A survey on scientific authenticity of health information in Iranian popular magazines: A case study

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Abstract:

BACKGROUND: The content of the mass media is a suitable tool for making changes to the society. One of the most read news in the mass media is nutritional information. The goal of this study is to assess the scientific authenticity of such information published in Iranian popular magazines.

MATERIALS AND METHODS: This study is a qualitative study (content analysis) and uses bibliographic approach. A researcher-designed checklist is used as data gathering tool, and the statistical population included the messages obtained from the printed material in 173 volumes of 8 Iranian popular magazines. 10 most frequent messages were identified, and their scientific authenticity was investigated using Pubmed and IranMedex databases. The SPSS Software version 24 (IBM Corporation, Armonk, New York, USA) was applied in the analysis of this work.

RESULTS: The findings indicated that preventive trends had the highest (86.8%) and the treatments had the lowest (4.2%) frequency. Concerning the type of cancer, more than half (51.2%) of the conclusions were about cancer. Regarding authorship, 68% of articles were author signed, but the profession of 66.4% of the authors was not clear. Regarding references, only 25.4% of the articles had validated references.

CONCLUSION: It is revealed that 70% of the "nutrition information" related to cancer which was published in the popular magazines during 2012, considered to be acceptable according to scientific medical information sources. Although in some cases, the amount of evidence is not sufficient. Finally, it could be deduced that the nutrition information published in the Iranian popular magazines are still credible.

Keywords:

Authenticity, cancer, health information, Iran, nutrition, popular magazines, validity

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Introduction

Since the beginning of the 20th century, social scientists began paying attention the content of the mass media. The founder of this view was Max Weber who believed the content of media to be a suitable tool for creating cultural changes.[1] Mass media are among the most important and most influential tools in sharing the information and knowledge and play an important role in creating communication between people and policymakers; thus, one cannot deny the effect of mass media on the public opinion and the general behavior of people.[2] Therefore, mass media need to gain the confidence of their audience by reporting suitable information from credible sources in a format which is understandable for the general public[3] and avoid reporting information that is not supported with facts proven by scientific studies or is not in agreement with new advances in the science and the worries of the scientific community.[4,5]

One of the subjects that have gained increased attention in the mass media in the recent years is the nutritional information. Media can increase the general knowledge of people about a healthy diet and thus leads to improving the lifestyle quality of people.[6] However, some studies show that most of the nutritional information presented to the public by the mass media has suspect scientific credibility[2,7,8] which can be potentially dangerous for people who trust this information and even cause serious damage.[2] By investigating the scientific credibility of this information and comparing them to the credible medical sources, one can create a clear picture of the current state of the media and use this picture to improve the current conditions. These studies can lead to people reevaluating their relation with the mass media thus refusing to accept health-related information without considering the facts.[9]

Some studies in Iran and other countries have tried to investigate the quality of the information presented in the media by comparing them to credible scientific sources, some of which are as follows. Mohammadpour Ahranjani *et al*. in their study "Nutritional messages in Iranian newspapers: A content analysis" showed that 79.5% of the nutritional content of the investigated media were informative, 9.6% were instructive, and 18.1% were a mixture of the two types. In addition, the authors of 13.9% of the information were nutritional experts. In addition, "credible scientific organizations" and "Islamic Republic News Network" were the source of 23% and 18.9% of the contents, respectively, and 29.5% of the contents had a positive and 47.5% of them had a negative direction.[10]

Niknam and Azadbakht in their study called "Nutrition and gastric cancer: A review of epidemiologic evidence" found that the chance of stomach cancer decreases using high amounts of fruits and probably green tea. In addition, using processed meats, salt, and salted food leads to increasing the chances of stomach cancer and no evidence regarding the relation between different types of meat, fish, black tea, and coffee with stomach cancer exists. This study showed that increasing the amount of fruit and fresh vegetables and decreasing the amount of processed meats, salt, and salted food can be considered a suitable strategy for preventing the stomach cancer.[11]

Shokri Mashhadi and Azadbakht conducted a study called "Food groups and breast cancer: A review of current evidence." They found out that some studies claimed a relation between a diet rich in vegetarian foods and low on processed meat and other processed foods and decreasing the chances of breast cancer; however, other studies had failed to verify these claims. In addition, these studies had extrapolated the effectiveness of certain fruits and vegetables to mean the effectiveness of all fruits and vegetables in preventing breast cancer

and the relation between processed meats and increasing the changes of breast cancer were in agreement with some other studies.[12]

Van Trigt *et al*. in "Setting the agenda: Does the medical literature set the agenda for articles about medicines in the newspapers?" showed that scientific articles in the field of medicine were mostly about general antiinfective (especially vaccines) and central nervous system, and the auricles in the newspapers were generally about general antiinfections, central nervous system medicines, reproductive organ medicines, and sexual hormones and no mention of the medicines concerning sensual organs existed. In general, one could say that the articles printed in newspapers closely resembled the articles printed in scientific journals except a few differences.[4]

Moynihan *et al*. in their study called "Coverage by the news media of the benefits and risks of medications" showed that among 207 investigated articles 40 of them did not present the benefits in a qualitative manner. In addition, among the 124 articles reporting benefits in a quantitative manner, 83% of them had only reported relative numbers, and 15% of them had reported relative and absolute quantitative numbers. In addition, among the 207 investigated articles, 47% of them were about the potential damage to the patient and only 30% of them investigated the cost. Among 170 articles that cited a scientific study or an expert 50% of them had at least cited one expert or study with the financial link to the investigated medicine, and this link was only mentioned in 39% of articles.[13]

Shaw *et al*. conducted a study called "A content analysis of the quantity and accuracy of dietary supplement information found in magazines with high adolescent readership" and showed that among 88 investigated claims only 15% of them were credible, 23% had inconclusive evidence, 3% of them were incredible, 5% of them were somewhat credible, and 55% of them had no reference in the two investigated databases. Also among the 94 articles about food supplements in the advertisements, 43% of them were only in text, 79% of them lacked the Dietary Supplement Health and Education Act[1] warnings. In addition, 46% of these articles cited a study and 32% of them used evidences.[14]

Salzman in "Nutrition and the News: An Analysis of Nutrition Coverage on the Today Show" showed that the nutritional information presented in today show are usually without references or evidence and provides no special advice on how to use the information presented. The findings showed that credible nutritional experts and medical specialists were generally invited to the program. In general, the findings indicated that today show program endeavors to provide nutritional

information but needs to increase the affirmation of the information presented.[15]

Ashorkhani *et al*. in their study called "Quality of health news disseminated in the print media in developing countries: A case study in Iran" showed that 18% of the articles printed in the newspapers are not suitable for general public and that several different factors such as low incentive, limited knowledge, and other barriers effect the quality of the news at several levels.[7]

Shahar *et al*. conducted a study titled "Quality and accuracy assessment of nutrition information on the Web for cancer prevention." Their findings showed that among the investigated websites, 54% had below average quality, 48% lacked a known author, and 57% of them lacked references to credible sources. In addition, 100% of the investigated websites had not been updated in the last month and 86% of them lacked the health on the net certificate. The results also showed that 44% of these websites were "hard to understand" and 91% of them were not in line with the last World Cancer Research Fund/American Institute for Cancer Research guidelines. In addition, 20 specialized websites had high quality and the best accuracy belonged to government websites. In general, the quality of the investigated websites in this study was satisfactory but serious concerns existed about the accuracy and credibility of provided information.[16]

A study of previous works shows that many researchers have concerns regarding the accuracy and credibility of the health and nutritional information provided by mass media. In addition, previous studies show that most of the media are unable to provide their audience with suitable, accurate, and credible health and nutritional information and the accuracy of their information depends on several factors. Most studies emphasize the necessity of collaboration between the media and health and nutrition experts. In some of the previous studies other than the accuracy of the provided information, the similarity of the published information with credible sources in that field, the availability of the references (citations) and the authors of the messages were also investigated.

Therefore, the goal of the current study is to investigate the authenticity and validity of the nutritional information related to cancer in Iranian popular magazines through to compare the most frequent messages in those magazines[17] with the credible and evidence base medicine articles in medical databases.

Materials and Methods

This study is a qualitative study (content analysis) and uses bibliographic approach. The data gathering tool was a researcher-designed checklist whose validity was confirmed by the experts. This checklist had four parts including (a) Magazine information; (b) Properties of the message; (c) Citation of the message; and (d) Evidence related to the message.[9,17] The statistical population in first part included the ten most frequent messages obtained from printed material in 173 volumes of 8 Iranian popular magazines.[17] These messages were identified, and their scientific authenticity and validity were investigated using Pubmed and IranMedex databases where the evidence are assessed, then subjected to acceptance, rejection, opposition, and neutrality. Therefore, the second part of this study included searching for articles related to most frequent subjects in PubMed and IranMedex databases and selection (including or excluding) of the articles using the search results and reading the abstract, conclusion, and full text of the article whenever necessary. The statistical population of this part was all the articles and evidence in these two databases including PubMed database (8291 English articles) and IranMedex (52 Farsi articles) and the sample size selected using purposeful, nonrandom sampling was 206 English, and 31 Farsi articles. Inclusion criteria for the articles included direct relation to one of the ten frequent subjects and the importance of the article based on evidence pyramid. This pyramid states that systematic reviews, meta-analyzes, and randomized controlled trials are of particular importance in the medicine, and other studies such as cohort studies, case–control studies, case series, and case reports are important in the next category. Editorials, comments, animal researches, and *in vitro* researches have lower grades of medical evidence.[18] The exclusion criterion was lack of relation with one of the ten frequent subjects. Data were analyzed using the statistical package SPSS version 24 (IBM Corporation, Armonk, New York, USA) for descriptive (frequency and percentage) and analytic statistics (the Chi-square and Fisher exact test) (significance level = 0.05).

Results

Findings show that 68.1% of cancer-related nutritional messages had known authors. Messages with authors of undetermined profession had been the most frequent with 196 (66.4%) messages, and messages authored by doctors had the lowest frequency with 0 messages (0%). The "Weekly information" magazine had the highest number of messages with known authors by 55 (100%) messages and "Green Family" magazine had the lowest frequency of articles with known authors with all of its cancer-related nutritional articles lacking a known author.

Citation analysis showed that 74.6% of the messages lacked any citation and 25.4% of the messages had

citations to other texts. Among the investigated magazines, "Women Messages" magazine with 57 messages with citation (96.6%) had the highest and magazines of "Weekly information," "Days of life," "Family," "Green Family," and "Family consultant" had the lowest number of messages with proper citations with none of the printed messages having citations.

As can be seen in Table 1, ten most frequent subjects regarding nutrition and cancer were extracted after several refinements to investigate their citation in the second part of the study.[9,17]

Table 2 shows the evidence supporting the most frequent subjects in different databases. Results show that there is a meaningful relation between the database and the frequency of the evidence for subjects of antioxidant, Cancer (general)-Prevention ($P < 0.001$), Pomegranate– Prostate Cancer– Prevention ($P = 0.008$), Walnut– Breast cancer–prevention ($P = 0.03$), and Coffee– Prostate Cancer– prevention ($P = 0.02$). However, no meaningful relation exists between the database and the frequency of the evidence for another six subjects in Table 2.

Table 3 shows the frequency distribution of the citation of the most frequent messages related to cancer

published in Iranian popular magazines based on the database and the type of citation. The findings show that articles confirming the most frequent messages in both databases had the highest frequency. The frequency of the validating articles is 55.8% (115 articles) in the PubMed database and 74.2% (23 articles) in IranMedex database. On the other hand, the lowest frequency of articles on PubMed database belonged to neutral articles 22.3% and the lowest frequency of articles on IranMedex database belonged to articles against the messages (3.2%). Chi-square test showed that there is a meaningful relation between the database and the type of citation (validating, neutral, contravening, or contesting) with $P = 0.014$.

Table 4 shows the frequency distribution of evidence concerning messages based on the message's subject and the type of citation on the PubMed database. Results show that the most validating evidence in this database was about the subject of pomegranate – prostate cancer– prevention (33 articles) and the least amount of validating evidence belong to the subject of tangerine peel – cancer (general) – treatment (1 article). In addition, the most amount of contesting evidence belonged to the subject of antioxidants – cancer (general) – prevention (9 articles) and the least amount of contesting evidence were about the subjects of tangerine peel – cancer (general) – treatment, walnut – breast cancer – prevention and coffee – skin cancer – prevention (0 articles each). The highest number of contravening evidence in this database concerned the subjects of antioxidants– cancer (general) – prevention and coffee – cancer (general)– prevention (6 articles each) while the subjects of pomegranate– prostate cancer– prevention, onion – cancer (general)– prevention, tangerine peel– cancer (general) – treatment, mayonnaise – cancer (general) – cause, walnut– breast cancer – prevention and coffee – skin cancer – prevention each had 0 contravening acritlces. the subject with the most frequent neutral articles in this database was the subject of coffee – prostate cancer– prevention and

Table 1: The most frequent subjects about the relation between nutrition and cancer in Iranian popular magazines

Rank	Subject
1	Antioxidant, cancer (general)-prevention
2	Pomegranate-prostate cancer-prevention
3	Onion-cancer (general)-prevention
4	Tangerine peel-cancer (general)-treatment
5	Processed meats-cancer (general)-cause
6	Mayonnaise-cancer (general) cause
7	Coffee-cancer (general)-prevention
8	Coffee-skin cancer-prevention
9	Coffee-prostate cancer-prevention
10	Walnut-breast cancer-prevention

Table 2: Frequency distribution of the evidence regarding the ten frequent subjects in different databases

Rank	Subject	Database			P
		PubMed, frequency (%)	IranMedex, frequency (%)	Total, frequency (%)	
1	Antioxidant, cancer (general)-prevention	34 (16.5)	16 (51.6)	50 (21.1)	<0.001
2	Pomegranate-prostate cancer-prevention	39 (18.9)	0	39 (16.5)	0.008
3	Onion-cancer (general)-prevention	5 (2.4)	0	5 (2.1)	0.49
4	Tangerine peel-cancer (general)-treatment	1 (0.5)	0	1 (0.4)	0.87
5	Processed meats-cancer (general)-cause	39 (18.9)	5 (16.1)	44 (18.6)	0.71
6	Mayonnaise-cancer (general)-cause	5 (2.4)	1 (3.2)	6 (2.5)	0.57
7	Walnut-breast cancer-prevention	3 (1.5)	3 (9.7)	6 (2.5)	0.03
8	Coffee-cancer (general)-prevention	33 (16)	5 (16.1)	38 (16)	0.98
9	Coffee-skin cancer-prevention	9 (4.4)	0	9 (3.8)	0.28
10	Coffee-prostate cancer-prevention	38 (18.4)	1 (3.2)	39 (16.5)	0.02
Total		206 (100)	31 (100)	237 (100)	<0.001

the subjects of onion– cancer (general) – prevention, tangerine peel – cancer (general) – treatment and mayonnaise – cancer (general) – cause had the least amount of neutral articles about them. The Chi-square test shows that there is a meaningful relation between the message's subject and type of evidence about it in the PubMed database ($P < 0.001$).

Table 5 shows the frequency distribution of evidence concerning messages based on the message's subject and the type of citation on the IranMedex database. Results show that the most validating evidence in this database was about the subject of antioxidants – cancer (general) – prevention (15 articles) and the lease amount of validating evidence belong to the subjects of pomegranate– prostate cancer – prevention, onion – cancer (general)– prevention, tangerine pee l– cancer (general) – treatment, mayonnaise – cancer (general) – cause, coffee – skin Cancer – prevention and coffee – prostate cancer – prevention (0 articles each). The most contesting evidence was about the subject of processed meats – cancer (general) – cause (1 article) while no contesting articles about other subjects existed. In addition, the most Contravening evidence was about the subject of coffee – cancer (general) – prevention (2 articles) and the subjects of pomegranate – prostate cancer– prevention, onion – cancer (general) – prevention, tangerine peel – cancer (general)– treatment, processed meats– cancer (general) – cause, walnut – breast cancer – prevention and coffee – skin cancer – prevention with 0 articles each had the lowest amount of contravening evidence. Also in this database, the most neutral articles

Table 3: The frequency distribution and citation situation of the most frequent cancer-related nutritional messages in the popular magazines based on the database and citation type

Type of citation	Database		Total, frequency (%)	P
	PubMed, frequency (%)	IranMedex, frequency (%)		
Validating	115 (55.8)	23 (74.2)	138 (58.2)	0.014
Contesting	28 (13.6)	1 (3.2)	29 (12.2)	
Contravening	17 (8.3)	5 (16.1)	22 (9.3)	
Neutral	46 (22.3)	2 (6.5)	48 (20.3)	
Total	206 (100)	31 (100)	237 (100)	

Table 4: Frequency distribution of the evidence about messages in the PubMed database based on the type of evidence and the message's subject

Rank	Subject	Type of evidence					P
		Validating, frequency (%)	Contesting, frequency (%)	Contravening, frequency (%)	Neutral, frequency (%)	Total, frequency (%)	
1	Antioxidant, cancer (general)-prevention	8 (23.5)	9 (26.5)	6 (17.6)	11 (32.4)	34 (100)	<0.001
2	Pomegranate-prostate cancer-prevention	33 (84.6)	1 (2.6)	0	5 (12.8)	39 (100)	
3	Onion-cancer (general)-prevention	4 (80)	1 (20)	0	0	5 (100)	
4	Tangerine peel-cancer (general)-treatment	1 (100)	0	0	0	1 (100)	
5	Processed meats-cancer (general)-cause	29 (74.4)	6 (15.4)	2 (5.1)	2 (5.1)	39 (100)	
6	Mayonnaise-cancer (general)-cause	4 (80)	1 (20)	0	0	5 (100)	
	Walnut-breast cancer-prevention	2 (66.7)	0	0	1 (33.3)	3 (100)	
7	Coffee-cancer (general)-prevention	13 (39.4)	2 (6.1)	6 (18.2)	12 (36.4)	33 (100)	
8	Coffee-skin cancer-prevention	8 (88.9)	0	0	1 (11.1)	9 (100)	
9	Coffee-prostate cancer-prevention	13 (34.2)	8 (21.1)	3 (7.9)	14 (36.8)	38 (100)	
Total		115 (55.8)	28 (13.6)	18 (8.3)	46 (22.3)	206 (100)	

Table 5: Frequency distribution of the evidence about messages in the IranMedex database based on the type of evidence and the message's subject

Rank	Subject	Type of evidence					P
		Validating, frequency (%)	Contesting, frequency (%)	Contravening, frequency (%)	Neutral, frequency (%)	Total, frequency (%)	
1	Antioxidant, cancer (general)-prevention	15 (93.8)	0	1 (6.2)	0	16 (100)	0.03
2	Pomegranate-prostate cancer-prevention	0	0	0	0	0	
3	Onion-cancer (general)-prevention	0	0	0	0	0	
4	Tangerine peel-cancer (general)-treatment	0	0	0	0	0	
5	Processed meats-cancer (general)-cause	4 (80)	1 (20)	0	0	5 (100)	
6	Mayonnaise-cancer (general) -cause	0	0	1 (100)	0	1 (100)	
7	Walnut-breast cancer-prevention	3 (100)	0	0	0	3 (100)	
8	Coffee-cancer (general)-prevention	1 (20)	0	2 (40)	2 (40)	5 (100)	
9	Coffee-skin cancer-prevention	0	0	0	0	0	
10	Coffee-prostate cancer-prevention	0	0	1 (100)	0	1 (100)	
Total		23 (74.2)	1 (3.2)	5 (16.1)	2 (6.5)	31 (100)	

were about coffee – cancer (general) – prevention (2 articles) while other subjects had 0 neutral articles about them. Chi-square test showed that there is a meaningful relation between the subject of the message and the type of evidence about it in IranMedex database ($P = 0.03$).

Finally, Table 6 shows the total number of evidence in both PubMed and IranMedex databases about cancer-related nutritional messages in Iranian popular magazines. The most number of validating evidence in these databases were about the subject of pomegranate – prostate cancer – prevention and processed meats– cancer (general) – cause (33 articles each) and the least number of validating evidence belonged to the subject of tangerine peel – cancer (general) – treatment (1 article). In addition, the subject of antioxidant, cancer (general) – prevention with 9 articles had the most and the subjects of tangerine peel – cancer (general) – treatment, walnut – breast cancer – prevention and coffee – skin cancer – prevention had the least number of contesting evidence. Also among the investigated subject, Coffee – Cancer (general) – prevention with 8 articles had the most number of contravening evidences while the subjects of pomegranate – prostate cancer – prevention, onion– cancer (general) – prevention, tangerine peel – cancer (general) – treatment, walnut – breast cancer – prevention and coffee – skin cancer – prevention had no articles contravening them. Finally, the subject of coffee –cancer (general) – prevention and coffee – prostate cancer – prevention had the most amount of neutral articles (14 articles each) while there were no neutral articles about the subjects of onion – cancer (general) – prevention, tangerine peel – cancer (general) and mayonnaise – cancer (general) – cause. Chi-square test showed that there is a meaningful relation between the subject of the message and the type of evidence about it in both database ($P < 0.001$).

Discussion and Conclusion

The results of the current study about the authorship of cancer-related nutritional messages in Iranian popular magazines showed that most messages lacked authors with specialties related to the discussed topic and that the specialization of most authors is unknown. This is similar to the results reported by Mohammadpour Ahranjani *et al.*, who claimed only a small percent of articles published in Mass-circulation newspapers in Iran have authors with professions related to the topic at hand.[10] On the other hand, this result is in contrast with the results of the study by Salzman, who reported that the today show television program usually uses specialized doctors to deliver nutritional messages[15] and is also opposite of the results reported by Moynihan *et al.*, who reported that 50% of the articles in the mass media have at least one specialized author.[13]

Investigating the citation of the cancer-related nutritional messages in Iranian popular magazines show that three-quarters of them lack any citation which is in agreement with the results of Salzman, who claimed that today show program usually presents the topics without mentioning citations.[15] This is also similar to the results reported by Shahar *et al.*, who claimed most nutrition-related websites to lack citations to proper databases.[16] On the other hand, these results are in contrast to the results reported by Moynihan *et al.*, who reported 50% of the articles in the mass media to have at least one citation[13] and are also opposite of the results by Shaw *et al.*, who emphasized that most nutritional messages related to cancer prevention have proper citations.[14]

In this study, the type of evidence concerning the top 10 most popular cancer-related messages in Iranian popular magazines were investigated by searching in PubMed and IranMedex databases. As can be seen in Table 7,

Table 6: Frequency distribution of the evidence about messages in the Pubmed and IranMedex databases based on the type of evidence and the message's subject

Rank	Subject	Type of evidence					P
		Validating, frequency (%)	Contesting, frequency (%)	Contravening, frequency (%)	Neutral, frequency (%)	Total, frequency (%)	
1	Antioxidant, cancer (general)-prevention	23 (46)	9 (18)	7 (14)	11 (22)	50 (100)	<0.001
2	Pomegranate-prostate cancer-prevention	33 (84.6)	1 (2.6)	0	5 (12.8)	39 (100)	
3	Onion-cancer (general)-prevention	4 (80)	1 (20)	0	0	5 (100)	
4	Tangerine peel-cancer (general)-treatment	1 (100)	0	0	0	1 (100)	
5	Processed meats-cancer (general)-cause	33 (75)	7 (15.9)	2 (4.5)	2 (4.5)	44 (100)	
6	Mayonnaise-cancer (general) cause	4 (66.7)	1 (16.7)	1 (16.7)	0	6 (100)	
7	Walnut-breast cancer-prevention	5 (83.3)	0	0	1 (16.7)	6 (100)	
8	Coffee-cancer (general)-prevention	14 (36.8)	0	0	1 (16.7)	6 (100)	
9	Coffee-skin cancer-prevention	8 (88.9)	2 (5.3)	8 (21.1)	14 (36.8)	38 (100)	
10	Coffee-prostate cancer-prevention	13 (33.3)	0	0	1 (11.1)	9 (100)	
Total		138 (58.2)	29 (12.2)	22 (9.3)	48 (20.3)	237 (100)	

Table 7: The evidence regarding top ten most common cancer-related nutritional messages in Iranian popular magazines

Rank	Message	Message frequency	Number of evidence	Validating	Contesting	Conclusion
1	Antioxidant, cancer (general)-prevention	13	39	23	16	Validated
2	Pomegranate-prostate cancer-prevention	8	34	33	1	Validated
3	Onion-cancer (general)-prevention	5	5	4	1	Requires more study
4	Tangerine peel-cancer (general)-treatment	4	1	1	0	Requires more study
5	Processed meats-cancer (general)-cause	3	42	33	9	Validated
6	Mayonnaise-cancer (general)-cause	3	6	4	2	Validated
7	Walnut-breast cancer-prevention	2	5	5	0	Requires more study
8	Coffee-cancer (general)-prevention	2	24	14	10	Validated but requires more study
9	Coffee-skin cancer-prevention	2	8	8	0	Validated
10	Coffee-prostate cancer-prevention	2	25	13	12	Validated but requires more study

it can be said that 70% of cancer-related nutritional messages published in Iranian popular magazines in the year 2012 were supported by scientific evidence from credible medical sources. To calculate the numbers of evidence about a set subject, the neutral articles were ignored and contesting and contravening articles were considers together.

These results are in agreement with the results reported by van Trigt *et al*.,[4] Ashorkhani *et al*.,[7] and Shahar *et al*.,[16] who claimed the accuracy of the information in the mass media to be acceptable. However, these results are in contrast to the results by Shaw *et al*., who reported only 15% of the information regarding food supplements in popular adult magazines to be scientifically validated.[14]

The background study shows that content analysis studies about mass media content related to the subjects of nutrition or cancer have been conducted in Iran and other countries; however, the number of these studies in Iran is very limited. On the other hand, content analysis studies regarding the relation of these two subjects are greatly limited even in other countries. The novelty of the current work is the fact that instead of the content of academic publications, the content of popular mass media was analyzed because the effect of popular mass media on general populace is far greater than the effect of specialized, academic publications. In general, people search for their health-related information in mass media and internet and lack the necessary specialization to understand the contents of specialized academic publications.[14] Another fact that sets this study apart from other similar ones is the fact that this study goes beyond mere content analysis and tries to investigate the evidence regarding the information published in the media.

The results of this study show that the giving citation of the nutritional messages published in Iranian popular magazines is not satisfactory. On the other hand, while due to the specialized nature of this topic one expects the authors of cancer-related nutritional messages to be specialists, the results showed that these messages lacked proper authorship situation.

Regarding the scientific evidence any by ignoring neutral articles and counting contesting and Contravening together, it can be said that 70% of cancer-related nutritional messages published in Iranian popular magazines in the year 2012 have proper scientific evidence from credible medical journals supporting them; although in some cases, the available evidence was not enough for reaching a definite conclusion or the number of validating and contesting evidence was nearly similar, thus necessitating more studies to confirm or deny these claims [Table 7]. Finally and with some caution, one can say that despite the lack of proper citation or specialized authors, cancer-related nutritional messages in Iranian public magazines were trustworthy.

Conflicts of interest
There are no conflicts of interest.

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