The importance of diabetes foot care education in a primary care setting

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Article points

1. The authors assessed the awareness and prevalence of foot care education amongst people living with type 2 diabetes in Malta.
2. A significant number of participants had not received prior foot care education, and had vascular insufficiency, abnormal neural function and deformities in the feet.
3. It was concluded that foot care education in primary care is vital to reduce the incidence of diabetic foot complications.

Key words

- Diabetic foot
- Education
- Primary care

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It has been reported that foot examinations by healthcare professionals, together with appropriate educational initiatives, play a vital role in decreasing diabetic foot complications. A fuller understanding of the factors that contribute to suboptimal foot care, leading to costly diabetic complications, is important for improved outcomes. In this article, the authors highlight the importance of diabetes foot care education in primary care settings amongst people living with type 2 diabetes.

Although new methods of observation and state-of-the-art treatments have been introduced to reduce the number of diabetic foot complications, the importance of diabetes foot care education as an effective tool for the reduction of ulceration and amputation should not be under-estimated (Crawford et al, 2007; Cassar, 2010). It has been repeatedly reported that a reduction in amputation rate of up to 45–85% can be achieved by regular and appropriate foot care education, together with regular foot examinations by healthcare professionals (Al-Wahbi, 2010; Goetti and Keast, 2005).

Diabetes education has been recognised as an integral part of diabetes management. One of the goals of "Healthy People 2020" is to increase the proportion of people with diagnosed diabetes who receive formal diabetes education from 56.8 to 62.5% (Centers for Disease Control and Prevention, 2010). For people affected by diabetes, self-management education is important since the individuals, together with their families, provide 95% of the overall care of their condition (International Diabetes Federation, 2004). Although there have been major advancements in the treatment of diabetes, the successful implementation of these advancements often requires behavioural and psychological demands on the people living with this condition, which can only be achieved by the appropriate educational methods (Strine et al, 2005).

The main aim of diabetes education is to change behaviour and promote self-management of the condition, since poor foot care behaviours are known to increase the risk of ulcerations, amputations and mortality (Knight et al, 2005; Rathur and Boulton, 2007; Sigurdardottir et al, 2007). Improving

the foot care behaviours of people living with type 2 diabetes is reported to be one of the most effective strategies in minimising diabetic foot complications (Kurniawan and Petpichetchian, 2011). Nation-wide effective education programmes have been shown to improve the public healthcare system in developing countries (Soundarya et al, 2004). An example of such a programme includes DESMOND (Diabetes Education and Self-Management for Ongoing and Newly Diagnosed), which follows the NICE recommendations for evidence-based group education programmes. This programme is underpinned by a philosophy that is dedicated to empowering people with diabetes to take the lead in self-managing their condition. Davies and colleagues reported that participation in the programme resulted in greater improvements in weight loss, smoking cessation and improved knowledge of the condition; however, no differences were observed in HbA_{1c} levels up to 12 months following diagnosis (Davies et al, 2008). However, inconsistencies in patient education in primary care clinics are known to have failed to demonstrate consistent statistical improvement in related outcomes and behaviours (Cilia, 2007). Lack of access to diabetes education in primary care clinics has been proposed as a potential barrier to reaching people living with diabetes, particularly in communities where the closest diabetes education hospital-based programme is located far away (Emerson, 2006).

Patient education activities are currently implemented in various ways in different countries and most use primarily didactic education styles (Visser et al, 2001). A number of countries could be considered as still at the experimental stage of the development of patient education in different ways (Deccache and Aujoulat, 2001). Diabetes education is often offered on an *ad hoc* basis and is not ongoing nor based on any proven educational or behavioural principles, limiting its effectiveness (Cilia, 2007). As a result of this inconsistency, research indicates that 50–80% of people living with diabetes worldwide have significant knowledge deficits in relation to the management of their condition (Strine et al, 2005). Furthermore, patient-centred care delivered by a multidisciplinary team, usually including a diabetes educator, is not always available in most primary care offices, though most people with diabetes receive their care from primary care providers (Emerson 2006).

The need for diabetes educators to serve the increasing number of people with diabetes is a common challenge worldwide. Lack of human resources in diabetes education is a key issue as the quality of diabetes care clearly depends on those who provide it (Siminerio, 2006). Training for health educators is required to deliver culturally appropriate advice to individuals living with diabetes, particularly in countries such as Malta where, despite the high prevalence rate of diabetes compared with neighbouring European countries, few diabetes educators are available and very little diabetes education is offered at a primary care level (personal communication with Mario Grixti).

In this article, the authors question the current availability and approaches to diabetes foot care education in primary care settings with a particular reference to Malta. The aim of this article is to highlight the importance of diabetes foot care education in a primary care setting and to discuss how appropriate diabetes education can help improve knowledge and translate into improved behavioural change and quality of life outcomes.

Methods

This study involved the assessment and evaluation of 243 people living with type 2 diabetes. The study included participants from two local catchment areas in Malta, Floriana and Mosta, with a combined population of 126 000 people. People living with diabetes from the aforementioned regions were invited to participate in this study via the media and an advert displayed in the local health centres. There was no patient streaming and all those who wished to participate were included in the programme. This study was approved by the University of Malta Ethics Research Committee. All participants had provided consent to participate in the study.

Page points

1. Nation-wide effective education programmes have been shown to improve the public healthcare system in developing countries.
2. Limited access to diabetes education in primary care clinics has been proposed as a potential barrier to reaching people living with diabetes.
3. The lack of human resources in diabetes education is a key issue as the quality of diabetes care clearly depends on those who provides it.

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Authorisation was also obtained from the Department of Primary Healthcare to access the database in which patient data were stored. For the purpose of data analysis, each foot was scored separately.

The local diabetes foot screening study

Although encouraged, it is still not the current practice for all people living with type 2 diabetes to visit a podiatrist or foot health practitioner in Malta. Thus, the aim of this study was to evaluate the foot health status of the participants in order to determine the extent of foot-related problems amongst the type 2 diabetes population. The reported investigations were carried out in accordance with the principles of the Declaration of Helsinki as revised in 2000. The clinical tools used were based on validated and previously published tools. They were selected on the basis of a review of the literature, international guidelines and consultation with experts in the field. The testing modalities and examination methods were carried out by the same two investigators to ensure uniformity. The screening process involved a review of each patient's medical history and a lower-extremity physical examination. Each individual's personal lifestyle characteristics, such as smoking and drinking habits, together with his or her clinical history, including the duration of diabetes, last HbA_{1c} reading, blood pressure, dyslipidaemia, diabetic retinopathy, diabetic nephropathy, weight, height and current medications, were recorded from clinical notes. Participants interviewed were also asked whether they recalled having any prior foot care education. Footwear suitability was determined by the examining podiatrist, who defined "inappropriate" footwear as that which could be detrimental to the individual, including open-backed sandals, flip-flops and narrow pointed shoes, as per normal practice.

Peripheral vascular disease (PVD) was assessed using documentation of the history of intermittent claudication, rest pain and palpation of peripheral pulses. Palpation of the pulses of participants was completed using fingertips by two experienced clinicians. Dorsalis pedis and posterior tibial pulses were recorded. Cyanosis, cold feet, skin thinning and hair anomalies were also recorded. Claudication was evaluated from information supplied by the participants with regard to exercise-induced calf pain. Measurement of ankle–brachial index (ABI) for definitive diagnosis of PVD was performed using a portable hand-held Doppler and blood pressure cuffs. Lower-extremity vascular disease was defined as an ABI of <0.80 in either foot. An ABI of >1.3 was considered significantly elevated and indicative of vascular calcification.

Sensory testing was performed at five locations on each foot using the 5.07 Semmes-Weinstein monofilaments. Neuropathy was considered present if one or more sites were insensate to the monofilament. Using previously published methods, the two trained healthcare professionals examined each participant to identify lower-extremity complications and risk factors. Individual screening assessments took approximately 20 minutes. A database was constructed to record all the screening information.

Results

A total of 243 people (134 males and 109 females) with a mean age of 68.5 years were included in the study. The mean duration of diabetes was 12.28 years. Individuals were divided into the following categories by two trained podiatrists using NHS Borders Foot Classification System: "low risk 1" (27.2%), "low risk 2" (28.4%), "moderate risk 3" (22.6%) and "high risk 4" (21.4%) of developing foot ulcers; and those with an "active foot disease" (0.4%). Upon clinical examination, the following deformities were observed within the study population:

- Thirty-eight per cent presented with corns or callosities in their feet.
- Hallux valgus deformity was present in 49.4% of the participants (58% mild; 30% moderate; 12% severe).
- Thirty-nine per cent had hammer toes of differing severities.
- Prominent metatarsal heads (24%) and other bony prominences (44%) were also recorded during clinical examination.

Despite these foot deformities, 56% of the sample presented with unsuitable footwear and, upon clinical biomechanical examination, a further 28% of the sample required prescription orthosis. Moreover, 40% of the study group claimed that they had not visited a podiatrist previously and 54% of participants stated that they did not recall having received any prior foot care education. It was also reported that the service of a diabetes educator was not available in the primary care setting in Malta.

Discussion

In this article, the authors question the current availability and approaches of diabetes foot care education being offered to people living with type 2 diabetes, attending primary care clinics for their routine diabetes care. The evidence suggests that risk factors for developing diabetic foot complications are highly prevalent in this population. However, a significant number of the participants had never visited a podiatrist or foot care health practitioner, and the majority of participants did not recall having had any prior foot care education since being diagnosed with the condition. Upon examination, it was found that PVD, peripheral sensory neuropathy and foot deformities were common amongst the participants.

These data suggest that either people are not receiving any diabetes education at the primary care level or the education offered is not effective, perhaps owing to a lack of reported recall. In the authors' experience, preventative advice provided by healthcare professionals may not be well received until the person with diabetes develops an associated complication. The results reported in this study can be attributed to a number of factors, including poor communication between people with diabetes and healthcare professionals and insufficient counselling as a result of busy clinic schedules. In order to improve foot care amongst people living with type 2 diabetes, the authors suggest that healthcare professionals discover innovative ways that could help individuals with diabetes maintain necessary the changes in their behaviour and lifestyle (Formosa et al, 2012). As healthcare providers, it is important to motivate patients by trying to understand and adapt to their preferred learning styles.

The authors suggest that healthcare service providers and regulators need to allocate more time and resources to address this problem, as it is evident that in primary practice, people with diabetes may not be receiving the education and skill training they need to adequately self care (Emerson, 2006). A fuller understanding of the factors that contribute to suboptimal self-management is important if improved diabetes outcomes are to be achieved, informing future educational interventions offered at the primary care level (Formosa and Vella, 2011; Rankin et al, 2011).

The importance of the role of healthcare professionals in examining and assessing the foot, as well as educating those living with diabetes with regard to self-management and foot care need not be emphasised. However, a review of the literature indicates that primary care physicians are rarely performing this. Although conducted in a diverse population, this study reinforces the findings of other studies in that diabetes foot screening and diabetes self-management education are imperative in the primary care setting if diabetic foot complications are to be avoided (Emerson, 2006). Furthermore, as improved behaviours and outcomes are reliant on patient motivation, it is important to determine what information is recalled immediately following a diabetes consultation. In identifying and addressing an individual's areas of interest and any concerns regarding his or her condition, the effectiveness of the diabetes education may vastly increased.

To enhance this, a personalised follow-up plan including ongoing diabetes self-management support (DSMS) is today also being advocated to help people reach their goals. DSMS is being defined as a new way to assist individuals living with diabetes to implement and sustain the ongoing behaviours needed to manage their condition. This approach differs from traditional diabetes self-management education since it is more

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patient-centred. It is designed to meet the educational and support needs as identified by the patient at the time they are experienced. Since the issues addressed are those that have been requested by the patients during clinical visits or educational sessions, the education given will be culturally appropriate and consistent with adult learning theories (Funnell et al, 2008). This can only be achieved by good communication to ensure that individuals are receiving the support they need during their condition and at the time when they need it most. The true success of diabetes education will only be measured in better behavioural and health outcomes. Effective diabetes education involves creating a situation where people can actively participate in the management of their condition. In routine primary care clinical practice, healthcare professionals dealing with people living with type 2 diabetes need to listen to the unique needs of each individual, show empathy and equip them with the necessary skills during the consultation visits to help them adapt to health behaviours.

Conclusion

This study suggests that the majority of people living with diabetes who attend primary care clinics do not recall having any prior foot care education since diagnosis with the condition. Improvements in the approach to diabetes education – with attention given to local cultural differences – may improve outcomes for people with diabetes. A shift from the traditional biomedical model of care into a biopsychosocial model of care would promote positive change in outcomes. Encouraging diabetic foot care education in a primary care setting – in which most people with diabetes receive their care – is imperative in order to reduce the burden of this condition. Furthermore, the presence of a diabetes educator at every primary care clinic would facilitate the behavioural and lifestyle interventions required. ■

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