International Journal of Nursing Studies 80 (2018) 29–35

Contents lists available at ScienceDirect

International Journal of Nursing Studies

journal homepage: www.elsevier.com/locate/ijns

The role of telenursing in the management of Diabetes Type 1: A randomized controlled trial

Konstantia Kotsani[a], Vasiliki Antonopoulou[a], Aikaterini Kountouri[a], Maria Grammatiki[a], Eleni Rapti[a], Spyridon Karras[a], Christina Trakatelli[a], Panagiotis Tsaklis[b], Kiriakos Kazakos[b], Kalliopi Kotsa[a,*]

[a] Diabetes Center, Department of Endocrinology and Metabolism, 1st Department of Internal Medicine, AHEPA University Hospital, Thessaloniki, Greece
[b] Department of Nursing, Alexander Technological Educational Institute of Thessaloniki, Thessaloniki, Greece

ARTICLE INFO

Keywords:
Diabetes management
Diabetes type 1
Monitoring
Nursing care
Telenursing

ABSTRACT

Background: Diabetes Mellitus type 1 (T1DM) is a chronic disease that requires patients' self-monitoring and self-management to achieve glucose targets and prevent complications. Telenursing implicates technology in the interaction of a specialized nurse with patients with chronic diseases in order to provide personalized care and support.

Objective: To evaluate the effect of telenursing on T1DM patients' compliance with glucose self-monitoring and glycemic control.

Design: Randomized controlled study.

Settings: Outpatient Department of Diabetes, Endocrinology and Metabolism of a University Hospital in Northern Greece.

Methods: Ninety-four T1DM patients were recruited and randomized in two groups by a random number generator. The intervention group (N = 48) was provided with telenursing services. A specialized nurse made a weekly contact via telephone motivating patients to frequently measure blood glucose and adopt a healthy lifestyle. The control group (N = 46) received standard diabetes advice and care in the clinic. The primary outcome was the effect of the intervention in glucose control and glucose variability. The secondary outcome was the effect on frequency of self-monitoring. SPSS 20.0 was used for data analysis.

Results: The two groups did not differ in age, sex, physical activity or initial HbA1c. In the intervention group, blood glucose significantly decreased at the end of the study in all predefined measurements, compared to control group: morning (93.18 ± 13.30 mg/dl vs. 105.17 ± 13.74 mg/dl, $p < 0.005$), pre-prandial (114.76 ± 9.54 mg/dl vs. 120.84 ± 4.05 mg/dl, $p < 0.005$), post-prandial (193.35 ± 25.36 mg/dl vs. 207.84 ± 18.80 mg/dl, $p < 0.005$), and HbA1c decreased significantly over time in the intervention group (8.3 ± 0.6% at the beginning of the study vs. 7.8 ± 1% at the end of the study, $p = 0.03$). In the intervention group there were also fewer omitted glucose measurements than in the control group.

Conclusions: Patients in the intervention group achieved better glucose control and more frequent self-monitoring than patients in routine care in the clinic. The findings of our study indicate that telenursing can motivate T1DM patients to better control their disease.

What is already known about the topic?

- T1DM is a chronic disease associated with complications. The appropriate treatment in combination with patients' self- management contributes to prevention of these complications.
- Several studies have shown that telemedicine plays important role in the management of diabetes, whereas some studies had conflicting results.
- Telenursing uses technology in order to offer nursing care and support to patients with chronic disease.

Abbreviations: DM, diabetes mellitus; T1DM, diabetes mellitus type 1

* Corresponding author at: Endocrinology, Diabetes and Metabolism Department, 1st Department of Internal Medicine, AHEPA University Hospital, St. Kiriakidis 1, P.O. 54636, Thessaloniki, Greece.
E-mail address: kkalli@auth.gr (K. Kotsa).

https://doi.org/10.1016/j.ijnurstu.2018.01.003
Received 19 April 2017; Received in revised form 27 December 2017; Accepted 5 January 2018
0020-7489/ © 2018 Elsevier Ltd. All rights reserved.

What this paper adds

- Telenursing can provide nursing support through technology means in patients with T1DM, leading to their better glycemic control.
- Through telenursing, specialized staff can counsel and motivate patients through cost-effective means -telephone- and result in improvement of patients' compliance to self-monitoring.
- The role of nurse and the systematic and personalized care achieved by telenursing is crucial for the management of T1DM.

1. Introduction

Diabetes Mellitus (DM) is a chronic metabolic disorder complicated by long-term microvascular and macrovascular complications leading to high morbidity and mortality rates (Deckert et al., 1978). Its prevalence increases globally and tends to be rising in epidemic proportions. IDF Diabetes Atlas in 2015 suggests that 415 million adults in the world have DM and it is estimated that 642 million adults will have DM by 2040. DM of type 1 (T1DM), although less common, seems to be increasing by approximately 3% per year (International Diabetes Federation, 2015). In Greece, there are only a few studies about DM prevalence, conducted mostly in adults and elderly people with DM of type 2 (T2DM). Most of them are regional, small epidemiological studies. There is one large study conducted in general population about two decades ago (from 1996 to 1999), which estimated only self-reported data (Tentolouris et al., 2009). According to these studies, the prevalence of DM varied between 3.1–9.5%, depending on design and population (Gikas et al., 2008; Katsilambros et al., 1993; Lionis et al., 1996; Melidonis et al., 2006; Panagiotakos et al., 2005; Papazoglou et al., 1995; Tentolouris et al., 2009). In 2016, Liatis et al. studied the prevalence of both DM types in Greece based on prescribed pharmacological treatment and showed that the prevalence of T2DM was 7% and of T1DM was 0.24% (Liatis et al., 2016). Data about overall T1DM epidemiology in Greece are limited and based on decades-old studies, that report an incidence of T1DM in the whole country (1992) of 6.25 persons per 100,000 and in Athens of 9 persons per 100,000 (Bartsocas, 1998; Dacou-Voutetakis et al., 1995). Further studies also reported a T1DM incidence of 6.1 persons per 100,000 in Crete and of 4.6 persons per 100,000 in northern Greece (Green et al., 1992; Mamoulakis et al., 2003).

Studies have shown that strict glycemic control can reduce microvascular complications in both T1DM and T2DM and when applied early in the course of the disease, it can decrease the risk of macrovascular complications. In the case of T1DM, the Diabetes Control and Complications Trial (DCCT) and the Stockholm Diabetes Intervention Study (SDIS) have shown that intensive diabetes management prevents and decreases the development of microvascular complications. (Diabetes Control and Complications Trial Research Group et al., 1993; Reichard et al., 1988; Stratton, 2000) Lifestyle changes and proper self-management of the disease constitute an essential part of the treatment strategy, as it is evident from treatment guidelines (American Diabetes Association, 2017).

Self-management focuses on behavioral changes that an individual must adopt to optimize disease management. Self-management in DM includes self-monitoring of blood glucose, and handling of physical activity, exercise, nutrition and medication (McGowan, 2005). Studies have shown that self-monitoring of blood glucose is important to achieve glycemic goals in T1DM, by helping with titration of insulin and avoidance of extreme variations in blood glucose levels (Karter et al., 2001; Tattersall and Gale, 1981).

Patients with T1DM, especially young adults, in Greece as well as worldwide, find several difficulties in the management of their disease and need more structured education and support to achieve better glycemic control. Studies show that glycemic control in T1DM remains a challenge worldwide. The T1DM Exchange study examined glycemic levels among large numbers of T1DM patients in USA and indicated that only 17% of young adults with age 18–25 and 30% with age 25–30 met ADA criteria and achieved HbA1c < 7% (Beck et al., 2012). There is only one study including data from adult T1DM patients (> 25 years old) in Greece, which shows that mean HbA1c at the study time is 7.6% (McKnight et al., 2015). Glycemic control in T1DM is strongly associated with frequent monitoring (Miller et al., 2013). However, it seems that several factors impair the adherence of adults, especially young, in diabetes management. The transition from childhood into adulthood seems to be a possible reason. Adults are burdened with many changes in lifestyle and in health care, they are found in an unstable period with difficulties in work environment, inflexible working hours, financial instability and adjustment in a new lifestyle model away from their families. Young adults with T1DM need closer surveillance, motivation and psychological support, which can be provided in flexible hours and in remote areas in order to effectively manage of their disease (Monaghan et al., 2015). Health care providers play an important role for DM patients' compliance to self-management (Shrivastava et al., 2013). Nurses seem to provide significant support to patients in order to effectively manage their disease (Mulder et al., 2015; Tshiananga et al., 2012). However, adult T1DM patient care in Greece is physician based and specialized nurses do not interact with patients in an outpatient setting. On top of that, the infrequency of patients' visits to health services, lack of time, distance and high cost could be potential barriers. Telemedicine or telenursing interventions could possibly benefit these patients.

Telemedicine is defined as the transmission of medical information from one site to another via electronic media in order to improve disease management. Telemedicine is a general term that includes a growing variety of applications and services like two-way video, email, smart phones, wireless tools and other forms of telecommunications technology. Telenursing is the use of technology to "deliver nursing care and conduct nursing practice" (American Telemedicine Association, 2001). Telemedicine and telenursing in DM provide health services, including transmission of blood glucose measurements and delivery of advice and support from a DM healthcare provider. This form of indirect communication may lead to enhancement of the patient-doctor or patient- nurse relationship and may reduce visits to the clinic. Although it cannot replace personal contact and physical examination, it may help DM patients achieve their glycemic targets and may prove a form of cost-effective health care (Bellazzi et al., 2002).

Several studies have suggested that telemedicine plays a crucial role in motivating self-monitoring of blood glucose as well as improving self-management of DM patients (Fountoulakis et al., 2015; Montori et al., 2004; Salzsieder et al., 2007). There are also some studies that did not prove any difference compared to conventional treatment (Hanauer et al., 2009; Landau and Boaz, 2012; Greenwood et al., 2014). The role of telenursing in the field of T2DM has been examined by Borhani et al. and the results suggested that this method improved glycemic control in participants (Borhani et al., 2013). In Greece, Fountoulakis et al. also indicated that telemonitoring positively affects insulin-treated DM patients (Fountoulakis et al., 2015). However, telenursing studies in T1DM patients are lacking in Greece.

The aim of this study was to investigate whether telenursing positively affects disease management in young adult T1DM patients by assessing the effect on blood glucose control as well as on the frequency of glucose measurements.

2. Methods

2.1. Study setting and participants

This randomized controlled study was conducted among adult T1DM patients, recruited from the outpatient department of Diabetes, Endocrinology and Metabolism of a University Hospital in Northern Greece.

The inclusion criteria for the study were: 1) Diagnosis of T1DM for

Download English Version:

https://daneshyari.com/en/article/7514985

Download Persian Version:

https://daneshyari.com/article/7514985

Daneshyari.com