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## Illness beliefs predict self-care behaviours in patients with diabetic foot ulcers: A prospective study

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### ABSTRACT

**Aims:** Patients' illness beliefs are known to be influential determinants of self-care behaviours in many chronic conditions. In a prospective observational study we examined their role in predicting foot self-care behaviours in patients with diabetic foot ulcers.

**Methods:** Patients ( $n = 169$ ) were recruited from outpatient podiatry clinics. Clinical and demographic factors, illness beliefs and foot self-care behaviours were assessed as baseline (week 0). Foot self-care behaviours were assessed again 6, 12 and 24 weeks later. Linear regressions examined the contribution of beliefs at baseline to subsequent foot self-care behaviours, controlling for past behaviour (i.e., foot self-care at baseline) and clinical and demographic factors that may affect foot self-care (i.e., age and ulcer size).

**Results:** Our models accounted for between 42 and 58% of the variance in foot self-care behaviours. Even after controlling for past foot-care behaviours, age and ulcer size; patients' beliefs regarding the symptoms associated with ulceration, their understanding of ulceration and their perceived personal control over ulceration emerged as independent determinants of foot self-care.

**Conclusions:** Patients' beliefs are important determinants of foot-care practices. They may, therefore, also be influential in determining ulcer outcomes. Interventions aimed at modifying illness beliefs may offer a means for promoting self-care and improving ulcer outcomes.

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## 1. Introduction

Diabetic foot ulcers are a common complication of diabetes, affecting up to 25% of people with the disease [1]. The costs to health services are considerable. In 2010–2011 the English health service spent £639–662 million on diabetic foot care alone: equivalent to £1 in every £150 of total spending [2]. The burden of ulceration is also significant for patients, with the rate of depressive disorder in people with ulceration reported to be as high as 32% [3].

The personal and societal costs of diabetic foot ulcers have led to initiatives, such as educational and other more complex interventions, which seek to reduce the incidence and burden of ulceration [4,5]. The promotion of foot-related self-care behaviours is at the heart of most these approaches. Indeed, the central importance of self-care behaviours was echoed in a recent consensus statement issued by a multidisciplinary expert panel [6]. This panel advocated a range of behaviours for reducing foot complications such as ulceration, whilst also acknowledging that there is still very little evidence to support specific self-care practices.

This area of diabetes management is, however, thwarted by a lack of high quality evidence in two related areas. First, relatively little research has been undertaken into the factors which influence engagement with foot self-care. It is clear that patients often report limited knowledge and poor understanding of foot care practices [7,8]. Unfortunately, such observations have led investigators to focus, almost exclusively, on knowledge as the precursor to behaviour; and in turn to educational interventions as a means of improving foot self-care behaviours and reducing ulcer risk [4]. We know, however, that knowledge alone is a poor determinant of behaviour [9]; and that educational interventions have, at best, only short-term effects on self-care behaviours and no discernible effect on clinical outcomes [4]. Thus, if we are to develop effective interventions to promote foot self-care behaviours we need to shift the focus away from knowledge and towards other modifiable predictors of behaviour.

Although relatively little research has been conducted into other modifiable determinants of foot-self-care behaviours, many published studies point towards patients' beliefs as being potentially important determinants of foot-self-care practices [10–12]. The central role of patient beliefs in influencing outcomes in diabetes per se (e.g., glycaemic control, quality of life) is now well-documented [13,14]. In contrast, their role in influencing foot-care behaviours has been limited to cross-sectional and/or qualitative studies which necessarily limit the potential to interrogate causal pathways [10–12].

A second limitation is that much of the work in this area has focussed on the self-care practices of patients at risk of ulceration, rather than those with an ulcer. In view of evidence that patients without ulcers often do not see the relevance of foot-self-care [15], it seems unlikely that findings from patients without ulcers can be readily generalised to those contending with active ulceration.

We describe here results from a prospective observational study which examined the relationship between patients'

illness beliefs and their self-reported foot care practices. The design of the study allowed us to examine the role of illness beliefs whilst controlling for the effects of 'past behaviour' i.e., foot-care at study entry; as this is known to be the most influential determinant of current and future behaviour: [16,17]. Furthermore, we were also able to include in our model the effects of clinical and demographic variables which might be expected to influence engagement with self-care practices (i.e., age and ulcer severity as measured by ulcer size).

## 2. Subjects, materials and methods

### 2.1. Patients

A convenience sample of patients with diabetes mellitus and a foot ulcer was recruited from outpatient podiatry clinics in secondary care. Patients were recruited into a longitudinal research programme examining psychological and behavioural aspects of diabetic foot ulceration. Ethics and relevant regulatory approvals were obtained from all hospital trusts from which patients were recruited and all participating patients provided written informed consent. The clinical team identified eligible patients and introduced them to the research. Patients willing to find out more about the study and/or participate were then introduced to a member of the research team who, in turn, provided further written and verbal information.

All clinics subscribed to a standard regimen of foot care, i.e., aggressive debridement at each visit, treatment of infections with antibiotics and the use of removable Scotchcasts and other footwear/devices for offloading ulcers on weight-bearing areas, minimising the likelihood of between-centre variations in treatment outcomes. Inclusion/exclusion criteria ensured the population consisted of patients with neuropathic or neuroischaemic ulcers. Patients were not eligible if they had: no palpable pulses on the affected foot; a history of any major (i.e., above ankle) or minor (i.e., greater than a single digit) amputation; known large vessel peripheral vascular disease (e.g. previous bypass surgery, angioplasty); advanced diabetic retinopathy with severe visual impairment; advanced nephropathy (e.g., on dialysis); other severe disabling medical conditions (e.g. stroke); or were being treated with platelet-derived growth factor, tissue engineered skin or total contact casts.

A total of 169 patients were recruited into the programme. Over the course of follow-up, 24 patients withdrew; 33 were lost to follow-up; 5 died and 16 had amputations. One-way ANOVAs and  $\chi^2$  analyses revealed that the patients who participated in all phases of the study did not differ significantly at baseline from those who withdrew, were lost to follow-up, died or had an amputation, on any of the reported clinical and demographic variables (data not shown). Complete data were available on each of the seven dimensions of illness beliefs for 121–125 patients at baseline. Data on foot self-care behaviours were available for 130 patients at baseline, 102 patients at week 6, 79 at week 12 and 74 at week 24.

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