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Electronic Health Services in the Patients' Daily Activities – Willingness to Use Health Village Services

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Abstract. Patients and citizens are experienced in Internet use. Earlier studies have suggest that citizens' interest in electronic healthcare services has increased, and there is a need of healthcare professionals to inform patients and their families about this new format and provide them with guidance. The purpose of this study was to find out how patients accept electronic healthcare services and determine their intention to use them based on their opinions of perceived usefulness and perceived ease of use. A survey (N=150) was carried out at a university hospital before electronic services (e-service) were implemented. Participants were motivated to monitor their wellness based on their previous experiences of using electronic services. Patients were confident about the effectiveness of e-service provision.

Keywords. Patient, citizen, portal, electronic healthcare service, technology acceptance model

1. Introduction

Health information technology has fundamentally changed the means by which healthcare services are provided. In the future, clients will have an even wider range of health and social services from which to choose in Finland. The intention is that public, private and third sector operators will provide publicly funded health and social services [1]. Online services, client advisors and service coordinators will guide and support clients in choosing the services that best meet their needs. A national information strategy for healthcare and social services has already been decreed by the Ministry of Social Affairs and Health, and now the digitalization policy has brought a similar approach to other areas of the administrative branch, including healthy work, healthy living environments and health and wellbeing promotion [1]. The Virtual Hospital 2.0 program (2016-2018) has been created to support this strategy and will completely change how

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patients access health services [2]. The program includes a called Healthvillage.fi, which is a specialised outpatient care service developed with patients.

Based on earlier studies [3–5], patients' interest in electronic healthcare services has increased, and there is a need to inform patients and their families about this new format and to provide guidance. The purpose of this study was to find out patients' acceptance of and intention to use electronic services (e-services) based on their opinions of perceived usefulness and perceived ease of use of the services in question.

2. Health Village: Providing an E-Service

Patients and citizens are experienced in using the Internet to search for health-related information [5]. Although patients trust their physicians, due to their expertise and experience, they prefer the Internet because it provides easy access to information [6,7]. Patient portals for chronic disease management have shown promising results regarding patient outcomes [8]. In many countries, patient portals provide clinical information [9]. A typical electronic patient portal allows patients to see their visit history, current medication list and allergies, recent lab results and other medical data captured in their healthcare provider's electronic health record [10].

In addition to offering access to personal medical data, electronic portals frequently offer secure messaging to and from the office or provider, access to electronic libraries containing patient education resources, appointment scheduling or other patient-oriented functions [10]. In Finland, the My Kanta-portal is a personal online service in which anyone can view their national health data repository including electronic prescription and medical care details, case summaries and outpatient care records [11,12]. During the last 20 years, the Finnish government has made significant efforts to establish a digital ecosystem. Kanta is a core service in this development. For example, patient can renew e-prescription through the My Kanta-portal. The Kanta service has also created an extensive national database where physicians can find their patients' entire clinical histories in one place [12].

Patients and patient organisations jointly by professionals have been involved in developing the specialised virtual outpatient care service Healthvillage.fi, which provides information and tools for professionals. If our services today are professional - centered using Healthvillage.fi means that in the future services will be patient- and client-centered. Healthvillage.fi was developed in a collaboration between five university hospital districts and patient organisations. The Virtual Hospital 2.0 program will completely change health services access and harmonise care processes [2]. The university hospitals collaborated to design and implement a national Healthvillage.fi, which provides an e-service via hubs, similar to an outpatient clinic.

By 2018, Healthvillage.fi will contain 30 hubs, including mental health, women's health, rehabilitation, cardiac health, allergy and asthma, pain management and surgery. Citizens and outpatients will be able to visit these hubs to gather information and support. These services will provide a digital care pathway that will complement traditional treatment [2]. The establishment of digital pathways is a significant change in the provision of specialised outpatient care services. When a patient's referral has been accepted by a hospital outpatient clinic, he or she is sent an admission letter offering the opportunity to sign up for e-services or traditional visit. As part of the e-service, patients can complete questionnaires in preparation for a physician or nurse's visit, and they can become acquainted with the clinic by watching a video. This improves access to health

information, especially as it activates patient participation in the care process. Concurrently, healthcare personnel can use the e-service to prepare for the visit, which gives more time for actual interaction during the encounter. For chronic diseases, like asthma or rheumatism, the follow-up visit can be arranged virtually if it is convenient to the patient.

The conceptual framework that formed the basis of this study is the Technology Acceptance Model (TAM). TAM has been developed on existing behavioural intention models in social sciences: these include the Theory of Reasoned Action, and Theory of Planned Behaviour [13]. TAM is based on two fundamental beliefs, perceived usefulness and perceived ease of use systems. These beliefs determine an individual's attitude towards the use, behavioral intention, and actual usage of information systems [13]. Today, TAM is a widely used theoretical framework to study the acceptance of different health informatics technologies [14,15].

Digital technologies offer huge opportunities to improve healthcare delivery. This new way of providing services requires new competencies. Healthvillage.fi provides training to professionals before and during the implementation process. It also offers information and tools for professionals, who provide care using e-services [2].

3. Methods

A tool, based on the structure of the Technology Acceptance Model (TAM) [13], was created to assess the willingness of patients to use e-services in the future. Figure 1 depicts the conceptual model used for this study. The TAM model was chosen because it clearly captures the multi-factorial nature of technology use, while accounting for the context (i.e. external variables such as age, sex, role of visiting healthcare provider and their experience in using e-services). University hospital management approved the study as a part of e-service development, so the approval of the University of Eastern Finland Committee on Research Ethics was not required. Participants were offered written information prior to the survey. Based on the permission of the hospital management no informed consent was needed.

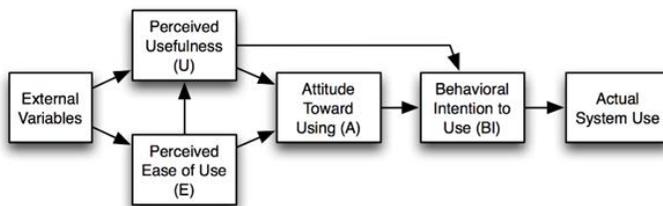


Figure 1. The original Technology Acceptance Model (TAM) [14].

Although the model's ultimate outcome is system use, the model focuses on user acceptance of a technology, which was viewed to be pertinent here. The questionnaire consisted of five background variables and 29 Likert scale questions based on TAM. Statistical methods were used to describe and test patients' intention to use e-services.

Sample data (n=113) was collected from six outpatient clinics at a university hospital. Both electronic and paper questionnaires (N = 150) were used in the data collection process, which occurred during a two-week period in the spring of 2017.

4. Results

Approximately two-thirds of the participants were women ($n=65$), and half ($n=55$) were between 40 and 60 years of age. Almost all participants had previous experiences of using e-services. For example, 95% ($n=98/111$) had used the e-prescription system, 64% had checked their lab results, 60% had experienced electronic appointment booking, and 66% had reviewed their medical case summaries on the My Kanta -portal. More than 60% found e-services easy to learn and use, 60% were motivated to use e-services in the future and 65% were confident of the effect this service was likely to have on service provision.

Participants were motivated to report their wellness based on their experiences using electronic services 63 % ($n=69$). Of the total sample 66 % ($n=73$) of patients reported feeling confident about the effectiveness of e-service provision. One-half of participants ($n = 64$, 58 %) had accessed electronic health assessment tools on the Internet. Kanta services were well known, and as the level of their experience using e-services increased, patients increasingly perceived services as useful.

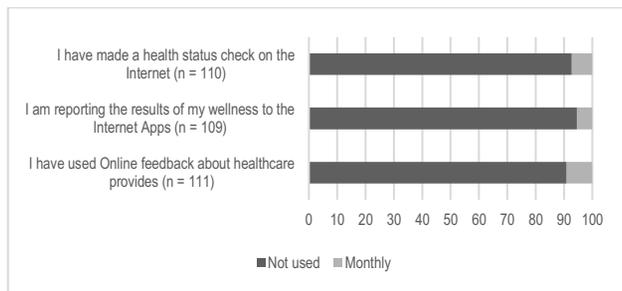


Figure 2. Challenges with e-services.

Young people dominated in the use of information technology (IT) and assessed their skills in using as good, while elderly participants were hesitant to use their IT skills. Perceived usefulness and perceived ease of use of e-services affects positively on attitudes towards using e-services and intention to use them. Patients' motivation and meaningfulness of e-services proved to be important in the ex-ante evaluation.

5. Discussion and Conclusions

During the transition period from traditional visits to virtual care, a survey was conducted to determine outpatients and citizens' motivation and willingness to use e-services. The purpose of this study was to find out patients' acceptance of and intention to use e-services based on their opinions. These were gathered by applying a standardised model to a survey instrument. However, the survey sample focused only on patients in one university hospital before the implementation of e-services.

Our results showed those participants' with positive perceptions of the usefulness and ease of use of e-services were a significant predictor of their attitudes and behavioral intention to use such services. Thus, the new Healthvillage.fi service fulfils the need to provide new services [1]. Our results suggested that the hubs are providing sufficiently

intensive support for health-related learning and behavior change, which is likely lead to an increase in patient activation and engagement.

Majority participants expressed the positive perceptions of the usefulness and ease of use of e-services [15]. This may be due to participants' age or their previous experience with e-services. Participants without any experience may find it difficult to assess the usefulness of the services [8]. Participants' experiences with e-services on the My Kanta were positive and provided a strong foundation for future virtual care information and support.

Prior to the adoption of e-services, citizens must be supported and guided so that they are able to use these virtual services effectively. In addition, it is important that health information –seeking skills are developed at an early age [5,7]. As more people use the Internet to seek health information, it may be helpful to teach adolescents and young adults how to create precise online searches, determine the credibility of content and how to become familiar with health vocabulary and numerical information, such as medicine dosages [10]. Our results show that citizens are motivated to use e-services and meaningfulness of e-services proved to be considerable. Healthvillage.fi will support access on health services and harmonise care processes. However, e-services cannot fully replace face-to-face services; they can only complement the range of existing services.

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