doi:10.3233/978-1-61499-951-5-206

Encouraging the Use of eHealth Services: A Survey of Patients' Experiences

Nina KARISALMI[a,1], Johanna KAIPIO[a] and Sari KUJALA[a]
[a] *Department of Computer Science, Aalto University, Finland*

Abstract. To promote eHealth services effectively, it is important to understand what motivates people to use these services and how they can be further supported. Our aim was to explore user experiences with eHealth services from the viewpoint of patients with chronic illnesses. The survey data included responses from 397 patients actively using eHealth services in Finland. Most of them had positive experiences using the services. We found that these positive experiences and the perceived benefits of eHealth services encouraged patients to continue using the services. In order to bolster the use of eHealth services, patients and other potential users must be informed about the new services and how to access them. Healthcare personnel play a key role in introducing eHealth services to patients and instructing them on their use.

Keywords. eHealth service, patient's experience, online questionnaire, user experience

1. Introduction

Patients and the wider public are increasingly using eHealth services that are referring to health services and information delivered or enhanced through the Internet and related technologies [1]. Recent studies of patients' experiences using eHealth services found that patients value getting information, professional responses, and peer support [2,3,4]. Patients also appreciate the possibility to be in touch with healthcare professionals and receive immediate answers [5] as well as to find answers to sensitive topics and difficult questions [3]. Study results show that eHealth services make it easier for patients to feel secure, safe, and in control [3,5,6]. Overall, eHealth services help to process feelings during care and enhance patients' overall satisfaction towards health care personnel [7].

On the other hand, numerous obstacles to eHealth usage have been reported. These include problems with usability [5] and accessibility [3]. In addition, an overload of information has been recognized as a possible risk that may increase patient anxiety [6]. Several studies have also pointed out that while eHealth services or applications are considered a valuable addition (to follow-ups, for example), they should not replace face-to-face encounters with healthcare personnel [6,7].

Currently, eHealth services are not widely used in Finland, even though readiness to utilize the services is considered high [8]. To encourage the use of eHealth services, it is important to understand what motivates people to use the services and how to better support their use.

[1] Corresponding author: Nina Karisalmi, Aalto University, Department of Computer Science, P.O. Box 15400, FI-00076 Aalto, Finland; E-mail: nina.karisalmi@gmail.com.

This paper reports results from a survey study designed to explore patients' experiences of eHealth services in Finland in 2017. The guiding questions are: *What motivates patients with chronic illnesses to use eHealth services? How can patients be better supported in using these services, particularly by healthcare professionals?*

The target group of the survey was patients with globally common chronic illnesses. This article focuses on the obstacles and challenges that patients encounter when using the services, their pleasant and unpleasant experiences, as well as their desires for future services. The aim of the study was moreover to understand the motivational factors related to eHealth services instead of getting inclusive statistics of the current use.

2. Methods

To explore patients' experiences with current eHealth services in Finland, we developed a web-based questionnaire, which included both multiple choice questions and open-ended questions. The topics of the questionnaire were:

- usefulness of and purposes for using currently available eHealth services (such as patient portals and access to personal health information)
- user acceptance (behavioral intention to use)
- level of support and guidance from health professionals
- barriers in using the existing services
- pleasant and unpleasant experiences
- wishes for future eHealth services.

The questionnaire was in Finnish and some questions were similar to those used in a Finnish national eHealth survey [9]. User acceptance was measured with two questions, adapted from previous surveys [10,11]: "Would you recommend eHealth services to a friend who is interested in them?" and "Are you willing to use eHealth services in the future?"

The questionnaire was validated by a group of three researchers working in the field and the representatives of three target patient organizations (diabetes, heart disease, and cancer). These organizations agreed to participate in the study by contacting their members via e-mail newsletter or through their website. In addition, the reliability of the questionnaire was tested with nine patients and pilot tests were conducted with 28 potential respondents to further validate the questionnaire. The data from the pilot survey was not included in the final results.

The data was gathered between February and April 2017 using a web-based questionnaire tool. As in [12], the target group was early adopters who use computers actively. In addition, we focused on patients with chronic illnesses – diabetes, heart disease or cancer – since these patients are more likely to use the services [13-16] and they could greatly benefit from those. The survey invitation and a link to the web-based survey were sent via email to members of these three patient organizations. The diabetes patient organization sent newsletter emails to all 8,300 of their members and we obtained 89 responses. The heart patient organization sent emails to 16,322 members and 244 responses were received. The cancer organization added the survey link to their webpage and 64 responses were obtained.

Statistical analysis and reliability analyses were conducted using SPSS Statistics 24 software. Cronbach's alpha coefficient was .91 for user acceptance, which indicates

excellent internal consistency [17]. Analysis of open-ended comments were content-analyzed using Atlas.ti software. Open coding was used to identify themes in the data without predefined categories [18]. It was performed in an iterative manner by two researchers (JK, NK).

3. Results

A total of 397 respondents answered the questionnaire. Table 1 shows the demographics of the respondents. The results indicate that the respondents were active users of eHealth services. Out of the respondents, 92% had used at least one eHealth service and the most used was the national My Kanta service, which includes health records and medication recorded by healthcare services.

Table 1. Respondent demographics.

		Total (N=397 / 100%)	**Diabetic patients** (N=89 / 22%)	**Heart patients** (N=244 / 62%)	**Cancer patients** (N=64 / 16%)
Age	Range (y)	23-83	23-80	31-83	31-76
	Mean (y)	64	60	67	57
Gender	Male (%)	36	30	46	5
	Female (%)	64	70	54	95

Almost 90% had used eHealth services to seek information related to their own health or an illness, more than half (53%) had been in contact with care personnel, and 40% had received support from other patients, their family, or a patient organization (Table 2). The respondents had used or tried to use eHealth services mostly on their own initiative (25-74% per patient group). Overall, the initiative to use eHealth services from the personnel's side was quite small (0-10% per patient group).

Table 2. Results concerning the question: "For what purpose have you used or tried to use eHealth services (via computer or mobile phone)?"

	Yes, on my own initiative	**Yes, on my own and personnel's initiative**	**Yes, on personnel's initiative**
I have sought information related to my health, illness, or care			
Total %	72	16	1
(Diabetes / Heart / Cancer) %	(74 / 71 / 73)	(19 / 14 / 16)	(1 / 1 / 0)
I have been in contact with healthcare personnel (messages / video contact)			
Total %	28	18	7
(Diabetes / Heart / Cancer) %	(35 / 25 / 31)	(21 / 17 / 15)	(2 / 10 / 4)
I have received support from other patients, their family, or patient organization			
Total %	29	11	0
(Diabetes / Heart / Cancer) %	(26 / 26 / 42)	(5 / 14 / 9)	(0 / 0 / 0)

Over half of all respondents (60%) had pleasant experiences related to eHealth services (Figure 1). In contrast, 23% reported having an unpleasant experience, and this number was particularly high among diabetic patients (42%).

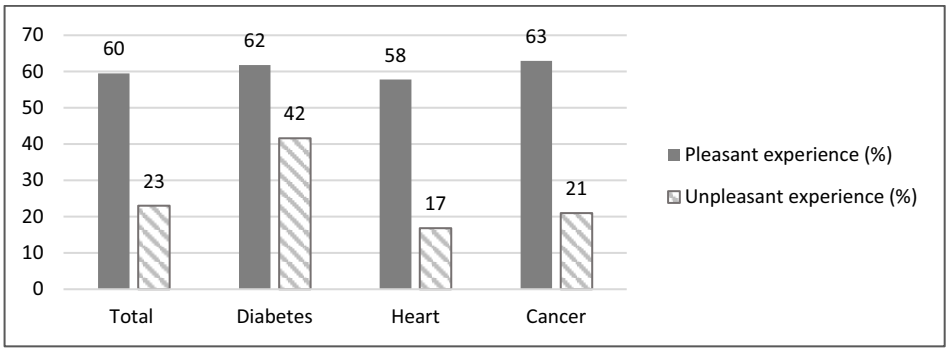

Figure 1. The percentage of respondents reporting pleasant or unpleasant experiences using eHealth services.

The overall user acceptance of eHealth services was high (mean 5.9, STD 1.47, range 1-7 with 7 = strongly agree). There was a significant positive correlation between reporting pleasant user experiences and user acceptance (r_{pb}=.365**, p<.001). Higher age was negatively correlated with user acceptance (r=-.173**, p<.001).

Table 3 presents the results of the qualitative analysis of open-ended answers by describing four of the most common themes within each four questions.

Table 3. Open questions and four of the most common themes of answers.

What obstacles or challenges do you experience in using eHealth services?	**(N=284)**
Lack of competence in using the services (patients' abilities, skills, and motivation)	(75)
Lack of appropriate computers and mobile devices as well as Internet connection	(47)
Technical issues behind the services, e.g. lack of interoperability between IT systems, lack of a national archive, security, and safety concerns	(38)
Services are not known or are not available	(32)
What kind of support or help would you like to have in using eHealth services?	**(N=232)**
No need for support or help	(63)
Support in finding out what services exist and how to access them	(37)
Guidance and information about services on a general level	(19)
Simple instructions and tutorials on how to use the services	(15)
If you have had a pleasant experience related to eHealth services, describe the experience and the related e-service.	**(N=184)**
Reading and following one's own health information using the national My Kanta service*	(77)
Renewing e-prescriptions via the national Kanta service*	(45)
Electronic appointment booking	(40)
Getting in touch and messaging with healthcare professionals	(29)
If you have had an unpleasant experience related to eHealth services, describe the experience and the related e-service.	**(N=83)**
Lack of up-to-date data at national and regional patient data repository services like Kanta*	(22)
eHealth services are not easy to use	
Challenges and problems using electronic appointment booking	(13)
Difficulties in starting to use the service (e.g. login, electronic authentication, consent agreement forms)	(11)
	(14)

*Kanta = The national archive for health information in Finland.

4. Conclusions

The aim of our study was to ascertain *what kind of experiences motivate patients to use eHealth services*. The questionnaire was targeted to patients who had chronic illnesses and access to computers. The results show that the respondents were active users of eHealth services and most of them had positive experiences using eHealth services. Positive experiences seem to encourage them to continue using eHealth services. We also found that increased age appears to be related to lower intention to use eHealth services as in previous studies [19]. The reported positive experiences were related to the perceived benefits of using eHealth services. Most of these experiences concerned basic functions of eHealth such as reading and following one's own health information, renewing e-prescriptions, booking electronic appointments, and communicating with healthcare professionals. These findings concur with earlier studies (e.g. from Finland [8]).

On the question of *how healthcare professionals can better support patients in using eHealth services,* we found that professionals should introduce the services to patients and provide support and guidance on their benefits and use. Currently, the use of eHealth services depends primarily on the patient's own initiative; even active patients need help in finding the services. In their open comments, several respondents mentioned that they need support to find out what services exist and how to access them. In addition, they wanted to obtain basic information and instructions on how to utilize the services. Reported obstacles to use the current eHealth services included technical issues (e.g. lack of interoperability between the systems), services not being easy to use, and a lack of competence in using the services.

Our study had some limitations. The data included responses from about 400 patients with chronic illnesses who were active users of eHealth services, or so-called lead users. The number of respondents can be considered relatively low compared to potential users of eHealth services in Finland and thereby the results cannot be generalized to the whole population. However, for the purposes of the study the number of responses was found adequate since the aim was to increase insights on the motivational and supportive factors of eHealth use. The setup of the study enabled us to identify what motivated lead users to use eHealth services and highlight ways to support their use. These findings are important for planning how to promote the use of eHealth services among potential users. Still, further research could include users that 1) are currently not using eHealth services and 2) are not as comfortable with technology.

To conclude, our main findings are: In order to encourage wider use of eHealth services, it is important to inform patients and other potential users about the new services and how to access them. Informing the patients about the potential benefits will motivate them to start using these services. Healthcare personnel play a key role in introducing the services to patients and instructing patients about how to utilize them properly. For healthcare professionals these changes will include new responsibilities, and they should be supported through additional training and adequate resources.

Acknowledgement

This work was supported by the Strategic Research Council at the Academy of Finland, decision number 303606

References

[1] G. Eysenbach What is e-health? *J Med Internet Res* 3(2) (2001)

[2] J.F. Zrebiec, A.M. Jacobson, What attracts patients with diabetes to an internet support group? A 21-month longitudinal website study. *Diab Med*, **18**(2) (2001), 154-158.

[3] S. Nordfeldt, L. Hanberger, C. Berterö, Patient and parent views on a Web 2.0 Diabetes Portal - the management tool, the generator, and the gatekeeper: qualitative study. *J Med Internet Res* **12**(2) (2010).

[4] C.M. Ruland., R.M. Maffei, E. Børøsund, A. Krahn, T. Andersen, G.H. Grimsbø, Evaluation of different features of an eHealth application for personalized illness management support: cancer patients' use and appraisal of usefulness. *Int J Med Inf*, **82**(7) (2013), 593-603.

[5] M. Pihlavirta-Helander, Hyvinvointiteknologian ja mobiilisovellusten mahdollisuudet diabeteksen omahoidossa-kuvaileva kirjallisuuskatsaus (2017), available at: http://urn.fi/URN:NBN:fi:amk-2017052610316 (referenced October 23rd, 2017).

[6] S. Lubberding, C.F. Uden-Kraan, E.A. Te Velde, P. Cuijpers, C.R. Leemans, I.M. Verdonck-de Leeuw, Improving access to supportive cancer care through an eHealth application: a qualitative needs assessment among cancer survivors. *J Clin Nurs*, **24**(9-10) (2015), 1367-1379.

[7] T.B. Baker, R. Hawkins, S. Pingree, L.J. Roberts, H.E. McDowell, B.R. Shaw, R. Serlin, L. Dillenburg, C.M. Swoboda, J.Y. Han, J.A.Stewart, Optimizing eHealth breast cancer interventions: which types of eHealth services are effective?. *Translational behavioral medicine*, **1**(1) (2011), 134-145.

[8] H., Hyppönen, P. Hämäläinen, J. Reponen, *E-health and e-welfare of Finland. Check point 2015*. National Institute for Health and Welfare. Juvenes Print Oy, Tampere 2015.

[9] A. Jauhiainen, P. Sihvo, H. Ikonen, P. Rytkönen, Kansalaisilla hyvät valmiudet sähköisiin terveyspalveluihin. *Finn J eHealth eWelf* **6**(2–3) (2014), 70–78.

[10] S. Kujala, R. Mugge, T. Miron-Shatz, The role of expectations in service evaluation: A longitudinal study of a proximity mobile payment service. *Int J Hum-Comput Stud* **98** (2017), 51–61.

[11] E.V. Wilson, N.K. Lankton, Modeling Patients' Acceptance of Provider-delivered E-health. *J Am Med Inform Assoc* **11** (2004), 241–248.

[12] J. Tavares, T. Oliveira, Electronic Health Record Patient Portal Adoption by Health Care Consumers: An Acceptance Model and Survey. *J Med Internet Res* **18**(3) (2016)

[13] E. Renahy, I. Parizot, P. Chauvin, Health information seeking on the Internet: a double divide? Results from a representative survey in the Paris metropolitan area, France, 2005–2006. *BMC Public Health* **8**(1) (2008), 69.

[14] R.W. Millard, P.A. Fintak, Use of the Internet by Patients with Chronic Illness. *Dis Manag Health Outcomes* **10**(3) (2002), 187–194.

[15] N. Nijland, J.E. van Gemert-Pijnen, S.M. Kelders, B.J. Brandenburg, E.R. Seydel, Factors Influencing the Use of a Web-Based Application for Supporting the Self-Care of Patients with Type 2 Diabetes: A Longitudinal Study. *J Med Internet Res* **13**(3) (2011), e71.

[16] J. Torrent-Sellens, Á. Díaz-Chao, I. Soler-Ramos, F. Saigí-Rubió, Modelling and Predicting eHealth Usage in Europe: A Multidimensional Approach From an Online Survey of 13,000 European Union Internet Users. *J Med Internet Res* **18**(7) (2016).

[17] C. Fornell, D.F. Larcker, Evaluating structural equation models with unobservable variables and measurement error. *J Mark Res* **18** (1981), 39–50.

[18] J. Lazar, J.H. Feng, H. Hochheiser, *Research methods in human-computer interaction*. Morgan Kaufmann, 2017.

[19] N.R. Hardiker, M.J. Grant, Factors that influence public engagement with eHealth: A literature review. *Int J Med Inf* **80**(1) (2011), 1-12.