

How health information is received by diabetic patients?

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Abstract

Background: Knowledge of correct information-seeking behavior by the patients can provide health specialists and health information specialists with valuable information in improving health care. This study aimed to investigate the passive receipt and active seeking of health information by diabetic patients.

Materials and Methods: A survey method was used in this research on 6426 diabetic patients of whom 362 patients were selected by a no percentage stratified random sampling. The Longo information-seeking behavior questionnaire was used to collect data and they were analyzed by SPSS 20 software.

Results: The most common information source by diabetic patients was practitioners (3.12). The minimum usage among the information sources were from charity organizations and emergency phone lines with a usage of close to zero. The amount of health information gained passively from each source has the lowest average of 4.18 and usage of this information in making health decision has the highest average score of 5.83. Analysis of the data related to active seeking of information showed that knowledge of available medical information from each source has the lowest average score of 3.95 and ability in using the acquired information for making medical decisions has the highest average score of 5.28. The paired *t*-test showed that differences between passive information receipt (41.68) and active information seeking (39.20) considered as statistically significant ($P < 0.001$).

Conclusion: Because diabetic patients are more passive information receivers than active information seekers, the health information must be distributed by passive means to these patients. In addition, information-seeking behavior during different time periods should be investigated; to identify more effective distribution of health information.

Key Words: Active information seeking, diabetes, health information-seeking behavior, Iran, Isfahan, passive information receipt

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INTRODUCTION

Information is most essential in many activities in various scientific and nonscientific fields.^[1] This information can be used as a means of coping with and reducing stress, increasing confidence, and to gaining control in the manner of increasing one's self-care.^[2] After the Second World War and with increase in scientific and technical information within various

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fields, the information-seeking behavior for the first time was addressed in the scientific and technical conference of the English Royal Academy in 1948. This event could be considered the beginning of a new approach in addressing the human information-seeking behavior.^[3] The information-seeking behavior is defined as a complex pattern of interactions between humans while seeking information.^[4]

Different groups seek information to satisfy their different needs. If information seeking is done to gain information about health-related issues, this act will become a factor in health decision-making process and sometimes it is considered as a decision-making process itself.^[5] The health information-seeking behavior describes how the individual searches and obtains health and medical information about health risks, diseases and illnesses, and health promotion activities.^[6]

Many people actively seek health-related information.^[7] However, some patients receive information involuntarily or by chance during their daily activities from a variety sources such as watching a TV program or reading a newspaper. On the one hand, contextual and/or personal background characteristics may affect a person's information-seeking behavior. On the other hand, health information-seeking behavior can influence a patient's active seeking and passive receipt of information thus affecting the health outcome.^[8]

Because of the following two events:

1. vast increase in health care demand all over the world due to the increase in the cases of noncontagious diseases such as cancers, chronic respiratory diseases, cardiovascular diseases, and diabetes;^[6] and
2. access to a vast amount of health information from a variety of sources other than health care providers, has necessitated an indepth understanding of the health information-seeking behavior of patients.^[9]

In spite of availability of a variety of health information resources, many people end up losing their life every year due to lack of access to information regarding these diseases.^[10]

Furthermore, the complications and disabilities caused by these diseases place a great burden on families, societies, and governments.^[11] Among today's common diseases, diabetes is one of the most common noncontagious diseases, and has a high priority in prevention and treatment programs in Iran and other countries.^[9] Understanding the information-seeking

behavior of diabetic patients can provide valuable information to practitioners and medical and medical informatics experts for improving the health of these patients.^[12] This approach can help in effective transfer of information to the patients,^[7] remove the obstacles in information seeking and creating efficient health information systems,^[3] which can help in the psychological adjustment of the patients,^[7] and increasing the self-management of disease.^[8] This process can control the spread of the disease and reduce psychological pressures result from it.^[13]

The necessity of searching information is affected by patient needs, the amount and type of information available, mental background, and estimated cost — benefit of active information seeking. A person who believes has adequate knowledge about a disease naturally won't actively seek new information. Factors that could prevent active information seeking are financial problems, time constraints, hopelessness, and confusion, poor physical and psychological condition, which sometimes overcomes the benefits of active information seeking. Among the advantages of active information seeking is the reduction of anxiety, uncertainty, and better control over the disease. Because the necessary information can be passively absorbed from the surrounding environment, the patient might believe that there is no need to actively seek information. Such a patient may not be inclined to ask questions from his/her doctor because he/she believes that the doctor will provide all necessary information. A patient can use active or passive information seeking based on his or her situation to reach medical care decisions.^[14] Investigating the information-seeking behavior of patients and its effects on self-care is so important that many studies have been conducted worldwide.

Kramer *et al.* discovered that the amount of active information seeking in hospitalized patients addicted to alcohol and drugs is very low.^[15] Andreassen *et al.* also reported very low active information-seeking behavior among the family members of patients with esophagus cancer. These people used mass media, interpersonal relations, and practitioners as the main information sources with the practitioners having been referred to the most. It was also reported that Internet had been unable to overcome the interpersonal relations in this regard.^[16] Eggly *et al.* discovered that cancer patients are not active in seeking medical information. The results also showed that the presence of an associate with the patient in the meeting with the doctor can improve the health outcome for the patient.^[17] McCaughan and McKenna reported that patients with recently diagnosed cancer will seek information about their disease over time in order to improve their

adaptation. These patients used three methods for seeking the necessary information, including active seeking, passive information receipt, and using the experiences of other cancer patients.^[18] Evans *et al.* showed that the lack of information provided by the practitioners inspires male cancer patients to actively seek information. The main information source used by these patients included family members, friends, and associates; and traditional information sources such as books, newspapers, brochures, and mass media have been used more frequently than Internet.^[19] Longo *et al.* discovered that more than half of the women with breast cancer receive the necessary information using active search and others receive the information in a completely accidental and passive manner. The most commonly used information source by these patients was interpersonal relations, especially interactions with practitioners.^[20] Gary *et al.* reported that patients with colon cancer receive information regarding target therapy actively by asking practitioners and passively from television, newspapers, and magazines.^[21] Longo *et al.* showed that diabetic patients receive their information from traditional sources as well as the Internet, television, newspapers, friends, and health experts. On the other hand, these patients also received the information passively.^[8] Shaw discovered that more than half of the diabetic patients gather the necessary health information using the Internet. Their results showed that social networks and Internet are capable of changing the behavior of people, especially in the case of diabetic patients and health care providers can use Internet and health promotion systems to create great advancements in providing diabetic patients with necessary services.^[22] Ellis *et al.* discovered that patients with high health literacy actively search the Internet for health information and patients with low health literacy usually won't actively seek information.^[23] Muusses *et al.* reported that patients under chemotherapy used treatment guides, brochures, and the Internet more than other media information sources, and medical experts, nurses, family members, and friends were the most common information sources using interpersonal relations.^[24] Moreland and Cumming discovered that patients have low confidence in health information provided in websites and are reluctant in sharing their information in these websites and that this lack of trust is the main obstacle in the way of providing health information online.^[25] Wang *et al.* showed that the information sources used to gather health information by adult Chinese citizens based on popularity include newspapers and magazines, television, radio, and Internet. Patients with chronic diseases used Internet and television more than healthy people.^[26]

Sasaki *et al.* discovered that more than half of the parents having children with type 1 diabetes would consistently search the Internet for information regarding diabetes.^[27] Zamani reported that cardiovascular patients think it is important to know about their disease and practitioners, television, and radio are the most common information sources used by these patients.^[28] Gavgani *et al.* discovered that those seeking health information in Iran are mostly passive seekers instead of active information seekers and that the most common information sources are television and talking to others.^[29] Yarahmadi *et al.* reported that passive receipt of information from nonattendance training using educational packages received by post, and tracking the instructions provided by medical teams and sending reminders using SMS can lead to improved treatment results and reduction of blood sugar, which in turn can reduce the number of visits to medical facilities and direct and indirect cost of the treatment.^[30]

Investigation of the previous studies showed that there are very few studies regarding information-seeking behavior of patients in Iran.^[28,30] Also most of these limited studies concentrated on the information-seeking behavior of medical students and medical teams such as practitioners and nurses and people visiting libraries.^[29,31-33] In other countries, the information-seeking behavior of cancer patients had been the subject of most studies.^[2,10,16,18-21,34-39]

Due to the increase in the number of diabetes cases worldwide in general and especially in Iran and Isfahan province,^[9,14-40] and the important effect of information on the treatment of the patients and self-management of diabetic patients,^[30,42] the importance of the current study becomes apparent. Therefore, the current study aims to investigate the ways in which diabetic patients in the city of Isfahan receive their medical information in order to provide the necessary information for prevention of this disease.

MATERIALS AND METHODS

A survey method was used in collecting patient's information. The statistical population consisted of diabetic patients receiving treatments in 10 treatment centers under the supervision of the province governor's department of health and treatment (6426 patient). From this population, a no percentage stratified random sampling was used to select 362 patients for additional study with confidence level of 95%. The data were collected using modified Longo's information-seeking behavior questionnaire, which included two parts: one actively seeking and one passively receiving health information with 27 questions. The accuracy of

this questionnaire was confirmed by the experts in the library and information science and its reliability was calculated using Cronbach's alpha of 0.748 for active seeking and 0.898 for passive receipt of information. Data gathered by personal visits to medical centers and distribution of the questionnaires to the visiting diabetic patients who volunteered. The patients were assured of the total confidentiality of their medical information. The gathered data were analyzed using descriptive (frequency distribution, average, and standard deviation) and analytical [paired *t*-test and analysis of variance (ANOVA)] statistics using SPSS 20 software.

RESULTS

All the respondents returned the questionnaires of which 71.3% of the patients were female and 28.7% of them were male. Among them, 99.4% were married and 0.6% were single. Also 0.3% of the patients had master's degree, 1.7% a bachelor degree, 1.4% had an associated degree, 10.5% had high school diploma, and the remaining 76.2% had an education below high school diploma. The age of the patients were between 20 and 82 years with an average of 58.37 years and standard deviation of 11.30 years. Among the patients 1.4%, 8.0%, 8.0%, 1.1%, 20.4%, and 63.3% were unemployed, self-employed, office workers, laborers, retired, and had other jobs, respectively. The monthly income of 81.8% of them was below 10,000,000 Rials, whereas 18% of them had a monthly income between 10,000,000 and 20,000,000 Rials and 0.3% had an income between 20,000,000 and 30,000,000 Rials.

Figure 1 summarizes the average score of different information sources among diabetic patients, on the scale of 1-5. As it can be seen, practitioners have a

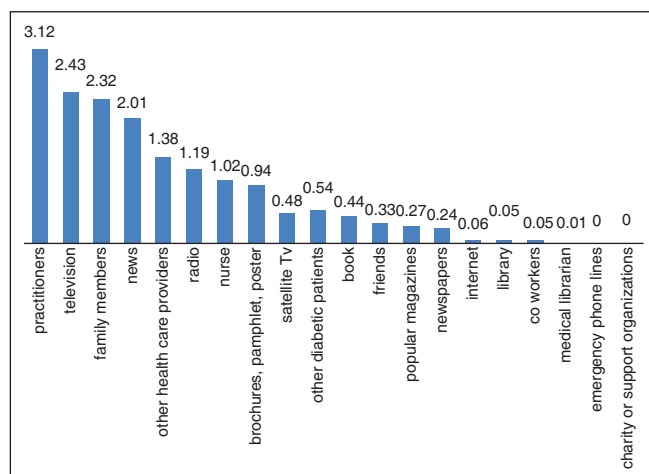


Figure 1: The average score of different information sources used by the patients

highest score of 3.12, followed by television (2.43), family members (2.32), news (2.01), other health care providers (1.38), radio (1.19), and nurses (1.02). On the other hand, charity or support organizations for diabetic patients and emergency phone lines both had the lowest scores (0).

The information source has been categorized into three groups in Table 1, with an average use of each of these categories by diabetic patients. Interpersonal relations refers to obtaining information from people such as practitioners, nurses, other health care providers, charity, or support organizations for diabetic patients, family members, friends, co-workers, other diabetic patients, and medical librarians. Traditional media include news, television, radio, newspapers, medical journals, popular magazines, brochures, booklets, and posters. The new media include satellite TVs, Internet, social networks, and other similar media. As can be seen in Table 1, the interpersonal relations have an average of (24.12), whereas the new media had an average of (8.02). ANOVA test with repeated observations showed that there is a statistically significant difference between the sources of information ($P < 0.001$).

Table 2 shows three dimensions of passive information receipt by the diabetic patients. As can be seen in Table 2, amount of health information gained passively from each source has the lowest average of 4.18. Among different methods of passive information receipt in this dimension, interpersonal relations and traditional media are used more often than new media. The second dimension of passive information receipt is usage of the passive information with an average of 5.55. Among different options of this dimension, interpersonal relations and traditional media are used more often than new media. Usage of passive information received and used in making health decision has the highest average score of 5.83. In this dimension, like the other dimensions interpersonal relations and traditional media are used more often than new media.

Table 3 shows the dimensions of active information seeking by diabetic patients. As can be seen in Table 3, knowledge of available medical information

Table 1: Average usage score of different information sources used by diabetic patients

Information source	Average	Standard deviation	Minimum	Maximum	P-Value
Interpersonal relations	24.12	9.65	3.13	63.89	
Traditional media	19.14	12.83	0.00	67.50	<0.001
New media	8.02	18.76	0.00	100.00	

Table 2: Dimensions of passive information receipt by diabetic patients

Dimension	Answer	Frequency/Percent	Never	Very rarely	Rarely	Often	Usually	Average	Total average
Amount of health information gained passively from each source	Traditional media	Frequency	0	113	154	83	13	1.99	4.18
		Percent	0	31.1	42.4	22.9	3.6		
	New media	Frequency	336	3	14	8	2	0.17	
		Percent	92.6	0.8	3.9	2.2	0.6		
	Interpersonal relations	Frequency	0	118	140	86	19	2.02	
		Percent	0	32.5	38.6	23.7	5.2		
Usage of the passive information received	Traditional media	Frequency	0	30	136	119	78	2.67	5.55
		Percent	0	8.3	37.5	32.8	21.5		
	New media	Frequency	337	2	11	7	6	0.19	
		Percent	92.8	0.6	3.0	1.9	1.7		
	Interpersonal relations	Frequency	0	27	136	121	79	2.69	
		Percent	0	7.4	37.5	33.3	21.8		
Usage of passive information received and used in making health decision	Traditional media	Frequency	0	24	115	132	92	2.80	5.83
		Percent	0	6.6	31.7	36.4	25.3		
	New media	Frequency	333	0	13	10	7	0.23	
		Percent	91.7	0	3.6	2.8	1.9		
	Interpersonal relations	Frequency	2	24	112	133	92	2.80	
		Percent	0.6	6.6	30.9	36.6	25.3		

Table 3: Dimensions of active information seeking by diabetic patients

Dimension	Answer	Frequency/Percent	Never	Very rarely	Rarely	Often	Usually	Average	Total Average
Knowledge of available medical information from each source	Traditional media	Frequency	1	59	236	66	1	2.02	3.95
		Percent	0.3	16.3	65.0	18.2	0.3		
	New media	Frequency	336	3	3	14	7	0.22	
		Percent	92.6	0.8	.08	3.9	1.9		
	Interpersonal relations	Frequency	0	182	117	82	12	1.71	
		Percent	0	50.1	32.2	14.3	3.3		
The attempted level for obtaining information from medical sources	Traditional media	Frequency	0	106	158	61	38	2.09	4.35.
		Percent	0	29.2	43.5	16.8	10.5		
	New media	Frequency	338	9	6	8	2	0.15	
		Percent	93.1	2.5	1.7	2.2	0.6		
	Interpersonal relations	Frequency	0	103	158	63	39	2.11	
		Percent	0	28.4	43.5	17.4	10.7		
Ability in using the acquired information for making medical decisions	Traditional media	Frequency	0	25	161	135	42	2.54	5.28
		Percent	0	6.9	44.4	37.2	11.6		
	New media	Frequency	337	3	12	5	6	0.18	
		Percent	92.8	0.8	3.3	1.4	1.7		
	Interpersonal relations	Frequency	0	24	158	138	43	2.56	
		Percent	0	6.6	43.5	38.0	11.8		

from each source has the lowest average score of 3.95. In this dimension, the interpersonal relations and traditional media are used more than new media. The second dimension of active information seeking is the attempted level for obtaining information from medical sources with an average of 4.35. Among different options of this level, interpersonal relations and traditional media are used more often than new media. Ability in using the acquired information for making medical decisions has the highest average score of 5.28. Similar to the previous two dimensions, the new media are used less than interpersonal relations and traditional media in this dimension.

Table 4: Average score of active information seeking and passive information receipt

Option	Average	Standard deviation	Minimum	Maximum	P-value
Active information seeking	39.20	12.03	16.67	88.89	<0.001
Passive information receipt	41.68	13.37	16.67	91.67	

Table 4 compares the active information seeking with passive information receipt among diabetic patients. The paired *t*-test showed that differences

between passive information receipt (41.68) and active information seeking (39.20) are considered as statistically significant (39.20, $P < 0.001$).

DISCUSSION

Analysis of the data showed that the information sources used by diabetic patients in the city of Isfahan included interpersonal interactions with people such as practitioners, nurses, other health care providers, and charity or support organizations for diabetic patients, family members, friends, co-workers, other diabetic patients and medical librarians. Among these people, practitioners and family members had the highest and medical librarians had the lowest number of visits. New media such as satellite TV, Internet, social networks, and other similar media were used less than other information sources; however, among these media Internet has been used more often than satellite TVs. Among traditional media (news, television, radio, newspapers, medical journals, popular magazines, brochures, booklets, and posters), television, radio, and news had the highest and libraries and emergency phone lines had the lowest number of uses. These findings are similar to the results of Andreassen *et al.*,^[16] Muusses *et al.*,^[24] Zamani^[28] and Longo *et al.*^[20] who reported that practitioners were the most popular information source among patients. Also studies by Gavgani *et al.*,^[29] Evans, *et al.*,^[19] Zamani^[28] and Longo *et al.*^[20] show that patients consider television and interpersonal relations to be the best source for medical information, which are in line with the findings of this study. The results of this study are also in confirmation with the results reported by Evans *et al.*,^[19] Moreland *et al.*,^[25] and Longo *et al.*,^[8] which reported that Internet was used less than other information sources by the patients. The results of this study are in contrast with the findings by Muusses *et al.*, who reported that Internet and brochures were the most popular information sources among cancer patients.^[24] The results of this study also contrasted with that of Wang *et al.*,^[26] who reported newspaper and magazines as the most commonly used information sources among adult Chinese citizens. Furthermore, the results also contrasted with the study of Shaw^[22] and Sasaki *et al.*,^[27] who named Internet to be among the most commonly used information sources. The discrepancies in findings could be due to cultural difference, lack of widespread Internet use in Iran, digital gap between Iran and developed countries,^[43] and the type of a disease investigated.^[38] However, most of the diabetic patients investigated in this study were elderly people with limited internet access.^[26]

Analysis of the three dimensions of passive information receipt in diabetic patients showed that amount

of health information gained passively from each source has the lowest average and usage of passive information received and used in making health decision has the highest average, whereas diabetic patients do not receive much information from their environment and other information sources, but they use the information obtained casually and passively to make medical decisions. This is similar to the findings by McCaughan and McKenna who reported passive information receipt to be among the methods of gaining information for patients with recently diagnosed cancer.^[18] The results of this study are similar to the findings of Evans *et al.* about passive information receipt by cancer patients^[19] and Gray *et al.* who reported that the information needs of cancer patients are met by passive information receipt from television, newspapers, and magazines.^[21] The results of this study are in agreement with the study conducted by Longo *et al.* who reported that a portion of information needs of diabetic patients is met using passive information receipt,^[8] and Yarahmadi *et al.* reported that passive information receipt causes lowering in blood sugar level of diabetic patients.^[30]

Analysis of the three dimensions of active information seeking among diabetic patients showed that the knowledge of available medical information from each source has the lowest average score and the ability in using the acquired information for making medical decisions has the highest average score. Therefore, it could be concluded that diabetic patients in this study do not have enough knowledge about the availability of diabetes-related health information; however, when they actively search for this information or come upon, they have exhibited the ability to use that information for medical decisions. These findings are similar to the study by McCaughan and McKenna who reported that active information seeking is one of the ways for patients with recently diagnosed cancer to collect information.^[18] A study by Evans *et al.* showed that when the practitioners do not provide enough information, patients are encouraged to actively seeking needed information.^[19] In a study by Longo, *et al.*, it was also reported that diabetic patients obtained a portion of their knowledge from actively seeking information related to their disease.^[8] Gray *et al.* discovered that active information seeking and asking practitioners to be one of the two methods of obtaining the necessary information by cancer patients.^[21] Ellis *et al.* also reported that patients with high health literacy actively search for the necessary information.^[23] This study has conformed with the findings reported by Zamani where that lack of knowledge about medical expressions and lack of proper response from medical teams were among the barriers limiting the information gathering by

patients, thus encouraging patients to actively and independently seek the necessary information.^[28]

Analysis of information-seeking behavior of diabetic patients in Isfahan showed that the majority of them are passive recipients of information. The majority of the patients believed that their doctor will provide them with all the necessary information about diabetes and because of that belief, they considered most of their questions as unnecessary and failed to bring it out to doctor. Majority of the patients did not believe that they are able to personally seek information regarding diabetes but that they are willing to use any information provided to them by the medical centers. Results of this study are in agreement with the findings by Gavgani *et al* who reported that passive information receipt to have a larger share compared with active information seeking.^[29] These findings are also similar to the results reported by Kramer *et al.* that informed, active information seeking to be very rare occurrence among hospitalized patients with alcohol or drug addictions.^[15] Eggly *et al.* also reported that active information seeking among cancer patients is rare, which is in line with the findings of the current study.^[17]

The analysis of the data identified the information-seeking behavior of diabetic patients in Isfahan and the most valuable information sources used by them. By identifying the search patterns of diabetic patients, it is possible to devise a method for effective sharing of information through sources such as practitioners, television, family members, news, other health care providers, radio, and nurses. Also the fact that diabetic patients in Isfahan are more passive information recipients rather than active information seekers, makes it necessary for family members, practitioners, and other health care workers to provide diabetes-related health information passively to the patients.

By self-managing diabetes, it is possible to control and stop its advance if the disease is in the prediabetes stage. This can prevent the diseases from turning to diabetes. If the advancement of diabetes is not controlled, it can lead to complications such as reduced quality of life and even death. However, it is impossible to effectively self-manage this disease without access to credible health information. Therefore, it is imperative to make health information available to patients. Providing necessary information to the patients is impossible without knowing the information-seeking patterns of the patients. To this day, a very few studies have dealt with information-seeking behavior of diabetic patients in Iran. It is expected that the current study can provide impetuous for additional studies in the future in this field.

In summary, practitioners and other health care providers should passively provide the patients with the health information related to diabetes. Because interpersonal relations and support of others play an important role in patients seeking information about their disease, it is suggested that the practitioners should provide the family members and actively encourage their participation in patient's recovery. Furthermore, it is also suggested that the number of television and radio programs about diabetes or any other disease be aired more frequently to provide needed guidance for self-management of the disease. The difficulties encountered by this researcher included lack of a complete cooperation by patients in filling at the forms and lack of adequate literacy, and not receiving adequate supports from personnel at a clinic where study was conducted.

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