Education films: a means of reducing diabetic foot ulcers? Dream or could it be reality?

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Article points

1. Improving access to patient education and support using modern information technologies could provide opportunities to engage and promote healthy lifestyle choices and good self-care practices
2. Digital films for diabetes mellitus provide an opening or stepping-stone to engage patients to review their disease control and the implications it has on their foot health
3. Including patient stories in education materials will improve relatedness and thus increase the likelihood of positive behavioural change.

Key words

- Diabetic foot ulcers
- Education

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The continued increase in patients diagnosed with diabetes mellitus (DM), coupled with NHS resources stretched to cope with the increasing demands of managing the condition and its complications, has encouraged healthcare providers to develop appropriate means to educate patients such that they can swiftly become experts in their condition. Accessing education and motivational messaging via prescribed film content designed to precipitate behavioural change as a vehicle to promote healthy lifestyle choices and good self-care practices could reduce the costly complications of DM, such as diabetic foot ulceration and potentially represents a scalable and cost-effective approach. This concept is currently being evaluated in Wales.

Diabetes mellitus (DM) is widely acknowledged as the fastest-growing health threat of our times (Diabetes UK, 2015). In Wales, 182,600 people have DM, but it is anticipated that this figure will exceed 300,000 by 2025 (Diabetes UK, 2015). The annual NHS spend on DM is approximately £500m — 10% of the NHS Wales total budget — 80% of which is spent on managing the complications of DM, such as diabetic foot ulceration (DFU) and amputations (Diabetes UK, 2015), many of which are avoidable (International Best Practice Guidelines, 2013). However, the total cost of diabetic foot disease (DFD) is likely to be much higher when indirect costs, such as lost productivity among workers and the use of social care services, are taken into account (Kerr et al, 2014). Furthermore, the cost to individuals in terms of pain, disability and the psychological impact of DFD are difficult to measure, but are nonetheless important (Weinger et al, 2012).

In a time of increasing financial constraints this demand for services is unsustainable and challenges the commissioners of services to ensure funding is spent effectively and within budget. The NHS in Wales introduced the principles of Prudent Healthcare in 2014 to respond to these challenges by ensuring that care is provided to those with the greatest health need first, doing only what is needed and ensuring that there is co-production or an equal partnership between patients and healthcare professionals (HCP) (Welsh Government, 2014) (*Figure 1*).

Prevention

Prevention of DFU in individuals 'at risk' and prevention of amputation in those with active DFD remains the cornerstone of diabetic foot services (Boulton et al, 2005). The National Institute for Health and Care Excellence (NICE, 2015) guidance NG19 recommends that in addition to annual foot assessment, patients are to be given education on basic foot care, appropriate footwear, diabetes and the importance of blood glucose control. It is widely recognised that good glycaemic control reduces the risks of developing microvascular complications, such as peripheral neuropathy (The Diabetes Control and Complications Trial Research Group (DCCT) (1995); United Kingdom Prospective Diabetes Study Group (UKPDS) 1998), often a precursor to foot ulceration (International Best Practice Guidelines 2013) and poor glycaemic control is associated with delayed wound healing (Guo and Dipietro, 2010). The importance of healthy lifestyles was also identified in the recent publication of the National Diabetic Foot Audit (NDFA) (NHS Digital, 2017), an audit of patients with active DFD. The audit

found that only 35.2% of patients in Wales met the recommended target for their HbA_{1c} in the previous year, had an average BMI of 31.3 kg/m² and 44.2% of patients were either smokers or ex-smokers, which is associated with peripheral arterial disease (PAD) and poor wound healing (Ahn et al, 2008). The average duration patients had DM in the NDFA (2017) was 16.4 years, during which time opportunities to provide education on the complications of the disease would have been expected. The characteristics of these patients with DFD may suggest that the current methods of education to promote lifestyles modifications are not sufficient.

Education

The Diabetes Delivery Plan for Wales (Welsh Government, 2016) acknowledged that patients spend only a small amount of time in direct contact with HCPs so need to be supported to take personal responsibility to manage their condition. This primarily involves making good lifestyle choices, including physical activity, reducing alcohol intake, smoking cessation and participation in education programmes to minimise the risk of complications. This concept reflects one of the key principles of prudent healthcare, co-responsibility and co-production of care. However, self-care requires information to improve health literacy and providing this education is challenging.

NICE guidance NG28 (2015) advocates the use of structured education programmes as an integral part of DM care, although the Diabetes Annual Statement of Progress (Welsh Government, 2017) identified that in Wales 76% of newly diagnosed diabetics were offered structured education courses, but only 1.4% attended. In recent years, investment in these courses, such as X-PERT, DAFNE and Desmond, have shown to increase health literacy in some patients, but is reliant on patients being able and motivated to attend such programmes (Clarke, 2008). Horigan et

Page points

1. Structured educational programmes should be an integral part of diabetes mellitus (DM) care
2. Patient educational programmes are widely used for many chronic conditions to support lifestyle modifications
3. New and innovative methods of delivering DM education is required.

Figure 1. The principles of Prudent Healthcare.

al (2017), in a recently published systematic review, identified that the reasons for non-attendance to DM education programmes were diverse and complex. The authors concluded that new and innovative methods of delivering DM education were required that address patients needs, while maintaining quality and efficiency.

Patient education programmes are used widely within the NHS for many chronic diseases to support lifestyle modifications in order to aid the management of the condition. An example is those used for cardiac rehabilitation in patients with heart disease. Evidence has shown that cardiac rehabilitation programmes that include education can reduce mortality, morbidity and unplanned hospital admissions in addition to improving exercise capacity, quality of life and psychological wellbeing of patients (Dalal et al, 2015). Patients with DM have a 2–4 increased risk of cardiovascular disease (Fox, 2010) so education programmes that include lifestyle modifications to target cardiovascular risk factors such as optimal blood pressure, cholesterol and smoking cessation, would seem appropriate. However, in Wales currently there is no DM educational programme that encompasses all the risk factors, rather the current programmes focus on nutrition and physical activity. Patients 'at risk' of developing PAD and DFD would seem suitable recipients of a more comprehensive educational programme.

Within the UK currently, it is accepted there is a lack of consistency of foot health education for people with DM (McInnes et al, 2011), with many education interventions unregulated and weak in evidence, supporting the need for accurate evidence-based education programmes. A general lack of understanding of the complications of diabetes in relation to foot health within the DM population (McInnes et al, 2011) is often sensed by HCPs across the UK. Similarly, a lack of patient understanding has also been acknowledged by NICE in the PAD guidance CG147 (2012), which recognised that patients understanding of the disease was poor and expectations of treatment, such as surgical options were unrealistic.

The evidence of the effectiveness of education interventions provided to patients with DM regarding foot health and foot self-care appears unclear. Several small studies have demonstrated that both patient behaviour and knowledge of foot care were positively influenced by education in the short term (Corbett, 2003; Lincoln et al, 2008; Monami et al, 2015). Although Dorresteijin et al (2014) in a Cochrane systematic review concluded there was little evidence to support the effectiveness of patient education for the prevention of DFD. However, the authors did acknowledge that the studies reviewed were generally underpowered and at high or unclear risk of bias.

In addition, personal learning needs and preferences also need to be considered when providing educational interventions to ensure a person-centred approach is adopted (Bullen et al, 2017). Within Wales, this has been recognised in the Diabetes Delivery Plan (Welsh Government, 2016), which recommends a suite of educational options to better meet the needs of the individual. However, it must also be acknowledged that the increasing availability of the internet has provided opportunities for individuals to research their health conditions, in order to identify treatment

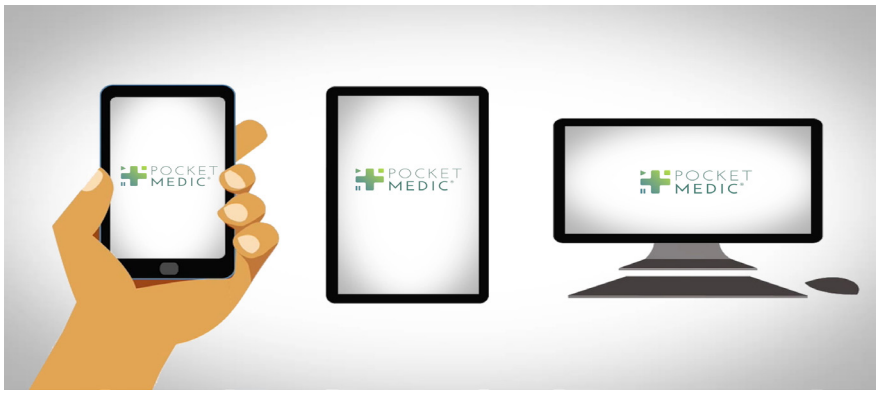

Figure 2. The current suite of PocketMedic films for diabetes mellitus are readily available for prescription by podiatrists in Wales.

choices (Wright et al, 2013). This has been broadly encouraged by HCPs to empower individuals to manage their own health, rather than relying on the traditional paternalistic role of the HCP (Coulter, 2011); although as Ellis and Ellis (2006) caution, the lack of internet regulation poses the risk of incorrect information being obtained.

Although an advantage of internet-based education is that it can remove geographic, economic and demographic barriers that prevent attendance to formal structured education sessions.

PocketMedic

There is little published material on alternative methods of delivering empirical education to patients with DM, but providing educational and motivational films would seem a low-cost viable option (Rice et al, 2017). McInnes et al (2011) recognised that patients with DM are often expected to assimilate a huge amount of information and are often at risk of information overload, however, opportunities to provide bite-sized amounts of information to the patient at a time most suitable to them could be beneficial. It is acknowledged that retention of information given by HCPs is challenging; 40–80% of the information given by HCPs is forgotten immediately by patients (Kessels, 2003). eHealth Digital Media (EHDM) (2017), a specialist health communications company, working in collaboration with HCP and patients in NHS Wales, two foundation trusts in NHS England and Swansea University has devised PocketMedic, to create and deliver such films. Using a web-based interface, HCPs can view and prescribe a series of films to patients. Patients are then able to access the link sent to them and watch their prescription on a personal computer, laptop, tablet or smartphone whenever or wherever they wish and share them with carers or family.

The suite of available films include type 1 DM, type 2 DM, Gestational Diabetes, Chronic Pain, Chronic Lung disease, Lymphoedema, Heart Failure, Life after Cancer, Pressure Ulcer Prevention and Wellbeing (anxiety and depression), most of which incorporate powerful patient stories, which can often encourage, emulate empathy and a connection to other patients. The simplicity, scalability and flexibility of this educational intervention provides a cost-effective way of helping patients become more expert in managing their health.

In a small service evaluation study of the suite of educational films for type 2 DM, Rice et al (2017) found a significant reduction in HbA1c among those patients who watched one or more of the prescribed films compared with no change in the non-watchers over a three month period. The authors recognised the limitations to this small study but suggested this type of educational delivery could provide a catalyst for patients to engage in structured education courses and develop autonomy in managing their health. Although this study was small and undertaken over a short period of time, the results are encouraging and while there was no evaluation of any direct effect on the incidence of DFU, opportunities to engage with patients can only be positive. NHS Wales has signed up to enable the prescription of PocketMedic films to patients for the next three years.

The role of Podiatry Services/Foot Protection Teams

Traditionally, diabetic foot education has been provided during clinical consultations in verbal and or written format, although a number of studies have reported that patients rarely follow the advice around self-care practices despite education being given (McInnes et al, 2011). Podiatrists involved in diabetic foot care have countless opportunities to 'transfer knowledge as care' at each clinical consultation though there is an expectation that patients with this would manage their disease differently and health outcomes would then improve. The use of digital technology could provide a 'patient-friendly' method of delivering educational advice, enhancing basic patient understanding of DFD and evidence-based interventions, such as the importance of rapid access to the MDT in the event of a 'red hot foot' or new foot wound and the use of total contact casting with DFU.

The current suite of PocketMedic films for DM are readily available for prescription by podiatrists in Wales (*Figure 2*), to patients, providing an opening or stepping-stone to engage and discuss their health and the implications it has on their feet. It is widely accepted that providing education or knowledge alone does not improve health behaviour in the long term (Mudge and Price, 2004), so in addition to the prescription of educational films, there is investment in delivering lifestyle modifications through the use of the methodology and principles of 'Making Every Contact Count (MECC) (Public Health Wales, 2017).

Furthermore, behavioural change management, motivational interviewing, is also being employed to support patients to make healthier lifestyle choices before they develop long-term conditions and for those patients already diagnosed with DM to reduce the risks of developing complications such as DFU and amputations. Patient involvement with decision making and treatment planning has been associated with greater adherence to treatment and improved health outcomes (Edwards et al, 2009), which echoes the prudent healthcare principle of co-production. The Diabetes Delivery Plan for Wales (Welsh Government, 2016) advocates structured education courses, peer support, written and electronic information, video prescriptions and referrals to other programmes, such as the national exercise referral scheme and education programme (Education Programmes for Patients Cymru, 2017) for all patients where appropriate.

Conclusion

The rapidly rising numbers of patients diagnosed with DM and the need to provide economically and clinically effective care to reduce the costly complications is a challenge. PocketMedic films offer a simple, cost-effective method of delivering education in small, bite-sized amounts, readily accessible to patients. Although evaluation of the effectiveness of these films is limited to date, a preliminary study has shown the potential of this method of education to improve DM management which, in turn, could reduce the risk of developing DFU. Further evaluation is required of this intervention and the employment of behavioural change management to determine if this can reduce DFU. Subsequent NDFA-published reports may also provide additional substantiation. There is also scope for additional films to be produced that cover evidenced-based treatments for DFU, such as the use of TCC for offloading and the importance of rapid access to the MDFT, which could also support the reduction of DFU occurring. ■

For more information contact info@pocketmedic.org or see www.ehealthdigital.co.uk

Ahn C, Mulligan P, Salcido RS (2008) Smoking-the bane of wound healing: biomedical interventions and social influences. *Adv Skin Wound Care* 21(5): 227–36; quiz 237–8

Boulton AJ, Vileikyte L, Ragnarson-Tennvall G, Apelqvist J (2005) The global burden of diabetic foot disease. *Lancet* 366(9498): 1719–24

Bullen el al, Young M, McArdle C, Ellis M (2017) Visual and kinaesthetic approaches to pragmatic, person-centred diabetic foot education. *The Diabetic Foot Journal* 20(1): 29–33

Clarke M (2008) Diabetes self-management education: A review of published studies. *Prim Care Diabetes* 2(3): 113-120

Corbett CF (2003) A randomized pilot study of improving foot care in home health patients with diabetes. *Diabetes Educ* 29(2): 273–82

Coulter A (2011) *Engaging Patients in Healthcare*. Open University Press, Maidenhead pp1–11

Dalal HM, Doherty P, Taylor RS (2015) Cardiac Rehabilitation. *BMJ* 351: h5000. [Online]. Available at: http://www.bmj.com/content/351/bmj.h5000 (accessed 15.08.2017)

The Diabetes Control and Complications Trial Research Group (1995) The effect of intensive diabetes therapy on the development and progression of neuropathy. *Ann Intern Med* 122: 561

Diabetes UK (2015) *State of the Nation. Challenges for 2016 and Beyond*. Diabetes UK, Wales

Dorresteijn JA, Kriegsman DM, Assendelft WJ, Valk GD (2014) Patient education for preventing diabetic foot ulceration. *Cochrane Database Syst Rev* 16:(12): CD001488

Edwards M, Davies M, Edwards A (2009) What are the external influences on information exchange and shared decision-making in healthcare consultations: A meta-synthesis of the literature. *Patient Educ Couns* 75(1): 37–52

EHealth Digital Media (2017) *Introducing PocketMedic*. Available at: http://ehealthdigital.co.uk/ (accessed: 15.08.2017)

Ellis M, Ellis B (2006) Evaluating World Wide Web-based foot

care information. *The Diabetic Foot Journal* 9(1): 38–48
Education Programmes for Patients Cymru (2017) *Health and Well Being Courses*. Available at: http://www.wales.nhs.uk/sites3/home.cfm?orgid=537 (accessed: 15.08.2017)
Fox CS (2010) Cardiovascular Disease Risk Factors, Type 2 Diabetes Mellitus and the Framingham Heart Study. *Trends Cardiovasc Med* 20(3): 90–5
Guo S, DiPietro LA (2010) Factors affecting wound healing. *J Dent Res* 89(3): 219–29
Healthcare Quality Improvement Partnership (2017) *National Diabetic Footcare Audit Report 2014-2016 England and Wales*. NHS Digital. [Online]. Available at: http://bit.ly/2x0rYke (accessed 15.08.2017)
Horigan G, Davies M, Findlay-White F et al (2017) Reasons why patients referred to diabetes education programmes choose not to attend: a systematic review. *Diabetic Medicine* 34(1): 14–26
International Best Practice Guidelines (2013) *Wound Management in Diabetic Foot Ulcers*. Wounds International, London. Available at: http://bit.ly/2fV6oGT (accessed: 15.08.2017)
Kerr M, Rayman G, Jeffcoate WJ (2014) Cost of diabetic foot disease to the National Health Service in England. *Diabet Med* 31(12): 1498–504
Kessels RPC (2003) Patients' memory for medical information. *J R Soc Med* 96(5): 219–22
Lincoln NB, Radford KA, Game FL, Jeffcoate WJ (2008) Education for secondary prevention of foot ulcers in people with diabetes: a randomised controlled trial. *Diabetologia* 51(11): 1954–61
McInnes A, Jeffcoate W, Vileikyte L et al (2011) Foot care education in patients with diabetes at low risk of complications: a consensus statement. *Diabet Med* 28(20): 162–7
Monami M, Zannoni S, Gaias M et al (2015) Effects of a short Educational Programme for the Prevention of Foot Ulcers in High Risk Patients: A Randomised Controlled trial. *Int J Endocrinol* 2015: 615680
Mudge E, Price P (2004) Risk of diabetic foot ulceration: perception and behavioural change. *The Diabetic Foot Journal* 7(2): 95–101
NHS Digital (2017) *Diabetic Footcare Audit Report 2014–2016 England and Wales V1.0*. Available at: http://content.digital.nhs.uk/catalogue/PUB23525/nati-diab-foot-care-audit-14-16-rep.pdf (accessed: 15.08.2017)
NICE (2012) *Peripheral Arterial Disease: Diagnosis and Management*. NICE, London. Available at: http://bit.ly/1BKwajQ (accessed 08.09.2017)