

# Evaluation of the knowledge level of health violations in food production, distribution, sales centers and public places and their authorities investigating among the women of Bushehr city

Hamidreza Rassafiani, Mahtab Ghazanfari<sup>1</sup>, Masoumeh Ravanipour<sup>1</sup>, Niloofar Motamed<sup>2</sup>, Maryam Ravanipour<sup>3</sup>, Dariush Ranjbar Vakilabadi<sup>1</sup>, Sedigheh Zare<sup>1</sup>

Department of Educational Health, <sup>1</sup>Department of Environmental Health Engineering, School of Health, <sup>2</sup>Department of Community Medicine, School of Medicine, <sup>3</sup>The Persian Gulf Tropical Medicine Research Center, Bushehr University of Medical Sciences, Bushehr, Iran

## ABSTRACT

**Background:** Women and mothers are the most important educational audience to convey health teachings. This study was aimed to evaluate the knowledge level of different types of health violations of food production, distribution, sale centers and public places; and authorities investigating the violations among women referring to health care centers in Bushehr.

**Materials and Methods:** In this descriptive-analytical study, which was done cross-sectionally, 600 women who were referred to health care centers affiliated to the Bushehr University of Medical Sciences was selected by convenience sampling. Two-part questionnaire was used to collect data: demographic information and a researcher-designed knowledge survey questionnaire consisted of 25 questions with Cronbach's alpha = 0.7. Data were analyzed with the software SPSS version 13; using Chi-square test and Phi and Cramer test.  $P \leq 0.05$  was considered to be statistically significant. **Results:** The findings showed that 56.9% and 26.5% of women had good and moderate knowledge levels regarding health violations, while the general knowledge level of authorities investigating health violations were at the moderate level among 57.3% and at the good level among 15.3% of women. Overall, there was a significant relationship between education level and the women's knowledge level of health violations ( $P < 0.0001$ ). The relationship between the women's education level and authorities investigating health violations was not significant ( $P = 0.073$ ). **Conclusion:** Applying interventional methods of education in health violations to the women by health centers can elevate the level of health knowledge among them.

**Key words:** Environmental health, food contamination, health violations, knowledge, women

## INTRODUCTION

The preservation of health and freedom from pain and suffering caused by diseases has been one of the most important issues

**Address for correspondence:** Dr. Masoumeh Ravanipour, Department of Environmental Health Engineering, Faculty of Health, Bushehr University of Medical Sciences, P.O. Box 7518759577, Rishahr Street, Bushehr, Iran.  
E-mail: m.ravanipour@bpums.ac.ir

that have always occupied the human mind since ancient times.<sup>[1]</sup> A healthy environment includes clean water, healthy food, clean air, and proper disposal of sewage and garbage. The means of maintaining health include food safety, control and supervision of food production, distribution and sales centers, and public places in terms of health issues problems that, in turn, have a special significance;<sup>[2]</sup> and lack of attention to

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**This article may be cited as:** Rassafiani H, Ghazanfari M, Ravanipour M, Motamed N, Ravanipour M, Vakilabadi DR, et al. Evaluation of the knowledge level of health violations in food production, distribution, sales centers and public places and their authorities investigating among the women of Bushehr city. J Edu Health Promot 2016;5:11.

### Access this article online

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DOI:  
10.4103/2277-9531.184551

its hygiene standards can be considered as a health violation. Usually, this objective can be achieved by regulatory forces that are active in medical universities (environmental health inspectors) and have the required scientific and practical abilities; and at the same time, they have the legal instruments and administrative facilities necessary to support and attract proper supports of relevant organizations.<sup>[3]</sup>

Food contamination and spoilage caused by negligence, jobbery, fraud, and noncompliance with health regulations have annually caused the illness and death of thousands of people around the world which, besides the physical damages, causes enormous economic damages to communities. Over the past 20 years, these economic losses are nearly 1–1.2 billion dollars, which show the importance of food security.<sup>[2]</sup> Nowadays, with the development of urbanization and enlargement of production, distribution and sales centers of Edible, Potable, Cosmetic and Hygienic Materials, types of fraud have been expanded in different fields of food production and distribution, for various reasons such as ethical issues, social living conditions and similar cases, which are considered as part of the health violations of these centers. Other types of health violations of food production, distribution and sales centers and public places are defined according to the executive bylaw of the amendment of Article 13 of the Law on Edible, Potable, Cosmetic and Hygienic Materials enacted by the Islamic Consultative Assembly and the Ministry of Health of Iran, which is related to the violation of personal hygiene, building sanitation and hygiene of work equipment and supplies.<sup>[4]</sup>

The general administration of justice in each province is the judicial authority investigating the violations for which, depending on the type, cases will be formed in the Dispute Resolution Councils and the Governmental Discretionary Punishments Organization affiliated with it, and natural and legal penalties for such violators is investigated according to the rules and standards of the country.<sup>[5,6]</sup> In this regard, according to law, different organizations are the authority to recognize and refer violators to the judicial authorities that are responsible for health violations reported by the universities of medical sciences (Ministry of Health and Medical Education)-environmental health inspectors and inspectors of the Food Monitoring Office.<sup>[4]</sup>

In almost all societies, women are responsible for a significant role in the food chain, especially in the procurement, preparation and cooking.<sup>[7]</sup> According to experts, a community will be at the desirable standard of hygiene and health when the women in the community are well aware of the hygiene and health information and are sensitive to the care and preventive measures.<sup>[8]</sup> Women play a major role in family health because they are responsible for their own health as well as the health of their husbands and children. Women and mothers also are the most important educational audience of the Ministry of Health to convey health teachings.<sup>[9]</sup> Hence, women had been the majority of respondents in similar studies aimed to assess the knowledge, attitude, and practice of patients referring to health care centers or consumers' knowledge of food safety.<sup>[10-12]</sup>

Effective teaching can change the behavior of a learner from three aspects of knowledge, attitude, and skills.<sup>[13]</sup> A person's knowledge and attitude regarding an issue can affect his/her behavior and practice.<sup>[14]</sup> Usually in the knowledge survey research, a researcher seeks to assess the existing knowledge of the individuals under study in a particular area, because knowledge will be effective in increasing the information of the people in that particular field when it is based on the realities of society and the actual knowledge levels of the people.<sup>[11]</sup> A review of studies on knowledge survey in diverse fields of health and medicine showed that the following are less than expected or need to develop additional training programs in the areas of research: rural women's knowledge of folic acid and its use among women,<sup>[15]</sup> knowledge of the Pap-Smear test among women 15 to 49 years of age in Yazd,<sup>[16]</sup> the literacy rate of women in a study examining feeding knowledge, belief and behavior among urban women with middle and low education regarding food materials,<sup>[17]</sup> and consumers' awareness of food safety from shopping to eating.<sup>[12]</sup> A study on nutrition and food hygiene knowledge (which was performed on female teachers in Ferdous at two stages of before and after intervention (training)) showed the increased awareness of teachers can also affect the promotion of health among school students.<sup>[18]</sup> A review of knowledge surveys on employment rules and regulations in Ireland also showed that 78% of the chefs under study stated that they are unaware of state laws on food safety.<sup>[19]</sup> In another study, the knowledge level of midwives working in midwifery offices, hospitals and clinics regarding Islamic punishment laws was at weak level;<sup>[20]</sup> and in the study of Hosseini *et al.*, midwives' awareness of the law and drug use in midwifery was obtained to be 62.4% at the good level.<sup>[21]</sup> A study on the effect of applying Article 13 of the Law on Edible, Potable, Cosmetic and Hygienic Materials on health indicators of different restaurants of Torghabeh in 2011, which have been referred to judicial authorities because of health violations, also showed that the health indicator of the workers in restaurants has dropped before and after the application of the law for reasons such as frequent changes of personnel, nonnormative selection of employees and their ignorance of the principles of food hygiene.<sup>[22]</sup> According to results of the above studies, all of which have somehow emphasized the need for information on the target group's level of knowledge in order to apply to medical interventions, and given the importance of the women's knowledge of health violations and their role in health promotion and health literacy of the community, and since based on the search of the literature by the authors, it seems that such a study has been not done in the country, we intended to perform a study with the aim of determining the Knowledge Level of Women Referring to Health Care Centers in Bushehr regarding Different Types of Health Violations of Food Production, Distribution and Sales Centers and Public Places and Authorities Investigating the violations in 2012.

## MATERIALS AND METHODS

This research is a descriptive analytical study that was cross-sectionally performed to determine the knowledge

level of health violations of food production, distribution and sales centers and public places and authorities investigating them among the women of Bushehr city in the autumn of 2012. The study populations were women aged 15 years and older who were residents of Bushehr city and were referred to health care centers affiliated with the Bushehr University of Medical Sciences. Considering the level of confidence of 95% and the relative accuracy of 10%, and assuming that 40% of women have appropriate information (knowledge) based on our usual practice, 576 samples were determined using the formula for determining sample size, and finally, questionnaires were distributed to 600 people. Considering that there are 14 urban health care centers in the city of Bushehr, the samples of each center was determined by proportional method according to the number of women who get their health services or had a family health record in those health care centers. The samples were selected from this group by convenience sampling. In a way that every woman who referred to each health care center in the morning work time, for maternal/child health services, or dental care services and etc., in the case of willingness to participate in our study based on inclusion criteria, were considered as the study samples. Two-part questionnaire was used to collect data: the first part contained demographic information (age, marital status, education, employment status, and the frequency of their referral to food production and distribution centers and public places), and the second part consisted of 25 knowledge survey questions (19 questions related to health violations and 6 questions related to the investigating authorities). In the health violation section, there were 4 domains: personal hygiene of workers (having medical examination card, compliance with hygienic wear uniform, respect to hygiene in getting and give back the money, etc.), hygiene of the buildings (considering the hygienic principles of wall and roof, unsanitary wastewater disposal around the shopping centers, etc.), hygiene of the equipment (unhealthy cover for packing sandwiches, unhealthy meat and poultry transportation, the frequency of changing bed sheets in hotels, etc.), and food fraud (adding soil to bean and cereals, use of simulated food like broad bean instead of pistachio, etc.). Questions were designed as close-ended to choose the correct answer from four options. Data were collected through questionnaires distributed among women that were referred to health care centers and were eligible for the features of the project. Since based on surveys conducted by the researchers, no similar study has been already done, the relevant questions were prepared using the literature and a self-administered questionnaire was designed. Then, the validity was calculated after obtaining the opinion of several university professors, as well as environmental health professionals working at managerial and executive levels of health care centers in the province. The reliability of this questionnaire was calculated on the data of the study as 70% with Cronbach's alpha co-efficiency. Then, with referring the questioners to each health care center, each participated woman started to answer the questionnaire in a predetermined location in each health care centers.

The average time for completing each questionnaire was about 20 min. The data were analyzed by the software SPSS version 13 [SPSS Inc., Chicago] and finally, the results were expressed as frequencies, percentages (%), rank, and relative mean. Considering the score obtained out of the entire score (percentage of correct answering questions), the knowledge levels of women participating in the study were divided into three groups: Good (percentage of correct answering > % 70), moderate (%50–70) and weak (percentage of correct answering < %50).

In the section of inferential statistics, the Chi-square test was used to test the hypotheses. At all stages of data analysis, ( $P < 0.05$ ) was considered as the criterion for significance of the test.

To address take account ethical considerations, after the project objectives were stated for the officials of health care centers in the city and province of Bushehr, permission to entry these centers and conduct research was received, and at the end of the study, the results were also provided for the officials. In addition, the objectives of the study were explained to the participants in the study and informed consent was obtained from participants upon the agreement to participate in research.

## RESULTS

Totally, 49 out of 600 completed questionnaires were excluded from the study because of incomplete data, and the analysis of data was performed on a total of 551 women participated in the study, of whom 475 people were married (86.2%). The minimum age and maximum age of women participating in the study were 15 and 52 years, respectively, with an average age of 29.31 years (standard deviation: 7.26). A review of the women's general knowledge level of health violations of food production and distribution centers and public places revealed that 56.9% and 26.5% of women have a good knowledge level and a moderate knowledge level, respectively, while the women's general knowledge level of authorities investigating health violations are 15.3% at the good level and 57.3% at the moderate level. In such a way that the knowledge level in the personal hygiene of worker's domain was 65.36%, in hygiene of building domain was 67.8%, in hygiene of instruments' domain was 62.96% and in food frauds' domain was 80.3% [details of each domain is in Table 1]. In addition, the results showed that women with an under diploma degree had a weaker knowledge level of health violations of the centers and places, and the percentage of people with weak knowledge level decreased with the increase of education level. The highest percentage of the women with good knowledge level of health violations was obtained for women with a bachelor's degree (74.3%). Evaluation of the education level on the women's knowledge of authorities investigating health violations indicated that women do not have good information in this regard and that their knowledge level is mostly at the moderate level and then the weak level in that order. The highest percentage of women

with good knowledge level of authorities investigating health violations included women with a bachelor's degree (21.2%); and women with an associate degree and a bachelor's degree had the highest percentage at the moderate level of knowledge (64.7% and 60.2%, respectively). In general, there is a significant relationship between education level and the women's knowledge level of health violations ( $P < 0.0001$ ), while the relationship between the women's education level and authorities investigating health violations was not significant ( $P < 0.073$ ) [Tables 2 and 3].

**Table 1: Minimum and maximum percentage between items in each domain**

Domain	The least percentage of correct answering (question)	The most percentage of correct answering (question)
Personal hygiene of workers	44.5% (the forbiddance of traditional wearing for catering sector workers)	81.9% (the wearing hat, gloves, and gown while working with food materials)
Hygiene of the buildings	49.8% (considering the hygienic principles of wall and roof)	85.8% (unsanitary wastewater disposal around the shopping centers)
Hygiene of the equipment	16.8% (frequency of changing bed sheets in hotels)	82.1% (unhealthy cover for packing sandwiches)
Food fraud	69.5% (use of simulated food like broad bean instead of real food)	91.3% (considering food fraud as a healthy violation)

In addition, the results showed that increasing the frequency of referral to food production, distribution and sales centers, and public places (once a day compared to once a year) has had no effect on the women's knowledge level of health violations. Thus, in each referral to the centers, the number of people with weak, moderate and good knowledge levels has increased in that order, and this is true even among people who have not ever referred to these centers and places. Accordingly, no significant relationship was found between women's frequency of referrals to these centers and their knowledge level of health violations and/or centers investigating them ( $P < 0.499$  and  $P < 0.94$ , respectively) [Tables 2 and 3].

A review of the relationship between the women's knowledge level of health violations and authorities investigating them and women age showed that the majority of women in the two age groups of below 30 years or above 30 years had a good knowledge level of health violations, while their knowledge level of authorities investigating health violations is at the moderate level for both the age groups. Overall, there is no statistically significant relationship between women's age of and their knowledge level of health violations and the centers investigating them ( $P < 0.057$  and  $P < 0.269$ , respectively) [Tables 2 and 3]. The intensity of the relationship between the variables and the women's level of knowledge is obtained by Phi and Cramer's index [Table 4]. Since the variable of education level only had a significant relationship with the women's

**Table 2: Frequency distribution for the knowledge level of women in Bushehr city regarding the health violations of food production, distribution and sales centers and public places in terms of demographic characteristics, and results of Chi-square test and Phi and Cramer test about the relationship and the severity of its impact on the variables\***

Variable	Knowledge level of health violations <i>n</i> (%)				The severity and the relationship between variables					
	Weak	Moderate	Good	Total	Chi-square	Degree of freedom	Significance level	Phi level	Cramer's level	Intensity of relationship
Education level										
Under diploma	30 (26.8)	44 (39.3)	38 (33.9)	112	-	-	-	-	-	-
Diploma	38 (16.5)	63 (27.4)	129 (56.1)	230	-	-	-	-	-	-
Associate degree	12 (14.1)	17 (20)	56 (65.9)	85	-	-	-	-	-	-
Bachelor	11 (9.7)	18 (15.9)	84 (74.3)	113	-	-	-	-	-	-
Master's degree or higher	0 (0)	3 (37.5)	5 (62.5)	8	-	-	-	-	-	-
Total	91 (16.6)	145 (26.5)	312 (56.9)	548	43.02	8	0.0001	0.28	0.198	Relatively moderate
Frequency of referral										
Daily	36 (17.6)	45 (22)	124 (60.4)	205	-	-	-	-	-	-
Once a week	29 (14.2)	55 (27)	120 (58.8)	204	-	-	-	-	-	-
Monthly	14 (15.4)	29 (31.9)	48 (52.7)	91	-	-	-	-	-	-
Once a year	5 (26.4)	7 (36.8)	7 (36.8)	19	-	-	-	-	-	-
Has not ever referred	6 (20)	10 (33.3)	14 (46.7)	30	-	-	-	-	-	-
Total	90 (16.4)	146 (26.6)	313 (57)	549	1.39	8	0.499	-	-	-
Age										
<30 years	63 (19.1)	91 (27.7)	175 (53.2)	329	-	-	-	-	-	-
Above 30 years	28 (12.7)	55 (24.9)	138 (62.4)	221	-	-	-	-	-	-
Total	91 (16.5)	146 (26.5)	313 (56.9)	550	5.726	2	0.057	-	-	-

\*The frequency difference and nonequality of their sum (=551 people) are due to the fact that age, education, or frequency of referral to the centers has been not reported by some women



**Table 3: Frequency distribution for the knowledge level of women in Bushehr city regarding the authorities investigating health violations of food production, distribution and sales centers and public places in terms of demographic characteristics, and results of Chi-square test and Phi and Cramer test about the relationship and the severity of its impact on the variables\***

Variable	Knowledge level of authorities investigating health violations n (%)				The severity and the relationship between variables					
	Weak	Moderate	Good	Total	Chi-square	Degree of freedom	Significance level	Phi level	Cramer's level	Intensity of relationship
Education level										
Under diploma	37 (33)	62 (55.4)	13 (11.6)	112	-	-	-	-	-	-
Diploma	70 (30.4)	125 (54.3)	35 (15.2)	230	-	-	-	-	-	-
Associate degree	18 (12.2)	55 (64.7)	12 (14.1)	85	-	-	-	-	-	-
Bachelor	21 (18.6)	68 (60.2)	24 (21.2)	113	-	-	-	-	-	-
Master's degree or higher	4 (50)	4 (50)	0 (0)	8	-	-	-	-	-	-
Total	150 (27.4)	314 (57.3)	84 (15.3)	548	14.35	8	0.073	-	-	-
Frequency of referral										
Daily	61 (29.8)	114 (55.6)	30 (14.6)	205	-	-	-	-	-	-
Once a week	56 (27.5)	119 (58.3)	29 (14.2)	204	-	-	-	-	-	-
Monthly	16 (17.6)	56 (61.5)	19 (20.9)	91	-	-	-	-	-	-
Once a year	9 (47.4)	8 (42.1)	2 (10.5)	19	-	-	-	-	-	-
Has not ever referred	8 (26.7)	18 (60)	4 (13.3)	30	-	-	-	-	-	-
Total	150 (27.3)	315 (57.4)	84 (15.3)	549	0.123	2	0.94	-	-	-
Age										
<30 years	98 (29.8)	183 (55.6)	48 (14.6)	329	-	-	-	-	-	-
Above 30 years	52 (23.5)	133 (60.2)	36 (16.3)	221	-	-	-	-	-	-
Total	150 (27.3)	316 (57.5)	84 (15.3)	550	2.262	2	0.269	-	-	-

\*The frequency difference and nonequality of their sum (=551 people) are due to the fact that age, education, or frequency of referral to the centers has been not reported by some women

**Table 4: The values determined for the intensity of the relationship based on Phi and Cramer's test**

Very weak	Weak	Relatively moderate	Moderate	Relatively strong	Strong	Very strong
0.1	0.2	0.3	0.4	0.5	0.6	0.7 and higher

knowledge level of health violations, Phi index showed the intensity of this relationship to be at a relatively moderate level (Phi = 0.28).

## DISCUSSION

The women's knowledge was at a good level for health violations of food production, distribution, and sales centers and at a moderate level for authorities investigating health violations. There was no significant relationship for the woman's age and their frequency of referral to food production, distribution, and sales centers; but the education level had a significant positive relationship with the women's level of knowledge. Age, education level, and occupation are the common factors that can affect the evaluation of the proposed training program.<sup>[23]</sup>

As mentioned above, women's knowledge to health violations of food production, distribution and sales centers and public places was good. Our findings are consistent with a study entitled "Assessment of Knowledge and Practice of Women Referring to Torab Health care center (Region 3 of Tehran)

regarding the Importance of Fish Consumption and its Influencing Factors," which was performed with a descriptive analytical method on 100 women referring to the health care center in the summer of 2004 using the knowledge and practice questionnaire through interviews, showed that regarding the importance of fish consumption, 48%, 44% and 8% of women have a good knowledge, moderate knowledge and weak knowledge, respectively.<sup>[24]</sup> In our study, knowledge of women referring to health care centers regarding health violations of food production and distribution centers and public places was nearly half at the good level, approximately a quarter at the moderate level, and slight at the weak level, so that a total of 83.3% of the women in this study had a knowledge level of >50% (moderate and good) regarding health violations, which is 43.3% more than the hypothesis of the present study.

The women's awareness in the domain of food fraud was at a good level, and in three other domains were moderate level. It is perhaps happened due to most media attention and training provided at the community level in the field of health and violations of food compare to the building hygiene, hygiene of the instrument and the personal hygiene of food production, distribution and sales centers, and public places, although it needs much more detailed studies in future. Moreover, sex is probably also a factor affecting in increasing the awareness of food fraud that could be caused by most responsibility of women in buying and cooking food in the house. However, a deeper analysis is needed.

Consistent with our findings, a study which was conducted on awareness of women in Kermanshah about iodized salt, the largest source of information was mentioned broadcasting.<sup>[25]</sup> Also Ghasemi *et al.* reported that the knowledge of mothers referred to health centers in Khorramabad on preventing food poisoning in 2004 showed that providing training has been affected through courses in schools, mass media, the press, and health centers. They are also recommended for mothers who are directly responsible for providing food for the family, should be aware of food poisoning symptoms and methods of food hygiene.<sup>[26]</sup>

As mentioned above, women's knowledge from the investigating authorities of food production, distribution and sales centers, and public places was moderate. Few studies have been performed to measure knowledge regarding the employment rules and regulations, as well as legal affairs among different health care sectors in the country. Haji Foghaha and Keshavarz provided a comparison of the knowledge levels of midwives working in Shiraz's midwifery offices, hospitals and clinics regarding Islamic punishment laws related to those in the health professions in 2007. This study analyzed the awareness of 157 midwives working in midwifery offices, hospitals and clinics regarding Islamic punishment laws related to those in the health professions. The results showed that the average general knowledge of midwives working in midwifery offices, hospitals, and clinics regarding Islamic punishment laws related to those in the health professions was at weak level; but the average knowledge of midwives working in midwifery offices was lower than that of midwives working in hospitals and clinics.<sup>[21]</sup> The study of Shah-Hosseini *et al.* in 2005 on the midwives' knowledge level of law and drug use in midwifery, which was performed on 140 midwives in private and public centers in Mazandaran, showed that 62.4%, 35%, and 0.8%, of midwives have good knowledge (scores between 41 and 55), moderate knowledge (scores between 21 and 40), and weak knowledge (scores <20).<sup>[21]</sup> In the present study, the knowledge of women referring to health care centers regarding authorities investigating health violations in food production and distribution centers and public places was at good level in a little, at moderate level in about half, and at weak level in about a quarter. Thus, a total of 72.6% of the studied women had moderate and good knowledge levels of authorities investigating health violations, which is, therefore, desirable; and thus, it does not confirm another hypothesis of the study, in which the women's knowledge level of authorities investigating health violations is assumed to be <50% at the good and moderate levels. Another study was performed by Yaghoubi *et al.* on the effect of applying Article 13 of the Law on Edible, Potable, Cosmetic and Hygienic Materials on health indicators of the offending restaurants in Torghabeh-Shandiz city in 2011. In this study, the restaurants that were referred to the judicial authorities in the city of Torghabeh-Shandiz, located in the province of Khorasan Razavi, due to health violations under Article 13 during the years of 2010 and 2011 (54 restaurants), were compared at the two stages of before and after the law intervention. The results showed that those indicators that are associated with

the health habits of individuals not only had no significant differences at the later stages of the application of the law, but also the rate of decline in indices has been greater than the rate of improvement.<sup>[22]</sup> In the present study, in total, the women's knowledge level of authorities investigating health violations was at moderate level, and only about a quarter of the women reported at least one health violation to the investigating authorities. In addition, about half of the women believed that the health center is the authority investigating health violations of food production, distribution and sales centers, and public places.

Regarding to the relationship between demographic data and the knowledge in two sections (health violations and investigating authorities), it should be mentioned that the education level of individuals has been evaluated as a variable affecting the knowledge level of subjects in several studies.<sup>[15-17,19,24,27]</sup> A study that was performed on the awareness of 723 pregnant women living in rural areas of Golestan province regarding folic acid and its consumption in 2012 showed a significant relationship between folic acid consumption before pregnancy and the women's educational levels (high school and university) ( $P < 0.001$ ),<sup>[15]</sup> which confirms a significant relationship between education level and awareness level of the women regarding health violations in the present study. However, some studies have also shown significant differences in the education level and the knowledge level, including a study performed to assess the knowledge, attitude, and practice of married women aged 15 to 49 years in Yazd regarding Pap-Smear tests, or a comparative study of the knowledge and attitude levels of pregnant women exposed to cigarette smoke and their spouses regarding the effects of smoking in patients referring to health care centers in the city of Ardabil,<sup>[16,27]</sup> which both confirm the results of the present study, according to which there are significant differences in the women's knowledge level of authorities investigating health violations and their education level. Although the results of the present study showed that frequency of daily, weekly, monthly or yearly referral to food production, distribution and sales centers, and public places has no significant relationship with the women's knowledge level of health violations and authorities investigating them, it seems that women can be considered as a suitable core for receiving health education about food production, distribution and sales centers and public places in households, due to their high rate of referral to these centers and places (daily and weekly referrals of 37.3% and 37.2%, respectively) [Tables 2 and 3]. A comparative study that was performed on the knowledge and attitudes of pregnant women exposed to cigarette smoke and their spouses regarding the effects of smoking in patients referring to health care centers showed that age and regular visits to health care centers has a significant effect on the women's knowledge level,<sup>[27]</sup> which was inconsistent with the results of our study, while the study of Bolton *et al.*, which was performed to determine the level of food security in chefs and managers (70% men and 30% women) of 200 catering division (in independent restaurants and hotel restaurants) in Ireland to develop the intended objectives, confirms the results of the present study about the

variable of age. It showed that the chefs' health knowledge level has no significant relationship with age, the amount of their information about the rules and regulations, and even their prior education, the number of their clients per week, their information about bacteria and finally about Hazard Analysis Critical Control Point. Furthermore, in this study, health education and information culinary etiquette showed that 78% of the chefs said that they were unaware of state laws related to food safety. As for the health education, however, 35% and 45% of the chefs had valid certificate and diploma in food hygiene, respectively, while 20% had not received any formal training in food hygiene.<sup>[19]</sup> According to law and in accordance with Article 1 of the executive by law of the amendment of Article 13 of the Law on Edible, Potable, Cosmetic and Hygienic Materials, all operators and employees of production, distribution and sales centers of food and hygiene products are obligated to complete courses in public health, whose term and specifications are determined by the Ministry of Health and Medical Education, and the universities of medical sciences are responsible for the supervision of the specific courses that are taught in health institutions of trade unions.<sup>[4]</sup> A study on the efficacy of the trade unions' institutions on the health knowledge level of operators and employees of food production, distribution and sales centers in the city of Yazd showed that before and after intervention (training), the individuals' awareness levels decreased with increasing age and experience, but with the increase of the education level, knowledge, and practice levels have increased significantly.<sup>[2]</sup> The results of the present study also showed that age of women in the two age groups of below 30 years and above 30 years has no significant relationship with their knowledge of health violations and their knowledge of authorities investigating health violations, which it is consistent with the result of Mazaheri's study,<sup>[27]</sup> and is contrary to the studies of Bolton *et al.*<sup>[19]</sup> and Haghighi and Toyeserkani<sup>[24]</sup> about the relationship between age and knowledge level.

## CONCLUSIONS

As adequate health literacy about medicine and especially diseases can have even more important role in the secondary prevention of diseases,<sup>[28]</sup> health literacy on health violations in a community can also play a fundamental role in the recognition and prevention of violations and consequently diseases and epidemics. If the people are familiar with the health and legal issues governing food production, distribution and sales centers, and public places, they can act as the health inspector who is aware of the healthcare legislation in the community, recognize many cases of violation that are committed by the above guilds in the absence of environmental health inspectors, and immediately report it to the authorities investigating health violations. In the present study, the women's general knowledge level of authorities investigating health violations was less than the women's level of knowledge of health violations, but it still found more than expected in this study, which can be basic information useful for planning training activities by health authorities in the community. However, there

is always the need to educate and prepare the grounds for the application of women's knowledge and increase the sensitivity of the community, especially women to current regulations on health violations. In our study, location chosen for the subjects was health care centers in the city of Bushehr, and due to the fact that certain people refer to such centers because of the need, obviously, the studied women cannot be indicative of women in Bushehr, and this was one of the limitations of this study. Since in this study, the education level showed a significant relationship with the women's knowledge level of health violations, for a more effective influence, such training is recommended to be done in different manner in the community of women, given their education level.

## Acknowledgments

The authors would like to express their gratitude to the Deputy of Research of the Bushehr University of Medical Sciences for funding this research project that was approved by the University as well as the supervisor and employees of Bushehr Health Center and affiliated health care centers for their sincere cooperation in this project.

## Financial support and sponsorship

The research was approved by the Ethics Committee of Bushehr University of Medical Sciences, Iran.

## Conflicts of interest

There are no conflicts of interest.

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