

Achieving engagement by provider and patient in the use of patient portal for standardized care pathways

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Abstract

A digital patient portal is a promising mechanism to support greater patient engagement. Yet questions remain about how adoption of these portals can be encouraged since patients and providers still face a lot of resistance. This paper examines, by building on the MOA framework, if and how usage behavior is influenced. With action research in an innovation project at Ghent University Hospital we collected data (interviews, observations, log data, questionnaires) of involved parties. Preliminary results showed higher use of the portal by implementing changes. The role of intrinsic and extrinsic motivation of all included parties needs to be further investigated.

Keywords: action research; eHealth; motivation, opportunity and ability framework (MOA); patient portal.

Introduction

In the last decades, day surgery has steadily and significantly grown in countries with established stable economies (Jarret et al., 2006). Advances in surgery and analgesia, changes in clinical practice and in the attitude of the surgical team, as well as the establishment of dedicated day-surgery facilities with dedicated staff and well-defined care pathways, together with financial incentives have made this development possible (Leroy et al., 2017). Ambulatory surgery becomes more important and will be further promoted by the government; it is safe and cost-efficient but quality must be guaranteed. As more complex operative procedures will be performed on a day care basis, patient follow-up has to be intensified. This increase in day surgery entails some challenges,

mainly in the continuity of care and in patient follow-up after day surgery unit discharge. Persisting postoperative pain, post-discharge nausea and vomiting, and wound problems remain critical symptoms that necessitate continuous monitoring (Apfel et al., 2012; Goldfarb et al., 2017; Odom-Forren, 2013). Systematic e-assessment can increase patients' quality of recovery and identify key areas for improvement in peri- en post-operative care. As such, an eHealth solution could be the answer to some of these challenges.

The implementation of technology in the health sector, popularly known as eHealth, is emerging as one of the most rapidly growing areas in healthcare today (Srivastava et al., 2015), with the potential to provide innovative solutions to health problems. The emergence of the Internet and the electronic health record has brought new opportunities for patients to play a more active role in his/her care. The implementation of a *digital patient platform* could provide in the requirements that an ambulatory surgery center needs (Ammenwerth et al., 2012).

An active integration of the patient in his/her treatment bears multiple potential benefits. Certainly as we notice a change in the patient's role from a patronized patient to an informed patient, and further to a responsible, autonomous and competent partner in his or her own care (Bravo et al., 2015). A patient portal is an online platform that provides patients with access to their health record, improves the patient-provider communication, and enables patients to take control of their condition(s) (Otte-Trojel et al., 2015). So a patient portal is a promising mechanism to support greater patient engagement. However, the expected benefits of the implementation of such an eHealth technology under the form of a digital patient platform are not always a match with the actual outcomes (Van Gemert-Pijnen, et al., 2011).

EHealth technology must be developed as a user-friendly digital tool with benefits for the different users. . Therefore different stakeholders have to work together to develop and implement the application in everyday practice. Although new technologies can offer the new opportunities and benefits, stakeholders don't always seem to appreciate it (Hee-Woong & Kankanhalli, 2009). There is often a mismatch between the expected benefits eHealth technology can offer to the users and the actual outcomes in practice (Van Gemert-Pijnen, et al., 2011). In addition, healthcare professionals often have a sceptical view on the digital transformation and do not see the potential benefits for themselves and their patients. Van Gemert-Pijnen et al. (2011) demonstrated possible explanations of this mismatch: (1) the absence of a pre-defined scope and clear objectives that cover the requirements of all stakeholders; (2) the lack of coordination and communication between the relevant stakeholders; (3) the position of the user and the level of their involvement during implementation. If users do not see the benefits in using technology, they will resist using it as it looks to be time consuming and frustrating. Above that, there are situations where the innovation of eHealth technologies is not enough reimbursed because of a lack of financial trust by investors. Further, it could also be that the implementation of eHealth is not supported by legislation, which slows down the development process (Gemert-Pijpen et al., 2011).

In an effort to understand usage or non-usage of technology, researchers have frequently turned to technology acceptance models. The Technology Acceptance Model (TAM and TAM2) (Davis, 1989) and the Unified Theory of Acceptance and Use of Technology (UTAUT) (Venkatesh et al., 2003) are the dominant approaches in the technology acceptance research. The models suggests that when users are presented with a new technology, a number of factors influence their decision about how and when they will use it (i.e. 'perceived usefulness' and 'perceived ease of use'). These models

however, are not always fulfilling (Peek et al., 2016) and further research is needed. Agarwal et al. (2010) stress out the importance of further research in the field of Health IT as following: “*The healthcare industry faces the same challenges as other industries while integrating IT. At the same time, however, the healthcare industry has its unique features and attributes.*” Questions remain about how adoption of patient portals can be encouraged since patients and providers still face a lot of resistance (Irizarry, 2015). We investigate the actual use of a patient portal peri-operatively in ambulatory surgery and how this is perceived by patients and healthcare workers. Secondary we try to identify and remediate reasons for non-use.

Framework

Motivation–opportunity–ability (MOA) framework

The integrative motivation–opportunity–ability (MOA) model proposed by Ölander and Thøgersen (1995) was constructed to explain customer actions. The MOA framework uses information on the targeted stakeholders’ motivation, opportunity and ability to undertake the preferred behaviour (Rothschild, 1999). A deeper understanding of these three key aspects would allow programme developers to formulate effective behavioural change strategies. In this model, “Motivation” influences “Behaviour” with “Ability” and “Opportunity” as moderating influencing factors (Figure 1).

Some theoretical models used in information system research may lack explanatory power and consistency because of their failure to provide an adequate means of accounting for contextual and situational factors which influence behaviour. The motivation-opportunity-ability (MOA) framework addresses these problems for important new areas of information system research by theorizing two of the most critical factors, ability and opportunity, on the link between motivation and behaviour. The MOA framework has been used in many studies in different areas of research. For example, MOA was used to discuss the public health and social issue behaviours (Rothschild et al., 1999) and consumer behaviour (Ölander & Thøgersen, 1995).

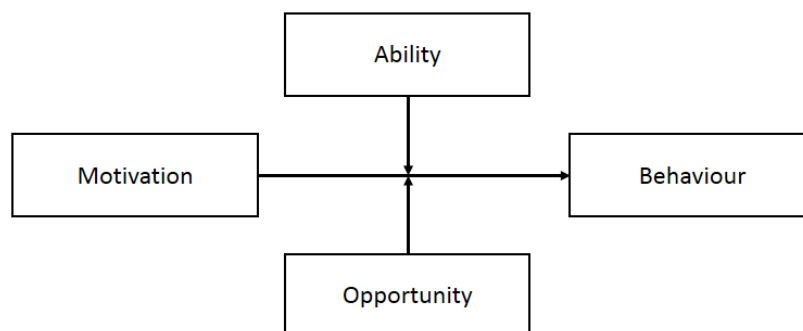


Figure 1 – Ability, Motivation, and Opportunity Theory (Hughes, 2007)

Building on the MOA framework “Motivation”, “Opportunity” and “Ability”, are defined as patients’ motivation, opportunity and ability to adopt the digital patient portal. MOA theory is used as a foundation because it is believed that in the context of patient portal adoption “Motivation” is considered as the drives, urges, wishes or desires which initiate the patient’s intention to use the patient portal. “Ability” can facilitate patients in adopting the patient portal and “Opportunity” is interpreted as situational factors that encourage patient in the adoption of digital patient platform. “Behaviour” reflects the “adoption” of the digital patient portal.

Methods

This study presents preliminary data of the innovation project in Ghent University Hospital, Ghent. The ambulatory surgery unit at Ghent University hospital aims at electronic communication with both patient and caregivers involved in ambulatory care (e.g., in-hospital, out of hospital, general practitioner, physiotherapist, home nursing). In cooperation with CoZo (Collaboratief Zorgplatform), an electronic hub which allows safe and efficient multidisciplinary communication, a digital patient platform was developed.

Design

To conduct the study we opted for action research. Action research involves actively participating in a change situation, often via an existing organization, whilst simultaneously conducting research (Cordeiro & Soares, 2018). Researchers who believe that existing practise or issue can be improved or refined can attempt to develop and implement new approaches through action research (Kaplan et al., 1988). As such, we had to develop a coherent process, posit a theoretical framework and align these with the research aims and procedures, and local transformation needs. As stated by Denscombe (2010, p. 6) our action research strategy's purpose is to solve a particular problem and to produce guidelines for effective practises. In this case best practise could increase the adoption of a digital patient portal.

Setting

We included two care pathways to measure the adoption of the digital patient platform. Patients planned for knee arthroscopy or sinus surgery.

The patient platform includes (1) an informative part: visualization of the individualized care path (different steps can be chosen for each patient which makes the pathway customized), provision of reliable information about the diagnosis and the treatment, links to relevant websites, contact details of the treatment team, and (2) an active part with the possibility to have secure conversations with the treatment team, self-registration of complaints and other problems in diaries and other questionnaires, and a question prompt list (Figure 2).

Data collection

We conduct a longitudinal study with different phases. In each phase we implemented, according to the action research strategy, new insights learned from the former phase. A pilot study started in September 2017 introducing the digital patient platform to the participating care processes and the stakeholders. The first phase of the study started in August 2018 and was recently finalized. Meanwhile, a second phase is initiated (see further). In each phase data is collected, analyzed and conclusions are taking into account to be able to evolve to the next phase.

A multimethod approach, combining qualitative and quantitative data, was chosen because of the nature of the research. Collection of both qualitative and quantitative data bolsters the findings by combining the strengths of each method. Data was collected through interviews (with patients, involved caregivers and physicians), observations (first introduction to patient with platform, team meetings), log data collected from the patient platform, clinical outcome measures and a patient questionnaire (see Table 1).

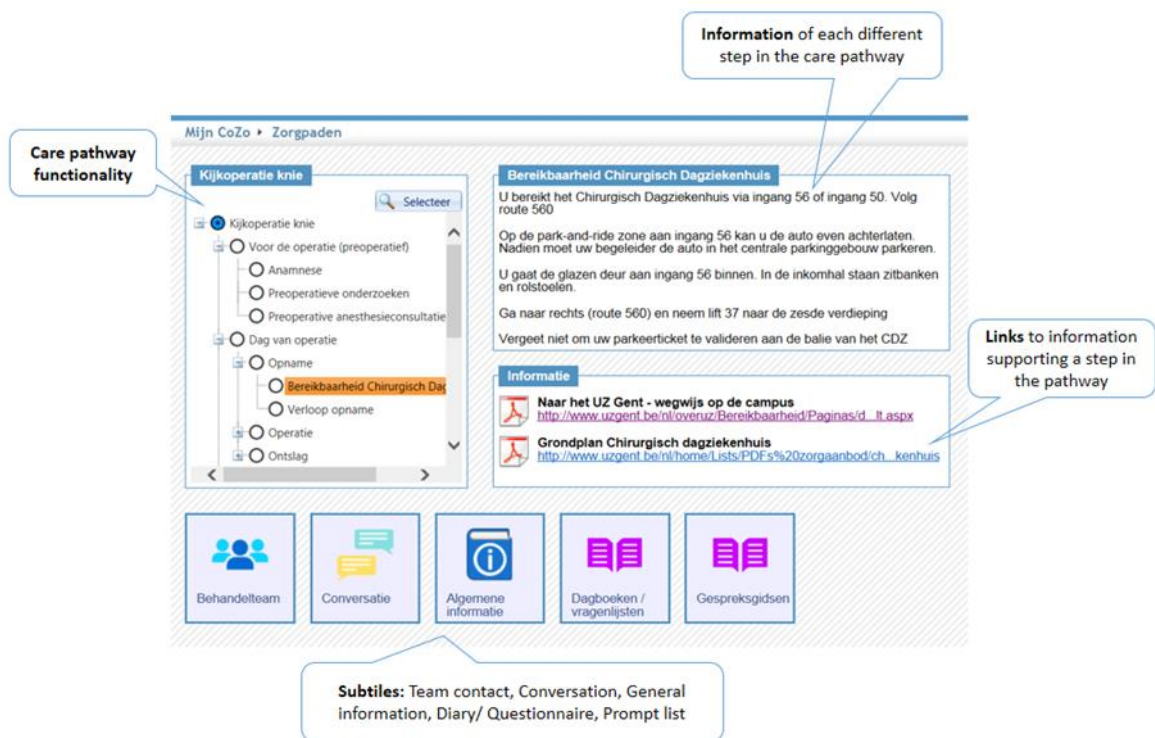


Figure 2 – The Digital Patient Platform

Semi-structured interviews were held with patients and involved care providers to gain deeper insight into the user-friendliness and applicability of the portal. We explicitly included patient who did not use the patient portal as well to understand why the portal was not used and what factors could trigger patients to use the portal.

Additionally, patients received a validated survey. This survey, based on the questionnaire of Bakken et al., 2006, assessed the user-friendliness and satisfaction with the patient portal. The original scales were translated in Dutch using the standard back-translation technique. A fourteen-item scale for user-friendliness was used. We used eight items for the satisfaction scale. The usability of the eight different sections of the system was also asked (see Figure 2). Responses were provided on a five-point Likert scale, with anchors ranging from 1 (strongly disagree) to 5 (strongly agree), and for usability from 1 (not at all useful) to 5 (very useful). Previous research provides evidence of high reliability and validity evidence regarding perceptions on eHealth (Demiris, Speedie, & Finkelstein, 2000).

Similarly, system-related log data were tracked; namely the number of logins on the system (patient and caregiver), the number of times the various sections were consulted, number of messages sent and number of completed diaries and questionnaires. Demographic, tech savviness, satisfaction and clinical variables were also collected from patients (users and not-users). To compare the baseline need of the patient in information support we calculated the profile of the patient at the start of the study. This data will be used to compare groups with different needs.

Sample

All patients from the selected care pathways willing to participate were included, this results in a convenience sample. As we noticed in the pilot study that only few patients willing to use the patient platform actually used the platform (17%), we opted not to randomize to have sufficient data in this project. Also, we described the reasons why patients did not participated in the study.

Patients with one of the following criteria (1) not having a computer with an internet connection, (2) not having the Belgian identity, (3) not Dutch speaking, (4) having a cognitive and/ or psychological disorder (as assessed by the research team) and (5) unable to read or write (as judged by the research team) were excluded. All involved caregivers were included. The flow of the use of the patient portal can be found in Figure 3.

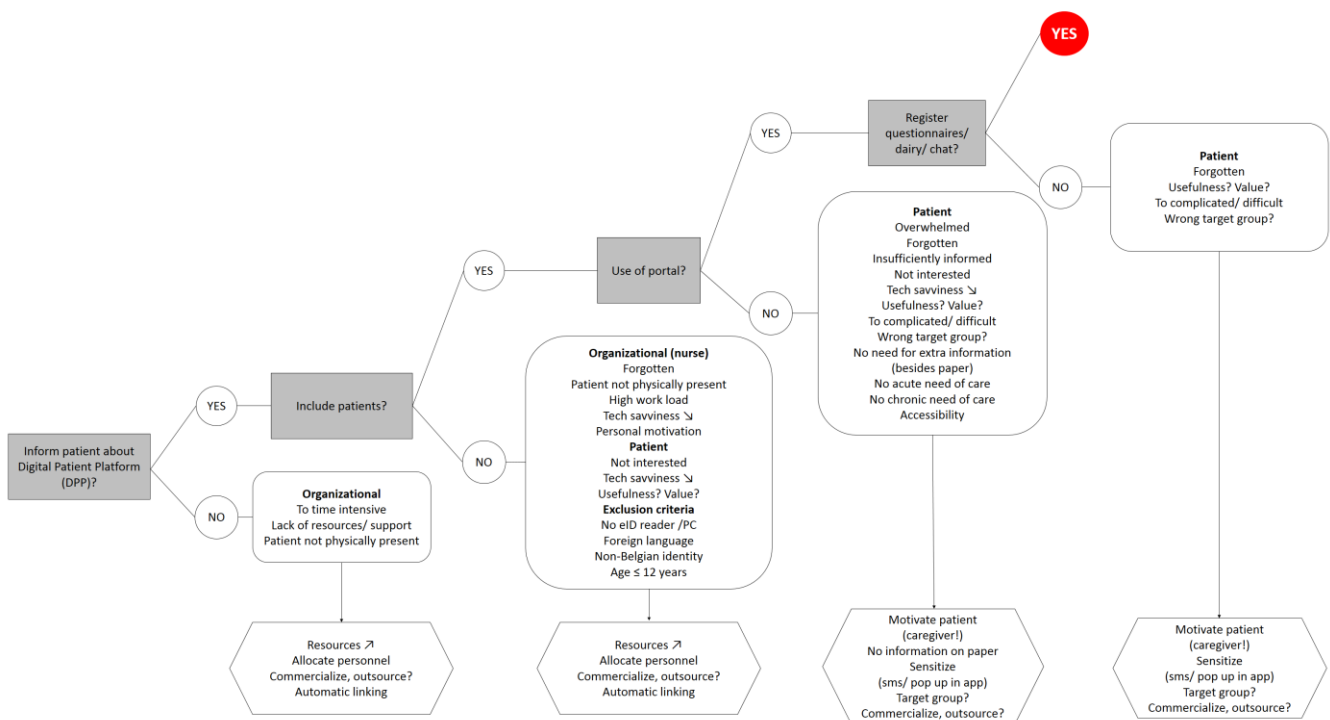


Figure 3 – The flow of use of the Digital Patient Platform

Data analysis

Interviews were conducted both by telephone and face to face with the end users (patients and caregivers) and were recorded on tape. Immediately after the interview, the findings were noted. The interviews were transcribed verbatim. The qualitative data were analyzed through thematic content analysis. The analysis was carried out by two researchers, both experienced in qualitative research.

The sample and study variables of the patients will undergo descriptive statistical analysis. Cronbach alpha reliability scores will be calculated to test the internal consistency of the scales. Variance analysis (Anova) will be used to compare groups.

Ethical considerations

The study protocol was approved by the institutional review board and all participants took part voluntarily. Written informed consent was obtained from all patients.

Phases

Table 1 – Different phases in the innovation project

Phases	Time frame	Main actions	Data collection
Development and implementation of the Digital patient platform (DPP)	2015-2016	See De Regge et al. (2018)	See De Regge et al. (2018)
Pilot study	October 2017- August 2018 Start October 2017 for orthopedics From mid February 2018 for Otorhinolaryngology	<ul style="list-style-type: none"> ○ Develop specific care process information for patient platform ○ Create information folders for caregiver and patient ○ Education sessions for caregivers ○ Implementation of mobile app 1.0 	<ul style="list-style-type: none"> ○ Interviews with caregivers ○ Meetings ○ Observations ○ Log data
Phase 1	September 2018- April 2019	<ul style="list-style-type: none"> ○ An automatic email can be coupled to the patient questionnaires reminding patients to fill in these questionnaires ○ Motivation sessions where organized with care providers who are responsible for presenting the platform during a first consultation ○ Alternative login for eID reader (Itsme® app) ○ Platform information was simplified Update mobile app (vs. 2.0) ○ no longer supply information on paper for specific group 	<ul style="list-style-type: none"> ○ Interviews with patients (users and non-users) ○ Observations ○ Meetings ○ Questionnaires from patients ○ Log data
Phase 2	May 2019- currently	<ul style="list-style-type: none"> ○ Involve nurses of day surgery center to inform patient with a real life demo of the portal. ○ Expansion of care pathways in the patient platform. 	
Phase 3	To be decided	To be decided	

Results

In phase 0, 252 patients were willing to participate. However, a substantial number of patients were not enrolled (n=51). Main reasons for not enrolling where: not having the Belgian nationality (n=13) or not speaking Dutch (the language used in the portal, n=8); not having an eID reader, PC and/or smartphone (n=24), or patient not feeling digital competent, lack of interest or lack of added value (n=6). The healthcare professionals acknowledged that the technological barrier under the form of the need to use the eID

user (according to the European GDPR guidelines), has a negative influence on the user acceptance.

Some patients were not asked or informed to enroll (exact data incomplete) due to organizational issues (e.g., forgot to ask patient, too busy) indicating a need to automate this process. Within the orthopedic setting this was caused by a turnover in personnel, where at the otorhinolaryngology setting this was rather due to lack of motivation of the nursing staff. In short, in the pilot study we were confronted with a high number of not included patients and low use of the portal by patients who agreed to participate.

Preliminary data of phase 1 (work in progress) included 85 patients (who underwent surgery before April 2018) that enrolled in the study. Fifty one patients did not enroll in the study, this for the same reasons as in phase 0, but notable more number of patients being not interested (n=29). Forty one % of the patients were not asked or not informed. Observations and interviews showed that the nurses allocated to enroll the patients had a major influence on the latter two reasons of non-participating. High work pressure, shortage of staff and lack of interest in the project (from the otorhinolaryngology setting) resulted in low enthusiasm. As such, less effort was made to include patients.

Forty five % (n=38) of the enrolled patients used the patient platform. This suggest that there is interest but patients do not perceive an urge to log in. The majority of the actions taken on the platform where gathering information (n= 1214); while 71% of the patients actively used the platform to register questionnaires or diaries (n= 27). Rarely a conversation with a care provider was started (n=15) and the prompt list was not used. A positive trend of higher use of the patient portal by patients was found in time. This being the results of different measures taken by the innovation team (e.g., prompts to patients by mail, better inform and motivate involved care providers) during the study (see Table 1).

Interviews demonstrated that patients using the portal find the portal a user-friendly tool, mainly for searching new information. Our observations showed that patients who are strongly motivated by the nurse to use the portal (e.g. by explaining the added value of the patient portal) leads to higher use. But we also observed a high lack of involvement of the surgeons who did not inform their patients about the patient portal. Data analysis of the interviews with non-active patients might reveal important insights why they did not use the portal. This will be supplemented with the data from the questionnaires. Also comparisons between the two cases is lacking at this moment in the data analysis.

As previously mentioned, patients have the possibility to use the functionalities of the digital patient platform both on computer and smartphone application. One third (n=13) used the smartphone app.

The profiles of users versus non-users will be compared after analysis of the questionnaires. Next step is to focus on motivating and lowering the threshold by guiding the patient in the first electronic identification in the portal during face-to-face contact preoperatively during preoperative anesthetic consultation (nurse or anesthetist). Additionally, interviews demonstrated that patients do not always see the added value of the portal. Therefore, a patient portal for day surgery involving a more complicated care

process (e.g. in pain experience) will be tested to investigate whether there is a higher perceived usefulness compared to the already included care processes in phase 2.

Discussion

Our study supports Classic Technology Acceptance theories by demonstrating the importance of '*perceived usefulness*' and '*perceived ease of use*' of technology towards the intention to use this technology (i.e., the patient portal). However, we also showed the importance of improving the operational process and applying operational features (such as automatically linking patients to the portal for standardized care processes).

Our findings support the MOA theory. The patient needs the 'ability' to use the patient portal. Patients not equipped with the right (access) resources cannot use the patient portal, substantiated by the high number of patients that not have access to the portal due to technical issues (e.g. no eID, no Belgian identity). Developers should beware of this group that cannot be reached and should not neglect them as they are probably more vulnerable. Another important factor is that the patients must identify the 'opportunity', patients not sensing the usefulness of the portal do not have an urge to use the portal, and thus not find it an opportunity. As such, we must not believe that all care processes are effectual for the use of a patient portal. Patients must see an added value for themselves (intrinsic motivation) when using the patient portal in their care process. Taking into account the opinion of the patients is of major importance in selecting the right care processes. But above all, to achieve patient engagement we highlight how third parties (in this study the physician or nurse who has a direct relation with the patient) are an important asset to extrinsically motivate patients to use the portal. Provider endorsement is one of the most influential factors of impacting patients' adoption (Ross et al., 2016). The theoretical framework will guide us in making the difference in intrinsic and extrinsic motivation of the patient and how these can be empowered resulting in higher use of the portal. Further analysis will provide more insight in why the portal is not used.

Conclusion

The introduction of eHealth has the potential to provide innovative solutions to health problems. However, eHealth technology should be developed so users can't find any reason not to use it. Patients who use the portal are positive and we notice an increase in the use and registration of questionnaires and diaries at the portal. This illustrates that by action research we can implement changes that improve eHealth implementation (i.e. the use of the digital patient portal). However, the development and understanding of the MOA constructs, particularly the important role of intrinsic and extrinsic motivation, might provide the potential to attain a higher use of the portal.

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