

Exploring the Consistency of Adults' Food Choice motives with Sustainable Diet Components: a Qualitative Study

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Abstract

Background Today, due to the impact of human food choices on increasing greenhouse gas emissions, water consumption and environmental degradation, there is a new thinking about changing the pattern of food production and consumption, including sustainable food and nutrition system related to consumption. This study aimed to explore the dimensions of a sustainable diet among the determinants of people's food choices.

Methods This qualitative study was carried out using an in-depth interview with 33 individuals aged 30-64 years old living in different areas of Tehran. Data gathering, data analysis and theoretical conceptualization were performed simultaneously and from the beginning of the research, and for managing and organizing the data, the MAXQDA 10 software was used.

Results In this paper, the findings are categorized according to the key components of a sustainable diet in five themes: "Health and Nutrition", "Food and Agriculture Security", "Environment and Ecosystems", "Markets, food trade and production chains", "social, cultural, and policy factors" were categorized. Meanwhile, the components of the "Health and Nutrition" domain had the highest contribution and the components of the two domains "food and agriculture" and "environment and ecosystems" had the lowest role among the statements of the participants in this study.

Conclusion Considering to the low importance of the dimensions of a sustainable diet in food choices of the community, promoting the individual awareness of sustainable diet components, clarifying the importance of food choices in creating environmental impacts and leading the national macro policies in the field food and nutrition toward sustainable diet goals are essential.

Introduction

Nowadays, in addition to worldwide demographic, epidemiologic, and nutrition transitions, urbanization and migration from the countryside, low physical activity, complex food environments, and unhealthy eating patterns have led to an increase in the prevalence of non-communicable diseases, including obesity, diabetes Type 2, cardiovascular disease and cancers [1]. Despite the sluggish economic growth, the nutritional transition in Iran has occurred in the context of urbanization, rapid demographic and social capital changes, so we face with another concept of malnutrition [2]. In the past few years, malnutrition has been associated to protein and energy deficiencies, and today it has transformed to abdominal satiety and cellular hunger so that today's intake of micronutrients is insufficient. While the malnutrition and micronutrient deficiency still persists, obesity and related issues have emerged seriously, especially between women in urban areas [3].

The worrying speed of climate and environmental change, and its destructive effects on food, nutrition and health systems, new thinking has currently emerged about changing the pattern of food production and consumption that includes sustainable food systems and nutrition. There has been a rising tendency in the food and diets sustainability which we consume today and in the future [4, 5]. In the field of food

production and consumption, sustainability related to extensive environmental implications of agriculture and meat production, which include land use, water resources, greenhouse gas emissions and waste production [6, 7]. Sustainable diet is known as a diet that, while preserving and respecting biodiversity and ecosystems, is culturally accepted, accessible, economically fair and capable of producing, having safety, adequacy and healthy, while also utilizing natural and human resources [8].

It is necessary to determine the components of sustainable diet from environmental, biological, cultural and health perspectives, at the worldwide, regional, local and individual levels [9]. From the sustainable nutrition approach, the diet is not simply about the production and consumption of the human food, what consumers buy, and consume will not only affect their health but also their environment [10]. The meals we eat have different effects on greenhouse gas emissions due to their protein and calorie content. People's daily food choices have potentially positive or negative effects on environment [11].

Knowing people's perceptions of sustainable diet concepts and their impact on food choices has the potential to plan and implement sustainable nutrition components. It can be understood that the position of food choices is very important in the pursuit of sustainable development goals, and therefore awareness of the consumer's decision-making process regarding sustainable food consumption is a good model for planning interventions. Therefore, the present qualitative study aimed to explore the dimensions of sustainable diet from among the determinants of adults' food choices in Iran.

Theoretical Framework

In this study, we applied the framework that developed by Downs et al [12]. This framework were constructed based on five domains: "Nutrition and Health"; "Food Security and Agriculture"; "Environment and Ecosystems"; "Markets, Trade and Value Chains for Economic Growth"; and "Sociocultural and Political factors". The sustainable diets framework developed in this study allows researchers and policy makers to expand their effort in order to integrate a more all-inclusive views of the food system [12]. In developing this framework, in addition to a literature review of both peer reviewed and grey literature, that other researchers' descriptions about sustainable diet were also included [8, 9, 13, 14].

Materials And Methods

Study design and participants

We conducted this study using qualitative design to deeply explore adults' food choice determinants which related to sustainable nutrition dimensions. In this study, participants aged 30–64 years old were selected using purposive sampling considering maximum variety in socioeconomic characteristics such as education, type of job and different residency areas in Tehran (capital of Iran). They invited to take part in the research after explaining the study objectives and included to study if they were eager and able to communicate verbally. We continued sampling until data saturation was ensured and rich data was gathered.

Data gathering, management and analysis

Data were collected using a semi-structured open-ended questionnaire designed to explore the determinants of food choice from the perspective of the participants. In this study, data collection continued until theoretical saturation. Data collection and analysis and theoretical conceptualization were carried out concurrently from the beginning of the research and MAXQDA 10 software was used to manage and organize the data. The thematic analysis was performed [15], and in the next step, the components of the sustainable diet were sought and analyzed from the perspective of individuals to determine whether participants' views were consistent with the components of sustainable diet.

Data validity and trustworthiness

The researchers spent enough time on interviewing, coding, and reviewing the concepts to enhance validity of the data. Participants were also selected on the way to maximize diversity in area of residence, occupation, and education to ensure data credibility and reproducibility. The researchers attempted to abandon their previous assumptions so as not to interfere with the process of interviewing, conceptualizing, and interpreting the data to achieve confirmability. Interviews were early transcribed by first author and all of the research team review the interviews, open and axial codes to ensure reliability. Transferability of data was done by clarifying the participants characteristic, data collecting methods, interpreting and conceptualizing the data and reporting some quotations which the participants expressed.

Results

In this study, the participants' statements are classified according to the key components of sustainable diet in five themes: "Health and Nutrition", "Food and Agriculture Security", "Environment and Ecosystems", "Markets, Food trade and production chains", "Social, Cultural, and Policy factors".

Table 1 represent the demographic characteristics of the participants in the qualitative study. The conceptualization of participants' statements showed that among the determinants of food choice in adults, there were some concepts which classified for sustainable diet (Table 2).

Table 1
 Participants' characteristics in this study
 (n = 33)

Demographic traits	Frequency (%)
Gender	22 (36)
Female	11 (34)
Male	
Age (years)	21 (64)
30–49	12 (36)
50–64	
Education	10 (30)
Primary	6 (18)
Diploma	17 (52)
University	
Marital status	30 (91)
Married	3 (9)
Single	
Employment status	20 (61)
Employed	13 (39)
Housekeeper	

Table 2

– Explored sustainable nutrition dimensions from among food choice determinants in the study participant (n = 33)

Sustainable nutrition domains	Explored sustainable nutrition dimensions
Health and Nutrition	Food diversity, diet quality
	Exercise, physical activity and/or sedentary lifestyle
	Food safety and sanitation
	Malnutrition (overweight and obesity)
	Burden of non-communicable diseases, chronic disease, diet-related diseases
	Consumption of calories, macronutrients, processed foods, fat, sugar, and junk foods
Food and Agriculture Security	Seasonal foods, traditional and local foods
Environment and Ecosystems	Use of pesticides, herbicide, fertilizers
Markets, food trade and production chains	Proper infrastructure and access to markets, distance to market, transportation costs to market, storage
	Food availability and cost-effectiveness, food price, food environment
	Food marketing, advertisement, food packaging
social, cultural, and policy factors	Nutrition awareness
	Consumers' compliance, taste, convenience, preferences
	Nutrition knowledge, cookery skills and training, food preparation,

Domain 1: Health and Nutrition

Participants' food choices in the domain of "Health and Nutrition" included several dimensions of a sustainable diet. Observing food diversity involves consumption of different food groups and avoiding repetitive food choices. Many people stated that they try to choose the food which has better quality and this quality could be of high quality raw materials, appearance of foods, less use of preservatives, food hygiene and standardization:

"I care about the quality of the food and I take care that the quality of the food does not go down. Usually the food we prepare is standard food and my wife is very careful when cooking it to get high quality."
(Male, 62 years old)

Physical activity level was one of the items that some participants mentioned and noted its importance in the amount and type of food consumed:

"Since most days I go to sports or clubs or yoga, my breakfast is just a little bit of date, tea and walnut. Bread and cheese do not eat too much. I prefer to exercise with light stomach and so I feel better. I mean, for me, dates and walnuts are good for breakfast." (Female, 39 years old).

According to the study participants, some of the foods they choose are influenced by their concerns about being obese and losing their current fitness. Sometimes people would choose foods that they believed could improve their appearance and refrain from consuming substances that might be harmful to them, for example sweets.

"I like sweets but try to eat less. Why? Because of its fat content. But my family eats. I eat sometimes" (Male, 62 years old)

Non-communicable diseases such as diabetes were also some of the barriers to choosing some foods. These sensitivities were increased particularly in the case of high-calorie foods containing sugar and fat.

"When trying to buy meat, I try to get veal that has less fat, or when trying to buy yogurt or dairy, I try to get less fat. Well, anyway, obesity has many dangers." (Male, 38 years old)

"I try do not eat fat and salt in our food anymore. We don't eat at all and my weight was too high. My weight was 106 kg, I'm 80 kg now, and I'm very happy. I find it much easier to live this way." (Male, 63 years old)

Domain 2: Food and Agriculture Security

In the domain of "Food and Agriculture Security", the participants' food choice centered on traditional, indigenous and local products. Many participants explained that because of the health and usefulness of traditional foods, they preferred these foods to industrial food, but there were still those who had to choose foods containing the additive and the occasional preparation of traditional foods because of occupational restrictions. The concept of indigenous, local and traditional foods was classified into two groups:

Having healthy look

The positive impact of local food on the health and wellbeing of children, traditional food preference to industry due to unhealthy, healthy beliefs and the character of local food were statements expressed by people about the local and indigenous foods.

Local and traditional foods are one of the most important cultural and indigenous symbols. Almost all of the foods that are cooked in one place and geographical area originate in the customs of that area. According to the participants in this study, local foods are better and healthier than modern foods and fast foods and have a very good effect on the health and disease status of the community:

"We still eat some local foods sometimes. I taught my kids to eat these foods, for example, KASHK (an Iranian cuisines that derived from dairy products) have a lot of calcium. I think they were more proper because we had more power when we ate that kind of food. I'm healthier." (Female, 39 years old)

"I think local food is much more effective. When my kids eat local food, I think they are much healthier and much better in terms of health" (Female, 43 years old)

The participants pointed to problems with the preparation and cooking of these types of foods that prevented them from choosing them. Most of these problems included inadequate cooking skills of local food, lack of interest in children, inappropriate living conditions and lack of necessary raw materials for their preparation:

"To cook "Abgoosht" (mutton Persian soup thickened with chickpeas), you have to be in the kitchen from morning to noon, or to cook the "Ghorme Sabzi" (an Iranian stew which is a mixture of sautéed herbs, kidney bean and meat), you have to wash the vegetables the night before, crush, fry then cook." (Male, 62 years old)

"I like traditional foods like beetroot "A'sh". Or I use animal oil myself to cook "Halva" but my children don't like it. But I do and I love it" (Female, 34 years old).

Ethnic patterns of food: Some of the participants expressed ethnic patterns of food, such as: preparing special traditional foods for the occasion, reconciling the spouse's family with local cuisine, ethnic training about the specific way of cooking, and cooking local foods when all my family members have been gathered. Participants believe special dishes are also served for many special occasions and ethnic patterns:

"Sometimes in a special occasion that my family and others join, such as my mother-in-law, father-in-law, grandmother, grandfather or sisters, particular food such as local foods is prepared" (Male, 62 years old).

Domain 3: Environment and ecosystems

In the domain of "Environment and ecosystems", the amount of pesticides, herbicides and fertilizer use are key components of a sustainable diet. Among participants' statements, their tendency to consume organic food was seen as one of the indicators of healthy food. Knowledge of how to produce and process organic food made them able to trust these foods and make them more suitable for consumption. Since chemical fertilizers, pesticides and hormones are not used in the production of these foods, and one of the concerns of some people is the contamination of food with toxins and hormones, it can therefore be a good incentive for their desire to consume organic food. However, in this study, there are some barriers to the consumption of these foods, such as high cost and low availability according to the participants' quotes:

"These green chickens are a bit more expensive than regular chickens. I haven't eaten so far, but there are also ostrich and turkey meats that I rarely buy." (Male, 43 years old)

"When artichoke comes to market in spring and early summer, we eat a lot because we love it. We're consuming everything that's natural, for example, artichoke grows in the mountains, and has no fertilizer " (Male, 62 years old).

"I try to make our food organic so that we don't have to worry about it anymore and feel comfortable eating it." (Male, 63 years old).

Domain 4: Markets, food trade and production chains

In the domain of "Markets, food trade and production chains" and their role in the sustainable diet, participants mentioned several determinants. In this study, participants pointed out components such as proper infrastructure and access to markets, distance to market, transportation costs to market, storage, food availability and food prices, food marketing in terms of advertising and food packaging:

"I only care about my time and whether I can store this food in the fridge now or need it now, for example, some food like vegetables, special fruits that need preparation, or carrots that I want to buy, I have time to shave carrots. "(Female, 36 years old)

"Ever since we entered the machine life system including newer, our food has become more stored and frozen". (Female, 61 years old)

Economic feasibility was expressed as the most important factor in the food selection process. From the participants' point of view, many factors contributed to their food choices, but what ultimately played the most important role was the financial affordability of the food that could affect the quantity and quality of the food in various forms. In many cases people were aware of the benefits of eating healthy and healthy foods, but due to economic constraints, it was not possible to provide such foods:

"As usual, family income is very important, whether it can buy the foods that are useful" (Female, 36 years old).

"Sometimes we had no money and we had to put aside meat and poultry and replace with the other foods such as soy and mushroom" (Female, 39 years old).

According to some participants in the study, they were exposed to widespread advertising by manufacturers, exporters, importers and Internet networks every day. On the other hand, the majority of participants believed that foods promoted through the press and mass media, especially radio and television, were safe, healthy and harmless foods. According to the study participants, media advertising played a significant role in their understanding of the food and familiarity with reputable brands:

"For example, the various advertisements that exist, for example, do not eat tilapia fish, which unconsciously affects me and that I may not eat fish anymore". (Female, 39 years old).

"The training we received anyway from broadcasting or the media is very effective in changing people's lifestyles". (Female, 36 years old).

According to the participants, the type and appearance of food packaging were some of the factors influencing their food choices. This was especially evident when people went to grocery stores to shop. The good color of the packaging could be so effective that people were encouraged to choose that food because the packaging was attractive, even when they had no previous plans for that food:

"The food packages I choose are very important. When I go to Hypermarket, I see the fruits that are in the packaging and its packaging very neat and clean, I like to buy". (Female, 50 years old)

"In my choice of food, the packaging also has some influence. I like to be stylish". (Female, 33 years old)

Domain 5: social, cultural, and policy factors

In the "social, cultural and political" domain of sustainable diet, some of the components such as nutrition awareness, consumer acceptance and taste preferences, knowledge, skills, education and nutritional literacy are mentioned in this study. People's awareness of food properties, cooking skills, the effect of foods on health and disease could influence their food choices. Participants also pointed to the role of nutritional awareness in the quality of their food choices. According to them, nutritional knowledge was acquired through training classes, related books, newspapers and television programs and information gained through employment:

"With this information and knowledge we get from people around or we hear in the media or we read and acquire in the training class, our awareness has increased here and we have learned how to make healthier foods". (Female, 62 years old)

Color, odor, and taste were some of the issues that the participants paid particular attention to when purchasing food, and even color, odor, and taste were in some cases indicative of nutrient health. Many participants considered tastes as one of their reasons for choosing food. The intrinsic tendency of the flavors, tastes and some of the special foods resulted in choosing food even by ignoring other criteria and only according to taste:

"Taste is very important. I choose more sour foods than sweet ones". (Female, 62 years old)

"I consider more my interest and if I am not restricted, my taste is still important". (Female, 35 years old)

Poor cooking skills were another reason why people were forced to abandon certain foods:

"I like fish and seafood but one reason it's hard to cook at home, so I choose less". (Female, 39 years old).

Discussion

The findings of the present study showed the domains that were considered as effective dietary factors in the participants' food choices were a small part of the key domains identified in the field of sustainable diet. The "Health and Nutrition" domain was the main contributor and the two domains of "Food and Agriculture Security" and "Environment and Ecosystems" had the least segment among the participants"

motives in choosing foods. It merits mentioning that in case of the latter two domains, we faced with concepts that are at the macro-level of policy-making scale and community dwellers are not involved in their development; such as food production and sustainable agriculture, food aid, social support networks, subsidies and fiscal policies, soil and water pollution, and greenhouse gas emissions.

Production and trade-related policies include national level policies and interventions which govern what food is available, reasonably priced, and accessible for community. These interventions should address a broad population at various levels such as individual, community and national; society groups (school, workplaces, food production Stakeholders) or food setting (grocery store and canteen); and sub-group people which categorized by different traits (socio-economic status, gender and age) [16].

Given the nature of the domains of Health and Nutrition, individual performance plays an increasingly important role in the social, cultural, and political areas. The safety of the food, which was mentioned by the participants was not specific to any particular social class, and people with any socioeconomic status were concerned with the health and safety aspects of food. Most people expressed concerns about the contamination of food at the market. In other words, one of their concerns was the attempt to choose and prepare food that had the least contamination with possible chemicals and hormones, and this finding is consistent with the Brimblecombe study [17].

The environment and Ecosystems are the other domain that the participants were less sensitive about them when choosing their food. According to all dietary guidelines, people must consume a variety of different foods to meet their nutrients needs. However, to reduce the environmental impact of food choices, it is necessary to decrease the consumption of certain foods such as red meat and dairy products. Even though the change in food choice should be in a way that nutritional adequacy of diet be ensured. For instance, the consumers should be aware of how to substitute red meat with lower-fat plant foods, i.e., legumes [18]. Accordingly, aiming to put dietary patterns in line with the sustainability targets, governments should start to reconsider their national dietary guidelines in a way that ensure the public health, while protecting the environment in a sustainable manner [19].

“Social, cultural, and policy factors” are another domain of sustainable diet which participants had considering to its components when choosing foods. Urban life characteristics, such as the lack of access to some food items, made it impossible for the participants of the study to prepare the traditional foods. Moreover, some other considerations such as particular limitations which exist in the urban residences, do not allow participants to choose and cook some food items. Traffic and concerns about air and environmental pollution, as well as water and food contamination, may also influence people's food choices and, sometimes force them to eliminate or substitute some food items. In another study, other barriers to climate-friendly food choices, including high food prices, convenience, and lack of awareness were identified [20]. Living in different geographical areas of the country forms a dietary pattern for individuals that is specific to the foods and variety of local agricultural products due to its climatic and ecological features. This result is also in consistent with the Devine study of food choices [21]. Concerning food prices coming from “markets, food trade and production chains” domain, the cost of

purchasing and preparing food has been an important factor in many studies regarding the food choice [17, 22, 23].

Many participants considered tastes as one of their reasons for choosing food. The innate tendency of the flavors and the tastes may led them to choose some food items, even by ignoring other criteria. In Blake's study, people also tended to choose foods that fit their interests, and they also focused on their dietary and taste preferences [24].

Changes in consumption behavior patterns appear to be an effective way of influencing dietary choices based on environmental conditions. One possible solution is to increase access to environment-friendly food at food supply centers such as restaurants and grocery stores to give consumers better options for food choices [25, 26].

In another study, similar to the findings of the present study, it has been shown that literacy plays a critical role in the quality and quantity of food selection. In other words, ethical and environmental-based food choices are an active, conscious and smart process that happens with sufficient awareness [27, 28]. Media and advertising are considered as the main source of information about food and nutrition for people. In addition, the media has the capacity to convince people about some particular food choice. Studies have shown that both positive and negative advertising messages are associated with the formation of short-term changes in nutritional knowledge and attitudes, and even a nutritional message may have a direct effect on behavioral changes [29]. A series of the evidence also show that women may reflect the information they receive about the sustainable diet in their food choice more than men, and show significantly greater concern about the environmental sustainability when deciding about the food [30–32].

Conclusion

Based on the findings of this study, it can be concluded that at present the status of components of a stable diet was less diminished than other factors of dietary choices.

To achieve the goals of sustainable nutrition, it is necessary to raise the awareness of people about the various aspects of a sustainable diet to be one of the most important strategies to be considered in Iranian society. In addition, the role of macro policymakers in planning and formulating effective policies to achieve sustainable dietary goals is of particular importance.

Declarations

Ethics approval and consent to participate

This research project approved by research council of National Nutrition and Food Technology Research Institute, Shahid Beheshti University of Medical Sciences (ethic code IR.SBMU.nnftri.Rec.1393.053556). Informed written consent provide by all participants.

Consent for publication

Not applicable.

Availability of data and materials

Not applicable

Competing interests

The authors declare that they have no competing interest.

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Authors' contributions

AHR contributed to conceptualization, design, data collection and interpretation and manuscript drafting. AV supervised the study, MSH and AMB helped to draft and edit the manuscript. All of the authors approved the final manuscript.

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