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Rome Wasn't Reached in a Day: How to Motivate Patients to Keep Walking?

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Abstract. We have to sit less and take more steps. This message is important for us all, and especially for patients with chronic diseases. As solutions to motivate us and to boost our physical activity make use of gamification, and by doing so focus on the fit and healthy, we are wondering how we could do the same for people who see their abilities decrease (e.g. patients with chronic diseases). We worked on a solution for transplant patients that highlights the cumulative effect of daily activity. During the design and evaluation of this solution, we were confronted with a number of questions on this topic of keeping patients motivated. During the workshop, we would like to discuss how we could keep patients motivated, and how we could implement a social component to let patients interact with their environment, without getting demotivated.

Keywords: Patient, Physical activity, Self-management, Step counter.

1 Introduction

Technology enables us to remain seated throughout the day for our own comfort. While living life from the couch can feel like the ultimate sophistication of mankind, it is a bad habit with profound effects on our health [2]. On average 25% of the population is not active enough [4], and we can expect that this number is even higher for people with decreased abilities, e.g. patients. However, a healthy lifestyle that includes sufficient physical activity would certainly benefit the condition of the patients.

Existing solutions to keep us physically active are based on known behaviour change models (e.g. Fogg Behavior Model [1]). Activity trackers and accompanying dashboards raise awareness, let users set goals and achieve them, and have a social component to show off progress and facilitate competition between friends. Gamification, where game elements are used to

facilitate behaviour change, is applied widely. But we argue that these tend to focus on the fit, who might be able to increase their step count day by day, in order to earn badges and to become the leader among their friends.

For patients who see their abilities decrease, these approaches could be counterproductive. As multiple transplant patients told us, their disease is not a game. Being confronted with your limitations as a patient can be very demotivating. The use of step counters to support patients to increase physical activity has proven to be successful in other studies, e.g. for diabetes patients [3]. So we worked on a solution to keep transplant patients motivated by highlighting the cumulative effect of walking every day, because every step counts. Along the road, some remaining questions were raised which we would like to discuss further.

2 About the PICASSO-Tx project

The PICASSO-Tx project wants to investigate the influence of preference on the outcome of interventions that focus on self-management assisted by technology. Therefore, a technology solution was designed that supports the self-management of physical activity, medication adherence, and a healthy diet. Participants receive a Fitbit One activity tracker to register steps, Fitbit Aria weight scale to register weight, and an Aardex pillbox that registers the time of opening the pillbox. We wanted to have one low-barrier point of access to all data, in Dutch (as most of our participants don't speak English), and that meets the existing regulations regarding security and privacy of (big) data in healthcare. Therefore we decided to design this web application ourselves, as most commercial solutions don't meet our requirements. After all, it was utterly important that participants would not reject the technology for user experience issues that could have been prevented.

During one year, we followed a user-centred design approach in intense collaboration with researchers within the medical domain. We performed a diary study with twenty participants to map the current needs and existing solutions for the self-management of physical activity, medication adherence, and healthy eating. Based on this knowledge, we designed the interface of the web application through iterative prototyping. We invited patients to our lab to gather feedback on a prototype and then repeated this exercise. The final design of the PICASSO-Tx web application was finished by a graphical design team and was then validated in usability tests. To conclude the design phase, we performed a field test where twenty participants received the activity tracker, weight scale, pillbox, and access to the web application for

two weeks. We evaluated the solution using surveys and a semi-structured interview based on the critical incident technique.

In the next paragraphs, we will discuss our experiences with physical activity and the activity tracker throughout the design phase of the PICASSO-Tx project. We argue that the standard approach used in games for health is not suitable for our target group. We list a number of remaining questions that were raised during the design and evaluation of the PICASSO-Tx web application.

3 A pilgrimage that keeps patients walking

The PICASSO-Tx application offers a very limited simple view on the patients activity. The application allows patients to view their daily amount of steps for the past seven days. As the display of the activity tracker also displays the total number of steps, people were familiar with this daily step count. Our field test showed that people do look at this number throughout the day. Other details and stats (e.g. number of floors, number of active minutes) are not displayed to keep the interface as simple as possible. Furthermore, the stats functionality does not allow people to look at activity history for more than seven days at once, to avoid confronting the patients with a potential strong decrease in abilities.

Patients also have a goal, which they can try to reach in one week's time. The physicians set this goal, based on a baseline measurement. It can be adjusted according to the changing abilities of the patient during a face-to-face meeting with the physician, once every few months. If the goal is reached for at least five of the last seven days, it is raised with a few hundred steps – this leaves the patient two extra days to buffer a bad day or a visit to the hospital with less physical activity (something which happens quite frequently). If the patient does not reach the goal, a motivational message is displayed.

For the long term, we implemented a pilgrimage that highlights the cumulative effect of daily activity in order to motivate patients. If you take 150 steps per day, you walk a marathon in a year time. This idea was implemented on the PICASSO-Tx web application. Patients would virtually walk to e.g. Santiago de Compostela, a well-known Christian pilgrimage destination. For patients without Catholic background (or religion in general), other destinations could be selected that leads to the required motivation. The field test showed that this aspect of the feedback was especially well received by our participants. During our final interview, people were proud they reached France in two weeks time. Some of the participants reported that walking to Compostela feels like a dream, but their condition would never

allow them to do this. Even though our pilgrimage is virtual, it does appeal to our target audience.

4 The Road Ahead: Some Open Questions

Our solution will now be tested in a randomized controlled trial, to see if patients find motivation in the long term. We are interested in how seasonal changes will affect the physical activity of our patients. And for this group of patients, a (temporary) relapse in abilities is common. The same mechanisms could be at play here as well. Our field study showed that patients would like to involve their environment or family in this type of solutions. We did not implement this, as we did not want the competition between patients and their able-bodied environment to demotivate the patient. We also did not implement interaction between patients, as most patients stated during our diary study they don't like to be treated as patient. Still, we are wondering how social interaction between patients and their environment can be organized in an optimal way. During this workshop, we would like to discuss how to keep people motivated, even though their abilities decrease. And, how can we implement a social component for this group of people?

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