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E-Health in Sweden: Citizens' Attitudes and Expectations

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Abstract: E-health offers tremendous opportunities for providers to improve and enhance healthcare service delivery. In order for e-health to be successful, it is however imperative to understand citizens' needs and to match the services to them. The purpose of this paper is to explore and describe citizens' attitudes and expectations of two common e-health services that are offered to citizens in Sweden today. The aim is to compare between the two services as well as to between expectations of users and non-users. Based on previous research a questionnaire was developed which was sent to 2.000 Swedish citizens. A total of 768 responses was received. The results show that citizens' awareness of e-health is relatively low but that the general attitude toward the use of e-health is rather positive. Citizens express a more positive attitude toward online health guides as compared to ask-the-doctor online services. Users were found to have a higher level of education and more experience with the Internet. Also, users perceive e-health to be more useful, easier to use, more compatible with their lifestyle, more accessible, and less risky.

1. Introduction

E-health broadly refers to the application of common information and communication technologies (ICT) to healthcare service delivery. E-health is generally regarded as a tool for overcoming the challenges healthcare sectors all over the world have to face. In the light of an ageing population, healthcare demand grows steadily, while at the same time financial and human resources are limited. E-health enables healthcare providers to deliver more citizen-centred healthcare faster and more efficiently [1]. With its reach the Internet brings the possibility to deliver on both global and local level and can serve as a tool to reduce costs, improve information exchange and the quality of care to patients as well as to improve access to geographically disperse populations [1]. This has lead to an increasing use of ICT in the healthcare sector with more and more e-health services being offered by both public and private healthcare providers [2].

However, even though the potential of e-health has been recognized and acknowledged in practice and academia, its application in the healthcare sector has proven to still be difficult [3]. Usage rates of e-health services are still rather low, which has caused many e-health projects to fail in the end [4]. Most research on the adoption of e-health has taken the healthcare providers and e-health professionals' perspective, which is important, but only shows one side of the story. A longitudinal study on citizens' acceptance of e-health services conducted in the United States found that even though access is growing rapidly, most people still do not use e-health [2]. Understanding citizens' needs and expectations thus becomes imperative in order to be able to successfully offer e-health services in the future [4,5]. Obviously, continued research on citizens' acceptance is crucial for e-health to be able to fulfil its promises [2].

2. Objectives

The purpose of this research is to explore and describe Swedish citizens' general attitude and expectations of e-health. Two common e-health services that available in Sweden today are investigated, which also makes it possible to compare attitudes toward the two services. Moreover, it is important that not only citizens that have already used e-health before are included in the study, as it is the case in most previous research, but particularly those that have not previously used e-health. Being able to study expectations and attitudes of people with no previous e-health experience may provide more insight into why they might hesitate from using them. Based on this knowledge, recommendations can be given and technical features pinpointed that capture and support those factors key to the target user group of the service that is to be developed. Also, by doing so, users can be compared with non-users through which possible demographical differences may be identified.

3. Methodology

Well established IS literature on user acceptance and innovation diffusion builds the theoretical foundation of this study. An extensive literature review and a small qualitative study consisting of several in-depth interviews with Swedish citizens of various backgrounds lead to the identification of seven key determinants of e-health acceptance. Based on these factors a questionnaire was then developed, measuring expectations and perceptions related to two examples of e-health services offered in Sweden. All attitudinal variables were measured using seven-point scales from "strongly disagree" to "strongly agree". Also individuals' previous knowledge and use of the two e-health services, as well as their general attitude toward and intention to use e-health in the future were covered. Finally, some demographics were inquired including gender, age, the level of education and the level of Internet experience. Age was measured using six ordinal categories (1=16-19, 2=20-29, 3=30-39, 4=40-49, 5=50-59, and 6=60-69) and the level of education using five ordinal categories (1=comprehensive school, 2=two years of upper secondary school, 3=at least three years of upper secondary school, 4=university degree, 5= licentiate or PhD degree). The level of Internet experience was measured on a seven-point scale with a higher number on the scale indicating a higher level of experience.

At the beginning of the questionnaire, the individuals were given a scenario telling them to think about themselves searching for information regarding a particular health concern or question they are interested in. Based on this scenario the respondents could answer the questions hypothetically without it being necessary for them to actually having experienced a particular website. This approach makes it possible to explore citizens' general expectations of the two e-health services, not limited to a specific website.

During November 2007 a survey was conducted including 2000 randomly selected Swedish citizens in the age of 16 to 69. A total of 768 responses was received which corresponds an effective response rate of about 39 percent. Techniques used for data analysis include several independent sample t-tests and chi-square tests.

4. Description of Services

Two e-health services are investigated, namely the online health guide (HG) and the ask-the-doctor online service (ATD). Those two services were selected as they represent e-health services readily available to citizens in Sweden today. Furthermore, both fulfil the same need – the request for additional health information – which makes it possible to compare between the two e-service alternatives. These services are provided by several public healthcare organizations, such as various county councils and the national Swedish organization Sjukvårdrådgivning. Similar services are offered by private organizations as

well, but since healthcare in Sweden is mainly in the responsibility of the county councils, this study focuses on public provider e-health.

Online HG is a website on which general health information is provided in form of a dictionary. Here one can look for information on diseases, symptoms, and forms of treatments. Symptoms and diseases are explained and tips and advice on how to treat smaller complaints are given. ATD online is a service on a website through which one can send a message with a health question or problem to a doctor with an answer guaranteed within one week. The personal answer can be read by logging on to the site with a code provided when the message is sent. This service is anonymous and the only personal information enclosed is the individual's age, gender and the county the individual lives in.

5. Results

Out of the 768 responses that were received 370 questionnaires relate to the HG and 398 to the ATD. More than 75 % of the respondents are female and the average age of the respondents is 49.

5.1 Overall Level of Awareness and Use

E-health is still in its infancy and the uptake still rather slow which is reflected in the low level of awareness of the existence of the two services among the respondents. Approximately 41 percent indicated that they were totally unaware of the existence of HGs and around 65 percent totally unaware of the existence of ATDs. Around 23 % of the total sample has previously used a HG (as offered by the county councils or another organization) which accounts to around a third of those that indicated at least some level of awareness. The rate of previous use of ATDs is substantially lower, with around 9% indicating previous use of an ATD. Even though this number might seem rather low, comparing it to the level of awareness among the respondents, it means that around a fourth of those that indicated at least some level of awareness of ATDs have used one before.

5.2 Differences in Demographics Between Users and Non-Users

An independent samples t-test was conducted to compare individuals with previous use (users) and individuals that have not made any previous experience with the e-health before (non-users) with respect to some demographical variables (gender, age, level of education and level of Internet experience). The results of the t-test are summarised in Table 1 below. In terms of gender, no statistically significant difference appears between users and non-users. Particularly interesting and in contrast to previous research on technology acceptance however is that no significant differences could be found between users and non-users in terms of age. The results provide that users are not relatively older or younger than non-users. Users do differ from non-users in terms of being more highly educated and more experienced with the Internet though.

Table 1: Demographical Differences Between Users and Non-users

Variable	Scale	Users	Non-Users	T	Sig. (2-tail)
Gender	m=0; f=1	,78	,73	-1,458	,145
Age	1-6	4,34	4,39	,378	,706
Education	1-5	**3,23**	**2,88**	**-3,643**	**,000**
Internet Experience	1-7	**6,22**	**5,31**	**-5,579**	**,000**

5.3 Key Acceptance Factors

Based on previous work and several exploratory in-depth interviews, the following seven factors emerged as critical to citizens' acceptance of e-health:

- Usefulness
- Ease of use
- Compatibility
- Accessibility
- Information quality
- Risk
- Trust in the service provider

Table 2 outlines the average scores of the respondents' attitudes related to those seven key variables, comparing among the two services (HG and ATD) and between users and non-users. The bold numbers in the t- and p-value column show whether there are any significant differences between the groups.

Table 2: Factors Key to Acceptance by Service and Users/Non-users

Variable	HG (n=370)	ATD (n=398)	T	Sig. (2-tail)	Users	Non-Users	t	Sig. (2-tail)
Usefulness	5,53	5,19	**3,369**	**.001**	5,89	5,21	**-6,303**	**,000**
Ease of Use	5,26	5,35	-,845	,398	6,02	5,11	**-8,756**	**,000**
Compatibility	4,74	4,53	1,531	,126	5,46	4,41	**-7,535**	**,000**
Accessibility	5,62	5,68	-,547	,584	6,28	5,48	**-7,396**	**,000**
Information Quality	5,00	4,83	1,649	.099	5,31	4,81	**-4,320**	**,000**
Technical Risk	3,49	3,39	,950	,342	2,98	3,56	**4,720**	**,000**
Trust in the Service Provider	5,00	4,74	**2,349**	**,019**	5,33	4,74	**- 4,745**	**,000**
Attitude toward Use	4,88	4,61	**1,998**	**,046**	5,62	4,50	**-8,489**	**,000**
Intention to Use	4,54	4,09	**3,468**	**,001**	5,31	4,03	**-9,420**	**,000**

Perceived usefulness and perceived ease of use are two major determinants of individuals' acceptance of a technology or innovation [6]. Usefulness is the extent to which a service is believed to provide certain advantages to the individual as compared to other service alternatives. In the e-health context such advantages include higher convenience, being faster, more efficient, offering an additional source of health information (or a second opinion), and providing better access to healthcare services. Ease of use in this context implies that the website is easy to use and navigate and information easy to find and communicated in a way that is easy to understand. As summarised in Table 2, both HG and ATD are perceived as rather useful, achieving a mean of more than one point above the middle of the seven-point scale (HG: 5,53; ATD: 5,19). HGs are however perceived as relatively more usefulness than ATDs, demonstrated in the significance of the mean difference (t=3,369; p=,001). Both services are also expected to be rather easy to use (mean of 5,26 for HG and 5,35 for ATD) and even though the mean for ATDs is slightly higher this difference is not statistically significant.

The compatibility of using an e-service with the individual's lifestyle or way of doing things is another frequently discussed determinant of e-service acceptance [7,8,9]. If an individual is used to doing things online he or she is also more likely to use healthcare services online [9]. Since the notion of compatibility is more connected to the individual and the idea of using e-services in general, there is no difference in perceived compatibility of HGs and ATDs. Overall, respondents in this study perceive e-health to be compatible with their way of doing things, with the mean just above the scale middle point of 4.

The perceived accessibility of the service, another previously highlighted and rather obvious determinant of its acceptance [10], is rather high for both services (5,62 for HG and 5,68 for ATD). This high perceived accessibility of e-health is most likely due to the good Internet coverage in Sweden.

Also, perceived risk is a key issue that can keep individuals from using a system or technology [11,12]. Especially in such an uncertain environment as the Internet, perceived risks may hinder the uptake of an e-service despite its innovativeness or usefulness to the citizen [11,12]. The qualitative interviews revealed that risks related to the use of HGs and ATDs include the risk of privacy loss and security issues but also the risk of receiving wrong information or misinterpreting the information as a result of the lack of physical and human contact with a doctor or nurse. Another concern citizens have is the fear of becoming a hypochondriac and being overly concerned when using e-health. As the results of the survey demonstrate though, citizens in general perceive the risks involved with using the two services to be rather low (3,49 for HG and 3,39 for ATD). Also, HGs and ATDs are regarded as being approximately equally risky/secure.

Finally, trust in the service provider can help overcoming the risks perceived [12] making it another critical factor for e-health acceptance. The results demonstrate that trust in the county council as the service provider of HGs is rather high with a mean of 5 on the seven-point scale. Citizens also express trust in the county council as the provider of the ATD, yet to a significantly lower extent as compared to the provision of HGs (4,74, t= 2,349, p=,019).

Overall, citizens indicate a rather positive attitude toward using both HGs and ATDs, with average scored of more than half a point above the mid point of the scale. Citizens' have a more positive attitude toward using HGs (4,88) as compared to ATDs (4,61) though, which could explain the higher uptake of HGs. The higher level of acceptance of HGs is also reflected in citizens' intentions to use HGs in the future which are almost half a scale point higher than citizens' intentions to use ATDs.

The independent samples t-test, comparing individuals that have previous experience with e-health (users) with those that do not (non-users), reveals that there are statistically significant differences on all variables. As expected, users hold a more positive attitude towards the use of both services and have higher intentions to use the services in the future as well. Interestingly however, even though users' intentions to continue using the services in the future are high, considering that it is users, an average of 5,31 appears only moderate and may comprise some part of dissatisfaction with the services in previous experience. Thus, future research should assess what may keep e-health users from continued use.

Users perceive e-health to be more useful, easier to use, more compatible with their way of doing things, more accessible, and less risky. Users also express more trust in the county councils as the provider of such services. Yet, continued research is necessary in order to establish whether the more positive attitudes of users related to the key factors also caused their acceptance of e-health or whether they are an outcome of use.

6. Conclusions and Recommendations for Healthcare Managers

The purpose of this paper was to explore and describe Swedish citizens' attitudes and expectations of two common e-health services offered directly to citizens in Sweden today. Expectations regarding seven key factors touted to be critical to e-services acceptance were explored. Based on this knowledge advice and recommendations can be given to healthcare professionals that are planning to leverage the opportunities e-health offers.

In general, the results of the national survey conducted, provide that citizens' awareness of the existence of e-health in Sweden is quite low. Between 40 and 60 percent of the respondents indicated that they were totally unaware of HGs and ATDs. Consequently, use of e-health is still rather limited. Users and non-users do not differ in gender and not in

terms of age either. The technical advance of the youth, which is often pointed to, might be outbalanced by the higher interest in health topics of the elderly. As users however do show a higher level of education and express a higher level of Internet experience, it becomes imperative for providers to still offer alternatives for those that are not yet e-ready, so that no part of the population is excluded.

Attitudes toward using e-health are rather positive, also amongst those that have not been aware of e-health before. This highlights the importance for healthcare mangers and professionals to make citizens aware of the online alternative that is given to them. Also, even though the general attitude is rather positive, there is still potential for improvement. Citizens that have gained previous experience with e-health do express greater intentions to use e-health again. The numbers, however, still imply some level of dissatisfaction that may dampen future use intentions. Clearly, continued research is necessary to investigate what influences a citizens' intention to continue using e-health.

Seven key factors to the acceptance of e-health are put forward in this paper, namely: usefulness, ease of use, compatibility, accessibility, information quality, risks, and trust in the service provider. Comparing perceptions of the more widely used HG with perceptions on the less widely accepted ATD, a statistically significant difference appears with regards to their perceived usefulness, highlighting the imperative role of service value to citizens. We thus emphasize the importance of basing future e-health service development on citizens' needs and requirements. Also the level of trust citizens have in the county council differs between HG and ATD service delivery. As the notion of trust is an imperative but a very complex phenomenon, we call for further explanatory research on the antecedents of trust in the e-health context, to help explain this finding.

In terms of attitudinal variables, users are quite distinct from non-users and indicate much more positive perceptions with respect to all seven key variables. It is beyond the scope of this investigation to establish whether the differences in perceptions have caused users' acceptance, have been caused by some other underlying factors or whether they simply are an outcome of the individuals' previous experience with e-health. Future longitudinal and explanatory research is necessary to shed some more light on this issue.

In summary, in order to push e-health acceptance, healthcare managers should ensure that the services are easy to use in terms of website navigation but also in terms of an easy "laymen" language. Also, communicating to citizens what is done in terms of privacy and security may help reducing perceptions of risk that are related to the use of e-health. Creating clarity as to the source of the information, quality checks and statements and an indication of the last update on the site may help to improve the actual and perceived quality of the information. Furthermore, even though Internet coverage in Sweden is amongst the highest in Europe, accessibility still appears to be an issue that needs to be taken care of. As discussed earlier, important is that alternatives to e-health are continued to be offered to those that do not have access or are simply not yet ready for the e-society. Most importantly however, citizens need to be made aware of the online alternatives that are given to them and healthcare professionals should focus on communicating the benefits e-health can bring to them. If healthcare professionals take those key factors into consideration and focus on tailoring future e-service to citizens' needs and wants, e-health is likely to be able to unfold its full potential.

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