Patients perceptions of web self-service applications in primary healthcare

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Abstract
This paper presents the preliminary findings of a case study of patients' acceptance and usage of web self-service - online appointment system - in a primary health care centre in a regional area in Australia. After two months of implementation, structured interviews were undertaken over three months to ascertain patients' perceptions of the web self-service application. The findings indicates that patients' acceptance of the web self-service application maybe hindered by their relative lower computer ownership or inadequate computer skills and access to the internet, their preference for flexible personal communication for appointment making and inadequate flexibility of the appointment system compared to phone call. Our preliminary findings may suggest that more than half of the healthcare consumers in this area are likely to accept the PCEHR initiative, however the decision makers of the PCEHR system need to carefully design the strategies and practice for the introduction of the innovation to overcome the substantial barriers to consumers’ ability to access the internet-based e-health solutions.

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Patients’ perceptions of web self-service applications in primary healthcare

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Abstract. This paper presents the preliminary findings of a case study of patients’ acceptance and usage of web self-service – online appointment system - in a primary health care centre in a regional area in Australia. After two months of implementation, structured interviews were undertaken over three months to ascertain patients’ perceptions of the web self-service application. The findings indicate that patients’ acceptance of the web self-service application may be hindered by their relative lower computer ownership or inadequate computer skills and access to the internet, their preference for flexible personal communication for appointment making and inadequate flexibility of the appointment system compared to phone call. Our preliminary findings may suggest that more than half of the healthcare consumers in this area are likely to accept the PCEHR initiative, however the decision makers of the PCEHR system need to carefully design the strategies and practice for the introduction of the innovation to overcome the substantial barriers to consumers’ ability to access the internet-based e-health solutions.

Keywords. web self-service, personal controlled electronic record, patient-centeredness, technical acceptance model, diffusion of innovation theory

Introduction

Over the last two decades, primary health care has become the most important healthcare service in many developed countries. This is because it provides continuing and universally accessible health care services to individuals and families in a community [1]. Recently, the concept of ‘patient-centeredness’ in primary health care has been recognised as a growing area of importance as it can greatly improve patients’ access to their health information and better manage their health cost [2-4]. According to Davis et al. its benefits are: easy patient access to the health services and health information most important to them, the use of integrated clinical information systems to support smooth information transfer between different care providers, etc. [2]. In the US, ‘Patient-Centered Medical Home’ (PCMH) has become a core concept for transformation of primary health care [5, 6]. PCMH can enhance patients’ access to psychological health care, physical health care and social and community services [5, 7].

With the emergence of the internet and the rapid development of health information technology, many health providers have begun to deploy web self-service (WSS) applications to provide patient-centered medical practice and encourage patient
involvement in the treatment processes [8]. A Web Self-Service application is a type of computerised system which enables customers to access information and perform routine tasks independently through the internet [8, 9]. Typical examples of WSS include online airline ticketing systems, online banking and online bill payment systems [10]. Today WSS is used to facilitate consumer access to healthcare services, such as online appointment scheduling, personal health record management or other non-urgent medical requests [10, 11]. It is anticipated that these online health services will help patients make appropriate decisions and thus efficiently and effectively improve healthcare outcomes.

Although WSS is gradually being introduced into health care, consumers’ acceptance and use of it and its impact on patient healthcare outcomes are still poorly understood [12, 13], despite the fact that patients’ views on patient-centeredness predict healthcare outcomes [14]. Steward advises that the success of patient-centered innovation relies on the patient’s decision to accept or reject it [14]. Several recent studies on the adoption of healthcare information technology (HIT) innovations used Rogers’ innovation diffusion theory (IDT) and Davis’ technology acceptance model (TAM) as their research frameworks [15, 16]. Although IDT and TAM have been used to explore how care providers and organisations adopt healthcare information technology (HIT) innovations, no HIT adoption studies have focused on the adoption process from the patient’s point of view [14]. This study uses an online appointment system as a case study to fill this gap. Both IDT and TAM are used as the conceptual frameworks to guide the study.

1. Research Methodology

1.1. Research Setting

The case study was conducted in a primary health care Centre Health Complex (CHC) located in Shellharbour, a regional area in Southeast NSW. The centre provides family medical practice, specialist medical services, allied health services and wellness services to the local community.

1.2. Implementation

The online appointment system was developed by the first author and installed in a server in the CHC at the end of January 2011. There is a web link on the home page of the medical centre Web site to link visitors to the web-based online appointment system.

Information about the online appointment system was disseminated through the following channels: (1) fliers to be left at the reception desk for anyone to take for free; (2) posters placed at prominent locations in the medical centre; (3) an advertisement on the CHC web site. The information disseminated includes the web link to the online appointment system and, the steps to follow to make an appointment using the system.
1.3. Method of Investigation

A survey was conducted two months after system implementation, between April and June in 2011. Because patients may be reluctant to fill in a questionnaire survey form, a structured interview was conducted. The interview guide was developed through brainstorming among the team of researchers, the questions were designed to address the acceptance issues suggested by the TAM (Davis 1989) [16]. It consisted of a number of multiple-choice and Likert-scale questions that seeking patients’ feedback on four major issues: (1) their awareness of the existence of the online appointment system and the communication channel through which they got the information; (2) how useful they perceived the system to be; (3) how easy they thought the system was to use; (4) their preferred method to make appointments with general practitioners (GPs): phone-call, online appointment or walking into the clinic; and (5) their intention to use the online appointment system and web self-service applications in the future. In addition, patients’ basic demographic information, such as age, gender, work status and educational level, was also collected.

Convenience sampling was used for selecting patients in the waiting room for interview by the first author. In addition, data was also collected from the online appointment database which stored patients’ online appointment information, including date, time, and the name of the GP to be visited. All of the collected data was coded and entered into EXCEL, then imported into IBM SPSS 19 for the further statistical analysis.

2. Results

2.1. Age Profile

In total, 100 patients participated in the interview. 54 respondents were male aged between 18 and 70 years, with a mean age of 43 years (standard deviation (SD) 13), and 46 respondents were female aged between 17 and 74 years with a mean age of 45 years (SD 14). A comparison of the participants’ demographic profiles with the historical patient profiles in the medical centre suggests that the sample was representative of its patient population.

2.2. Awareness of the Online Appointment System and Communication Channel to Get the Information

Eighty five percent of the participants (n = 85) were not aware of the availability of the online appointment system. Only 15% (n = 15) were aware that appointments could be made online. 13 of them used the online appointment system at least once. They were aware of its availability through the web advertisement on CHC’s web page. None of the patients appeared to notice the existence of the online appointment system through posters or fliers.
2.3. Patient's Perceptions of the Usefulness

Eleven of the 13 respondents (84.6%) who used the online appointment system at least once agreed that they could schedule an appointment as soon as they need it. One respondent said:

"Online system gives your available slots, or just straight away what's available and what's not."

Another aspect of perceived usefulness of the online appointment system over phone-call based appointment system was less waiting time to make an appointment. One respondent commented:

"They don't answer the phone quickly. And sometimes you just got to ring back again."

This view was agreed by another patient, who also pointed out that:

"They take too long to answer the phone. When they do answer the phone, they put you on hold."

2.4. Patient's Perceptions of Ease of Use

Twelve of the 13 respondents (92.3%) who used the online appointment system agreed that the system was easy to use. However, some feedback also suggested that the flexibility of the system needs to be improved. One patient suggested to:

"Enhance the appointment search to support 'find next available appointment for Doctor X'. My usual aim is to find the earliest appointment for one of a select group of doctors, rather than find a doctor that fits my desired time-slot".

2.5. Patients' Preferred Appointment-making Method

Three options for appointment making were offered at the CHC: phone-call, online self-service or a walk-in appointment. Seventy two percent of the respondents (n = 72) used only phone call to make appointments. Only 13% of the respondents (n = 13) used the online system. The rest 15% of the respondents (n = 15) were walk-in patients.

2.6. Patients' Intention to Use the Online Appointment System in the Near Future

Positive results were gathered for this question. 61% of respondents expressed their intention to use the online appointment system next time they need to see a doctor. 23% preferred to use a phone call for the following reasons:

1. A Phone call is easier. For example, one patient said:
   "Because I don't use Internet for the appointment, I probably don't know. I probably use the phone. I find it is easier (to use the phone)."
2. They prefer speaking to directly. One respondent said:
   "I prefer to talk to someone in person. In case there is nothing is available. Or the nature of my illness, it requires them to fit me in somewhere because it is urgent than just go to the computer to make an appointment.”
3. They trust a person more than a computer, as one participant said:
   "I would prefer to use the phone because I prefer to speak to someone and confirm. I would rather to trust the person than trust the computer”.
4. For urgent cases, a phone call is more reliable.
"Because we won’t be sure if there is an appointment (available) here. And when we do want an appointment, we want it urgent, not for next week, that’s probably why.”

5. Malfunctions of the online appointment system discouraged usage, as one participant mentioned:
"I have tried twice, but each time it said ‘not available’. The site wouldn’t let me get into it”.

2.7. Patients’ Use or Intention to Use Web Self-service Applications in the Future

Fourteen percent of respondents (n = 14) often used the internet to search for different health information, such as symptoms of a specific disease, the location of hospitals, or general health information. For example, one respondent said:

"Maybe (web-based self-service applications can be used to get) some sort of information about normal illness, like normal common flu, normal things like that we can get some basic information that may not requires us to see a doctor, or know what to do”.

The majority of the respondents (n = 86), however, suggested that they did not need to use web-based health services. The reasons were:
1. They did not even have a computer or internet access at home.
2. Not an ‘Internet’ person. For example, one participant said:
"I don’t know about (the online appointment system). I won’t use Internet for that, I definitely use the phone, because I’m not an Internet person”.
3. They trusted the credibility of the information delivered by health care providers with whom they had therapeutic relationship more than information from the internet. For example, one respondent said:
"Because when you search for Google for common illness, you get all different sorts of information. But coming from this organisation, it’s creditable, because it is written by actual doctor that you can trust. Things like that, maybe new medication, reminds of flu, vaccination and things like that”.

3. Discussion of Key Findings

Although this is a preliminary study of the adoption of a particular type of web self-service application – an online appointment system - in a primary health care centre at the early stage of system introduction, it does provide some insight into the patients’ perceptions of and willingness to use web self-service applications in primary health care. The issues to be investigated include patients’ demographics, the communication channel for them to receive the information about the availability of the online appointment system, how useful or easy to use patients perceived the system to be, and patents’ preferred method for making appointment.

3.1. The Impact Demographics

The average age of the survey participants was over 40 years for both males and females. As the computer was only introduced into the high school education system in Australia in 1980s, it is likely that people in this age group missed out on basic
computer training at school. This may be one of the reasons that the online appointment system was not acceptable to the majority of the survey participants (86%).

3.2. The Ineffective Communication Channel for the Diffusion of the Innovation of Online Appointment System

Roger’s diffusion of innovation theory (DOI) indicates that the communication channel for the dissemination of an innovation is one of the key determinants of the rate of innovation adoption [15]. In this study, the message disseminated through the web-site of the medical centre was the most effective way for disseminating the information about the availability of the online appointment system. Of course, only those patients who visited this web-site would access that information. The patients who did not visit this web-site appeared to be completely unaware of the innovation. Unfortunately, this happened even though the message was also disseminated through the specially designed fliers placed at the reception area or prominent locations in the medical centre. The patients’ lack of awareness of this innovation suggests that dissemination of the information about the online appointment system needs to be improved.

3.3. Patient’s Perception of the Usefulness and Ease of Use

David’s Technology Acceptance Model (TAM) suggests that perceived usefulness (PU) and perceived ease of use (PEOU) are the key determinants of users’ intention towards using an IS system [16, 17]. The survey results show that patients chose to use the online appointment system because they believed that the system provided an effective and easy way to make a medical appointment with reduced waiting time compared to the phone-call based appointment system. Therefore, PU and PEOU are the encouraging factors for the participants to adopt to use the online appointment system.

3.4. Patient’s Preferred Appointment-making Method

Apart from the limited flexibility of the online appointment system, patients’ preference for communication with the receptionist by phone call was the main reason why patients preferred telephone or simply come in to making an appointment. Lee et al. suggest that consumers’ need for interaction influences their intention to use self-service [18]. It is possible that some patients prefer direct communication with the receptionist simply because of the human contact. Direct oral communication also permits some flexibility and the possibility of negotiation and shared problem solving, so these may also be the reasons for the patients’ preference.

4. Limitations of the Study

As the research is at the preliminary stage, a number of issues are yet to be further investigated to fully understand the various factors impacting on patients’ acceptance of web self-service applications. For example, the impact of demographics (e.g. age, gender, education and income) on the adoption of web self-service needs to be further analysed. A systematic, longitudinal study needs to be continued to fully understand
the factors, processes and outcomes for the adoption of the web self-service application in primary health care in regional Australia.

5. Conclusion

This paper provides a case study in a relatively new area of patient’s acceptance of web self-services from the patients’ perspective. An online appointment system was developed and used as an exemplar web self-service application in this case study. Patients’ perceptions about the online appointment system and their willingness to use it have been investigated. The findings show that the users of the online appointment system were those patients who visited the medical centre web site. Our case study may suggest that the ability to access web-based self-service for the majority of the patient population in regional Australia is still hindered by patients’ lack of computers, lack of access to the internet or inadequate computer skills, however, the willingness of the majority of the patient population to adopt web-based self-service in primary health care when possible is a good sign.

This case study serves as a preliminary study for the future analysis of consumer acceptance and usage of e-health applications, such as PCEHR in primary health care in regional Australia. Future statistical analysis of qualitative and quantitative results will be undertaken to improve our understanding of patients’ behavior in adopting e-health applications and the factors that impact on this behavior. Our preliminary findings are highly valuable for the decision makers charged with the responsibility of implementing PCEHR to consider in designing their strategies and plans for the introduction of the PCEHR system in regional Australia.

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