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Original Research

Introducing a telemonitoring platform for diabetic patients in primary care: Will it increase the socio-digital divide?

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ABSTRACT

Aims: This study investigates whether diabetes patients visiting a primary care setting are interested in using a telemonitoring platform and if so, whether characteristics of interested users could be distinguished.

Methods: Three questionnaires were administered by 92 diabetes persons recruited between May and September 2011. Descriptive statistics and logistic regression analysis were performed. Special attention was drawn to include patients with low educational levels.

Results: Patients with middle or high educational levels show quite some interest in the use of a telemonitoring platform, especially for the transmission of glycaemic data or for asking questions. Patients with low educational levels only show a minor interest in using such a platform.

Conclusions: It is possibly worthwhile to implement a telemonitoring platform in a primary care setting; however this study did not show immediate profit for implementation in a CHC that organises diabetes clinics on regular basis. In primary care settings where it will be implemented, even if there is a social–digital divide today, the use of a telemonitoring platform could possibly reduce inequity in health care as time could become available for those most in need for face-to-face contact with their physician.

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1. Introduction

Diabetes as a chronic disease is one of the most important and most challenging health problems in the 21st century [1]. In Belgium, the accumulated prevalence of type 1 (T1DM) and type 2 (T2DM) diabetes in adults is estimated to be 8.0% in 2010 and there is still an upward trend with an estimation of 9.6% in 2030 [2]. Another 6.5% of the Belgian adults have impaired glucose tolerance [3]. Also, one out of ten adult Belgians has elevated blood glucose values and is therefore

eligible for prevention or treatment of their diabetes and related complications.

Self-management is one of the crucial factors of the current diabetes therapy. Most insulin-dependent diabetes patients self-monitor on regular basis their blood glucose level allowing them to react efficiently when one feels ill; when the blood glucose levels fluctuate too much; or when the blood glucose levels are too high. The blood glucose readings help patients to evaluate the effects of physical exercise, nutritional habits, stress and impact of daily living conditions. Based on these values patients can adapt their insulin dosages. Through

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self-monitoring an improved glycaemic control can be reached [4,5].

In Belgium, diabetes patients can – but are not obliged – get ‘complementary refund’ for a part of their treatment costs if they agree to cooperate with different healthcare professionals and consent to have their diabetes monitored. Three initiatives have been taken and have been described shortly below: the diabetes convention, the diabetes pass, and the diabetes care-trajectory.

The ‘diabetes convention’ was created in 1987 in order to overcome the financial barriers associated with the rather expensive blood glucose monitoring. All patients with T1DM and those with T2DM treated by at least two insulin injections, per day can benefit. This convention is an agreement between the National Institute for Health and Disability Insurance (NIHDI) [6] and different Belgian diabetes centres. These centres offer diabetes patients tools and material for blood glucose monitoring under strict conditions.

In March 2003 the Minister of Social Affairs and Public Health introduced the “diabetes passport” which can be used by all diabetes patients. It was developed by the ‘Vlaamse Diabetes Vereniging’ (VDV), the ‘Association Belge du Diabète asbl’ (ABD), the ‘Wetenschappelijke Vereniging van Vlaamse Huisartsen’ (WVVH), the ‘Société Scientifique de Médecine Générale’ (SSMG) and the sickness funds. An application file, signed by the general practitioner or the specialist, enables the patient to receive the diabetes pass from his/her health insurance organization. One of the goals of this pass is improving communication between the different care providers and the patient.

Finally, since January 2009 the “care trajectories” for diabetes are introduced for patients with severe T2DM for whom it is not possible to enter the diabetes convention. This care trajectory is meant for T2DM patients having an insulin treatment with one or two insulin injections a day or for whom a treatment with tablets is unsatisfactory and an insulin treatment is considered. Besides these medical conditions, there are also some other requirements: having a Global Medical Record administered by a general practitioner; and having at least two consultations a year with the general practitioner and one consultation a year with a specialist. The diabetes care trajectory is a written commitment and has to be signed by the three partners: the patient, the general practitioner, and the specialist.

Telemonitoring has shown to have a positive impact on education, empowerment, and clinical outcomes [7–10] and it could be an added value for certain patients. It has been defined by Meystre [11, p. 63] as ‘the employment of information technology with the goal of monitoring patients over distance’. Applied to diabetes, it comprises ‘the recording, transmission, and visualisation of the main variables considered in diabetes care’ [12,13, p. 165]. Such a platform could enhance the electronic communication between different actors taking into account privacy and security [14–16]. Patients could receive timely (personalised) feedback; less transcription errors could occur [17] and a higher reliability of direct transfer of blood glucose data into the system could be the result [12]. Until now, most telemonitoring studies are conducted over a rather short time period. Also, it is not so easy to compare different studies because the technologies

used vary. In a study from Ahring in 1992 [18] glucometers were connected via telephone and modem. Nowadays, it is possible to connect the glucometer directly to a smartphone and use an app to transmit data [19].

These rapid evolutions in technology are associated with some concerns. In 1998, Eng [20] warned for possible barriers patients could encounter when they are confronted with electronic health (eHealth). Patients wanting to make use of eHealth should have access to the hardware and infrastructure; they also should know how to work with the technology in an appropriate and effective way. Also, the educational level plays a role in this social-digital divide as well as it does in health inequity. Patients with lower-educational levels have higher odds of having chronic conditions compared to patients with higher educational levels [21]. In Belgium, the amount of higher-educated people keeps increasing. In 2010, 27% of Belgians had a higher degree while it was only 14% in the Nineties. Remarkably however, is that still 39% of the Belgians only has a degree of lower secondary school. A recent study from the Belgian government showed that in Belgium higher educated people live longer and healthier [22].

The aim of this study was to investigate whether diabetes patients visiting a primary care setting are interested in using a telemonitoring platform and if so, whether characteristics of interested users could be distinguished. In this study, special attention was drawn to include patients with lower-educational levels. Three groups of patients have been distinguished: low-educational levels (no degree till degree low secondary school); middle-educational level (degree higher secondary degree); and high-educational level (degree high school or university).

2. Methods

In 2011, three questionnaires were completed by 92 T1DM and T2DM patients. We collected general information complemented by basic clinical information, retrieved from their medical record. All data were anonymized.

2.1. Participants

All participants were adults (aged ≥ 18 years at date of the study) diagnosed with T1DM or T2DM. With the exception of ‘language’ (i.e. Dutch-speaking) and ‘being adult’, there were no specific exclusion criteria. Special effort was made to include patients with low-educational levels. About 30% of the sample has been recruited via their Community Health Centre. Such a primary health care centre is characterised by being located in the patients’ neighbourhood and thus oriented at people living nearby. It is an easy accessible, multidisciplinary centre for primary care using a patient list and a mixed capitation payment system. Quite some patients with very low educational levels are visiting such a centre. The General Practitioner (GP) asked the patients visiting the diabetes clinic to participate in this study. To include as much as possible patients visiting a CHC, the researcher visited the patients willing to participate at their home. There, they received information regarding the study from the researcher and filled in the questionnaire.

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