



## ORIGINAL ARTICLE

# DiabeTIC website: A pilot study of satisfaction and impact on metabolic control<sup>☆</sup>

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### KEYWORDS

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### PALABRAS CLAVE

Diabetes;  
Telemedicina;  
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Control metabólico;  
Satisfacción

### Abstract

**Objectives:** To evaluate satisfaction and short-term impact on metabolic control of diabetes monitoring through the DiabeTIC website.

**Patients and methods:** A prospective, uncontrolled intervention study was conducted in 32 patients aged  $29.7 \pm 9.7$  years (65% female) incorporated to the telemedicine platform DiabeTIC between March and September 2012. All patients completed a satisfaction questionnaire in the first month, and impact on metabolic control was evaluated at three and six months.

**Results:** In the satisfaction survey conducted in the first month of follow-up, the following mean scores (0–10) were obtained: overall impression with the platform:  $8.6 \pm 1.8$ ; ease of use:  $8.1 \pm 1.5$ ; intuitive navigation:  $6.7 \pm 3.0$ ; value of measurements:  $9.1 \pm 1.1$ ; importance of the platform in diabetes management:  $9.5 \pm 0.9$ ; sense of security:  $9.5 \pm 0.8$ ; value of the library:  $9.4 \pm 1.1$ ; value of messages:  $9.1 \pm 1.4$ , and recommendation to use the platform:  $9.4 \pm 0.9$ . Glycosylated hemoglobin concentrations significantly improved at six months as compared to study start ( $7.0 \pm 0.8$  versus  $8.1 \pm 1.9$ ;  $p = 0.007$ ). Nine patients were discharged from DiabeTIC before completing six months of follow-up.

**Conclusions:** Patients with diabetes monitored through the DiabeTIC website report a high degree of satisfaction, showing improved metabolic control at short-term follow-up.

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### Página web DiabeTIC: estudio piloto de la satisfacción e impacto sobre el control metabólico

### Resumen

**Objetivos:** Evaluar la satisfacción y el impacto sobre el control metabólico a corto plazo del seguimiento de la diabetes a través de la página web DiabeTIC.

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**Material y métodos:** Estudio prospectivo de intervención no controlado realizado en 32 pacientes de  $29,7 \pm 9,7$  años de edad (65% mujeres) incorporados a la plataforma de telemedicina DiabeTIC entre marzo y septiembre de 2012. Todos los pacientes cumplimentaron en el primer mes un cuestionario de satisfacción, analizándose la evolución del control metabólico a los 3 y 6 meses de seguimiento.

**Resultados:** En la encuesta de satisfacción realizada en el primer mes de seguimiento se obtuvieron las siguientes puntuaciones medias (0 a 10): impresión general con la plataforma:  $8,6 \pm 1,8$ ; facilidad de uso:  $8,1 \pm 1,5$ ; navegación intuitiva:  $6,7 \pm 3,0$ ; utilidad de las mediciones:  $9,1 \pm 1,1$ ; importancia de la plataforma en el control de la diabetes:  $9,5 \pm 0,9$ ; sensación de seguridad:  $9,5 \pm 0,8$ ; utilidad de la biblioteca:  $9,4 \pm 1,1$ ; utilidad de los mensajes:  $9,1 \pm 1,4$ ; y recomendación de uso de la plataforma:  $9,4 \pm 0,9$ . Las concentraciones de hemoglobina glicosilada mejoraron significativamente a los 6 meses de seguimiento respecto al inicio del estudio ( $7,0 \pm 0,8$  versus  $8,1 \pm 1,9\%$ ;  $p = 0,007$ ). Nueve pacientes fueron dados de baja de DiabeTIC antes de completar 6 meses de seguimiento.

**Conclusiones:** Los pacientes con diabetes seguidos a través de la página web DiabeTIC comunican un elevado grado de satisfacción, observándose a corto plazo una evolución favorable del control metabólico.

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## Introduction

In 2008, the Andalusian Agency for Health Technology Assessment (AETSA) and the Spanish Ministry of Health and Consumer Affairs jointly issued the results of a systematic review of the medical literature and an economic evaluation whose main objective was to ascertain whether the use of information and communication technologies (ICTs) could improve the effectiveness and efficiency of and satisfaction with metabolic control in patients with diabetes.<sup>1</sup> The authors of this study concluded that telemedicine applied to diabetes control is effective (good quality of evidence) and efficient (good to fair quality of evidence) and that its users are highly satisfied with it (good quality of evidence). They recommended that health care institutions should have the infrastructure required to provide ICTs to patients with diabetes, and that research should be conducted to find the best way to implement these ICTs in health care organizations.<sup>1</sup>

Two years later, the Group of New Technologies of the Spanish Diabetes Society (SED) issued a position statement on the use of telemedicine for diabetes control that described some characteristics and results of the use of telemedicine for the care of patients with diabetes and proposed a ten point plan for the use of telematic systems in diabetes care. Like AETSA, this group also stressed the importance of creating the infrastructure for the development of telemedicine.<sup>2</sup>

Despite these recommendations, few Spanish health centers have implemented telematic care for people with diabetes, as is shown by the low number of papers referring to this modality of care which are submitted to national meetings and publications.<sup>3-9</sup> Moreover, most such reports refer to patients with very specific profiles, such as pregnant women<sup>3,4</sup> or patients with insulin pumps.<sup>5-8</sup> Finally, in most studies published to date on telemedicine and diabetes, the information was transmitted between patients and professionals by telephone, short message services (SMS), video conference, or electronic mail.<sup>1,10-12</sup> Very few studies used web sites specifically developed for the telematic care of

diabetic patients.<sup>9,13-15</sup> Thus, the purpose of this study was to assess satisfaction with short-term metabolic control and its impact in a cohort of diabetic patients monitored through the DiabeTIC web site, recently developed in Spain for the telematic monitoring of patients with diabetes.

## Subjects and methods

A prospective, open-label, non-controlled, intervention pilot study was designed to analyze the satisfaction with and the impact on metabolic control in a cohort of diabetic patients monitored through the DiabeTIC telemedicine platform. This web site, developed by Sanofi and Orange, is specifically designed for monitoring people with diabetes and has been accessible on the Internet to patients and professionals since mid-2012 at the address <https://www.diabeticservicios.es/>. This web site allows for remote two-directional communication between health care professionals and patients with diabetes, providing for the remote monitoring of blood glucose control, remote diabetic education, consultation through messages between professionals and patients, and the design and conduct of remote surveys. Professionals may sign up patients, assign them to specific groups and subgroups (e.g. "type 1 diabetes with pump") where the measurements to be made (blood glucose, blood glucose/insulin, or blood glucose/insulin/carbohydrate servings) and the periodicity of these measurements as well as visits to be made by health care professionals are established, and may prescribe the treatment to be received by the patient. Once included, patients may enter their measurements (blood glucose, insulin dose, and carbohydrate servings), consult their statistics, see and modify the treatment prescribed by their physicians, write and read messages, see documents in the library, and answer questionnaires proposed by the assigned professionals.

The subjects eligible for the study were patients with diabetes older than 14 years on insulin treatment who attended the outpatient clinics of the endocrinology unit of Hospital

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