**Foot care, ‘spousal’ support, and Type 2 diabetes: an exploratory qualitative study**

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**Abstract**

***Objectives***

People with type 2 diabetes (T2DM) should check their feet and protect them against harm, but few do. Living with a spouse may contribute to good foot care behaviour. This study explores awareness, perceived susceptibility of, and concern about, foot problems, and reported foot care behaviour, and ways in which a spouse may or may not contribute to foot care in T2DM.

***Methods***

1:1 interviews were conducted with 6 individuals with T2DM. Half had a spouse and half did not. There was one person at low, medium and high risk in each sample. Each spouse participated in a separate interview, and the dyads were interviewed together. Interviews were analysed using Applied Thematic Analysis.

***Results***

All participants knew that diabetes was associated with foot problems. Not all people with T2DM thought that they were susceptible; spouses perceived greater susceptibility for the patient. This was unrelated to risk level. Most people with T2DM and all spouses engaged in behaviour to identify problems or protect feet, but rarely both. Spouses’ attitude and behaviour did influence the patients’ own behaviour. At times spouse support was perceived positively, and at times negatively.

***Conclusion***

Engaging spouses in foot care education may improve foot care behaviour.

Keywords: Diabetes; Foot care; Qualitative; Spouse

**Objective**

The prevalence of type 2 diabetes mellitus (T2DM) is increasing, with estimated global prevalence reaching 10% by 2040 (IDF, 2015). T2DM and associated high levels of blood glucose can provoke damage to blood vessels and peripheral nerves in the feet, resulting in peripheral artery disease (PAD), which causes a decreased delivery of oxygen to the lower legs and feet, and/or peripheral neuropathy (PN), a decreasing sensation in the legs and feet (Kolluru, Bir & Kevil, 2012). It is estimated that 15-25% of people with T2DM will develop foot problems of one kind or another (Reiber, Libsky & Gibbons. 1998), which, if left untreated, may lead to infection, ulceration, osteomyelitis, amputation, or death (Reiber et al. 1999).

***Diabetes Foot Care***

Current NHS guidelines (NICE, 2010; LDMCN, 2017) recommend that people with T2DM check their feet daily to detect foot problems, such as cuts, sores, blisters or calluses, or signs of infection such as swelling, heat or redness skin damage, which are early indicators of foot ulceration, PAD and PN (NICE, 2014). However, qualitative research (Gale, Vedhara, Searle, Kemple & Campbell, 2008) suggests that the majority of people without history of foot ulceration have no clear awareness of what foot ulceration is. Quantitatively, daily foot examination is less than optimal (Schmidt, Mayer & Panfil, 2008). Among individuals at high risk of diabetes-related foot complications, estimates suggest that only 25% check their feet daily (Chin, Huang & Hsu, 2013). For individuals with no existing or prior foot problems, frequency of foot checking is very low. For example, Hrisos et al (2009) found that only 51% of a large UK low-risk cohort with T2DM (N=2426) and 43% of a Dutch low-risk cohort (N=993) reported checking their own feet in the past 12 or 15 months respectively.

In addition to checking their feet daily, standard NHS guidelines (NICE, 2010; LDMCN, 2017) recommend that people with T2DM engaging in daily behaviour to protect the feet against harm (e.g. cutting nails, using moisturizer).

Awareness of risk, and knowledge of the need for both protective and detective foot care behaviours, may be important in ensuring good foot health among people with T2DM. This should include people with no existing or prior foot problems as these can develop relatively quickly (Assari, 2011) and habits established early tend to persist over time (Jacobsen et al. 1990).

***Dyadic health behaviour***

Models of dyadic health behaviour such as the Systemic Transactional Model (STM; Bodenmann, 1997), the Interdependence Model (Lewis, McBride, Pollak, Puleo, Butterfield & Emmons, 2006) and the Developmental-contextual model of couples coping with chronic illness (DCM; Berg & Upchurch, 2007) emphasize the interdependent context in which health-directed behaviours may occur. Such models purport that behaviours influenced by both the patient and partner are stronger than any effects that may be influenced by the patient alone. Empirical studies in T2DM have shown that that strategies employed by patients and their partners to cope with the daily challenges of T2DM are rarely developed or implemented independent of the coping behaviours of the other (Chung, Moser, Lennie & Rayens, 2009, Bodenmann, Meuwly & Kayser, 2011). Communal coping, where both members of the dyad consider diabetes to be their joint problem, has been shown to improve satisfaction with adaption to T2DM and to reduce interference to role functioning (Housten-Barrett & Wilson, 2014). It is clear, therefore, that living with a partner may contribute to ensuring good foot health through dyadic processes in which physical and emotional support is provided (Trief, Wade, Britton & Weinstock, 2002; Berg & Upchurch 2007; Trief et al. 2011).

However, it is important to note that the quality or, type of support may determine behavioural outcomes. Misalignment in a dyad, where one individual in the dyad appraises T2DM as “our problem”, and the other appraises it as “their problem”/”my problem”, can cause cognitive dissonance within the dyad (Housten-Barrett & Wilson, 2014). Further, Stephens, Franks, Rook, Iida, Hemphill & Salem (2013) found that support provided through persuasion and pressure was counter effective in promoting dietary behaviour, and associated with decreases in adherence and increases in patients’ distress. Considering daily foot care in this context, we need to understand the participation of a spouse/significant other on patients’ foot care attitudes, beliefs and behaviour.

***Dyadic Foot Care in Diabetes***

Spousal knowledge and involvement of the spouse in health management can impact on patients’ perceived risk and care-based goal prioritisation (Stallwood, 2006; Mohamed & El-Bahnasawy, 2012). This in turn can predict behaviour (Gillick, 2013). It is possible that there would be differences in people’s knowledge of foot problems associated with diabetes, their perceived severity and susceptibility and benefits and barriers to recommended foot care behaviour according to their risk status if they had a spouse/significant other with which to discuss T2DM. For example, the attitude and beliefs of the partner may impact on the person with T2DMs own attitudes, beliefs, and behaviour, and may also impact on the overall provision of foot care, with the partner providing physical support where the person with T2DM is unable to self-care owing to physical constraints (e.g. weight) and common co-morbidities (e.g. arthritis). This is as yet largely untested as research seeking to understand dyadic coping in T2DM management have rarely focused on routine and habitual behaviour, and even where day-to-day behaviour has been examined, (e.g. Trief, Ploutz-Snyder, Britton & Weinstock, 2004) the checking of feet has not been explored from the dyadic perspective. Research is needed to examine foot care among people with T2DM who do and do not have a spouse/significant other.

***The current study***

The current study examines ways in which a spouse/significant other may influence foot care in T2DM via in depth semi-structured qualitative interviews. Interview data is analysed using applied thematic analysis; intended to test hypotheses through an iterative coding frame of latent and semantic themes in order to “describe and understand how people feel, think and behave within a particular context relative to a specific research question” (Guest, MacQueen & Namey, 2012). Qualitative methodologies were employed over quantitative methods for two primary reasons; (1) the research questions require a methodology which allows for in depth and iterative examination of the participants’ behaviour and the influences of this behaviour; (2) as the literature on spousal support in T2DM foot care and perceptions of foot care behavioural variables by risk status is sparse, exploratory methods were required to develop in-depth and inductive insights.

**Design**

1:1 interviews were conducted with individuals with T2DM stratified by current risk of foot problems and relationship status. When the person with T2DM was in a relationship, the spouse or significant other also participated in separate 1:1 qualitative interviews, and the dyads were interviewed together. The study was approved by the Ethics Review Board at the University of Chichester.

***Participants***

Participants responded to an online advert about the study on research forums and social media sites such as facebook.com, callforparticipants.com, and twitter.com. The following groups were recruited per stratification criteria:

* Group 1: People with T2DM (“patients”) who were married or living as married, and their spouse/significant other; n=3 dyads
* Group 2: Patients who were not in a committed relationship; n=3

The inclusion criteria for all participants were ≥18 years of age, able to read and speak the English language, and have no cognitive impairment/acute psychopathology. The 6 people with T2DM comprised the “patient” sample. Patient ages ranged from 60 to 70 (*M* = 65.50; *SD* = 3.27); duration of T2DM ranged from 2-16 years (*M* = 9.41; *SD* = 5.61). Within group 1 and group 2, recruitment targets ensured that one patient was at low risk, one was at increased (medium) risk and one was at high risk of foot complications, defined per the National Institute of Health and Care Excellence (NICE) guidance (2004). Demographic information of patients by relationship status is presented in Table 1. A total of 17 people with T2DM responded to the advert. The six participants were among the 10 initial responders – two failed screening and the other two represented strata already filled.

For patients in a committed relationship (group 1), the spouse or significant other with whom they are living also participated in the study. This comprised the “spouse” sample. Age for the spouse sample was 58-65 (*M* = 62.33; *SD* = 3.79), with dyads living together for a mean (SD) of 40.83 (2.47) years (range: 38-42.5); in all cases from prior to the diagnosis of T2DM (see Table 1).

[Table 1 here]

***Procedure***

In group 1, following provision of consent, patients and spouses were interviewed independently (1:1) and thereafter were interviewed in their dyads. In group 2, patients were interviewed only once 1:1. All interviews were conducted in person in the participants’ preferred location (home, place of work, researchers office) and audio-recorded with participants’ permission. Each interview lasted between 60 and 90 minutes.

The semi-structured interview guide for the 1:1 patient and spouse interviews was structured according to the Health Belief Model (Rosenstock, 1966; Rosenstock, Stretcher & Becker, 1988). Questions asked about:

* The threat of foot problems (perceived severity and susceptibility): for example “Do you think it is important to look after your/your partners feet?”; “What do you think the chances are of you getting [identified complication]?”
* Beliefs about positive foot care behaviours (benefits, barriers): for example “Do you find it easy or difficult to do that?”; “Do you actively avoid examining your/your partner’s feet?”; “Why?”
* Cue(s) to action: for example, “When did your behaviour change?”; “Why did your behaviour change?”; “Does your behaviour follow cycles?”
* Actual behaviour: “Tell me about what you do, if anything, to look after your/your partner’s feet?”

Additional factors associated with human health behaviour, such as self-efficacy, locus of control, knowledge, past behaviour and success of this behaviour, and emotion, were also examined with questions such as “Does the thought of [identified complication] scare you?”; “Do you feel in control of whether you will get [identified complication]?”; “Have you always engaged in your foot care in the same way since you were diagnosed with diabetes?” As the interview was semi-structured, this allowed for other topics to be discussed as they were raised by the participants. The patient sample also completed the foot care item from the Summary of Diabetes Self-Care Activities questionnaire (SDSCA (Toobert, Hampson & Glasgow, 2000)).

The dyad interviews further asked about communication (e.g. “Do you talk about / have you agreed who should do what with regards to looking after your/your partner’s feet?”), perceptions of diabetes generally (e.g. “How do you feel about diabetes now?”), perceptions of responsibility (“Do you consider looking after your/your partner’s feet as your responsibility, your partner’s responsibility, or a collective responsibility?”), and knowledge attainment (“Has your general practitioner / diabetologist ever talked to either of you about looking after your feet?”).

***Analysis***

Interviews were transcribed verbatim, and analysed using Applied Thematic Analysis methods (Guest et al., 2012). This involved a number of iterative steps. First, patterns of text were coded in each transcript using both pre-specified codes consistent with the themes in the interview guide, and codes generated empirically from the transcripts. Second, codes were assessed for conceptual overlap and collated into themes. A ‘theme’ constitutes a pattern of explanation given by more than one interviewee.~~,~~ The theoretical framework of the interview guide provided a starting point for determining themes, but these themes were expanded and additional themes were developed iteratively through transcript review and labelled inductively from the words of the interviewees. Themes were grouped under the main foci of interest; awareness of foot problems and their association with T2DM, perceived susceptibility of, and concern about, foot problems, and reported foot care behaviour. Analysis used the QDA Miner program (Provalis Research). To ensure objective interpretation of the data, 25% of the transcripts were independently coded by a second researcher, in which that researcher applied independent thematic labels to the data (inter-rater agreement).

**Results**

Inter-rater reliability was high, with more than 85% of the quotes coded with thematic consistency across raters. Results are presented in relation to the research question - that is ways in which a spouse/significant other may influence foot care in T2DM - highlighting key themes. A participant referenced as Dx (where x is a number) is part of a dyad; Sx refers to a single patient. Risk is indicated by the letters L, M and H, for “low”, “medium” and “high” respectively.

***Patients with spouses***

*Awareness*

All participants (patients and spouses) knew that diabetes was associated with potential foot problems, and perceived that foot care was the responsibility of the patient. All three patients communicated that their spouse was interested in ensuring their good health, from attendance at healthcare professional visits, to assisting with care.

*Susceptibility and concern*

While some patients thought that they were personally susceptible, others perceived low levels of susceptibility. Two of the three patients reported that their spouse was concerned about risk, and two patients reported anxiety with regards to current or future health state, and the impact that diabetes and foot health has had, or may have, on daily activities or hobbies. For example:

*“[PARTNER's], I think very concerned that I might do something to hurt my foot and there might be difficulties in it healing or whatever”* (D1, patient, M)

*“I look at my feet every day yes, so does [partner]. Because she got concerned where I had been poking around the big toe on the right foot and she was concerned about the infection that could have possibly come”* (D2, patient, L)

*“It does bother me that there is that possibility of severe infection and possibly amputations, yeah. Even the most careful people I think sometimes can have problems regardless of what you try to do”* (D2, spouse, L)

*“Sometimes I find the heel gets a bit hard, I cut back on the games of bowls”* (D2, patient, L)

In dyad 1, the difference in perceived susceptibility between the patient and the spouse was notable, with the spouse perceiving a greater risk of foot issues than the patient (note: the patient is classified as medium risk (NICE, 2004) due to dry skin on their feet):

*“I've got a pair of feet that are working reasonably well and that they are looked after so that is probably going to help”* (D1, patient, M)

*“I worry about it quite a lot; I have significant worries about it now. I mean I jumped at this. I have significant worries that he doesn't acknowledge it really”* (D1, spouse, M)

This led to a few terse exchanges during the dyad interview, and the patient perceiving the spouse as interfering at times, rather than supportive:

Patient: *“I wasn't to let my feet get thin and glassy and papery”*

Spouse: *“Did I use those words?”*

Patient: *“well words like that and that it was to be nice and supple so that I didn't damage them.”*

Spouse: *“Right, ok……I thought I talked about heel cracks and getting infections that wouldn't resolve very well. But if that's your interpretation then that's fine.”* (D1)

*“She wears me down is probably not quite right but…..”* (D1, patient)

Similarly, in another of the dyads (D2) the spouse perceived a greater risk of foot issues than the patient, who is classified as low risk with no foot issues:

*“provided I carry on doing what I'm doing it should be alright”* (D2, patient, L)

*“He doesn't quite get that [he is at risk of foot complications] still and I don't know why”* (D2, spouse, L)

In the third dyad, the patient was at high risk of foot complications, having reported corns, calluses, fungal infections, dryness of the skin and cellulitis at the time of the interview or previously. However, she did not know whether to attribute these issues to her diabetes and did not consider her diabetes or the foot issues as significant as they were not currently affecting her lifestyle; “*significance is if it stops you being able to do something that you could do before*”. Her spouse however did consider diabetes as “significant” and acknowledged that it could affect her lifestyle in the future:

Interviewer: *“Ok, so by your own definitions of significant is type 2 diabetes significant?”* Patient: *“Probably not”*; Spouse: *“Yes”* (D3, H)

“*you hear sort of extreme stories of amputations as a result of diabetes…and the thought of her becoming disabled as a result of diabetes if it could be avoided is a very sad thought*” (D3, spouse, H)

*Behaviour*

Foot care behaviour was coded into two distinct categories; behaviours associated with protecting the health of the feet, and behaviours associated with identification of potential problems. Two dyads reported engaging in behaviours for protecting feet. These included washing, drying and moisturizing, “sensible” foot wear choices, avoiding walking bare-footed, regular nail cutting, and routine visits with a podiatrist/chiropodist. Only one patient reported engaging in problem identification behaviours, but all three spouses did so. This included looking for cuts, abrasions, and *“anything that shouldn’t be there”* (D2, patient, L), and observing any discomfort.

Concern related to engagement with foot care behaviour was explicitly shared by patients who attributed their lack of engagement in part to ability and inconvenience. For example:

“*I can't reach my feet, very easily”* (D3, patient, H)

“*there is nothing worse than having to pick up a tube of cream in the morning and rub it into your feet then you're thinking how am I going to get my sock on without getting cream all over it?*” (D1, patient, M)

One of the spouses (D1, M) had a good knowledge of diabetes foot care and encouraged and assisted the patient in their foot care, both in terms of providing physical support for detection, and encouraging protection behaviours which directly (albeit reluctantly) influenced the patients’ behaviour:

*“if you keep it moist less likely to dry fissuring, less likely to have bugs and infections, I've got him on that [cream]…I make sure his socks are good. I deal with that and replace and them regularly and see they are a good fit, I do the nail cutting”* (D1, spouse, M)

*“she has been worrying about using…some cream that's just come out…so I now have to use this…I mean be compliant is the thing normally”* (D1, patient, M)

*“I look quite often. I look certainly if he's sitting there rubbing the cream in of a morning…I mean obviously if he does start to develop a problem then I will have to be more proactive with it and make sure he was more aware of preventative measures if necessary…He listens to me when I say stuff, no he wouldn't resist me”* (D1, spouse, M)

Similarly, in another of the dyads (D2, L) the patient acknowledged that their partner liked to inspect their feet and considered the spouse as a “back up” in case things went wrong. Like D1, there was reluctance from the patient, with the spouse alluding to the fact that the patient didn’t like her interfering. As such, she inspected his feet opportunistically, only raising issues when necessary. However, her behaviour did alter the patients’ behaviour in that he would check his feet himself after she had commented:

*“If she sees something she doesn't like she has a good nose, even if I try and hide it”* (D2, patient, L)

*“So he always tends to have some slippers on it at least, or socks. So I suppose it's only when he's maybe getting in or out of bed I might just have a quick gander”* (D2, spouse. L)

*“as soon as I saw it recognised that it could be a problem so I said to him it needs to be observed and monitored and I kept saying to him can I have a look at your toes and how's it doing now, you know. He wasn't very happy… I don't want to become a bore with him; I don't want it to become a huge issue”* (D2, spouse, L)

*“Yeah, I suppose [her concern] does [change my behaviour]. If there is something serious there to think about then her concern yeah, that's part of married life, isn't it?”* (D2, patient, L)

In the same dyad, although the patient noted issues with self-care (*“I was still managing but I was losing breath”*), the spouse was unsympathetic:

*“it doesn't take much too just sort of look at the feet and see that there's nothing sort of no abnormal colour or sites of possible infections or whatever that is appearing…So I think yeah, for the most part [he] should be able to recognise something that shouldn't be there”* (D2, spouse, L)

In the third dyad (D3, H), the spouse also observed for any problems, perhaps as a consequence of the patients’ physical limitations (*“I can't reach my feet, very easily. Gone are the days when I can put my feet up on my leg and I'm not that mobile anymore. It can be quite, it takes a long time yeah it can be quite difficult to reach the bits that need reaching”).* However, he highlighted difficulties in knowing how to support the patient:

*“I am very conscious of looking out for discomfort. Things like long walks and things like that…but not in terms of closely inspecting them”… “I don't know apart from just encourage her to probably, sort of be a little bit more overt and encouraging her to do, to give her feet lots of attention. But I don't know what attention should be given to them”* (D3, spouse, H)

This, coupled with the patients’ reluctance to discuss her diabetes with her spouse made providing support difficult. Although the spouse indicated an interest in assisting with identification of foot problems, the patient did not agree:

“*she's defensive about it, yeah. And it's very difficult to comment about diabetes in a way that is perceived to be positive*” … *“I just don’t like feet, feet are just not nice things…. [but] despite my aversion to feet I would be very happy to [look at the bottom of her feet every morning]”* (D3, spouse, H)

*“[My husband] hates feet…He doesn't like to see me doing my feet either”… “I'd like him to be my podiatrist, but I don't think he would”* (D3, patient, H)

***Patients without spouses***

*Awareness*

As with the patients with spouses, all patients without spouses understood that diabetes was associated with potential foot problems, and perceived foot care as the responsibility of the patient.

*Susceptibility and concern*

Two patients reported anxiety with regards to future health state; both defined their foot care by the presence or absence of any issues which were affecting his or her lifestyle. For example:

*“I'm concerned about things like getting ulcers that would stop me walking, that would stop me pursuing my walking. I like to go abroad walking….* *if that was taken away from me I think my life would be awful. Um, so foot care is really important to me.”* (S3, patient, L)

*“I do worry about the feet thing but it is a kind of remote thing in a way. In – Back here somewhere in the back of your mind – Yes, I am aware of it I think but because I don't feel it apart from occasional tingle which then goes away when the blood sugar goes down a bit it doesn't have a kind of ongoing impact on my life”* (S2, patient, H)

*Behaviour*

Foot care behaviour was coded into two distinct categories; behaviours associated with protecting the health of the feet, and behaviours associated with identification of potential problems. Two single patients reported engaging in behaviours for protecting feet. These included washing, drying and moisturizing, “sensible” foot wear choices, avoiding walking bare-footed, regular nail cutting, and routine visits with a podiatrist/chiropodist. Only one patient reported engaging in problem identification behaviours. This included looking for cuts and abrasions, and observing any discomfort. Patients attributed their lack of engagement with foot care behaviour, in part to knowledge (e.g. *“people don't know how to wash their feet, they don't know how to dry them*” (S3, patient, L)), and cost (e.g. “*a lot of these creams are too greasy. The one the chiropodist uses is good but they are expensive and you can't expect a lot of people to pay £6-7-8 for a tube*” (S1, patient, M)).

Two of the three single patients highlighted the support they receive from family members and friends, although this was related to health in general rather than specifically about diabetes and foot care. One single patient (S2, H) reported that her doctor influenced her behaviour. However, the same patient also indicated that the advice is soon forgotten, perhaps due to her perceived low risk of developing foot issues (in fact the patient is classified as high risk; NICE, 2004):

“*I thought I do kind of do as I'm told really, if the doctor tells me to do something then I just go along and do it……I tend to take the advice for a very short time and then I forget again*” (S2, patient, H)

*“I suppose I would be more likely to read [a leaflet] or look at it if I felt I was at significant risk of having real diabetic foot complications”* (S2, patient, H)

Another single patient (S1, M) indicated that that she did not engage with her doctor a great deal because “*I know [my feet] are alright”* and highlighted that the absence of another voice within the home allowed her to engage in behaviour that she knew was incorrect:

*“So, I mean yes I've spoken to my son about it and he understands the pitfalls, but he doesn't live with me so what would he know… No he doesn't interfere in what I think is right for me…I know I'm naughty at times…I am always in open shoes I hate wearing closed in shoes, at the best of times. So my feet are always open to the air so is more danger there…. I'd have to have a problem [to change my behaviour] because I like my feet naked”* (S1, patient, M)

The third single patient (S3, L) also highlighted the lack of support in daily care:

*“I can't see underneath [my feet]…I would use a mirror like if I was, if I had a blister or something. I had a blister the other day, so I was anxious and keeping an eye on that”* (S3, patient, L)

**Conclusion**

One component of good self-monitoring and management of T2DM is daily checking of feet (NICE, 2010; LDMCN, 2017; Mishra, Chhatbar, Kashikar & Mehndiratta, 2017). As the first step in developing appropriate management plans for people with T2DM, this research sought to understand whether the presence of a spouse/significant other impacts on foot care behaviours in T2DM. The study utilised qualitative methods to conduct interviews with patients with T2DM stratified by relationship status; half of the sample (n=3) were married/in a committed relationship. In this sample, patients and their “spouse” were interviewed separately, and then together. The other half of the sample (n=3) were not in a committed relationship and were interviewed alone. This research also stratified the sample by risk status for foot ulcers. There was one person at low, medium and high risk in each of the patient samples (in a committed relationship; not in a committed relationship).

The results of this study are encouraging in that awareness was high; all patients and spouses knew that diabetes was associated with potential foot problems. Perceived susceptibility was more variable however. While some patients thought that they were personally susceptible, others perceived low levels of susceptibility. Perceived susceptibility in the diabetes sample was not related to having a spouse. However, the spousal sample did perceive significant susceptibility for the patient. The American Diabetes Association (ADA, 2014) and NICE (2004) suggests that a foot care management plan should be agreed with people at low current risk of foot ulcers as well as those at increased or high risk of foot ulcers. However, foot care education is largely targeted at those patients with pre-existing complications (McInnes et al, 2001; De Berardis et al. 2005), and previous research has suggested that those with low risk are least likely to understand the value of checking their feet on a daily basis (Gale et al., 2008). The current study did not support this statement.

Most patients (with and without spouses) and all spouses engaged in behaviour that aimed to identify problems with the feet, or else protect the feet and reduce the likelihood of problems occurring. Although all the noted protective behaviours are recommended for good foot care, it is worth noting that none of the participants reported partaking in all of these; most reported just one or two, with only one patient reporting more than this (D1 (medium risk) moisturizes, has orthotic foot wear, cuts his nails regularly and visits a podiatrist routinely).

Although all participants in the current study perceived foot care as the responsibility of the patient, all spouses reported engaging in some supportive foot care behaviour. This is encouraging given that educational interventions still primarily target the patient as an individual without exploring the dyad as a unit (Chung et al., 2009; Badr, Carmack, Kashy, Cristofanilli & Revenson, 2010; Trief et al. 2011). Specifically, two of the three spouses in this study assisted in protection behaviours; all three in identification. Therefore no impact of risk status was noted. However, coping was primarily at the individual level rather than at the dyadic level. The one spouse who did not participate in protective behaviours (D3, H) reported *“I just don’t like feet, feet are just not nice things”*.

A body of literature suggests that support from significant others can enhance the patients’ own ability to cope with adapting to the consequences of chronic illness (eg Trief, Himes, Orendorff & Weinstock, 2001, Martire, Schulz, Helgeson, Small & Saghafi, 2010). There was evidence from two dyads that the spouses’ attitude and behaviour influenced the patients’ own. This would suggest that engaging spouses/significant others in foot care behaviour education may improve foot care behaviour and clinical and psychosocial outcomes, as has been shown with medication adherence in heart failure (Chung, Moser, Lennie and Riegel. 2006). Of note however, there was some dissonance in the dyads in terms of perceived risk (the spouse perceived a greater risk than the patient in all 3 dyads) and a reluctance to discuss diabetes which may make dyadic coping difficult. This resulted in poor communication, with the spouse engaging in behaviour (e.g. checking feet for abrasions) without the patients’ knowledge. As such, there was no universal perspective of provision of spousal support as positive or negative; that is it was at times perceived positively, and at times negatively. As such, knowledge of good foot care behaviour and good communication appears important for positive spousal support.

Although they did not have a spouse, two of the three single patients highlighted the support they receive from family members and friends. This was related to health in general rather than specifically about diabetes and foot care. A lack of support in daily care was noted by one single patient. Another single patient reported that their doctor drove their behaviour, although advice was shortly forgotten. This study supports others’ suggestion for the need to further explore communal coping, as well as the individual coping strategies, when considering an intervention for foot care in T2DM (Badr, Carmack, Kashy, Cristofanilli & Revenson, 2010; Trief et al. 2011; Bodenmann, 1997).

This study represents the first qualitative research among T2DM patients and their spouses pertaining to foot care practices, and is the first to simultaneously explore those at low, increased, or high risk of foot ulcers. However, there are some limitations to consider, pertaining to the study size and recruitment strategy; both of which limit its generalizability. As is often the case with qualitative research, the sample was small, recruiting just six patients and three spouses, although its strength is that these patients and spouses represented various risk-levels. Each participant was allowed to provide a rich account of his or her experience providing a rigorous dataset. However, a larger quantitative study may provide additional important information from a more representative and generalizable sample in which concept saturation could be established. The sample represented a non-probabilistic convenience cohort, recruited through online advertising. This is common in exploratory research and efforts were taken to ensure the patients’ eligibility through detailed screening involving information about medication for T2DM. All participants were from the UK and represented a homogenous and older demographic. Findings may differ depending on cultural norms and activities, particularly as recent research suggests that dyadic coping differs by culture (Hilpert et al., 2016). It may be useful to confirm these results through interviews with patients in other countries and who are younger. The prevalence of good foot care behaviour was higher in this study than seen previously (e.g. Chin, Huang & Hsu, 2013; Hrisos et al. 2009), perhaps as a consequence of the recruitment. Finally, while the selected method of applied thematic analysis allowed for strata to be set during recruitment, alternative approaches to qualitative research, such as grounded theory, would have allowed for a more iterative sampling method determined during data collection. However, such methods come with their own constraints, including the assumption of significant prior knowledge on behalf of the researcher(s). As prior literature was scarce and the interview guide was intentionally exploratory and semi-structured (using the health belief model as a guide), applied thematic analysis was preferred.

***Summary***

The results from the current qualitative study suggest that awareness of the association between diabetes and potential foot problems is high, but that perceived susceptibility is variable and unrelated to risk level. Most patients engage in some behaviour to identify problems with the feet or reduce the likelihood of problems occurring. Further information is needed for patients with T2DM about how to appropriately and comprehensively care for their feet, and why. There was evidence of positive foot care behaviour from spouses, and evidence that the spouses’ attitude and behaviour influenced the patients’ own. Engaging spouses/significant others in education may therefore improve foot care behaviour. The role of the spouse in the dyadic management will however depend on multiple factors including their own willingness and abilities, as well as those of the individual with T2DM. As foot complications can develop relatively quickly, and habits established early tend to persist over time, low-risk patients and their spouses are as much a prime audience for foot care education higher risk groups. Given the ever-rising prevalence of T2DM, foot care education may even target people who are “at risk” of T2DM.

Exploratory qualitative research is generally used to generate hypotheses for further study. Findings from this study lead us to hypothesise that provision of effective information on T2DM foot care targeted to patients and spouses may have a more significant impact on foot health than when targeted to patients alone. Results from this study do not indicate that the messages to patients and spouses should differ in any meaningful way, but the processing of foot care information by patients and spouses may differ whether they receive information individually or together. This requires quantitative research to comprehensively test. The most appropriate way (modality, context, framing etc.) to provide messages about foot care is an important avenue for exploration.

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**Table 1. Demographics & clinical characteristic of the sample**

|  | | | Dyads (n=3) | Singles (n=3) |
| --- | --- | --- | --- | --- |
| Patient | | | | |
| Mean (SD) age (years) | | | 64.00 (3.61) | 67.00 (2.65) |
| Mean (SD) duration of diabetes (years) | | | 10.67 (7.57) | 8.17 (4.07) |
| N(%) Caucasian | | | 3 (100.0%) | 3 (100.0%) |
| Mean (SD) years living with partner | | | 40.83 (2.47) |  |
| N(%) male | | | 2 (66.67%) | 1 (33.3%) |
| N(%) diagnosed by GP | | | 3 (100.0%) | 3 (100.0%) |
| N(%) by employment status | | Full-time work | 1 (33.33%) | 1 (33.33%) |
| Part-time work | 1 (33.33%) | 1 (33.33%)1 |
| Retired | 1 (33.33%) | 2 (66.67%)1 |
| N(%) by highest level of education | | Post-graduate degree | 1 (33.33%) | 0 |
| Post-graduate certificate | 0 | 1 (33.33%) |
| University degree | 1 (33.33%) | 1 (33.33%) |
| Vocational/work-based qualifications | 1 (33.33%) | 1 (33.33%) |
| N(%) under current care of a podiatrist | | | 1 (33.33%) | 2 (66.67%) |
| N(%) by current risk of foot problems2 | | Low | 1 (33.33%) | 1 (33.33%) |
| Medium | 1 (33.33%) | 1 (33.33%) |
| High | 1 (33.33%) | 1 (33.33%) |
| N(%) by foot problems | | Dryness of the skin (current/past) | 2 (66.67%) / 0 | 2 (66.67%) / 1 (33.33%) |
| Corns (current/past) | 1 (33.33%) / 0 | 1 (33.33%) / 1 (33.33%) |
| Calluses (current/past) | 0 / 1 (33.33%) | 1 (33.33%) / 0 |
| Fungal infections (current/past) | 0 / 1 (33.33%) | 1 (33.33%) / 1 (33.33%) |
| Cellulitis (current/past) | 1 (33.33%) / 0 | 1 (33.33%) / 0 |
| Number of days in past week when checked feet3 | | Mean (SD) | 4.00 (3.61) | 3.67 (1.15) |
| Range | 0-7 | 3-5 |
| Number of days in past week when checked inside of shoes4 | | Mean (SD) | 3.00 (3.61) | 2.33 (4.04) |
| Range | 0-7 | 0-7 |
| Spouse/significant other | | | | |
| Mean (SD) age (years) | | | 62.33 (3.79) |  |
| N(%) heterosexual partner | | | 3 (100.0%) |  |
| N(%) Caucasian | | | 3 (100.0%) |  |
| N(%) by employment status | Full-time work | | 1 (33.33%) |  |
| Part-time work | | 1 (33.33%) |  |
| Retired | | 1 (33.33%) |  |

1 One participant was both retired and a part-time worker

2 Low risk = normal sensation, palpable pulses; Increased (medium) risk = neuropathy or absent pulses or other risk factor; High risk = neuropathy or absent pulses **and** deformity or skin changes or previous ulcer (NICE, 2004)

3 Summary of Diabetes Self-Care Activities questionnaire (SDSCA (Toobert, Hampson & Glasgow, 2000)) item: “on how many of the last 7 days did you check your feet?”

4 SDSCA (Toobert, Hampson & Glasgow, 2000) item: “on how many of the last 7 days did you inspect the inside of your shoes?”