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The experiences of professional footcare among adults living with type 2 diabetes in Switzerland: a qualitative study

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Abstract

***Background*:** Foot ulceration is a common complication of type 2 diabetes, which can lead to amputations and earlier mortality. National footcare guidelines recommend routine foot surveillance, preventative self-management patient education and prompt referral to professional footcare services when complications occur. However, little is known about how people living with type 2 diabetes experience diabetes footcare in Switzerland. The aim of this study was to explore the experiences of people living with type 2 diabetes who are at high risk for foot complications, when accessing and using professional footcare, in the context of the Swiss healthcare system.

***Method*:** Individual, in-depth semi-structured telephone interviews were conducted with adults with type 2 diabetes ($n = 9$) recruited from two regional hospitals and two primary care practices in the German-speaking region of Switzerland. Data were analysed thematically using Framework Analysis.

***Results*:** Three themes with subthemes were generated from the data: 1) footcare, the neglected component of diabetes management; 2) perceived roles of healthcare professionals; and 3) signposting within the healthcare system. The findings illustrated ambiguity and lack of consistency in the provision of services, which do not always align to national guidelines, as well as a lack of clarity of the roles of healthcare professionals in relation to diabetic footcare.

***Conclusion*:** The experiences of participants in this study highlight the need for increased awareness and new ways of working, including alignment to national guidelines and a clarification of the roles and responsibilities of multidisciplinary healthcare professionals, including general practitioners, diabetes nurses and specialist podiatrists within primary care in Switzerland.

Keywords: *type 2 diabetes mellitus*; *foot complications*; *footcare*; *primary care*; *qualitative research*

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The prevalence of diabetes is increasing exponentially. In 2021, an estimated 10.5% of all adults aged 20–79 years globally were living with the condition. Ninety per cent of these had type 2 diabetes (T2D)[1]. In Switzerland, an estimated 389,000 of the population have diabetes[1]. Diabetes-related foot ulceration is common, affecting up to 6.3% of people with T2D globally during their lifetime.[2] Approximately 20% of ulcers will result in some form of lower digit or foot amputation, whilst the onset of first diabetic foot ulcer increases mortality rates at five years to over 70%.[3] Risk factors for foot complications include: being male, older, longer diabetes duration, hypertension, diabetic retinopathy, and smoking.[4] Predictive factors are: diabetic neuropathy, including sensory dysfunction resulting in a reduction or loss of protective sensation in the feet, motor dysfunction such as small muscle wasting and autonomic dysfunction leading to decreased sweating and dry skin, which is prone to callus.[5] In addition, diminished circulation in the lower extremities impairs wound healing.[6] Callus and high plantar foot pressure can lead to altered weight distribution and injury to the underlying tissue resulting in ulcers, which are at risk of infection and at worst, need for amputation.[7] Callus debridement is vital both as a treatment and prevention; however, when there is diminished sensation, debridement must be done professionally to avoid trauma and infection.[8]

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It is well documented that up to 75% of diabetes related foot complications are preventable.[9,10] The International Working Group of the Diabetic Foot (IWGDF) outlines five key preventative factors for the 'at-risk-foot': regular inspection and examination, early education of the person with diabetes and their family, wearing of appropriate footwear and prompt treatment of pre-ulcerative signs, such as fissures.[8] The footcare guidelines of the Swiss Associations of Diabetology and Endocrinology (SGED)[11] are based on the International IWGDF recommendations, which are considered the gold standard of footcare globally.[8,12]

Professional footcare can help reduce the risk of people with T2D developing foot ulcers and amputations. However, there is little evidence to date on how people access and navigate footcare services in the Swiss context, or if this aligns with national guidelines. The aim of this study was to investigate the experiences of individuals with T2D who are at high risk for foot complications in accessing and using professional footcare within the Swiss healthcare system.

Characteristics of the Swiss healthcare system

In Switzerland, mandatory basic health insurance is required. Most diabetes care is delivered in primary care practices. Standard diabetes patient education is usually provided by General Practitioners (GPs) or Physician's Assistants (PAs). A comprehensive programme of diabetes education is provided by specialist diabetes nurses (DNs), usually within secondary care, including preventative self-management skills such as foot skin care, regular inspection, prompt treatment of wounds or infection, and wearing appropriate footwear. If a foot complication has occurred, care and treatment from a specialist podiatrist is indicated. Whilst people with diabetes can self-refer to a DN, this attracts a fee which is not reimbursable unless referred by a GP, at their discretion. Similarly, until 2022, podiatry services in Switzerland were not covered by basic insurance. Hence, accessing these services may have been prohibitive for many people.

Methods

Design

This qualitative study aimed to explore how people with T2D at high risk for diabetes-related foot complications access and utilise professional footcare services in Switzerland. Individual, in-depth, semi-structured interviews were conducted using a topic guide, which was informed by the currently available literature, discussion with local experts, the research team and people with diabetes.

Inclusion and exclusion criteria

This study included adults with T2D who had diabetic neuropathy and peripheral artery disease, an active foot ulcer or a history of a foot ulcer in the previous 12 months, in line with the SGED definition of high risk for foot complications.[11] Individuals with type 1 diabetes or other forms of diabetes were excluded as were those with unstable mental health conditions, inability to speak German fluently, or who were unable to provide informed consent.

Sampling

A convenience sample of adults with T2D ($n = 9$) attending two primary care GP practices and wound clinics in two regional hospitals in the German region of Switzerland were purposively recruited by their usual healthcare providers, including primary care physicians and wound nurses. The 'information power' principle was used to guide the sample size, with nine participants providing quality of dialogue.[13]

Data collection

All participants were offered video or telephone interview due to COVID-19 social distancing regulations. All interviews were conducted between May and July 2020 by one researcher (AC) via telephone. The interview duration ranged between 16 and 56 minutes and were recorded and transcribed verbatim by the lead author AC. After the first two interviews, the transcripts and the topic guide were reviewed by the research team, and minor changes were made. All interviews were conducted in Swiss German. A sample of transcripts were translated into English and cross-checked by a bi-lingual academic fluent in Swiss German and English.[14]

Data analysis

Data were analysed using Framework Analysis, which enables the integration of a priori information within the analysis.[15,16] This was relevant as whilst the experiences of footcare for people living with diabetes have been previously explored[17], little is known about this phenomenon in the context of the Swiss healthcare system. The data analysis followed the interconnected stages of Framework Analysis (FA), described in seven stages by Gale et al.[18]

Stage 1 transcription

The audio-recorded interviews were transcribed and translated as outlined above.

Stage 2 familiarisation

The transcripts were anonymised, read and re-read, and reflexive notes were made to aid familiarisation by AC. The transcripts were then uploaded to NVivo12[19] for data management.

Stage 3 and stage 4: Coding and developing a working analytical framework

A priori codes were derived from the literature to ensure that the codes were consistent with the conceptual

Table 1. Participants' characteristics ($n = 9$)

Participants	TN1	TN2	TN3	TN4	TN5	TN6	TN7	TN8	TN9
Age	57	64	69	58	60	66	59	70	69
Gender	Male	Male	Male	Female	Male	Male	Male	Male	Male
Time since diagnosis (years)	20	12	1	>10	4	5	20	not applicable[6]	1.5
Mode of treatment	MDI[2]	OAD[3]	OAD/ GLP1-A[4]	MDI	OAD	OAD/ GLP1-A	OAD	OAD	OAD
HbA1c[1](%)	not applicable	6.8	not applicable	not applicable	6.8	6.5	not applicable	not applicable	not applicable
Diabetic neuropathy	yes	not applicable	not applicable	yes	yes	yes	yes	yes	suspected
Peripheral artery disease	not applicable	No	not applicable	not applicable	not applicable	No	No	yes	yes
Active wound	yes			yes	yes	yes			
History of foot lesion < 12 months		yes	yes				yes	yes	no
Care team	Diabeto-logist	GP[5]	GP	GP	GP	GP	GP	GP	GP

[1]glycated haemoglobin; [2]multiple daily injections; [3]oral antidiabetic drugs; [4]Glucagon like peptide 1-Analogues; [5]General practitioner; [6]the data were unknown by the participants.

framework of the study.[20] New codes identified from the data were applied. The analytical framework was iteratively adapted following discourse between members of the research team AC, MAT and RF, which also supported the mitigation of researcher bias. The analytical framework was initially formed deductively and then inductively expanded based on the analysis of the study transcripts. This analytical framework remained flexible until the last transcript was coded.

Stage 5: Applying the analytical framework

All transcripts were reviewed, and the data indexed using the existing codes, which were then organised into categories. Where data did not relate to the codes within the framework, new codes were generated inductively.

Stage 6: Charting data into the framework matrix

The data were summarised by category from each transcript and charted into the Nivo12 framework matrices. Supporting quotes and annotations were electronically linked to the summaries and annotations. This ensured that at all times, the participants' quotes were linked back to the original transcript and were contextualised.

Stage 7: Interpreting the data

We aimed to identify characteristics and differences between the data and map connections between categories. Identified concepts and potential themes were repeatedly discussed within the research team AC, MAT and RF until an interpretation of the data was developed by identifying themes and subordinate themes.

Ethical considerations

Ethical approval was granted by King's College London (Ref.: LRU-19/20-17785). In addition, a justification of clarification was conducted by the ethical committee of the Canton of Zurich. An informed consent was obtained from all participants prior to the interviews.

Findings

Nine adults (males $n = 8$, female $n = 1$) aged 57–70 years with a T2D duration ranging from 1–20 years participated in this study. Self reported diabetes duration, diabetes management and complication profile and level of glycaemia are summarised in Table 1.

Three main themes with subthemes were generated from the data and are illustrated in Figure 1. The themes illustrate the experiences of the people in this study in relation to routine diabetes footcare within the Swiss context (*Footcare, the neglected component of diabetes management*); as well as their perceptions of the various roles of the healthcare professionals (*Perceived roles of healthcare professionals*), and the challenges of navigating the Swiss healthcare system (*Signposting within the healthcare system*).

Footcare, the neglected component of diabetes management

The experiences of the people in this study suggest that footcare is not integrated into the routine care of people living with T2D in Switzerland. How and when they became aware of the relationship between living with diabetes and the need for footcare was arbitrary. Participants indicated that they did not fully appreciate the consequences of

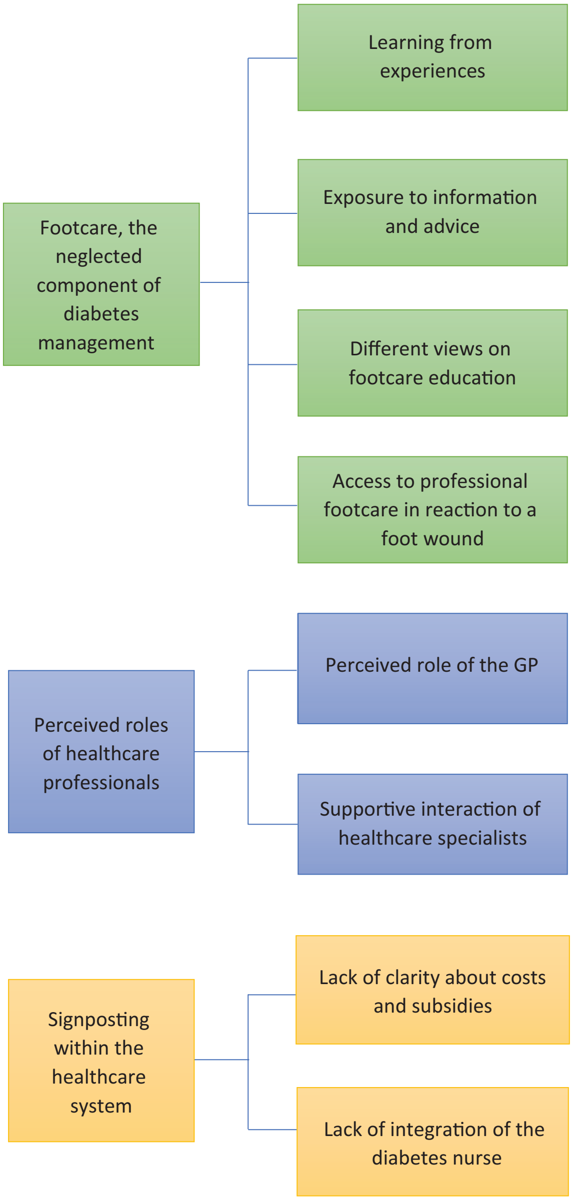

Figure 1. Superordinate themes and subthemes derived from the interview.

changes or injury to their feet, nor did they link this to diabetes or relate footcare education to preventative self-care measures. Consequently, responding to foot issues was reactionary and often in response to injury or other complication. There was limited understanding of when or how to access education and care. This theme presents four subthemes illustrating these experiences,

Learning from experiences

One participant illustrated his prior lack of awareness of the preventability of a foot ulcer through personal experience, *'I had to go to the hospital [with a foot ulcer], and since then I check [my feet], almost every day, so that it's not going to happen again.'* (TN8).

Conversely, a participant without a previous foot complication did not understand that a foot injury could be of significance. He described having a haematoma under the toenail, which was not healing, but delayed seeking help, stating, '*Well, I don't know if that is a special place on the toe, but I think it is taking an extraordinarily long time to heal*' (TN9).

Exposure to information and advice

Participants with a previous foot ulcer were generally referred for specialist treatment. During encounters with specialist footcare professionals, they were exposed to information, support and advice about preventative footcare and potential foot complications, which enabled them to actively participate in discussions during their subsequent care. This was described by a participant, *'I discussed this [skincare] during the check-up with my podiatrist, where I regularly go, every sixth week'* (TN8). However, prior to his foot injury, he did nothing special and was unaware of the risks and potential outcomes of a foot ulcer. Whilst another attributed their lack of awareness and understanding to a lack of information or education, '*nobody explained this to me*' (TN9).

Unaware of footcare education

None of the participants recalled receiving any footcare education or information about the need for preventative footcare at diagnosis. Similarly, this was not mentioned during their follow-up consultations. There was also a lack of understanding about why they had not received education, as one participant explained, it was '*because I just did not have any discomfort in my feet*' (TN2).

Significantly, none of the participants differentiated between receiving footcare education and receiving foot 'surveillance' or a physical examination. Within the Swiss healthcare system, the latter would be initiated by the GP if they deemed it necessary rather than as a routine aspect of diabetes care. The lack of foot surveillance during a consultation was justified by one participant, '*well, at the moment, it is not urgently necessary; I think my doctor would have checked*' (TN3).

None of the participants had been instructed on the care of their feet, nor did any of them link this with the role of diabetes nurses (DNs).

Access to professional footcare in reaction to a foot lesion

The participants reported that access to professional footcare via a referral from a GP was generally made available once a complication was present. This delay frustrated one participant who shared that they had 'finally' negotiated a referral due to recurrence of foot ulcers, '*She [podiatrist] does the footcare. I finally received a referral so that a professional can do it, I have been attending for about three months now and am relieved that nothing else will be missed.*' (TN7)

While others who were not engaged in professional footcare reported little knowledge about services available to them, one stated, *'I don't know if I am allowed to go to podiatry, as a diabetic patient?'* (TN2).

Perceived roles of the healthcare professionals

This theme offers insights into how the participants interpreted the role and responsibilities of the healthcare professionals. Two subthemes were identified, the perceived role of the GP and supportive interaction with healthcare specialists.

Perceived role of the GP

Foot surveillance did not feature routinely in diabetes reviews and was only offered if the person with diabetes voiced concern about a wound or injury or at the GP's discretion. Consequently, the participants did not think preventative foot examinations or footcare by their GP was a necessary aspect of their diabetes care and management, as one participant stated, '*Well, the foot examination did not happen because it was not necessary*' (TN2).

Others considered foot surveillance as a personal responsibility, with one participant indicating, *'In my case, foot examination [by my GP] is maybe not necessary because I examine my feet myself'*. Going on to elaborate that despite having had recurring ulcers on his foot: '*as long as I stick to the recommendations from the podiatrist and the orthotist, I'll have no problems*' (TN8).

Some participants reported that other health issues were prioritised by GPs above footcare, particularly among those with multi-morbidities, as one participant illustrated, '*I would have wished that footcare had been tackled long before, but then suddenly my heart was put in the foreground and, well...*' (TN5).

Supportive interaction with healthcare specialists

Participants who were exposed to specialised care recognised these as supportive interactions and particularly valued the ongoing support provided, expressing the positive influence these 'experts' had on them, '*The shoe orthopaedist is perfect. I go regularly there. I always can call him if I have a problem and get an appointment immediately*.' (TN4)

Signposting within the healthcare system

This theme identified that navigating the Swiss healthcare system was challenging for many participants. Access to care and healthcare professionals outside of general practice was restricted by the mandatory requirement of a referral and additional charges. Furthermore, many were unaware of the role of the diabetes nurse (DN).

Lack of clarity about costs and subsidies

There were variations in participants' understanding of fees and insurance to access a diabetes nursing and specialist podiatrist services. Referral by a GP was the conduit to access to care without additional financial burden. In addition, participants revealed it was not always clear if their healthcare insurance included podiatry or footcare at all, as one participant explained, '*She [my wife] said I would be entitled to, because of my illness, that it actually would be paid by the health insurance … I don't know if that's correct*.' (TN2)

Some participants self-paid for access to professional footcare. However, regular or routine access was prohibitive due to the costs, as one participant explained, he would use podiatry care '*according to my pocket money*' (TN3).

Lack of integration of the diabetes nurse

There was ambiguity about the role of DNs and what preventative footcare and education they could provide. All the participants indicated that referral to DN services did not feature within their routine care, and most did not recall attending any educational sessions apart from dietary advice, as one participant illustrated, '*I didn't even know that diabetes counselling exists, to begin with, and that she [DN] is providing education about footcare. I actually didn't know this*.' (TN9)

Discussion

This study presents new insights into the experiences of people living with T2D who are at high risk of diabetes related foot complications, when accessing and using diabetes footcare in the Swiss healthcare context. It is widely accepted that footcare education should be offered at diagnosis and re-enforced at every diabetes clinic visit.[21–24] However, most participants in this study were neither aware of the importance of preventative footcare nor had received any footcare education. This resulted in a lack of awareness of the risk of foot complications, preventative self-care practices, or how and when to access further care if needed. In addition, participants were often not aware that professional footcare was even available to them.

The positive impact of multidisciplinary teams (e.g. DNs, dietitians and podiatrists) on diabetes care and outcomes is well recognised.[25] However, this study's results suggest that the multidisciplinary team (MDT) approach does not feature routinely within the Swiss primary care system, and resulted in our participants being unaware of the benefits. For example, DNs are ideally placed to provide preventative footcare education[26], and the Swiss national guidelines

(SGED)[11] and the international diabetes foot guidelines (IWDGF)[7] recommend DN services for people who are at high-risk for foot complications. Unlike in many other countries, such as the United Kingdom or the United States of America[26,27], where DNs successfully engage in diabetes care provision and self-management education, their role in Switzerland is not well understood, with participants only associating them with providing diet-related advice. In addition, there are a paucity of DNs within primary care in Switzerland, and the referral processes to access their services are ambiguous.

This study also suggests that the Swiss national guidelines have not been implemented more widely or consistently for this cohort. This finding is consistent with a cross-sectional study of people with diabetes in French-speaking region of Switzerland (n = 406), which reported low levels of referral to non-physician diabetes care specialists, with only 25–33% of participants seen by a DN, dietician or podiatrist.[28] To improve outcomes, clarity around clinical roles and responsibilities, and referral processes to the MDT are urgently required.[29]

Strengths and limitations

A possible limitation of this study was that due to the COVID-19 pandemic and participant choice, the interviews were conducted by telephone, which may have influenced the richness of information received due to the exclusion of the interpretation of non-verbal cues such as body language.[20] However, the researcher was able to develop a sufficient rapport in all the interviews and elicited rich experiences of the participants, evidenced by the data obtained. In addition, it is acknowledged that the number of participants was small, and the findings may not be transferable to all clinical and geographical locations in Switzerland. However, a qualitative exploratory study like this is not intended to be generalisable and can contribute valuable understanding of a topic whilst not being the final exploration.[13] A strength of this study is that it considered trustworthiness in qualitative research: credibility, dependability, confirmability and transferability.[30] Rigour was enhanced by using quotes along with the summaries of the analysed data. To attenuate researcher bias interpretation of the data was regularly discussed or challenged so that each one was defended and supported by data extracts, and the use of FA facilitated transparency alongside the entire analytical process so that interpretations can be traced back to the original data.[18] Finally, the participants in this study were predominantly male; nevertheless, this does mirror the increased risk of diabetes related foot complications in this population.

Conclusion

This study explored how people with T2D who are at high risk for foot ulceration access and utilise diabetes footcare in the Swiss healthcare system. National and international guidelines recommend that routine foot screening and surveillance, self-management education and timely referrals to an MDT when complications do occur should be integrated into care systems for people with T2D. Our findings indicate that, in this small sample, the care the participants experienced did not align with the national or IWGDF guidelines. Participants reported inconsistent, ad hoc foot screening and surveillance from primary care providers as well as a lack of awareness and utilisation of the services of DNs who could provide preventative footcare education. Participants also experienced delays in accessing specialist podiatry services due to a lack of personal awareness, the need for a GP referral, usually at the GP's discretion, and unclear payment requirements. It is clear that a wider evaluation of current heatlh care practices and further research are needed to establish if the experiences of the participants in this study are representative of Switzerland. However, from this preliminary study, it appears that improving foot-related outcomes for all people with T2D will require new ways of working, including system change and a multidisciplinary approach.

Conflict of interest and funding

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