Abstract The objective was to adapt and test an educational programme for type 2 diabetes patients. The sample consisted of 24 individuals with type 2 diabetes between 31 and 75 years of age that did not require insulin, without severe complications of diabetes. A patient satisfaction questionnaire was applied in the beginning and at the end of the survey. A five-month education was conducted on: hypo- and hyperglycaemia, nourishing and physical activity, feet care, eye care and possible adverse drug reaction. The costs of the education and the pharmacological treatment were calculated. Improvement was observed in patients’ diabetes knowledge and there was a decrease in the frequency of hypo- and hyperglycaemic incidents (about 60% less). At the end of the programme no incidents were matched, saving €10/patient. The benefit to cost ratio is about 1:1 (€140:€142.80). The patients’ quality of life improved by about 5% according to the Diabetes Questionnaire (IMG). The educational approach has the potential to decrease diabetes complications and therefore the economic cost of type 2 diabetes. Introduction of the programme will benefit diabetes patients, promote pharmacies as a source of independent drug information and recognise pharmacists as competent healthcare providers.

Key words Diabetes type 2 • Pharmaceutical care • Bulgaria • Pharmaceutical education • Educational programme for diabetic patients

Introduction

Diabetes is a rapidly growing disease whose impact is felt clinically, socially and economically [1]. It has reached epidemic proportions worldwide [2]. Recent studies found that diabetes affects 2.5%–3% of the population in some countries [3]. Rates of type 2 diabetes have been rising around the world. The increase in prevalence has accelerated due to the ageing population structures in developed counties and to globally increasing obesity. Poverty has been underrecognised as a contributor to the prevalence of type 2 diabetes [4, 5]. Patients with type 2 diabetes represent about 80%–90% of the diabetic population. In last decade, the overall incidence of diabetes has risen due to factors that are strongly related to lifestyle, such as inactivity, and population ageing [6, 7]. Diabetes is the sixth leading cause of death from disease in the world [1]. In Bulgaria the adult morbidity data collected after 1950 demonstrate a constant increase and nowadays type 2 diabetes affects nearly 2% of the population [8]. This chronic condition, which presents a substantial socioeconomic and quality-of-life burden [9], drains the limited healthcare financial resources, tests the boundaries of clinical resources and
decreases the quality of life of the patients and also of their families. If untreated, diabetes can lead to many serious complications such as eye disease that can develop to total blindness, nerve damage, kidney and heart failure, foot and leg ulcers that can lead to amputation, and many others. The profile of patients with diabetes has evolved to include people of all ages and socioeconomic backgrounds, with varying medical histories and health behaviours, whose approach to the disease should be facilitated by health professionals [1, 10].

In 1989, in St Vincent, Italy the St Vincent Declaration was signed, a joint initiative of the International Diabetes Federation European Region and the WHO European Regional Office. It is a programme for strategic action to reduce the human and economic burden of diabetes in Europe and has been adopted by most European governments. The St Vincent initiative has a few target areas that seek to improve the quality of life of people with diabetes and to promote the education of patients so to prevent diabetes complications. In this project all healthcare givers are involved, including pharmacists [11]. Recent clinical outcome studies have made diabetic patients a target for primary care and pharmacist initiatives, so as to improve their quality of life [3, 12–14]. Diabetes is now the subject of specific guidelines for community pharmacists in the different countries that highlight measures and steps for including these healthcare specialists in the primary care diabetic team [12].

Pharmacists are in fact in unique position to improve the care of people with diabetes by collecting patient information, conducting drug regimen reviews, counselling patients, providing consultations with doctors regarding the prescribed drug therapy and by monitoring patients’ treatment process [15–17]. It was proven that in the community pharmacy the patient has easy access to the pharmacist and the consultation is free of charge [17, 18].

However, in some countries, such as Bulgaria, only a minority of patients receive proper diabetes education [10, 19]. The reason for that is that the educational programmes require time, specific training and communication skills from the healthcare providers. The lack of educational resources for diabetes patients in fact is critical in Bulgaria, where the costs of diabetes treatment arise mainly from disease complications [20, 21].

This problem stimulated us to find and adapt an educational programme suitable for implementation in Bulgarian community pharmacies that will enable pharmacists to apply it easily after a short training period; and to evaluate the effect of this programme on clinical, therapeutic and economic outcomes. The educational programme chosen was one promoted by Novo Nordisk for physicians and nurses that has been implemented successfully in several Central and Eastern European countries, like Poland, Czech Republic, Russia, Hungary, Slovak Republic and Slovenia.

The goal of this study was to adapt the educational programme and to test its applicability in the community pharmacy area in Bulgaria for consultation of type 2 diabetes patients. The main study questions were: what will the results of the introduction of the educational programme for diabetes type 2 patients be for both pharmacists and patients, and how can they be measured.

**Research design and methods**

The educational programme continued for 6 months. It was designed and adapted to the local conditions of the Bulgarian community pharmacy. The course was presented to 24 ambulatory patients. The most suitable conditions for both patients and pharmacists that allowed good interaction were specified. The educational course included five teaching units over one month.

The first unit acquainted each of the patients with the aim of the educational programme, provided general concepts about type 2 diabetes and about self-monitoring, and emphasised active patient participation in the treatment. The personal information of each of the patients was collected, concerning the duration of the disease, the prescribed drug treatment and the frequency of hypoglycaemic and hyperglycaemic incidents. Each of the patients was instructed about the symptoms of hypoglycaemia and hyperglycaemia and how to manage them. As a practicum every patient was shown how to perform and record glucosuria self-monitoring in an individual notebook. At the end of the first unit, each of the patients was supplied with written materials on hypoglycaemia and hyperglycaemia. They were asked to monitor glucosuria twice daily (2 h after the main meal). The goal was to learn how to cope with hypoglycaemia and hyperglycaemia incidents.

During the second teaching unit the effect of obesity on insulin sensitivity and the advantages of weight reduction were discussed with every patient. The meaning of the term “bread unit” was clarified. An easy approach for meal selection based on “bread unit” was structured. It was emphasised that regular physical activity helps control weight and may help to manage type 2 diabetes, high blood pressure and cholesterol, heart disease, osteoporosis, arthritis and other chronic diseases. Each of the patients was supplied with written materials on proper nourishment for diabetic patients and physical activity.

The main topic discussed during the third teaching unit was foot care. The educator performed foot examinations and explained how serious it can be if sugars are out of control and a lesion (sore or ulcer) develops on the plantar (bottom) of the patient’s foot. The patients were taught that neuropathy is the loss of sensation, and the patient is not aware that he/she is developing sores on the bottom of his/her foot.

During the fourth meeting the educator discussed the essence of diabetic eye diseases with every patient. They include: diabetic retinopathy, cataract and glaucoma. It was explained that diabetic retinopathy is a leading cause of blindness among adults with diabetes. It was made clear that diabetic retinopathy cannot be completely avoided, but the risk can be greatly reduced by better control of blood sugar levels, which can slow the onset and progression of retinopathy and can lessen the need for laser surgery for severe retinopathy.