Students' attitudes towards impact of the health department website on their health literacy in Semnan University of Medical Sciences

Jamileh Mahdizadeh[1], Ali Valinejadi[2], Behnoosh Pooyesh[3], Fatemeh Jafari[3], Mehdi Kahouei[4]

[1] M.Sc. of English Language, Instructor, Department of English Language, School of Medicine, Semnan University of Medical Sciences, Semnan , Iran
[2] Ph.D. of Health Information Management, Assistant Professor, Social Determinants of Health Research Center, Department of Health Information Technology, School of Allied Medical Sciences, Semnan University of Medical Sciences, Semnan, Iran
[3] Student Research Committee, School of Allied Medical Sciences, Semnan University of Medical Sciences, Semnan, Iran
[4] Ph.D. of Health Information Management, Associate Professor, Social Determinants of Health Research Center, Department of Health Information Technology, School of Allied Medical Sciences, Semnan University of Medical Sciences, Semnan, Iran

Type of article: Original

Abstract

Background and aim: Health literacy has been of interest to policymakers because of its impact on health decision-making as one of the important issues for promoting community health and improving the quality of health care delivery. Therefore, it seems necessary to examine the status of the website of the health sector of the University of Medical Sciences in promoting health literacy from the viewpoint of the students.

Methods: This cross-sectional study was performed on 529 medical and allied students in schools affiliated to Semnan University of Medical Sciences, Semnan, Iran between 2016 and 2017. In this study, a valid and reliable adult health literacy questionnaire designed by Montazeri et al. was used. The questionnaire was distributed among students in medical and allied health schools and they were asked to complete the questionnaire. Independent-samples t-test, one-way ANOVA, and Pearson product-moment correlation were used to analyze data by SPSS 19.

Results: Mean scores of the participants' attitudes towards reading of health information was 3.14 and towards decision and usage of health information was 2.53. Relationship between the study subjects' demographic characteristics and their attitudes was significant ($p < 0.05$).

Conclusion: This study showed that interventional strategies are necessary to lead students to make effective use of the university's health department website. Hence, the results of this study showed that the website of the health department needs to be redesigned, and this design would allow a better link between the University of Medical Sciences and its audience to promote health literacy.

Keywords: Health department, Website, Health literacy, Students, Iran

1. Introduction

The knowledge-based age of information that has been the result of the human passage from the industrial age to the information age, has a different educational background than it used to have in the past. Information technology, which is increasingly expanding, can positively affect teaching, and modify its strategies and methods (1). In recent years, information and communications technology (ICT) has grown dramatically; the Internet in particular, has

made significant opportunities available to the public. One of the key objectives of using the Internet is to get access to health information and improve the quality of health at an affordable cost. This requires that active interaction between healthcare professionals and communication technicians be established in order to provide a platform for health information users' satisfaction and their needs in this area to be predicted and provided (2). For people with low education, or people who are not economically able to get access to the Internet or live on the margins of the community and use the Internet less widely, health data seems to be unavailable; however, this media still provides easy access to health information such as illness and symptoms, physical and behavioral abnormalities, disease prevention and health promotion, sex education, and therapeutic methods (3). Higher education institutions are increasingly planning to incorporate ICT as a tool for teaching learning, scientific cooperation, scientific communication, the development and empowerment of faculty members, and in practice, they are trying to develop ICT to realize goals. Today, however, this is much more important for education than before, because new tools and the use of information and communication technology are effective in teaching methods (4). The development of new tools and information and communication technology affects universities' policies and practices, changes the teaching and education process, and improves the learning process and the academic performance of learners (5). Today, one aspect of information technology considered by students is web sites (6). Web sites can make it easier for students to access health services and information. Web sites have become sources of information that can provide much information to users (7, 8). Insofar as 24% of users use websites to search for health-related information (9). The findings of a study by Lawson et al. showed that web sites, as a new approach, played an important role in the educational system of the students. They were also important in improving the quality of teaching, the diversification of teaching methods and empowerment of the students (10). A study by Islam et al. showed that Bangladesh University students got a lot of satisfaction from using the University Library website. They reported that the website had a significant impact on learning teaching concepts, acquiring information and sending scientific information to their friends (11). Higher education institutions are pursuing customer-centric approaches through providing quality services to students, and this helps them to survive in the competition market (12). Thus, universities are directing more of their resources toward website design (13). The website of Semnan University of Medical Sciences, besides providing marketing information on student recruitment and curricula in the field of health, has been working on the health sector with the help of the digital library, social media and messaging systems to provide the students of medicine and paramedics with health and medical information. Since the mission of the universities of medical sciences in Iran is to improve public health (14), the question arises whether the website of the Health Department of the University of Medical Sciences has been able to increase the health literacy of the students. In the other words; what is the contribution of medical universities websites in increasing its audiences' health literacy. Although several studies have been conducted on the role of information resources in health literacy, no study has been done regarding the impact of the websites of medical science universities as a source of information on students' health literacy as the most important audiences. Therefore, it seems necessary to examine the status of the website of the health sector of the University of Medical Sciences in promoting health literacy from the viewpoint of the students. Therefore, the aim of this study was to survey the attitudes of students' of Semnan University of Medical Sciences towards the impact that the health department website has had on their health literacy.

2. Material and Methods

Participants in this study were medical and allied health students of Semnan University of Medical Sciences in Iran. The research was conducted over five months, from December 2016 to May 2017. The census method was used and the sampling method was not used in the current study. A total of 832 questionnaires were distributed; 529 were returned, which represented a response rate of 63.5%. In this study, an adult health literacy questionnaire designed by Montazeri et al. (15), was used. The questionnaire consisted of 40 items. The first section focused on demographic information (sex, age, education, computer skills, general health status such as physical, psychological and social health, the frequency of use of the website and the frequency of use of the Telegram application. The second section is comprised of 6 items to measure the attitudes of the students in relation to the impact of the health department website on the students' access to health information. Attitudes on each item were measured on a 5-point Likert scale (never =1, rarely =2, sometimes =3, most of the time =4 and always =5). The third section included 4 items related to reading health information using the website. Attitudes on each item were measured on a 5-point Likert scale (very hard =1, hard =2, not easy and not hard =3, easy =4 and very easy =5). The fourth section included 7 items related to comprehension of health information. Attitudes on each item were measured on a 5-point Likert scale, (never =1, rarely =2, sometimes =3, most of the time =4 and always =5). The fifth section comprised of 3 items related to the assessment of health information. The sixth section included 13 items related to decision making and usage of health information. Attitudes on the fourth, fifth and sixth sections were measured on a 5-point

Likert scale, (never =1, rarely =2, sometimes =3, most of the time =4 and always =5). Then, the anonymous questionnaire was distributed among students in medical and allied health schools and they were asked to complete the questionnaires and return them to the researcher within 72 hours. To determine the distributions of responses, SPSS was used to perform descriptive statistics. A Kolmogorov-Smirnoff test indicated that data distribution was normal. A total attitude score for each of the sections was calculated (low score ≤3.4; high score ≥3.5). A low score indicated a negative attitude, while a high score indicated a positive attitude. Data were analyzed by IBM© SPSS© Statistics version 19 (IBM© Corp., Armonk, NY, USA), using independent-samples t-test, one-way ANOVA, and Pearson product-moment correlation. The significance level was considered as $p<0.05$. Ethics approval was obtained from the Semnan University of Medical Ethics Committee (IR. SEMUMS. REC.1395.204). A covering letter was prepared for distribution with the survey document, which described the purposes of the study and explained that a response to the survey would indicate the consent of the participant to take part in the research. It also assured participants of the confidentiality of their responses.

3. Results

Demographic characteristics of the data are outlined in Table 1. The participants' mean age was 21.37 years. There were 304 (57.5%) females, 353 (67.1%) people were undergraduates, and 206 (39%) people had moderate computer skills. Other data showed that 271 (51.2%) people had good general health, 230 (43.5%) people used the website monthly, 315 (59.5%) used Telegram daily. Mean scores of the participants' attitudes towards reading of health information was 3.14 and towards decision and usage of health information was 2.53 (Figure 1). Results in Table 2 showed that there were significant relationships ($p<0.05$) among the study subjects' demographic characteristics and their attitudes. The finding showed that there were significant correlations among the health literacy components ($p<0.001$) (Table 3).

Table 1. Demographic characteristics of the students of Semnan University of medical sciences

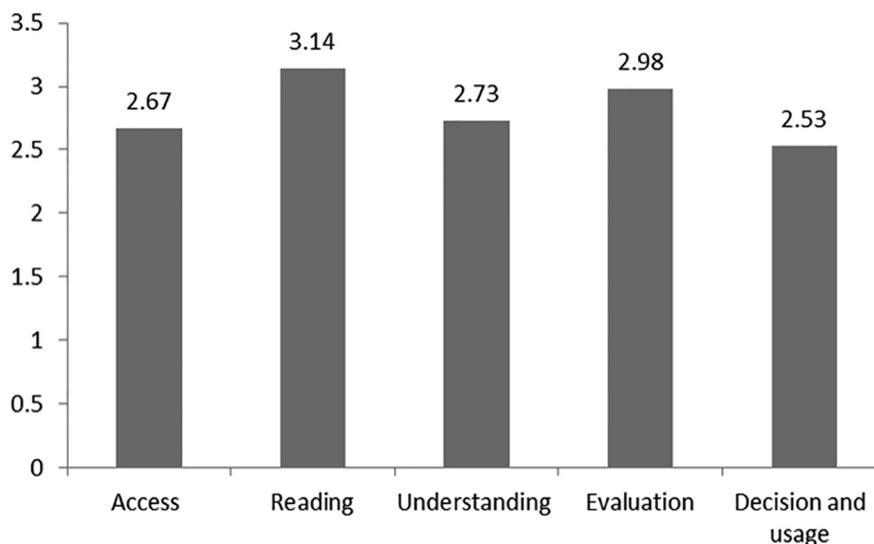| Characteristics		n	%
Sex	Male	225	42.5
	Female	304	57.5
Education	Undergraduate	353	67.1
	Postgraduate	173	32.9
Computer skills	Weak	54	10.2
	Moderate	206	39.0
	Good	148	28.0
	Excellent	120	22.7
General health	Very bad	6	1.1
	Bad	5	0.9
	Moderate	72	13.6
	Good	271	51.2
	Very good	175	33.1
Use of website	Never	41	7.8
	Daily	55	10.4
	Weekly	203	38.4
	Monthly	230	43.5
Use of Telegram	Never	29	5.5
	Daily	315	59.5
	Weekly	105	19.8
	Monthly	80	15.1

Figure 1. Mean scores of the participants' attitudes towards health literacy components

Table 2. Relationships between participants' characteristics and their attitudes towards the impact of website on health literacy components*

Website quality	Characteristics					
	Sex	Education	Computer skills	General health	Use of website	Use of Telegram
Access to health information	0.69	0.22	0.005	0.99	0.000	0.001
Reading health information	0.623	0.20	0.002	0.27	0.27	0.007
Understanding health information	0.90	0.49	0.003	0.85	0.004	0.001
Evaluation of health information	0.26	0.49	0.000	0.01	0.000	0.000
Decision and usage of health information	0.44	0.96	0.000	0.97	0.028	0.000

* Independent-samples t-test, one-way ANOVA

Table 3. Correlation matrix of health literacy components

Variables	1	2	3	4	5
Access to health information	1				
Reading health information	0.516*	1			
Understanding health information	0.650*	0.569*	1		
Evaluation of health information	0.537*	0.520*	0.623*	1	
Decision and usage of health information	0.580*	0.484*	0.704*	0.631*	1

*$p < 0.001$, Pearson product-moment correlation

4. Discussion

This study was performed to evaluate attitudes of students of Semnan University of Medical Sciences towards impact of the health department website on their health literacy. Some of the consequences of illiteracy in the health sector consist of less use of prevention services, more delay in diagnosis, fewer adherences to medical guidelines, increase in hospitalization, increased risk of death, and more health care costs, etc. (16). Hence, health literacy has been of interest to policymakers because of its impact on health decision-making as one of the important issues for promoting community health and improving the quality of health care delivery (3). Although the present study showed that there is a meaningful relationship between some of the students' personal characteristics (computer skills, use of website and use of Telegram) and their attitude towards access to health information on the website of the University Health Department ($p < 0.01$), the results of this study indicate that the website of health department of the university has failed in directing students towards obtaining health and medical information. This situation can

be related to poor data architecture on the website. The website should direct customers to an environment where information is easily accessible (9). The results of the Hazara & Bhandari study are consistent with the findings of this study. They found that the reasons for the lack of access to the information on the website were the bulk of information on website, the information needed was not easily found, and there was no communication between the websites of each of the departments (17). Information foraging theory indicates that users are constantly deciding on what information to look for, how to search for information, whether they will continue to search for information on a particular site, or to either go to another site or stop their information search (18). The decision to stay on a site and continue to search for required information is based on a cost-benefit analysis mechanism, which means that users evaluate the information obtained against the amount of effort they have undertaken. When users feel they do not get the information they need easily, they turn to another website (19). A study conducted by Sahusilawane et al., reported that in some cases they had easier access to their needed information via oral communication or by consulting other students than they could get from websites (20). It seems that if the university health department website had a better information structure, it would probably determine the effectiveness of users in finding health information. The subject of reading has a deep and close connection with the comprehension of written texts. It is a complex work that involves both understanding and thought (21). The results showed that there was a significant and meaningful relationship between computer skills and using telegrams, and students' attitudes towards the capability of the health department's website in reading health information ($p<0.01$). In other words, these individual characteristics of students have influenced their skills in getting information from the written content and understanding the message that is available on the website. However, the results of this study showed that the website of the university's health department was somewhat effective in reading students' health information (mean=3.14). Given that reading consists of two interrelated processes, which are knowing the word (or the speech) and also understanding that word (22), then, the findings of this study indicate that students had managed to learn the skills necessary for gaining health information via written material published on the website. According to the definition of health literacy as one's capacity to interpret and understand basic information and health services that are necessary for proper decision making (23), the findings showed that there is a meaningful relationship between computer skills, website and Telegram use, and the attitude of students regarding the ability of the website of the university's health department in providing the useful health information ($p<0.01$). Although these participants' attributes have affected the assumptions and perceptions they have had as regards the content on the website, the results of this study showed that the website of the university's health department has not contributed to the students understanding of the health issues (mean=2.73). Since the limited familiarity of some students with health concepts is probably one of the characteristics that damages students' ability to successfully interact with health care systems, the website of the university's health department needs to rebuild its relation with students based on their true health literacy. In this regard, simple and understandable written material can be used on the website (7). Health related materials such as pictures and photographs seem necessary to be available on the university health department website, in order to facilitate the students' understanding of hygiene and medical issues. The average population is of borderline health literacy. People with this level of health literacy often have an inaccurate understanding of health information and have difficulty in understanding their rights and responsibilities (24). The findings of this study showed that there was a significant and meaningful relationship between computer skills, general health, the use of the website and the use of Telegrams and students' attitudes towards the health department website's capability in evaluating health information ($p<0.01$). Although, these characteristics of the statistical society have been effective on their ability to evaluate and value the health-related content of the university's health department website, the results showed that the students expected the website to provide the correct health information. Hence, health and medical information on the website is expected to be based on medical protocols and expert opinions. This situation helps students to properly evaluate their health information. Other studies have assessed the validity of web pages based on golden standards (25, 26). According to studies by US Health Care Strategy Centers, people with low levels of health literacy do not understand the written and spoken information provided by the health team and do not respond to the recommendations given, have a poorer health status and incur more costs (27). The results of this study also showed that the university's website was unable to influence students in decision making and application of health information (mean=2.53). Therefore, based on these results, increasing the ability of the university's health website to establish proper communication with students is one of the most important factors affecting self-care behaviors among students (28). Nevertheless, the findings showed that there was a significant relationship between computer skills, using the website and using Telegrams, and students' attitude towards the website's ability in decision making and using the health information ($p<0.01$). In other words, these individual characteristics of students have affected their ability to identify health information and the selection of a health activity to solve a health problem for self-care. The results showed that there was a significant and meaningful correlation between the students' attitude regarding the capability of the website of the health sector in all components of health literacy

(p<0.001). This reflects the fact that each of the components of health literacy affects the other because health literacy includes the ability to use the sophisticated medical skills of reading, listening and decision analysis, and the ability to use these skills in health situations is not necessarily associated with years of study or general reading ability (29, 30). In a study by Alizadeh et al., health literacy was recognized as an effective factor in physical performance (31). The results of this study are important for designers. To have a high-quality website, designers must first understand the multiple qualities that affect user expectations, and then link these qualitative features to the website design specifications (32). The findings of this study indicate that interventional strategies are necessary to lead students to make effective use of university health department websites. Accordingly, if a medical university is to increase student health literacy through its website, it should use the Website Developmental Model for health care clients. It is a user-centric approach to designing and developing a website for customers. (33, 34). Furthermore, the level of literacy, the accuracy and the appropriateness of the website content should also be considered.

5. Limitations

This study has a number of limitations, the first limitation is that the study used a user-driven methodology to assess the quality of the website of the health sector, which is only perceived by users, and that is not easy because the quality of the website cannot be evaluated based on the understanding of users. The second limitation is related to the low number of participants. The study is better to be conducted with a high volume of participants. The third limitation is that there is no golden standard to assess the functionality of a website, so different ways of measuring can determine different aspects of a given website's capabilities. In spite of the above limitations, this study emphasizes the importance of training and designing a website for university health departments, using e-health software.

6. Conclusions

The results of this study showed a user-centered framework that provides the best performance in information quality and design interactions between the student and the website. This study showed that interventional strategies are necessary to lead students to make effective use of the university health department website. Hence, the results of this study showed that the website of the health department needs to be redesigned, and this design will allow a better link between the University of Medical Sciences and its audience, to promote health literacy.

Conflict of Interest:
There is no conflict of interest to be declared.

Authors' contributions:
All authors contributed to this project and article equally. All authors read and approved the final manuscript.

References:
1) Nicolle PS, Lou Y. Technology Adoption Into Teaching and Learning by Mainstream University Faculty: A Mixed Methodology Study Revealing the "How, When, Why, and Why Not". Journal of Educational Computing Research. 2008; 39(3): 235-65. doi: 10.2190/EC.39.3.c.
2) Hilty DM, Snowdy CS, Shoemaker EZ, Gutierrez YS, Carli V. Social media, e-health and clinical practice: tips for clinicians, guidelines, and exploring pathological internet use. Kei journal. 2016; 3(7): 2-14. doi: 10.4172/2167-0420.1000223.
3) Manganello J, Gerstner G, Pergolino K, Graham Y, Falisi A, Strogatz D. The relationship of health literacy with use of digital technology for health information: implications for public health practice. J Public Health Manag Pract. 2017; 23(4): 380-7. doi: 10.1097/PHH.0000000000000366. PMID: 26672402.
4) Tondeur J, Van de Velde S, Vermeersch H, Van Houtte M. Gender Differences in the ICT Profile of University Students: A Quantitative Analysis. Journal of Diversity and Gender Studies. 2016; 3(1): 57-77.
5) Dobrota M, Jeremic V. Shedding the Light on the Stability of University Rankings in the ICT Field. IETE Technical Review. 2017; 34(1): 75-82. doi:10.1080/02564602.2016.1144487.

6) Paris M. Website accessibility: a survey of local e-government websites and legislation in Northern Ireland. Univ Access Inf Soc. 2006; 4(4): 292-9. doi: 10.1007/s10209-003-0081-7.

7) Baron KA, Kehinde JO, Al-Khudairi A. Preconception Health Education and Website Development for College Students. Clin Scholars Rev. 2015; 8(2): 181-91. doi:10.1891/1939-2095.8.2.181.

8) Moreno JM, Del Castillo JM, Porcel C, Herrera-Viedma E. A quality evaluation methodology for health-related websites based on a 2-tuple fuzzy linguistic approach. Soft Compu. 2010; 14(8): 887-97. doi: 10.1007/s00500-009-0472-7.

9) Davies MA, Terhorst L, Nakonechny AJ, Skukla N, El Saadawi G. The development and effectiveness of a health information website designed to improve parents' self‑efficacy in managing risk for obesity in preschoolers. J Spec Pediatr Nurs. 2014; 19(4): 316-30. doi: 10.1111/jspn.12086.

10) Lawson A, Meischke H, Phelan E. Student Presentation Content development for a tailored, interactive website to guide older adults to prevent falls. Journal of the American Geriatrics Society. 2016; 64: S266-7.

11) Islam MM. Assessing students' perceptions of ease-of-use and satisfaction on mobile library website: a private university perspective in Bangladesh. M-Libraries 5: From devices to people. 2015; 5: 59.

12) Kamalova LA, Koletvinova NY. The Problem of Reading and Reading Culture Improvement of Students-Bachelors of Elementary Education in Modern High Institution. Int J Environ Sci Educ. 2016; 11(4): 473-84. doi: 10.12973/ijese.2016.318a.

13) Lilles A, Rõigas K. How higher education institutions contribute to the growth in regions of Europe? Stud High Educ. 2017; 42(1): 65-78. doi: 10.1080/03075079.2015.1034264.

14) Yazdani S, Rahmatabadi MD, Alimohamadi E. Encouraging Factors for Invest in Higher Education in the Private Sector in Iran. Journal of Medical Education. 2017; 16(1). doi: 10.22037/jme.v16i1.15772.

15) Montazeri A, Tavousi M, Rakhshani F, Azin SA, Jahangiri K, Ebadi M, et al. Health Literacy for Iranian Adults (HELIA): development and psychometric Properties. Payeshe. 2014; 13(5): 589-99.

16) Benjamin J, Jane V, Hayden B. Can This Patient Read and Understand Written Health Information? The Journal of the American Medical Association 2010; 304: 76-84 Doi: 10.1001/jama.2010.896.

17) Hazara AM, Bhandari S. Barriers to patient participation in a self-management and education website Renal Patient View: A questionnaire-based study of inactive users. Int J Med Inform 2016; 87: 10-4. doi: 10.1016/j.ijmedinf.2015.12.004.

18) Lawrance J, Bogart C, Burnett M, Bellamy R, Rector K, Fleming SD. How programmers debug, revisited: An information foraging theory perspective. IEEE Trans Softw Eng. 2013; 39(2): 197-215. doi: 10.1109/TSE.2010.111.

19) Limb M. Website aims to help people understand health research. Br Med J. 2016: 354.

20) Sahusilawane W, Hiariey LS. The Role of Service Quality toward Open University Website on The Level of Student Satisfaction. J Educ Learn. 2016; 10(2): 85-92. doi:10.1136/bmj.i4403.

21) Hutchinson N, Baird GL, Garg M. Examining the reading level of internet medical information for common internal medicine diagnoses. The American journal of medicine. 2016; 129(6): 637-9. doi: 10.1016/j.amjmed.2016.01.008.

22) Haragan A, Werner C, Himes K. 163: Misinformation in the information age: what are our patients reading about periviability online. American Journal of Obstetrics & Gynecology. 2017; 216(1): S109-10. doi: 10.1016/j.ajog.2016.11.067.

23) Berkman ND, Davis TC, McCormack L. Health literacy: What is it? Journal of Health Communication. 2010; 15: 9-19. doi: 10.1080/10810730.2010.499985.

24) Batterham RW, Hawkins M, Collins PA, Buchbinder R, Osborne RH. Health literacy: applying current concepts to improve health services and reduce health inequalities. Public Health. 2016; 132: 3-12. doi: 10.1016/j.puhe.2016.01.001.

25) Sowter J, Astin F, Dye L, Marshall P, Knapp P. Assessment of the quality and content of website health information about herbal remedies for menopausal symptoms. Maturitas. 2016; 88: 16-22. doi: 10.1016/j.maturitas.2016.02.016

26) Riahinia N, Attaran M, Asemi A. Evaluation of an Educational Website Based on a Well-structured Standard. Library Herald. 2011; 49(1): 63-9.

27) Sorensen K, Van den Broucke S, Fullam J, Doyle G, Pelikan J, Slonska Z, et al. Health literacy and public health: A systematic review and integra-tion of definitions and models. BMC Public Health. 2012; 12: 80. doi: 10.1186/1471-2458-12-80.

28) Cailor SM, Chen AM, Franz TT, Thornton PL, Ballentine J. Assessment of Student Self-care Counseling Skill Progression Across a Semester. American Journal of Pharmaceutical Education. 2016; 80(5): 99. doi: 10.5688/ajpe805s2.

29) Mullan J, Burns P, Weston K, McLennan P, Rich W, Crowther S, et al. Health literacy amongst health professional university students: a study using the Health Literacy Questionnaire. Education Sciences. 2017; 7(2): 54. doi: 10.3390/educsci7020054.

30) Kahouei M, Alaei S, Shariat Panahi SSG, Zadeh JM. Strategy of health information seeking among physicians, medical residents, and students after introducing digital library and information technology in teaching hospitals of Iran. JEBM. 2015; 8: 91–7. doi: 10.1111/jebm.12154.

31) Alizadeh M, Fakhrzadeh H, Sharifi F, Zanjari N, Ghasemi S. Survey of the health status indicators in elderly of Tehran. Journal of Diabetes and Metabolism. 2012; 13(1): 50-61.

32) Al-Qeisi K, Dennis C, Alamanos E, Jayawardhena C. Website design quality and usage behavior: Unified Theory of Acceptance and Use of Technology. J Bus Res. 2014; 67(11): 2282-90. doi: 10.1016/j.jbusres.2014.06.016.

33) Surif J, Ibrahim NH, Abdullah AH, Yaacob FS. The Beauty of I-Bonding Website Development Based on Needham 5 Phase Constructivism Model. In: International Conference on Teaching and Learning in Computing and Engineering (LaTiCE), Kuching, Malaysia. 2014: 283-8. doi: 10.1109/LaTiCE.2014.61.

34) Johnson C, Turley J. A new approach to building web-based interfaces for healthcare consumers. Health Inform J. 2007; 2(2): e8.