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Demographics Factors Associated with Housewives' Attitude towards Transgenic Food Products in Yazd

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ABSTRACT

Background: In the last two decades, genetic engineering has led to the production of genetically modified or transgenic products in the world using the modern biotechnology. However, accepting such products by consumers is still in doubt with respect to their negative effects on the environment and human health. Thus, the present study aimed to evaluate the attitude of housewives in Yazd towards transgenic food products. **Methods:** This cross-sectional descriptive study was conducted on 500 housewives in Yazd in 2018 by cluster-random sampling method. In order to collect the study data, a two-part questionnaire (demographic and attitude) was applied. The data were analyzed by SPSS software version 18 using descriptive statistics and ANOVA test. **Results:** The mean and standard deviation of the participants' attitude toward transgenic food products was 19.24 ± 4.92. The participants' attitude scores were significantly different considering the participants' reading the food label and education level ($P < 0.05$). Half of the studied women reported that they have received their information on transgenic food products through television and radio. **Conclusion:** Regarding the misconceptions in people with lower levels of education and those who do not read the food labels, culture promotion is necessary. Moreover, provision of scientifically proven trainings on the advantages and disadvantages of transgenic products seems to be essential in order to develop a proper attitude in housewives in Yazd.

Keywords: *Attitude; Transgenic food; Nutrition; Yazd*

Introduction

Undoubtedly, foods and nutrition are regarded as the most important debatable issues in the world (Marzban *et al.*, 2017, Rezaee *et al.*, 2018). Since the population is increasingly growing, provision of adequate food is one of the most complex and critical issues in the world, especially

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in the third world countries (Eslami *et al.*, 2015, Marzban *et al.*, 2018). By 2030, the world's population is expected to reach eight billion people; thus, increasing the quantity and quality of food material is unavoidable The limited available resources has led the practitioners to put forward an effective solution to meet the initial needs of the growing population. In this regard, for the first time in the 1980s, genetic modified (GM) crops were invented. Regardless of their medical applications, production of transgenic plants was one of the most prominent achievements of genetic modification technology. Transgenic plants are plants similar to their natural counterparts (Valente and Chaves, 2018). In this method, new DNA is used and new genes' combinations are transmitted to create the desired features; however, this transmission does not seem to be feasible via traditional methods (Rodriguez and Kulpavaropas, 2018). Transgenic foods, include infant milk, adult dairy products, potatoes, tomatoes, pumpkin, corn, soybeans, canola oil, wheat, rice, sugar beet, as well as fibers used to prepare clothing such as cotton and linen (Cui and Shoemaker, 2018). Despite the wide acceptance of biotechnology at the farm level, its acceptance for the consumers is still in doubt. Considering these developments, the transgenic products will be cheaper than other agricultural products by the year 2050, as these products will be readily available due to their special capabilities in enhancing the yield and sustainability (Huang *et al.*, 2017a). Nevertheless, their acceptance in developing countries is still a matter of doubt and there is a general negative attitude towards them (Kline *et al.*, 2017). Individuals' major concerns arise from the negative effects of transgenic products on the environment and human health (Huang *et al.*, 2017b). Ecological hazards such as gene transfer as well as effects on living organisms and food safety have been put forward following the production of transgenic crops (Neri-Numa *et al.*, 2017). Different studies have been carrying out regarding transgenic products in the world, although the debate has not stopped since they have entered the human society. In recent years, more studies have been conducted in this area; as a result, more sensitivity has come about these products. The majority of people are worried about the adverse effects of these materials on human health, environment, and future generations (Bornhorst, 2017). However, the uncertainty concerning the attitude towards transgenic food has led to policy makers' uncertainty in providing solutions to develop the biotechnology industry in general and to enhance transgenic products and food needs in particular. The consumers should have the right to opt for their own food and have a proper awareness and attitude towards the benefits and disadvantages of the foods, which is an introduction to the right to choose. Therefore, this study aimed to investigate the attitudes of housewives in Yazd towards transgenic food products.

Materials and Methods

Study design and participants: This descriptive cross-sectional study was conducted in 2018 via multi-stage cluster sampling method. The statistical population of the study involved housewives from Yazd city aged 20-70 years. A geographical map was used and Yazd was divided into 20 clusters, among which 10 were randomly selected for the study. An address was randomly selected from each cluster from the municipality and the questionnaires were completed. Later, sampling continued from the right direction of the selected house. Using a similar study (Giasvand F *et al.*, 2015), the number of participants was considered as 500 using the following formula considering the $\alpha = 0.05$, the test error of 60%, and standard deviation (SD) of equal 3.

$$n = \frac{(SD)^2 \times Z_{1-\frac{\alpha}{2}}^2}{d^2} = 500$$

Measurements: Data collection tool was a valid questionnaire developed by Giasvand et al. with a reliability coefficient of 0.92 (Giasvand F *et al.*, 2015). The questionnaire consisted of 8 demographic questions (age, occupation, income adequacy, education level, number of family members, source of information, purchase of organic food, and reading food labels). A total of

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20 items were included in the attitude section dealing with the effects of transgenic foods on social welfare (10 items) and the environment (10 items). The participants were required to answer the items based on a Likert spectrum of five options, ranging from completely agree (4 scores) to completely disagree (zero score). With the algebraic adding of these 20 items, the consumers' overall attitude towards transgenic food products was calculated in the range of 0-80; where, lower scores demonstrated a more negative attitude towards transgenic food. The questionnaires were completed by 2 trained researchers in the form of interview within 4 months by going the doors of the participants' houses randomly. After providing the necessary explanations about the research and obtaining the participants' satisfaction, the questionnaires were completed. The inclusion criteria involved residence in Yazd and satisfaction with participation in the study. The exclusion criterion was incompleteness of the received questionnaire.

Data analysis: In order to assess the normality of data, Kolmogorov Smirnov test was utilized. The study data were analyzed using descriptive statistics and ANOVA test at the significant level of 0.05.

Results

In this study, 500 housewives aged 20-70 years were studied in Yazd. The mean age of participants was 44.17 ± 4.11 years. The mean and standard deviation of the participants' attitude scores towards transgenic food products was 19.24 ± 4.92.

Based on the findings, 115 participants (22%) bought organic food, 200 (40%) never read label of food items, 152 (30.4%) were in the age range of 60-70 years, and 112 housewives (22.42%) had associate degree and BSc degree. Furthermore, 280 (56%) participants were housewives and the income of 301 women (60.20%) adequately afforded their life expenses. Considering the family size, 196 housewives (39.20%) lived in 3-5-member-families (**Table 1**). The participants' most and the least frequent sources of information with respect to transgenic food products were TV and radio (n = 250), followed by friends and relatives (n = 110), respectively (**Table 2**).

Table 1. Frequency and mean score of attitudes of housewives in Yazd in terms of their demographic characteristics

Demographic characteristics	n	%	Mean ± SD	P-value*
Purchase of organic food				
Never	102	20.4	38.23 ± 4.12	0.07
Seldom	97	19.4	39.35 ± 5.01	
Sometimes	86	17.2	40.21 ± 3.99	
Often	100	20.0	35.27 ± 4.87	
Always	115	20.0	31.11 ± 3.99	
Reading food labels				
Never	200	40.0	69.69 ± 4.37	0.01
Seldom	65	13.0	31.67± 4.78	
Sometimes	31	6.2	24.57 ± 3.98	
Often	70	14.0	16.46 ± 4.16	
Always	134	26.8	9.54 ± 4.87	
ge (year)				
20-30	103	20.6	19.18 ± 5.14	0.11
30-40	94	18,8	18.37 ± 3.51	
40-50	75	15.0	17.11 ± 4.27	
50-60	76	15.2	19.24 ± 4.98	
60-70	152	30.4	18.34 ± 4.01	
Education level				

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Elementary school	84	16.8	71.74 ± 5.54	<0.001
Middle school	105	21.0	68.54 ± 5.89	
High school	67	13.4	60.34 ± 5.17	
Diploma	99	19.8	45.71 ± 4.99	
Associate degree and BSc.	112	22.4	21.37 ± 5.98	
MSc and higher	33	6.6	11.69 ± 4.97	
Occupation				
Employee	60	12.0	18.17 ± 5.57	0.13
Self-employed	150	30.0	20.12 ± 4.67	
Housewife	280	56.0	19.34 ± 4.97	
Retired	10	2.0	19.11 ± 5.12	
Adequacy of income				
Yes	63	12.6	31.15 ± 5.57	0.08
To some extent	301	60.2	27.48 ± 5.48	
No	136	27.2	30.25 ± 4.97	
Number of family members				
<3	100	20.0	20.37 ± 5.16	0.06
5-3	196	39.2	19.95 ± 4.87	
7-5	114	22.8	19.67 ± 4.91	
>7	90	18.0	21.64 ± 5.14	

* ANOVA

Table 2. The participants' information sources regarding transgenic food products

Sources	n	%
Radio and TV	250	50
Friends and family	110	22
Newspaper and books	50	10
Social dialogue	45	9
Health Centers	45	9

Discussion

Risks that can be associated with human health are considered as the most important issue with respect to genetically revised products. For instance, they can cause allergies or increase the allergenicity of a foodstuff, as well as the unknown effects that can occur in the next generations many years later. Therefore, this study aimed to investigate the attitude of urban housewives towards transgenic food products in Yazd city.

The participants' attitude score was reported as 19.24 ± 4.92, which reflects their negative attitude towards these products. In this regard, Tas (Tas *et al.*, 2015) and Wunderlich (Wunderlich and Gatto, 2015) carried out research in Turkey and the United States, respectively and reported negative attitudes. In Nourizadeh's (Nourizadeh M *et al.*, 2018) study conducted in Tehran, citizens expressed positive attitudes towards transgenic products. Moreover, Ghiasvand studied consumers of Qazvin city in Iran and reported that the participants' attitude was 30.13 ± 0.70 and 57.7% of them did not have a particular attitude towards these products. In the studies by Ganian (Ganian M *et al.*, 2016) and Hall (Hall, 2008) over agricultural experts, high resistance to pests, more efficiency, increased profit, and reduced vulnerability of farmers to pests were stated as the most important benefits of transgenic products to the agricultural cycle. Therefore, it can be evidently observed that according to the respondents, the "economic benefits" aspect at the farm level was the most important and macroeconomic benefit, while "health" aspect of the transgenic products was considered as the least important one (Ganian M *et al.*, 2016). Perhaps such a discrepancy in participants' attitudes in different studies is related to the statistical population. In studies on

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stakeholders, the results demonstrated these people's positive attitudes in which developing prominence of the economic aspect of this industry was a focus of interest (Giasvand F *et al.*, 2015, Huang *et al.*, 2017a, Rodriguez and Kulpavaropas, 2018). In a study carried out among farmers, job creation and more resistance of these products resulted in participants' more positive attitudes (Huang *et al.*, 2017a). In a study conducted over the stakeholders of transgenic products in Malaysia, it was concluded that interpreting the views on transgenic products is a complex process that requires manifold analyses (Kaya *et al.*, 2013). In a study in Southwest of Iran, individuals expressed few merits and demerits of these products. I this regard, the experts' views were considered as the best solution. However, people and health professionals mentioned that the health aspects of these products led to an opposition towards this stratum (Ghasemi *et al.*, 2013). In another study in Turkey, people disagreed with using transgenic products and introduced them as an important agent in destructing the environment and causing harm to human health (Tas *et al.*, 2015). People have the right to receive reliable and scientific information about these products to make an informed choice. This important issue should be properly illuminated by officials in the health and food departments using public media to train individuals in schools, universities, and health centers.

The results showed a significant statistical difference between the individuals' attitude towards transgenic food products and reading the food label, which is consistent with the Giasvand's (Giasvand F *et al.*, 2015) and Amal's (Amal Bakr and Lukman Ayinde, 2013) findings. In the Ganian's study (Ganian M *et al.*, 2016), most participants emphasized reading labels of the transgenic food products. Since analyzing the information and reading food labels are among the influential variables on the participants' attitudes towards transgenic food products, the importance of reading food labels should be advertised by health centers and public media in order to promote the community health. As a matter of fact, appropriate culture needs to be developed with respect to reading food labels in the households. Moreover, food industry officials should give consumers the right to choose the transgenic or non-transgenic products by labeling in production or import of the transgenic crops.

The study results demonstrated that women with higher education levels showed more negative attitude toward transgenic food products, which is consistent with the findings reported by López (López Montesinos *et al.*, 2016), Burns (Burns *et al.*, 2003), and Mataia (Mataia *et al.*, 2003). However, it is in contrast with the research results of Giasvand (Giasvand F *et al.*, 2015). Individuals with higher educations pay more attention to their health on the basis of their knowledge and are cognizant about the disadvantages of transgenic food products. Therefore, they hold a negative attitude toward transgenic foods with an uncertain level of safety. However, clarification with regard to these products is necessarily required by food and nutrition custodians so that less-educated people can also opt for their food properly. The government must set rules and take regulatory measures in this regard to ensure that researchers and stakeholders obey the rules, because the effect of unhealthy nutrition on the body will emerge in the long run.

Most research collaborators had acquired their information on transgenic food products from television and radio, which was in line with the results of studies by Nurizadeh (Nourizadeh M *et al.*, 2018) and Burns (Burns *et al.*, 2003). Since public media have mass audience from different strata, especially housewives, they can play a significant role in informing and culture promotion in the vast majority of societies. Therefore, mass media can increase appropriate nutritional knowledge and introduce transgenic food products as well as their advantages and disadvantages, which result in a more cost-effective and efficient outcome in comparison with other solutions.

The present study suffers from some limitations. This was a descriptive study that did not elaborate

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on the reasons. In addition, due to financial constraints, the researchers were not able to measure the attitude of both genders in the study. Thus, the researchers of interventional studies are recommended to provide honest information about advantages and disadvantages of the transgenic food products in order to assess the impact of intervention on people's attitudes.

Conclusion

The findings of this study revealed the housewives' negative attitude towards transgenic food products. Less educated people and those who do not read the food labels have misconceptions about the transgenic foods. So, culture promotion and scientifically proven training should be provided with respect to the merits and demerits of transgenic food products to form the right attitude among housewives in Yazd.

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Authors' contributions

Marzban A designed the study and revised the content, scientific writing, discussion, and conclusion. Karimi-Nazari E designed and conducted the study, wrote the draft and discussion. Farrokhian A analyzed the data and interpreted the methods and results. Farrokhian A contributed in conducting the study. All authors reviewed the article and confirmed it.

Conflicts of interest

The authors declare that they do not have any conflict of interest.

References

Amal Bakr S & Lukman Ayinde O 2013. Awareness of GM food proliferation in Saudi Arabia: A case study of Makkah city. *Journal of the association of Arab Universities for basic and applied sciences.* **13 (1)**: 8-13.

Bornhorst GM 2017. Gastric mixing during food digestion: mechanisms and applications. *Annual review of food science and technology.* **8 (28)**: 523-542.

Burns M, Shanahan D, Valdivia H & Harris N 2003. Quantitative event-specific multiplex PCR detection of Roundup Ready soya using LabChip technology. *European food research and technology*. **216 (5)**: 428-433.

Cui K & Shoemaker SP 2018. Public perception of genetically-modified (GM) food: A Nationwide Chinese Consumer Study. *npj science of food.* **2 (1)**: 10-19.

Eslami H, Marzban A, AkramiMohajeri F, Rezaei Z & Rafati Fard M 2015. Students' knowledge and attitude of hygiene and food safety at Shahid Sadoughi University of Medical Sciences in Yazd, Iran. *Journal of community health research.* **4 (3)**: 159-167.

Ganian M, Mehrabgochani O & Darani M 2016. A review of experts' views on the necessity of Iranian transgenic rice to enter the country's agricultural and food cycle. *Quarterly journal of agricultural extension and education.* **36 (4)**: 1-12.

Ghasemi S, Karami E & Azadi H 2013. Knowledge, attitudes and behavioral intentions of agricultural professionals toward genetically modified (GM) foods: A case study in Southwest Iran. *Science and engineering ethics.* **19 (3)**: 1201-1227.

Giasvand F, Mirokzade AA & Shiri N 2015. Factors Affecting Consumer Attitudes to Transgenic Food Products (Case study: Qazvin city). *Iranian agricultural economics and development research.* **46 (3)**: 427-438 (Persian).

Hall C 2008. Identifying farmer attitudes towards genetically modified (GM) crops in Scotland: are they pro-or anti-GM? *Geoforum.* **39 (1)**: 204-212.

Huang J, Peng B & Wang X 2017a. Scientists' attitudes toward agricultural GM technology development and GM food in China. *China agricultural economic review.* **9 (3)**: 369-384.

Huang J, Wang X & Dang H 2017b. Impacts of and attitudes toward GM technology in China: Challenges, policy and research implications. *China agricultural economic review.* **9 (3)**: 334-339.

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[DOR: 20.1001.1.24767417.2020.5.2.3.0]

[DOI: 10.18502/jnfs.v5i2.2800]

Kaya IH, Poyrazoglu ES, Artik N & Konar N 2013. Academicans' Perceptions and Attitudes toward GM-Organisms and–Foods. *International journal of biological, ecological and environmental sciences.* **2 (2)**: 20-24.

Kline KL, et al. 2017. Reconciling food security and bioenergy: priorities for action. *Gcb Bioenergy*. **9 (3)**: 557-576.

López Montesinos OA, Pérez EF, Fuentes EES, Luna-Espinoza I & Cuevas FA 2016. Perceptions and attitudes of the Mexican urban population towards genetically modified organisms. *British food journal.* **118 (12)**: 2873-2892.

Marzban A, Barzegaran M, Delavari S, Marzban H & Rahmanian V 2018. Attitudes and Behaviors of People in Bandar-Abbas City About Herbal Medicine Consumption in Diabetes. *Iranian journal of diabetes and metabolism.* **17 (6)**: 300-306.

Marzban A, Rezaei Z, Karkhane M, Marzban H & Eslami H 2017. Surveying the knowledge, attitude and performance of lactating women of Yazd city about heavy metals transmitted from breast milk. *HOZAN; a scientific journal of environmental sciences.* **2 (2)**: 1-10.

Mataia A, et al. 2003. Public knowledge, attitude and perception on rice biotechnology research in the Philippines. *Unpublished.* **1 (21)**: 845-856.

Neri-Numa IA, Pessoa MG, Paulino BN & Pastore GM 2017. Genipin: A natural blue pigment for food and health purposes. *Trends in food science & technology*. **1 (67)**: 271-279.

Nourizadeh M, Kalantari E & Habiba S 2018. Modeling Of Tehran Residents Attitude To GMFs Using Structural Equations. *Science and technology policy*. **9 (4)**: 71-82.

Rezaee H, et al. 2018. The impact of education on knowledge, attitude and practice about Food Poisoning in students of Shahid Sadoughi University of Medical Sciences, Yazd. Iran. *Tolooebehdasht*. **17 (3)**: 39-51 (Persian).

Rodriguez L & Kulpavaropas S 2018. Factors Influencing US Consumers' Preference for Positively Versus Negatively Framed GM Food Symbols. *Journal of agricultural & food information.* **19 (1)**: 75-96.

Tas M, Balci M, Yüksel A & Sahin Yesilçubuk N 2015. Consumer awareness, perception and attitudes towards genetically modified foods in Turkey. *British food journal.* **117 (5)**: 1426-1439.

Valente M & Chaves C 2018. Perceptions and valuation of GM food: A study on the impact and importance of information provision. *Journal of cleaner production.* **20 (172)**: 4110-4118.

Wunderlich S & Gatto KA 2015. Consumer Perception of Genetically Modified Organisms and Sources of Information–. *Advances in nutrition.* **6 (6)**: 842-851.

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[DOR: 20.1001.1.24767417.2020.5.2.3.0]

[DOI: 10.18502/jnfs.v5i2.2800]