Relationship between health literacy and fast food consumption: A population-based study from southern Iran

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Abstract

Background Having appropriate health literacy may affect the consumption of fast food. We aimed to evaluate the effect of health literacy on fast food consumption among the general population. **Methods** We evaluated health literacy and fast food consumption using an appropriate questionnaire in 421 adult participants with the age range of 18-65 years old in Fasa city, Fars Province, southern Iran. Two-step cluster sampling and, then, systematic sampling were performed. Data collection was done through demographic information questionnaire, checklist on fast food consumption, and the Health Literacy for Iranian Adults (HELIA) questionnaire. Data were harvested by face-to-face conversations. Population data across groups with/without fast food intake were compared. **Results** Most of our participants used fast food every few months (49.9%). People with low or unstable income consumed more fast food than others ($P < 0.05$). Sandwich and hotdog were the most consumed fast food (60.8%) and pizza was in the next step (34.9%). Sausage and soda were the most seasoning food (66.7%). Most of our participants used fast food as dinner (67.9%) and along with their family (72.2%), suggesting the institutionalized consumption of this type of food in the family. Fun was the most frequent reason for the use of fast food (66.5%). Most of the participants completely knew about the raw materials for fast food and their adverse effects. Finally, we found that health literacy among those who used fast food was less than those who did not consumed fast food. This difference was also observed in the subscales of reading skills, critique, and decision-making. **Conclusion** Differences in health literacy and its components may affect fast food consumption. In addition, there was a negative relationship between health literacy and fast food consumption, which was also observed in reading skills, critique, and decision-making.

Introduction

To increase the health quality of the public, governments seek to find causes related to the patients' health such as health literacy (1). Health literacy is the ability to acquire, process, and conceive basic health-related information and services (2). Based on the definition provided by World Health Organization (WHO), health literacy is a complex of social and cognitive abilities to acquire, understand, and apply health-related information for health promotion (3). It has been confirmed that people with higher levels of health literacy have more information about their health status (4).

Fast food is defined as a convenience food purchased in self-service or carry-out eating venues without wait service (5). This kind of food can induce several health problems such as body weight gain. In this regard, most people do not know about the harmful effects of this type of food (6). Despite severe adverse health effects, fast food consumption has increased gradually due to the increase in the number of women workers, changes in the family structure, worldwide urbanization, long working hours, and rapid growth of fast food industries and restaurants (7). Nevertheless, the association between health literacy and fast food consumption is unclear. Given the lack of any investigations on the relationship between health literacy and fast food consumption, the present study was conducted to evaluate the effect of health literacy on the fast food consumption among the general populations of Fasa located in south of Iran in 2017.

Methods

Design

The present cross-sectional study (descriptive-analytic) was conducted in 2018 on the adult population (aged 18-65 years old) in Fasa, Fars Province, Southern Iran. Before initiating the study, it was approved by the Ethics Committee of Fasa University of Medical Sciences (IR.FUMS.REC.2017.255).

Sampling

The research population was selected from the age range of 18-65 years old. Other inclusion criteria were residence in Fasa during the research period, belonging to the family visited, and being literate (i.e. knowing how to read and write). The sample size was determined using Cochran's formula. Based on this formula, the required size was estimated at 384, which was then increased to 423 with the probability of 10% attrition.

The sampling method was stratified cluster sampling conducted in two steps. Since the population comprised those aged 18-65 years old residing in Fasa, clinics and health centers were considered as the cluster heads. In the first stage, by dividing the health centers, 11 regions (3 clinics and 8 health centers) were selected using stratified cluster sampling. In the next stage, systematic sampling was performed and, a list of households (as the basis for sampling) and the number of samples in each stratum were examined.

Instruments

1. Health literacy: The data collection instrument was the Health Literacy for Iranian Adults (HELIA), proposed by Montazeri et al. (8). The HELIA, measures five dimensions. "access" (items 1-6), "reading" (items 7-10), "understanding" (items 11-17), "appraisal" (18-21), and "decision-making/behavioral intention" (items 22-33). Scores on HELIA are classified into four categories: Inadequate and problematic (which together define "limited health literacy") and sufficient and excellent (which together define "desired health literacy"): 0-50: inadequate, 50.1-66: problematic, 66.1-84: sufficient, and 84.1-100 excellent. The reliability and validity of the different constructs of the questionnaire were confirmed by Cronbach's alpha (0.72 to 0.89). All items are scored positively, with 1 to 5 assigned to always, often, sometimes, rarely, and never, respectively, and 1 to 5 are allocated to very easy, easy, difficult, very difficult, and neither difficult nor easy, respectively (8).
2. Fast food consumption: A self-designed checklist was used to collect data on fast food intake. By fast food, we mean different sandwiches; hamburgers, cheeseburgers, and other burgers; fried fish and shrimp; hot dog; meat or chicken steak; French fries; fried chicken; tacos (a Mexican dish); pizzas; and snacks, which are usually prepared in restaurants and outside the home. If fast food was consumed at least once a month, the person was considered to be a user; otherwise, he/she was considered as a non-user. Finally, consuming fast food less than once a week was called "little use",

1-2 times a week was called “moderate use”, and more than twice a week was labeled as “excessive use” (9).

Data analysis

Data were expressed as mean, standard deviation (SD), frequency, and percentage. Population data across groups with/without fast food intake were compared using Chi-squared test. The HELIA score was compared across the groups using the Welch-corrected t-test. Moreover, the confidence interval and odds ratio were calculated using logistic regression. Multivariate logistic was incorporated to apply corrections based on the population variables. The significance level was <0.05 in all these tests. The data were analyzed in IBM SPSS 24 (IBM SPSS CO., Armonk, NY).

Results

In this study, 421 residents of Fasa were examined, of whom 294 were women (69.8%) and 127 were men (30.2%). Mean age of the participants was 37.3 ± 11.5 years old and their mean BMI was 25.1 ± 5.1 . Their demographic characteristics are presented in Table 1. Some of these variables were significantly correlated with fast food intake; e.g., fast food intake was higher in those with low income ($p = 0.005$) or unstable income ($p = 0.023$). Mean age of fast food consumers was 36.2 ± 11.9 years old and that of non-consumers was 38.3 ± 11.1 years old ($p = 0.056$).

Based on the findings, 49 persons (11.6%) had a membership card in fast food restaurants, indicating a tendency for the repeated intake of fast food in the future. Different types of sandwich and hot dog had the highest rate of intake (60.8%, $n=256$). This was followed by pizza ($n=147$, 34.9%) and other ready-made meals such as snacks, fried chicken, French fries, and other fried foods ($n=80$, 19.0%). Among fast foods, sandwiches (43.3%, $n=182$) and pizzas (27.1%, $n=114$) ranked the first and second in that order of their consumption. Steak ranked the least in the studied population (3.8%, $n=16$). Moreover, 249 people (82.9%) consumed sauces with fast food and 281 (66.7%) drank soft drinks with it.

Of all the studied individuals, 286 people (67.9%) had fast food for dinner, whereas 113 people (26.8%) had it for lunch. Also, 22 people (5.2%) had fast food for breakfast or supper. In addition, 304 people (72.2%) consumed fast food with their family, suggesting that the consumption of these foods is institutionalized in families. Also, 96 people (22.8%) had fast food with friends and 21 (5.0%) had it alone. The motivation for fast food was enjoyment and fun for 280 people (66.5%). Furthermore, 36 people (8.6%) had fast food owing to the ease of access and low price, and 116 (27.6%) consumed it because they were busy and had little time. The place of consumption was outside the house for 233 people (55.3%) and in the house for 188 people (44.7%). Also, 292 people (69.4%) were completely aware of the ingredients in the fast foods and 381 (90.5%) were aware of the harmful nature of these ingredients. Moreover, 321 (76.2%), 90 (21.4%), and 10 (2.4%) mentioned their priority factors in choosing such food as hygiene, diversity, and price, respectively. The cost of buying fast food was less than IRR 50,000 per week for 275 (65.3%) and more than IRR 100,000 per week for 40 (9.5%). The results showed that 16 people (3.8%) consumed fast food more than twice a week, 107 (25.4%) once or twice a week, 88

(20.9%) once or twice a month, and 210 (49.9%) less than once a month. Therefore, based on the definitions, 16 people (8.3%) were excessive users, 295 (70.8%) were low users, and the rest were moderate users. Findings of HELIA are presented in Table 2.

Table 3 compares the mean HELIA scores of consumers and non-consumers. Results revealed that mean HELIA was significantly lower in consumers (68.16 ± 23.85) than non-consumers (73.15 ± 20.15) ($p = 0.021$). The same was true about the subscales of reading, appraisal, and decision-making ($p < 0.001$, $p = 0.039$, and $p = 0.011$, respectively).

Also, based on Pearson's correlation, a significantly negative correlation existed between health literacy and fast food intake (i.e., multiple times a week, once or twice a week, once or twice a month, and less than once a month) ($r = -0.108$, $p = 0.026$). Higher health literacy correlated with a lower level of fast food intake, which was also true for the subscales of reading ($r = -0.176$, $p < 0.001$) and decision-making ($r = -0.115$, $p = 0.018$).

As noted before, the HELIA score is classified as inadequate, problematic, sufficient, and excellent. Logistic regression showed that by increasing the level of HELIA score compared to the group belonging to the inadequate level, the preventive effect of health literacy on fast food intake was also increased.

The odds of fast food intake in the groups with problematic, sufficient, and excellent health literacy was 0.693 times ($p = 0.253$), 0.616 times ($p = 0.076$), and 0.554 times ($p = 0.034$) compared to the group with inadequate literacy.

As already mentioned, the HELIA score was lower in the consumers than non-consumers. In other words, health literacy was a factor preventing the intake of fast food. Logistic regression analysis, in which fast food intake was the output variable, showed that per 1 score increase in health literacy, the odds of fast food intake was reduced by 0.990 with the CI of 0.981-0.998. However, this relationship must be corrected due to the existence of confounding variables. By removing the confounding variables one by one, this relationship still holds; even when all confounding variables are placed in the model, the preventive relationship of health literacy and fast food intake persists (OR = 0.990, 95%CI = 0.981-0.999) (Table 4).

In the previous analysis, reading, appraisal, and decision-making abilities had a preventive effect on fast food intake. The multivariate regression analysis showed that, after removing the effect of confounding variables, the ability of reading (R = 0.985, 95%CI = 0.975 – 0.993) and decision-making (OR = 0.986, 95%CI = 0.072 – 0.999) still had preventive effects on fast food intake (Table 5).

Discussion

In the present study, we investigated the frequency of health literacy and food consumption and their associations among the general population. We found that most of our participants used fast food every few months. The participants with low or unstable income used more fast food than others. Also, sandwich and hotdog were the most frequently consumed fast foods and pizza was in the next order.

Moreover, sausage and soda were the most seasoning foods. Most of our participants used fast food as dinner and with their family, suggesting the institutionalized consumption of this type of food in the family. Fun was the most frequent reason for the use of fast food. Most of the participants were completely aware of the raw materials for fast food and their adverse effects. According to our findings, health literacy in those who used fast food was less than those who did not use it. This difference also was seen in the subscales of reading skills, critique, and decision-making. Finally, we found a significantly negative association between health literacy and subscales of reading skills and decision-making with the consumption of fast foods.

According to several researchers, nutrition literacy as specific health literacy reflects the ability to access, interpret, and use nutrition-related information (10, 11). So, nutritional literacy about fast food is also very important in the public health. Given the importance of health literacy in fast food consumption, there are no studies on the general population concerning the relationship between health literacy and use of fast food. Furthermore, several studies have demonstrated the association between fast food consumption and obesity as a public health problem (12, 13). Therefore, we compare the results of some related studies with our findings. In a recent study on the relationship between health literacy and nutritional practice in high school adolescents of Tehran, capital of Iran, 74.5% of the adolescents had inadequate and not so adequate health literacy, and 68% had average nutritional practice. In addition, similar to our findings, nutritional practice was improved by increasing health literacy (14). However, our results are inconsistent with those reported by Ghanbari et al. about the mean of health literacy in students as a portion of the general population (15). Based on the results of the present study, reading skills and decision-making were important in health literacy and had some associations with fast food consumption. Linnebur (2016) also showed that limited health literacy is associated with students' inability to read and understand food labels (16). This also can be popularized to the general population of literacy and health literacy that people with lower education level could not understand the harmful effects of fast food. Fast food has several health-related adverse and harmful effects, which are comparable to cigarette smoking. Consistent with the present work, Panahi et al. evaluated the relationship of health literacy with knowledge and attitude toward the harms of cigarette smoking among university students and found a significantly direct relationship between the knowledge and attitudes toward smoking hazards (17).

Conclusion

Fast food consumption seems to have become an important part of the people's diet and rising consumption is likely to continue, increasing the risk of developing obesity and chronic illness in the future. Our results showed that several factors can affect food consumption, and differences in health literacy and its subscales may affect the consumption of fast food. In addition, there was a negative relationship between health literacy and fast food consumption, which was also found in reading skills, critique, and decision-making. In this regard, longitudinal studies are recommended to investigate this relationship.

List Of Abbreviations

HELIA: Health Literacy for Iranian Adults; SD: standard deviation.

Declarations

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Ethics committee approval and consent to participate

The ethics committee of Fasa University of Medical Sciences (Code: IR.FUMS.REC.2017.255) approved this study. All patients gave consent to take part in the study.

Consent for publication

Not applicable.

Availability of data and materials

The data are available from the corresponding authors.

Conflict of interests

The authors declare that they have no conflict of interests.

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Authors' contribution

The idea of this study was initiated by AN and AM. AN contributed to design, management of the study, data gathering and writing of the manuscript. AM participated to study design and edition and revision. MMN participated in the design of the study and performed the statistical analysis. MZ contributed in design and writing of the manuscript. All authors read and approved the final manuscript.

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Tables

Table 1. Demographic variables and effects on fast food use

		Using fast food						
		Total		Useless		Consumer		P- value Chi- square
Sex	Female	294		151	51.4%	143	48.6%	0.365
	Male	127		59	46.5%	68	53.5%	
Marital status	Single	105		55	52.4%	50	47.6%	0.554
	Married	316		155	49.1%	161	50.9%	
Education	<High school diploma	77		38	49.4%	39	50.6%	0.918
	>= High school diploma	344		172	50.0%	172	50.0%	
Job	Fixed payment	200		114	57.0%	86	43.0%	0.005
	Verified payment	221		96	43.4%	125	56.6%	
Income	< IRR 1,500,000	308		145	47.1%	163	52.9%	0.023
	> IRR 1,500,000	107		64	59.8%	43	40.2%	
BMI	Normal	223		116	52.0%	107	48.0%	0.325
	Overweight/ Obese	198		94	47.5%	104	52.5%	
Age		Mean	SD	Mean	SD	Mean	SD	P- value t-test
		37.3	11.5	38.3	11.1	36.2	11.9	0.056

Table 2. Health literacy score and levels

	Mean	SD	Inadequate		Problematic		Sufficient		Excellent	
			n	%	n	%	n	%	n	%
Total score level	70.65	22.20	92	21.9%	69	16.4%	136	32.3%	124	29.5%
Reading score level	66.08	21.51	115	27.3%	72	17.1%	154	36.6%	80	19.0%
Access score level	78.65	18.33	38	9.0%	55	13.1%	135	32.1%	193	45.8%
Understanding score level	64.62	21.51	124	29.5%	85	20.2%	134	31.8%	78	18.5%
Appraisal score level	68.07	17.04	73	17.3%	93	22.1%	179	42.5%	76	18.1%
Decision score level	69.85	15.27	42	10.0%	119	28.3%	182	43.2%	78	18.5%

Table 3. Effects of health literacy on fast-food use

	Using Fast food					Fast food Frequency	
	Consumer		Useless		P-value t-test	Pearson's correlation	P-value
	Mean	SD	Mean	SD			
Total score	68.16	23.85	73.15	20.15	0.021	-0.108*	0.026
Reading score	62.46	22.10	69.72	20.30	<0.001	-0.176**	<0.001
Access score	77.08	19.95	80.22	16.44	0.079	-0.083	0.089
Understanding score	64.81	22.94	64.43	20.03	0.858	0.009	0.855
Appraisal score	66.36	17.98	69.78	15.89	0.039	-0.078	0.111
Decision score	67.96	16.21	71.75	14.04	0.011	-0.115*	0.018

Table 4. Raw and adjusted odds ratio of using fast food for a total score

	P-value	OR	95% C.I. for OR	
			Lower	Upper
Total score (raw)	0.022	0.990	0.981	0.998
Total score (adjusted by sex)	0.026	0.990	0.981	0.999
Total score (adjusted by marital status)	0.024	0.990	0.981	0.999
Total score (adjusted by education)	0.018	0.989	0.980	0.998
Total score (adjusted by job)	0.021	0.990	0.981	0.998
Total score (adjusted by income)	0.044	0.991	0.982	0.999
Total score (adjusted by BMI)	0.023	0.990	0.981	0.999
Total score (adjusted by age)	0.009	0.988	0.979	0.997
Total score (adjusted by all)	0.045	0.990	0.981	0.999

Table 5. Raw and adjusted odds ratio of using fast food for health literacy sub-scores

		P-value	OR	95% C.I. for OR	
				Lower	Upper
Reading score	Raw	0.001	0.984	0.975	0.993
	Adjusted	0.004	0.985	0.975	0.995
Access score	Raw	0.080	0.991	0.980	1.001
	Adjusted	0.191	0.992	0.981	1.004
Understanding score	Raw	0.858	1.001	0.992	1.010
	Adjusted	0.781	1.001	0.992	1.011
Appraisal score	Raw	0.040	0.988	0.977	0.999
	Adjusted	0.166	0.991	0.980	1.004
Decision score	Raw	0.011	0.984	0.971	0.996
	Adjusted	0.049	0.986	0.972	0.999

Figures

Figure 1

Odds of using fast food