 1997. p. 175–85.
29. Mellin-Olsen T, Wandel M. Changes in food habits among Pakistani immigrant women in Oslo, Norway. Ethn Health. 2005;10(4):311–39.
30. Bayanzadeh M. Changes in food habits among Farsi and Dari-speaking immigrants women in British Columbia, Master Thesis; 2008 Simon Fraser University.
31. Satia JA. Dietary Acculturation: definition, process, assessment, and implications. Int J Hum Ecol. 2003;4(1):71–86.
32. Edmonds VM. The nutritional patterns of recently immigrated Honduran women in New Orleans, Louisiana. J Transcult Nurs. 2005;16(3):226–35.
33. Kudo Y, Falciglia G. Evolution of meal patterns and food choices of Japanese-American females born in the United States. Eur J Clin Nutr. 2000;54(8):665–70.
34. Kocturk-Runefors T. A model for adaptation to a new food pattern the case of 557 immigrants. In: Fürst EL, Prättälä R, Ekström M, Holm L, Kjærnes U, editors. Palatable Worlds. Olso: Socio-cultural Food Studies; 1991. p. 185–92.
35. Satia JA, Patterson RE, Kristal AR, Hislop GT, Yasui Y, Taylor VM. Development of scales to measure dietary acculturation among Chinese-Americans and Chinese-Canadians. J Am Diet Assoc. 2001;101(5):548–53.
36. Bermudez O. I Intake and food sources of macronutrients among older hispanic adults: association with ethnicity, acculturation, and length of residence in the United States. J Am Diet Assoc. 2000;100(6):665–73.
37. Hyman I. Changes in health behavior following immigration—an acculturation model. NHRDP Final Report-National Health Post-Doctoral Fellowship:1997; File N:6606:5529-5548.
38. Negy C, Woods DJ. The importance of acculturation in understanding research with Hispanic Americans. Hisp J Behav Sci. 1992;14(2):224–47.
39. Satia JA, Patterson RE, Taylor VM, Cheney CL, Shiu-Thornton S, Chitnarong K. Use of qualitative methods to study diet, acculturation, and health in Chinese-American women. J Am Diet Assoc. 2000;100:934–40.
40. Yang GP, Fox HM. Food habit changes of Chinese persons living in Lincoln, Nebraska. J Am Diet Assoc. 1979;75:420–4.
41. Abate N, Manisha C. 25 Ethnicity, type 2 diabetes & migrant Asian Indians Indian. J Med Res. 2007;125:251–8.
42. Chiu M, Austin PC, Manuel DG, Tu JV. Comparison of cardiovascular risk profiles among ethnic groups using population health surveys between 1996 and 2007. Can Med Assoc J. 2010;182(8):E301–10.
43. Cornelisse-Vermaat JR. Maassen van den Brink H. Overweight and food habits in the Netherlands. A study on the differences between native Dutch and immigrants. Ethn Health. 2004;9:S90–1.

44. Dijkshoorn H, Uitenbroek DG, Middelkoop BJC. Prevalence of diabetes mellitus and cardio vascular disease among immigrants from Turkeyand Morocco and the indigenous Dutch population Netherlands. Tijdschrift voor Geneeskunde. 2003;147(28):1362–6.
45. Dijkshoorn H, Nierkens V, Nicolaou M. Risk groups for overweight and obesity among Turkish and Moroccan migrants in The Netherlands. Public Health. 2008;122(6):625–30.
46. Essen B, Hanson BS. Increased prenatal mortality among sub-Saharan immigrants in a city-population in Sweden. Acta Obstetricia et Gynecologica Scand. 2000;79(9):737–43.
47. Gilbert PA. Santosh Khokhar. Systematic review: changing dietary habits of ethnic groups in Europe and implications for health. Nutr Rev. 2008;66(4):203–15.
48. Lean ME. Ethnic differences in anthropometric and lifestyle measures related to coronary heart disease risk between South Asian, Italian and general-population. Int J Obes Relat Metab Disord. 2001;25(12):1800–5.
49. Pudaric S, Sundquist J, Johansson S. Major risk factors for cardiovascular disease in elderly migrants in Sweden. Ethn Health. 2003;5(2):137–50.
50. Smith NR, Kelly YJ, Nazroo JY. Intergenerational continuities of ethnic inequalities in general health in England. J Epidemiol Community Health. 2009;63:253–8.
51. Sproston K, Mindell J. E. The 2004 Health survey for England: "The Health of minority ethnic groups". http://www.ic.nhs.uk/webfiles/publications/healthsurvey2004ethnicfull/Healthsurveyforengland2104.pdf.
52. Vyas A, Greenhalgh A, Cade J, Sanghera B, Riste L, Sharma S, Cruickshank K. Nutrient intakes of an adult Pakistani, European and African-Caribbean community in inner city Britain. J Hum Nutr Diet. 2003;16:327–37.
53. Uitewaal PJM, Manna DR, Bruijnzeels MA. Hoes AW, Thomas S. Prevalence of type 2 diabetes mellitus, other cardiovascular risk factors and cardiovascular disease in Turkish and Moroccan immigrants in North West Europe: a systematic review. Prev Med. 2004;39:1068–76.
54. Antecol H, Bedard K. Unhealthy Assimilation: why do immigrants converge to american health status levels? Demography. 2006;43(2):337–60.
55. Jianjian C, Ng E, Wilkins R. The health of Canada's immigrants in 1994–1995. Health Rep. 1996;1996(7):33–45.
56. Hummer RA, Powers DA, Pullum SG, Gossman GL, Frisbie WP. Paradox found (again): infant mortality among the Mexican-origin population in the United States. Demography. 2007;44(3):441–57.
57. Lerman-Garber I, Villa AR, Caballero E. Diabetes and cardiovascular disease. Is there a true Hispanic paradox? Rev Invest Clin. 2004;56(3):282–96.
58. McDonald JT, Kennedy S. Insights into the 'healthy immigrant effect': health status and health service use of immigrants to Canada. Soc Sci Med. 2004;59(8):1613–27.
59. McKay L, Macintyre S, Ellaway A: Migration and Health: a review of the international literature. Medical Research Council Social and Public Health Sciences Unit. Occasional Paper # 12. January 2003. University of Glasgow, Glasgow; 2003.
60. Newbold KB. Self-rated health within the Canadian immigrant population: risk and the healthy immigrant effect. Soc Sci Med. 2005;60:1359–70.
61. Pérez CE. Health status and health behavior among immigrants. Health Rep. 2002;13:98–109.
62. Singh GK, Siahpush M. Ethnic-immigrant differentials in health behaviors, morbidity, and cause-specific mortality in the United States: an analysis of two national data bases. Hum Biol. 2002;74:83–109.
63. Read JG, Reynolds M, Reynolds MM. Gender differences in immigrant health the case of Mexican and Middle Eastern immigrants in US. J Health Soc Behav. 2012;53(1):99–123.
64. Maximova K, McGrath JJ, Barnett T, O'Loughlin J. Do you see what I see? Int J Obes. 2008;32(6):1008–15.
65. Roshania R, Narayan KM, Oza-Frank R. Age at arrival and risk of obesity among US Immigrants. Obesity. 2008;16(12):2669–75.
66. Lahmann PH, Lissner L, Gullberg B, Berglund G. Differences in body fat and central adiposity between Swedes and European immigrants: the Malmo Diet and Cancer Study. Obes Res. 2000;8(9):620–31.
67. Darmon N, Drewnowski A. Does social class predict diet quality? American Society for Clinical Nutrition. Am J Clin Nutr. 2008;87(5):1107–11.
68. Burns, C. A review of the literature describing the link between poverty, food insecurity and obesity with specific reference to Australia. 2004, retrieved 1 April 2008 www.vichealth.vic.gov.au.
69. de Irala-Estévez J, Groth M, Johansson L, Oltersdorf U, Prättälä R, Martínez-González M. A systematic review of socio-economic differences in food habits in Europe: consumption of fruit and vegetables. Eur J Clin Nutr. 2000;54(9):706–14.
70. Robertson A, Lobstein T, Knai C. Obesity and socio-economic groups in Europe: evidence review and implications for action. SANCO/2005/C4-NUTRITION-03, Brussels 2007.http://ec.europa.eu/health/ph_determinants/life_style/nutrition/documents/ev20081028_rep_en.pdf.
71. Acevedo-Garcia D, Bates L. Latino health paradox empirical evidence, explanations, future research, and implications. In: Rodriguez H, Saenz R, Menjivar C, editors. Latinas/os in the United States: changing the face of America. New York: Springer; 2008. p. 101–113.
72. Uitenbroek DG, Verhoeff AP. Life expectancy and mortality differences between migrant groups living in Amsterdam, The Netherlands. Soc Sci Med. 2002;54(9):1379–88.
73. Franzini L, Ribble JC, Keddie AM. Understanding the Hispanic paradox. Ethn Dis. 2001;11:496–518.
74. Markides KS, Eschbach K. Aging, migration, and mortality: current status of research on the hispanic paradox. J Gerontol B Psychol Sci Soc Sci. 2005;60(2):68–75.
75. Razum O, Twardella D. Towards an explanation for a paradoxically low mortality among recent immigrants. Tropical Med Int Health. 2002;7:4–10.
76. Women's Health USA, 2004 http://mchb.hrsa.gov/whusa04/pages/ch2.htm.
77. Harbottle L. "Bastard" chicken or ghormeh-sabzi? Iranian women guarding the health of the migrant family. In: Edgell S, Hetherington K, Wards A, editors. Consumption matters. Oxford: Blackwell; 1996. p. 204–226.
78. Kenneth D Kochanek, Jiaquan Xu, Sherry L Murphy, Arialdi M. Minin, Hsiang-Ching Kung. Deaths: final data for 2009, National Vital Statistics Reports U.S. Dec 2011;60(3):5. http://www.cdc.gov/nchs/data/nvsr/nvsr60/nvsr60_03.pdf.
79. Collins K. The cancer, diabetes, and heart disease link. Today's Diet. 2013;15(3):46.
80. Flegal KM, Carroll MD, Ogden C, Johnson CL. Prevalence and Trends in Obesity Among US Adults, 1999–2000. JAMA. 2002;288(14):1723–7.
81. Parker S, Nichter M, Nichter M, Vuckovic N, Sims C, Ritenbaugh C. Body image and weight concerns among African American and white adolescent females: differences that make a difference. Human Organ. 1995;54(2):103–13.
82. Kulkarni KD. Food, Culture and Diabetes in the United States. Clin Diabetes. 2004;22(4):190–2.
83. Huijts T, Kraaykamp G. Immigrants' health in Europe: a cross-classified multilevel approach to examine origin country, destination country, and community effects. Int Migr Rev. 2012;46(1):101–37.
84. Ronellenfitsch U, Razum O. Deteriorating health satisfaction among immigrants from Eastern Europe to Germany. Int J Equity Health. 2004;3:4.

85. Haas GM, Parhofer KG, Schwandt P. Prevalence of CVD risk factors in migrants participating in the PEP family heart study Nuremberg. Int J Prev Med. 2010;1(1):19–28.
86. Thompson JL. Migration, Nutrition and aging across the lifecourse in Bangladeshi families. A transnational perspective (MINA). ESRC End of Award Report, RES-354-25-0002, Swindon: ESRC.
87. Gadd M, Johansson SE, Sundquist J, Wändell P. Morbidity in cardiovascular diseases in immigrants in Sweden. J Intern Med. 2003;254(3):236–43.
88. Kumar BN, Holmboe-Ottesen G, Lien N, Wandel M. Ethnic differencies in Body Mass Index and associated factors of adolescents from minorities in Oslo, Norway: a cross sectional study. Public Health Nutr. 2004;7:999–1008.
89. Wiking E, Johansson SE, Sundquist J. Ethnicity, acculturation, and self-reported health. A population based study among immigrants from Poland, Turkey, and Iran in Sweden. J Epidemiol Community Health. 2004;58:574–82.
90. Winkler V, Ott JJ, Holleczek B, Stegmaier C, Becher H. Cancer profile of migrants from the Former Soviet Union in Germany: incidence and mortality. Cancer Causes Control. 2009;20(10):1873–9.
91. Cruickshank JK, Sharma S. Cultural differences in assessing dietary intake and providing relevant dietary information to British African-Caribbean populations. J Human Nutr Diet. 2001;14(6):449–56.
92. Ikeda JP, Mitchell RA. Dietary approaches to the treatment of the overweight pediatric patient. Pediatr Clin North Am. 2001;48(4):955–68.
93. Varghese S, Moore-Orr R. Dietary acculturation and health-related issues of Indian immigrant families in Newfoundland. Can J Diet Pract and Res. 2002;63(2):72–9.
94. Wahlqvist ML. Asian migration to Australia: food and health consequences. Asia Pacific J Clin Nutr. 2002;11(3):562–8.