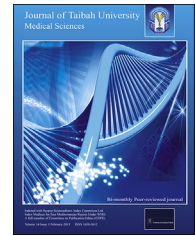




Taibah University
Journal of Taibah University Medical Sciences

www.sciencedirect.com



Original Article

Evaluation of satisfaction and internet self-efficacy of inquirers using an internet-based drug information centre



Prof. Fikret V. İzzettin^a, Asst. Prof. Zekiye K. Yılmaz^{b,*}, Assoc. Prof. Betül Okuyan^b and Prof. Mesut Sancar^b

^a Clinical Pharmacy, University of Bezmialem Foundation Faculty of Pharmacy, Istanbul, Turkey

^b Clinical Pharmacy, University of Marmara Faculty of Pharmacy, Istanbul, Turkey

Received 8 August 2018; revised 18 October 2018; accepted 20 October 2018; Available online 12 December 2018

المخلص

أهداف البحث: تهدف هذه الدراسة إلى تقييم خدمة الاستشارات العلاجية عبر الإنترنت، من حيث تأثيرها على رضا المتلقين ومهارات وعادات استخدام الإنترنت للأفراد الذين يستخدمون الإنترنت ويستفيدون من هذه الخدمة في تركيا.

طرق البحث: أجريت هذه الدراسة على أول 100 شخص وافق على المشاركة فيها ممن حصلوا على خدمة الاستشارات العلاجية عبر موقع www.ilacpedia.com، وهو موقع إلكتروني معلوماتي للعلاج والدواء قائم على الإنترنت، وتم تجميع المعلومات من خلال نماذج معطيات الأفراد التي ملأها المشاركون باستخدام مقياس الكفاءة الذاتية.

النتائج: متوسط عمر المشاركين هو 37.92 ± 12.32 (71 من النساء)، أظهرت النتائج أن 89% من الأفراد الذين حصلوا على خدمة الاستشارات العلاجية عبر الإنترنت استفادوا من المعلومات التي تحصلوا عليها لحل مشاكلهم، ويشير مقياس الكفاءة الذاتية للإنترنت إلى أعلى درجة من مقياس التمثل (20.94 ± 6.18) وأدنى درجة من جانب الاتصالات (9.77 ± 3.57).

الاستنتاجات: أظهرت النتائج أن خدمة الاستشارات العلاجية التي تقدم عبر الإنترنت عن طريق الصيدالوجيا السريرية تؤثر إيجاباً على مستوى رضا الأفراد، لذلك نؤمن بأهمية مشاركة الصيدالوجيا السريرية في هذه المراحل.

الكلمات المفتاحية: مركز معلومات العلاج والدواء؛ خدمة معلومات العلاج والدواء؛ خدمة عبر الإنترنت؛ استشارات المرضى؛ استشارة المريض

Abstract

Objectives: This study aimed to evaluate the satisfaction level of inquirers of an internet-based drug information centre along with the internet usage abilities and habits of individuals who had previously utilised services from an internet-based drug information centre in Turkey.

Methods: The first 100 individuals who received medication consultancy from the webpage entitled "www.ilacpedia.com" and consented to participate in the study were included in this study. This website is an internet-based drug information centre. Participants' data were collected using a participant data form and the Internet Self-efficacy Scale.

Results: The mean age of participants was 37.92 ± 12.32 years (71 female). It was found that 89% of the individuals who received pharmaceutical consultation from the internet-based drug information service believed that the information that they received was enough to solve their problem. The internet self-efficacy scale scores indicated the highest score on the decomposition subscale (20.94 ± 6.18) and the lowest on the communication subscale (9.77 ± 3.57).

Conclusions: The present study revealed that the internet-based drug information service provided by clinical pharmacists contributed positively to users' satisfaction, thus indicating the importance of the involvement of clinical pharmacists in this process.

Keywords: Drug information centre; Drug information service; Online service; Patient consultation; Patient counselling

© 2018 The Authors.

Production and hosting by Elsevier Ltd on behalf of Taibah University. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

* Corresponding address: Inonu Avenue Rose Road Street No: 6 D-12 Maltepe, Istanbul, Turkey.

E-mail: zkubraozden@gmail.com (Z.K. Yılmaz)

Peer review under responsibility of Taibah University.



Production and hosting by Elsevier

Introduction

By December 2017, the number of internet users worldwide had reached nearly 4.2 billion. Turkey has 56 million internet users according to the data for December 2017.¹

Health and finance are at the forefront of the topics searched for on the internet.² Further, 4.5% of the internet searchers worldwide are related to health, and that health-related searchers are increasing each day.³

In developed countries, where educated consumers take care of their health, especially in the US and Europe, health websites are the main target of individuals seeking knowledge about diseases, treatment methods, and medicines.⁴

Claims from academic researchers, policy sources, and patients themselves are that the increase in the use of the internet for accessing health information will result in positive changing towards more equitable, or even patient-controlled relationships between practitioners and patients.^{5–8} On the other hand, the dangers for patients using the internet for health information have been pointed out. For example, some researchers have suggested the potential for misdiagnosis and exploitation.^{9–12}

According to a study on clinical and commercial services offered on 200 licensed community pharmacy websites from Great Britain, the Netherlands, the Canadian provinces of British Columbia and Manitoba, and the Australian states New South Wales and Western Australia; the top five specific services mentioned on these websites were cosmetic materials (126/200, 63.0%), medication refill request options (124/200, 62.0%), over-the-counter medication (115/200, 57.5%), complementary and alternative medicine (107/200, 53.5%), and home medical aids (98/200, 49.0%). Clinical consultation services were presented on lesser number of websites, but they still comprised an important share of 65.0% (N = 130/200).¹³ However, to our knowledge there are no reliable data on either the internet self-efficacy or satisfaction level of inquirers of internet-based drug information centre in Turkey.

Therefore, the present study aimed to evaluate inquirers' satisfaction with an internet-based drug information centre and the internet usage abilities and habits of individuals who had previously utilized services from this centre.

Materials and Methods

This study was conducted from 1st August, 2014 to 1st August, 2015, via an online drug information website service in Turkey. The first 100 individuals who received personalized medication consultancy from the webpage entitled 'www.ilacpedia.com' and who consented to participate in the study were included. This website is an internet-based drug information centre managed by clinical pharmacists. On the website, clinical pharmacists provide online general drug information for all healthcare professionals and for the community. All users need to sign in to get drug information from the website and ask questions to the pharmacists. Fourteen pharmacists provide personalized online drug information to each individual, within 24 h since the submission of his/her request. The present participants were selected from these individual users.

Individuals were contacted on telephone and informed about the project. They were eligible to participate in the trial if they met all the inclusion criteria. Internet commitment was considered as indicative of willingness to participate in the study. The 'Participant Data Form', 'Participant Approval Form', and 'Internet Self-efficacy Scale' were sent to the individuals who consented to participate, and additional explanations were provided when necessary. The individuals were contacted by a pharmacist via telephone and e-mail.

Inclusion criteria

- Aged between 18 and 75 years;
- Providing written consent to participate in this study, via internet commitment;
- Having a computer at home and ability to use the internet.

Exclusion criteria

- Having a psychiatric disorder diagnosed by a physician;
- Wanting to leave the study for any reason;
- Having insufficient data;
- Not using the internet.

Questionnaires

A pharmacist recorded every participant's profile data, including age, sex, marital status, educational status, existing diseases, drugs using regularly, and satisfaction level of the service using the Participant Data Form.

Participants' satisfaction with the internet-based drug information service was measured using items 11–17 of the Participant Data Form. Responses were made on a five-point Likert scale (ranging from 1 = strongly agree to 5 = strongly disagree). The participants were asked to rate their satisfaction with the online drug information service from different perspectives. The total score on this scale ranges from 7 to 35, with higher scores indicating a greater satisfaction with the drug information service.

The Cronbach's alpha internal consistency of this 7-item scale was 0.85. This shows the validity and reliability of the scale applied in the study.

Internet usage abilities and habits were measured using the Turkish version of the Internet Self-efficacy Scale (ISES), developed by Kim and Glassman in 2013.¹⁴ Akın et al. verified the validity and reliability of the Turkish version of the scale.¹⁵ Permission for using the Turkish version of the ISES was received from researchers. The Turkish version of the ISES consists of 17 questions with 5 subscales (productivity, decomposition, organization, communication, and research). All questions are rated using a seven-point Likert scale (1 = not feel confident at all to 7 = feel very confident). The ISES has a reliability α of 0.94. Participants were asked to rate their confidence in using the internet in various situations that may pose difficulties. The score on each subscale is computed as the mean of the

questions relevant to that subscale, as described by the authors. These scores were used in the data analysis. The total score obtained on the ISES ranges from 17 to 119. Higher scores indicate a greater level of internet self-efficacy.¹⁵

In the present study, the Cronbach's alpha internal consistency of the ISES was 0.95, thus confirming its validity and reliability.

Data collection

The following steps were followed and achieved as planned:

- Individuals were provided detailed information about the project and the process via telephone, and their queries were answered.
- The Participant Approval Form and questionnaire (including the Participant Data Form and ISES) were sent to the individuals who consented to participate in the study via e-mail.
- Participants' queries during completing the Participant Approval Form and questionnaire were answered.
- All data were collected and recorded.

Statistical analysis

Analysis was performed using SPSS version 11.0. All data were considered to be statistically significant at p -value < 0.05 and 95% confidence interval. The data did not show a normal distribution, as determined using the Kolmogorov–Smirnov test. Categorical data were examined using frequency and percentage. Scores on the ISES were examined using mean \pm standard deviation. A Spearman correlation analysis was used to evaluate the correlation between the parameters. The Cronbach's alpha test was used to confirm the internal consistency of the scales applied.

Results

Of the 100 participants included in this study, 71 were women (71%) and the average age of all participants was 37.92 ± 12.32 years (min: 19 years, max: 65 years). Eighty three participants had received education for over 8 years (83%). Sociodemographic characteristics of the participants are presented in Table 1.

It was observed that 57 of the participants (57%) did not take any medication routinely. Further, 63 of the participants (63%) did not have any chronic disease, 29 of them (29%) had one chronic disease, and 8 (8%) had two or more chronic diseases. The distribution of chronic diseases among the participants is presented in Table 2.

Regarding the content of questions asked by the participants in the information service, 30% pertained to birth, pregnancy, and gynaecological diseases, 20% pertained to dermatological diseases, and 10% were about reproductive system diseases.

Further, 93 of the participants (93%) who used the drug information service on the internet indicated that the explanations provided were understandable. Specifically, 28 of the participants (28%) asked about effects of drugs, whereas 21 (21%) asked about forms of drug usage and usage

Table 1: Sociodemographic characteristics of participants.

Sociodemographic characteristics	n ^a = 100 (Mean \pm SD ^b)
Age (years)	37.92 \pm 12.32
Sex	
Female	n = 71 (71%)
Male	n = 29 (29%)
Marital status	
Married	n = 60 (60%)
Single	n = 40 (40%)
Educational status	
\leq 8 years of education	n = 17 (17%)
>8 years of education	n = 83 (83%)

^a n, number of participants.

^b SD, standard deviation; 8 years is the duration of compulsory education in Turkey.

Table 2: Distribution of chronic diseases among participants.

Name of disease	n ^a (%)
Absent	63 (63)
Hypertension	5 (5)
Diabetes mellitus	5 (5)
Allergic rhinitis	4 (4)
Hypothyroidism	3 (3)
Prolactinoma	2 (2)
Breast cancer	2 (2)
Migraine	2 (2)
Gastroesophageal reflux	2 (2)
Peptic ulcer	1 (1)
Other	16 (16)

^a n, number of participants.

conditions. The opinions of the participants about the internet-based drug information service are presented in Table 3.

The mean total score on the 7-item scale assessing participants' satisfaction with the consultation service via internet was 29.84 ± 4.33 . The mean scores on each question in this scale are presented in Table 4.

The present participants mostly felt confident about using the internet to access health-related information that is important for them (5.79 ± 1.61); whereas, they felt less confident about using blogs to influence other individuals' lives positively (3.33 ± 2.08). Participants' ISES scores are presented in Table 5.

The participants exhibited the highest score on the decomposition subscale (20.94 ± 6.18) and the lowest score on the communication subscale (9.77 ± 3.58) of the ISES (Table 6).

A comparison of participants' ISES total and subscale scores according to their marital status revealed no significant differences between married and single participants ($p > 0.05$). However, a statistically significant difference was found in the productivity, organization, communication subscales of the ISES and the total ISES score between participants who had received education for over 8 years and those who had received education for 8 years or less

Table 3: Participants' opinions about the internet-based drug information service.

Questions	I agree ^a n (%)	I am not sure n (%)	I do not agree n (%)
1. The explanations provided in the consultation service were understandable.	93 (93)	1 (1)	6 (6)
2. The information provided did not contribute enough to solving my problem.	5 (5)	6 (6)	89 (89)
3. The speed of reply was good.	93 (93)	1 (1)	6 (6)
4. It took a long time to access information through this method.	4 (4)	3 (3)	93 (93)
5. Scientifically, the service and information I received did not satisfy me very much.	4 (4)	16 (16)	80 (80)
6. The consultation service provided after I posed my question satisfied me.	83 (83)	9 (9)	8 (8)
7. I will gladly recommend this consultation service to others.	90 (90)	6 (6)	4 (4)

^a n, number of individuals.

Table 4: Participants' satisfaction score for internet-based drug information centre.

Questions	Mean±SD ^a
1. The explanations provided in the consultation service were understandable.	4.38 ± 0.86
2. The information provided did not contribute enough to solving my problem.	4.15 ± 0.86
3. The speed of reply was good.	4.38 ± 0.79
4. It took a long time to access information through this method.	4.36 ± 0.81
5. Scientifically, the service and information I received did not satisfy me very much.	4.04 ± 0.82
6. The consultation service provided after I posed my question satisfied me.	4.13 ± 0.95
7. I will gladly recommend this consultation service to others.	4.40 ± 0.85
Total score	29.84 ± 4.33

^a SD, standard deviation.

($p < 0.05$). On the other hand, no significant differences were found between male and female participants' ISES total and subscale scores ($p > 0.05$).

Discussion

The consultation service provided via the internet was associated with a positive effect on individual satisfaction and expectations. The consultation provided by pharmacists helped resolve problems related to individuals' health issues.

To our knowledge, this study is the first in Turkey to evaluate users' satisfaction with a drug information service

Table 5: Scores on the Internet Self-efficacy Scale.

To what extent do you feel confident about fulfilling the following tasks?	Mean±SD ^a
1. I can use the internet to find information that is important to me.	5.79 ± 1.61
2. I can use the internet to find information that will be useful to children and their development.	5.41 ± 1.63
3. I can use links on the internet to find information that is important to me.	5.45 ± 1.66
4. I can use links on the internet to find information that is important to others.	5.23 ± 1.56
5. I can use links on the internet to improve my knowledge.	5.39 ± 1.58
6. I can contribute to the development of other people using links on the internet.	4.87 ± 1.77
7. I can find important and interesting information by reading other people's blogs.	5.05 ± 1.79
8. I can forward important and interesting information to other people via the internet.	5.00 ± 1.86
9. I can use the information I find on the internet to answer questions.	4.87 ± 1.85
10. I can use the internet effectively to answer other people's questions.	4.59 ± 1.94
11. I can use the internet effectively to answer my own questions.	5.17 ± 1.84
12. I can use social networking sites like Facebook as an effective means of communication.	4.78 ± 1.97
13. I can effectively use blog sites like 'Blogger'.	3.75 ± 2.08
14. I can write blog posts on topics that other people care about.	3.42 ± 2.07
15. I can use social networks as an effective way to communicate with other people.	4.99 ± 1.87
16. I can use blogs as an effective way to communicate with other people.	3.81 ± 2.09
17. Using blogs, I can have a positive impact on other people's lives.	3.33 ± 2.08
Total score	80.89 ± 23.65

^a SD, standard deviation.

Table 6: Scores on the subscales of the Internet Self-efficacy Scale.

Subscales of the Internet Self-efficacy Scale	Mean±SD ^a
Research	11.20 ± 3.01
Decomposition	20.94 ± 6.18
Organization	19.63 ± 6.75
Productivity	19.36 ± 8.70
Communication	9.77 ± 3.57

^a SD, standard deviation.

provided on the internet by pharmacists, and their internet usage abilities and habits of individuals.

In a study on 1800 participants, Someya et al. reported that 49.9% of the participants declared that, if a consultation of up to 30 min was available at a pharmacy where patient privacy was ensured, they would use the service. On the other

hand, 41.7% of the participants declared that, because other patients were waiting for their turn, they did not ask pharmacists for consultation.¹⁶

Computers are easily accessible (at home, work, or in a library), available for use 24 h a day and offer anonymity. In most developed countries, ease of use is a major reason for participants' preference for internet-based consultations. Furthermore, the asynchronous access to internet-based patient consultation services allows users to access the service at their convenience, a characteristic appreciated by several participants.^{17,18}

During consultation via the internet, the participant may remain anonymous, thereby allowing users to ask private and shameful questions. In previous studies, 'health seekers' approved the anonymity of searching the internet for medical information. The users reported that this opportunity to use consultation services anonymously may complement regular health care.¹⁷

In our study, 30% of the questions asked by the individuals pertained to birth, pregnancy, and gynaecological diseases. Similar to the literature, inquirers in the present study reported that they were embarrassed to ask questions about these topics. Therefore, they were glad to be able to ask such questions anonymously to a pharmacist.

In a study by Eysenbach,¹⁹ participants stated that the information obtained from the internet might be conflicting (76%) and confusing. In contrast to literature, 93% of the present participants reported that the information provided by the consultation service was understandable, and 83% of our participants were satisfied with the answers provided. We believe that these positive high percentages observed in our study may be related to the individualized consultation offered by a pharmacist.

Umefjord et al. reported that almost 71% of inquirers using a patients' counselling service called 'Ask the Doctor' were women. As men are thought to be more technology-focused than women, one might suppose that men used the internet-based Ask the Doctor service more than women did. However, Umefjord et al. found that women used the service more than men did. This gender difference corroborates other studies that have shown that women are more likely than men to go online to seek health-related information.^{17,20} In keeping with the literature, in our study, the rate of women using internet-based individual counselling service (71%) was more than that of men.

In our study no significant difference was found between male and female participants' ISES total and subscale scores ($p > 0.05$). This finding was not consistent with those reported in previous studies concerning gender differences in internet self-efficacy. In previous studies, male participants displayed higher internet self-efficacy than females did.^{21–23}

As the demand for health information from the internet increases, it is important to evaluate the service quality of drug information services provided by pharmacists over the internet. Since such services are a new development in this field, there is no cultural adaptation study with similar aims as those of our study. While this increases the originality of our study, it restricts the comparison of our results.

The present study has several limitations. Internet users are a selected sample of the population. Sampling error (surveying a sample rather than the whole population) is a general quandary in research and is a more prominent

problem in online research. The participants of this study chose to use an internet-based consultation service by themselves. It is likely that they felt more positively about internet-based consultations than a population that has never considered this option.

Conclusion

The present study found that the internet-based drug information service provided by clinical pharmacists contributed positively on individual users' satisfaction. We also found that an individual counselling service driven by a pharmacist may also be of value for individuals with needs that regular health care services have not been able to meet. Such services could be a platform to ask sensitive questions, especially for inquirers preferring written communication and for individuals seeking advice on behalf of relatives.

We believe that clinical pharmacists should take part in providing internet-based drug information services to provide better drug information to individuals. By this means, we believe that we can reach more individuals at a lesser cost, and in a shorter time, to obtain more effective results.

Source of funding

This study did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

Conflict of interest

The authors have no conflict of interest to declare.

Ethical approval

This project was approved by the Human Research Ethics Committee of the Marmara University Institute of Health Science. The website provided written permission to contact their participants at the beginning of the study. All participants provided written informed consent at the time of enrolment, via the internet.

Authors' contributions

FVI conceived and designed the study, and prepared the initial and final draft of the article. BO provided research materials. ZKY conducted the study, and collected and organized the data. MS analysed and interpreted the data. All authors have critically reviewed and approved the final draft and are responsible for the content and similarity index of the manuscript.

References

1. Internet stats and Facebook usage in Europe December 2017 statistic. <https://www.internetworldstats.com/stats4.htm>. 2017 Dec [Accessed 3 July 2018].
2. Yeğenoğlu S, Sözen B. Evaluation of pharmacy related websites in Turkey under some principles. In: *XII. Internet Conference in Turkey*; 8–10 November 2007. Ankara.
3. Özer Ö, Santaş F, Budak F. A study of health web sites' usage level: a case application. *e-GİFDER* 2012; 1(4): 137–149.

4. Erdal M, Saygılı S. The effects of new technologies on the health sector and internet usage. **Curr Pharm** 2001 November; 98: 15–18.
5. Graham W, Smith P, Kamal A, Fitzmaurice A, Hamilton N. Randomised controlled trial comparing effectiveness of touch screen system with leaflet for providing women with information on prenatal tests. **BMJ** 2000 Jan 15; 320(7228): 155–160. <https://doi.org/10.1136/bmj.320.7228.155>.
6. Hardey M. 'E-health': The internet and the transformation of patients into consumers and producers of health knowledge. **Inf Commun Soc** 2001; 4(3): 388–405.
7. Ferguson T. Health online and the empowered medical consumer. **Jt Comm J Qual Improv** 1997 May; 23(5): 251–257.
8. Eysenbach G. Consumer health informatics. **BMJ** 2000 Jun 24; 320(7251): 1713–1716. <https://doi.org/10.1136/bmj.320.7251.1713>.
9. Hart A, Henwood F, Wyatt S. The role of the internet in patient-practitioner relationships: findings from a qualitative research study. **J Med Internet Res** 2004 Jul–Sep; 6(3): e36. <https://doi.org/10.2196/jmir.6.3.e36>.
10. Eysenbach G, Diepgen TL. Towards quality management of medical information on the internet: evaluation, labelling, and filtering of information. **BMJ** 1998 Nov 28; 317(7171): 1496–1500.
11. Heathfield H, Pitty D, Hanka R. Evaluating information technology in health care: barriers and challenges. **BMJ** 1998 Jun 27; 316(7149): 1959–1961.
12. Jadad AR, Gagliardi A. Rating health information on the Internet: navigating to knowledge or to Babel? **J Am Med Assoc** 1998 Feb 25; 279(8): 611–614.
13. Eysenbach G, Perepelkin J, Schulz P, Grindrod K, Yang Q, Zwier S. "Click for closer care": a content analysis of community pharmacy websites in four countries. **J Med Internet Res** 2017 Jun; 19(6): e205. <https://doi.org/10.2196/jmir.6899>.
14. Kim Y, Glassman M. Beyond search and communication: development and validation of the internet self-efficacy scale (ISS). **Comp Human Behav** July 2013; 29(4): 1421–1429. <https://doi.org/10.1016/j.chb.2013.01.018>.
15. Akın A, Akın Ü, Sahranç Ü, Kaya M, Uğur E. The validity and reliability studies of Turkish version of the internet self-efficacy scale. **BÜEFAD** 2014; 3(2): 404–415.
16. Someya F, Takuma H, Izumisawa M, Shiragami M. Patients needs for consultation with pharmacists. **Yakugaku Zasshi** 2009 Sep; 129(9): 1137–1140.
17. Umeffjord G, Petersson G, Hamberg K. Reasons for consulting a doctor on the internet: web survey of users of an ask the doctor service. **J Med Internet Res** 2003 Oct–Dec; 5(4): e26.
18. Williams P, Huntington P, Nicholas D. Health Information on the Internet: a qualitative study of NHS direct online users. **ASLIB Proc** 2003; 55: 304–312.
19. Eysenbach G. The impact of the Internet on cancer outcomes. **CA Cancer J Clin** 2003; 53: 356–371.
20. Fox S, Fallows D. Internet health resources: health searches and email have become more commonplace, but there is room for improvement in searches and overall Internet access. <http://www.pewinternet.org/2003/07/16/internet-health-resources/>. 2003 July [Accessed 5 July 2018].
21. Torkzadeh G, Thomas P, Dyke V. Effects of training on Internet self-efficacy and computer user attitudes. **Comput Hum Behav** 2002; 18: 479–494.
22. Durndell A, Haag Z. Computer self efficacy, computer anxiety, attitudes towards the Internet and reported experience with the Internet, by gender, in an East European sample. **Comput Hum Behav** 2002; 18: 521–535.
23. Wu YT, Tsai CC. University students' Internet attitudes and Internet self-efficacy: a study at three universities in Taiwan. **Cyberpsychol Behav** 2006 Aug; 9(4): 441–450. <https://doi.org/10.1089/cpb.2006.9.441>.

How to cite this article: İzzettin FV, Yılmaz ZK, Okuyan B, Sancar M. Evaluation of satisfaction and internet self-efficacy of inquirers using an internet-based drug information centre. *J Taibah Univ Med Sc* 2019;14(1):67–72.