

Abstract

Objectives: The purpose of this study was to explore the experiences of self-management of feet for patients with diabetes from the perspective of the patient, support person, and health care provider.

Methods: The qualitative method, Interpretive Description, was used to guide data collection and analysis. Semi-structured interviews were completed with 11 patients, 4 support persons, and 9 health care providers.

Results: The overarching theme was that self-management of diabetes and specifically foot health is complex. Six sub-themes were identified. Four confirmed what is known in the literature: knowledge of foot self-management; physical ability to provide foot care; footwear; and support. The remaining two sub-themes, readiness to self-manage feet and communicating between patients and health care providers, offered new insights related to self-management of foot health.

Conclusion: The findings have important implications for clinical practice that can be categorized as the 3Rs: *rapport, readiness, and reinforcement*. Rapport with patients and support persons is vital in creating an environment where foot health concerns can be addressed. Readiness to self-manage foot health is an important factor; health care providers can capitalize on a patient's level of readiness, regularly tailoring foot education to a patient's needs. Reinforcement of positive foot health with patients and support persons is an important strategy for all health care providers.

Introduction

Patients with diabetes are at high risk for poor foot health. Diabetic foot ulcers (DFUs) and amputations have been identified as a large and preventable cause of the global burden of disease [1] with significant physical, psychological, and social impacts for the patient as well as high costs for the health care system [2, 3, 4, 5]. Self-management is an important aspect of maintaining foot health and preventing complications. The International Working Group on the Diabetic Foot (IWGDF) recommends that patients with diabetes should receive structured dynamic foot care education from a HCP that considers the patient's health literacy, culture, and support person, and this content should be emphasized regularly

[6]. This standard was not being met with the patients interviewed in this study with patients receiving varying levels of education about foot self-management and often education was limited.

Foot self-management requires the person to engage in many activities such as regular daily care, wearing appropriate footwear, and seeking an assessment from a health care provider (HCP). Consequently, prevention is certainly not straightforward and this may be a factor in the limited success of foot self-management interventions in preventing DFUs and amputations [7, 8, 9, 10]. A key to understanding foot self-management is unpacking this complexity by exploring patients' experiences. However, there have been limited studies conducted in the Canadian context that have explored foot self-management. This paper will focus on Phase 1 of a larger three-phase mixed methods study that tested the effectiveness of a self-management strategy to prevent DFUs.

Objective

The research objective for Phase 1, reported here, was to explore the issues related to self-management of feet for people with diabetes from the perspective of patients, support persons, and HCPs.

Methods

Interpretive Description (ID) was used to guide the study [11]. ID aims to address real-world clinical practice issues and bring a clinical perspective to evidence-based practice using qualitative methodology. This is an approach that is being used by many researchers in applied health disciplines. ID was an appropriate method because nursing is an applied health discipline and a clinical question was asked that could be answered using qualitative research. With this methodology, the researchers were grounded in central concepts in the discipline of nursing, and these guided the direction of the study, including data collection and analysis. These central concepts were person, health, environment, and nursing. The researchers went beyond just describing what was happening in relation to the research question and asked the question: what does it mean; what can I do with these findings; why is it

important? Ethical approval was obtained from the NL Health Research Ethics Authority and written consent was obtained from participants before completing the interview. To ensure confidentiality any identifying information was removed from the transcripts.

Setting and participants

To gain a greater understanding of the complexity of foot self-management this issue was explored from the perspectives of patients, support persons, and HCPs. There were three eligible groups of participants: (1) patients that were residents of Newfoundland and Labrador (NL), 18 years and over, and identified as either having type 1 or type 2 diabetes; (2) support persons of the patients who were either a family member, friend, or home support worker who assisted the patient daily; and (3) HCPs who cared for patients with diabetes.

Purposive convenience sampling was used, and participants were selected that would inform the researcher about issues with foot self-management. To gain a comprehensive understanding of foot self-management, participants were selected who had a variety of experiences and characteristics, such as patients with diabetes with various foot health challenges and HCPs with different professional designations.

Recruitment took place between 2016 and 2017. Managers and HCPs working in the Eastern Health region of NL were contacted by the researcher (KS) to inform them about the study. HCPs were invited to participate and share information about the study with potential participants. Posters were placed in public and private clinics, such as diabetes care clinics and wound care clinics. Interested individuals contacted the researcher directly (KS) and were provided with further information about the study. Patients and support-persons were also recruited using information sheets that were provided by HCPs, who acted as intermediaries and were in the patient's circle of care. If the person was interested in

participating the HCP provided the researcher with the contact information and the researcher (KS) followed up with the potential participants to answer any questions and to determine if they were interested in participating. Recruitment was slow at the beginning of the study. To increase recruitment a \$25 gift card was offered as an incentive to participants. This change was approved through the NL Health Research Ethics Authority. If patients, support persons and HCPs were interested in participating, informed consent was obtained.

Procedures

Interviews occurred as participants were recruited and were either scheduled by telephone or at a mutually convenient location. Recruitment continued until there were sufficient data. It is important to note that the goal of Interpretive Description is not data saturation but to have sufficient data to report well-developed findings. This is in keeping with the nursing disciplinary view that every individual's response to illness is unique, and all the variations cannot be known [10].

After reviewing the study with the participant written consent was obtained and demographic information was collected. Interviews were semi-structured and were undertaken by the first author (KS). The length of participant interviews was 20-90 minutes. Except for two married couples who preferred to be interviewed together, participants were interviewed individually. All interviews were audio recorded and transcribed verbatim.

The interview guides are shown in Table 2.1 and were based on a review of the literature related to diabetes and foot self-management [2, 3, 4, 5] and were reviewed by researchers with extensive experience and knowledge in the areas of diabetes and foot health, self-management, data collection, and qualitative research, all authors of this article (KS, DM, SE, CM). As well, to ensure the interview guide was asking questions relevant to patients, feedback from a patient representative on the research committee was incorporated into the guide. The questions in the interview guide were broad and the participants were encouraged to talk about anything that would help the researcher (KS) understand their

experience with foot management. To understand the researcher's role in data collection a reflexive journal was completed after each interview (KS).

Data analyses

Demographic information about the sample was analyzed using descriptive statistics. The qualitative data analysis was conducted by one researcher (KS), a PhD student who had completed course work in qualitative methodology, under the supervision of the supervisory committee members (DM, SE, CM). Interview transcripts were analyzed using NVIVO, a qualitative software package (NVIVO 11, QRS International, Victoria, Australia). The analysis was guided by the research objective. Participants' experiences with foot self-management were explored and patterns, commonalities, and variations of people's experiences concerning self-management were identified within and across participant sub-groups. First, to become familiar with the data the transcripts were read several times. Under the methodological umbrella of Interpretive Description, the analytic framework of, The Three Cs: Coding, Categorizing, and Concepts, was used to conduct a thematic analysis of the data [11]. This approach was iterative and used the following steps: Step 1) Initial coding, going from step responses to summary ideas of the responses; Step 2) Revisiting initial coding; Step 3) Developing an initial list of categories; Step 4) Modifying the initial list based on additional re-reading; Step 5) Revisiting categories and subcategories; and Step 6) Moving from categories to concepts or themes.

The initial findings were shared with members of the research team, which included a patient representative who is a support person for a family member who has diabetes. The purpose of this consultation was to see if the experience of managing feet was captured accurately in the analysis.

Results

Participants' characteristics

Twenty-four interviews were completed with 11 patients, 9 HCPs, and 4 support persons. As shown in Table 2 all patients were Caucasian with 4 patients from a rural area and 7 patients from an

urban area. The mean age of patients was 64.6 years (range 50-74 years) with the length of time since diagnosis ranging from 1-44 years. The professional designation of the HCPs were: wound care consultant; diabetes educator; dermatologist; podiatrist; and family physician. Except for one HCP, all HCPs were from an urban area. Three support persons were spouses and one was a paid caregiver. Two of the HCPs had diabetes and statements were analyzed from the HCP or patient perspective as appropriate.

Interview results

The overarching theme was that self-management of diabetes and foot health was complex from the perspective of patients, support persons, and HCPs. One patient referred to self-management as “you have to manage your own destiny” which suggested that he believed his choices and behaviors impacted his disease outcome. Another patient described his self-management experience as sometimes “wandering off” but then he would start following a positive self-management plan again. What was clear from the data was that many factors impacted this destiny and the outcome. The analysis identified that there were personal challenges that negatively impacted foot self-management; furthermore, patients also utilized specific resources that supported self-management. Challenges were defined as the factors that made it difficult for a person to successfully look after their feet and resources were defined as something a person could draw on to help them be successful with foot-self management.

Underpinning these themes was the common perspective of patients, support persons, and HCPs that dealing with diabetes was a challenge for patients from the initial diagnosis to the ongoing management. Patients had to deal with physical impacts such as retinopathy, ulcers, and amputations. As well as these there were psychological impacts, the most common were fear, denial, weariness, and frustration. These perspectives should be kept in mind to provide context to the sub-themes related to foot self-management.

Six sub-themes related to foot self-management were identified. Four sub-themes confirmed what is known in the literature: 1) knowledge of foot self-management; 2) footwear; 3) physical ability to

provide footcare; and 4) social support. Patients, support persons, and HCPs identified a lack of knowledge of foot self-management as a personal challenge and having this knowledge was a resource. A common view of HCPs was that most patients have a very limited understanding of foot management because of their lack of education. As a result of a lack of knowledge, patients did not know the potential impact of diabetes on foot health. Several patients expressed that they had limited or no formal education about foot self-management; this sometimes led to patients having poor foot health maintenance practices. Also, this resulted in patients having foot complications and not realizing it or not knowing how to deal with foot complications. Some patients did express confidence in looking after their feet, but a strong knowledge base did not always seem to accompany such confidence. When patients knew how to care for their feet and diabetes it was a resource. An HCP indicated that when people were provided with education many patients were more “proactive.”

Footwear was identified by all three groups as a possible challenge because of the cost, discomfort, and the issue of fashion. Appropriate footwear was also viewed as a resource, with one patient identifying appropriate footwear as the most helpful strategy in looking after her feet. All three groups identified that the physical ability to provide foot care was a personal challenge to patients. Physical challenges related to vision, mobility, dexterity and /or co-morbidities, as these factors made it difficult for patients to care for their feet. Support was identified as a challenge and a resource for patients by all three groups. An HCP commented that a patient who had a lack of support may live alone or their family did not help them with their feet. Support from a spouse, family member, and a hired caregiver was also an important resource to people for diabetes and foot management. Support was in the form of providing physical care; assessing feet; encouraging and comforting the patient; advocating; and seeking information about foot health. In the opinion of one HCP the patient’s support system was the most helpful resource for a person with diabetes for foot management. One patient commented that his spouse, although supportive, sometimes enabled unhealthy behaviors.

The remaining two sub-themes were readiness to self-manage feet and communicating with HCPs; these offered new insights compared to what has been reported in the literature and thus are now discussed in more detail.

Readiness to self-manage foot health

There was variation in the responses of participants of the three groups concerning readiness to self-manage. Being ready and open to learning about foot self-management was viewed as a resource that patients could draw on to be successful with foot self-management, whereas not being ready to make changes was a personal challenge that made it difficult for a person to be successful. Although the participants did not refer to this as explicitly as ‘readiness’, it was clear from the patient and support person interviews that there was a continuum related to patient readiness to not only manage foot health but to self-manage diabetes in general, with some patients doing little and others being more motivated (See Table 3: quote #1).

The point was also made by a HCP that sometimes a patient was ready to self-manage one area but not another “It's whatever is affecting them at that moment that they feel is most important to them. And for some people, it's not foot care.” It appeared that readiness to self-manage foot health was sometimes not a priority in relation to some other areas of diabetes self-management and readiness was viewed as being individual. This variation can be seen between patients’ answers to the questions “tell me about managing your feet?” One patient who had diabetes for 22 years shared her well-established routine (See Table 3: quote #2). However, a patient who had diabetes for 8 years felt that his feet did not require any attention because he had no foot problems. When asked if he checked them every day he said “No, no because I don’t feel them tender. I feel my feet are no different than they were 20 years ago.” Another patient, when asked about his foot care routine, stated “I just keep them clean and keep my nails you know, cut. That's pretty much it.” As a result of this variation, an HCP stated it is important to provide information to patients that support their foot self-management, but it was up to them to follow the suggestions (See Table 3: quote #3).

Development of a wound was identified by HCPs as sometimes being the reason why patients began to take more interest in their foot self-management (See Table 3: quote #4). As well, self-management could be complicated by having neuropathy. Only one HCP pointed out that when patients are unable to feel pain they are sometimes not as motivated to self-manage their wound.

Interestingly, there seemed to be differences between HCPs' and patients' opinions on the timing of education. HCPs felt that when first diagnosed it was overwhelming for patients to receive foot health education. However, patients expressed that they would like this information early. A patient who had an amputation felt that he would have liked to have known about the possibility of the complications that could occur. He stated, "Right up front you should be told." When patients were asked if it would have been too much information to learn about foot self-management during the initial teaching one patient suggested it would be helpful to "break it into a couple of sessions, let it sink in." When another patient was asked if they felt overwhelmed with all the information, they stated "a little, but not concerning my feet."

Communication between patients and HCPs

Communicating with HCPs was identified as a challenge and a resource for all three groups. This sub-theme seemed more relevant to patients and HCPs as often the support person did not attend appointments.

A common pattern was that patients and support persons valued positive communication with their HCP. One patient talked about being able to call or email their diabetes educator. The same patient described the relationship that he had with his family physician in this way. "So, I find him good and he'll listen to you." When asked what was the most helpful for foot management a patient discussed their health care team (See Table 3: quote #5).

For the patient, communicating with the HCP was sometimes a challenge related to the provider's approach and behavior. One patient expressed his disappointment with the HCP's behavior during an education session (See Table 3: quote #6). Another challenging aspect of communication with HCPs was the lack of consistent information. One support person who was assisting with care of a DFU expressed frustration regarding the varying information that he was receiving related to caring for the wound.

From the HCP perspective, a common pattern was that HCPs communicated with patients about foot health using varying strategies such as encouraging, repeating, explaining, recommending, and discussing information. The potential complexity of this communication was evident as one HCP shared that patients often did not communicate up front that there were any issues with their feet. It was only when the HCP asked did they find out that there was a concern. These communications seemed to be more one-sided than reciprocal. Rapport presented a variation of this pattern as it allowed a more reciprocal pattern of communication. Building a rapport with the patient was identified as a helpful resource to promote positive foot health by one HCP (See Table 3: quote #7).

Discussion

People with diabetes are at risk of lower-limb complications, and effective foot self-management is vital to prevent complications. Foot self-management is complex, and this study provided an understanding of the experience of foot self-management for patients in the Canadian context from the perspective of the patient, support person, and HCP. Exploration of the process of foot self-management confirmed that: foot health education is important, but patients are not always "getting it"; patients may be physically unable to care for their feet and therefore need support; and footwear and social support are important factors that impact on foot self-management. These findings, along with new insights gained from the sub-themes of readiness to self-manage feet and communicating with HCPs, have implications for clinical practice and can be abstracted and categorized as the 3Rs: *rapport, readiness, and reinforcement*.

First, it is important that HCPs establish a *rapport* with patients and support persons. If support persons are not attending appointments HCPs can encourage the patient to bring their support person. From the literature, we know clear communication with HCPs has been reported to have a positive impact on foot health behaviors whereas if patients had a negative experience with an HCP they were more likely not to participate in healthy foot behaviors [13]. HCPs can assess their communication and teaching style to ensure that they are encouraging the development of rapport. In this study, the HCPs' behaviors that patients reported as contributing to a positive experience were being respectful, being accessible, listening, and providing gentle reminders about foot self-management. As patients do not always "communicate up front" about foot health issues, it is key that HCPs ask patients about their foot health to determine the extent of foot health needs. If patients and support persons are comfortable, they will be more forthcoming regarding any issues they are experiencing, ask questions, and participate in a discussion of their foot health needs.

Second, HCPs can assess and capitalize on a patient's level of *readiness*. Readiness to self-manage foot health is an important concept to consider. As demonstrated in the findings, there is a continuum of readiness, and understanding a patient's level of readiness can help tailor education to their individual needs. Some tools can be used to assess readiness such as the stage of change tool [14] and approaches to facilitate self-management such as motivational interviewing [15] and strengths-based care [16].

It is important for HCPs to recognize that whatever a patient's level of readiness, education about foot health could be beneficial. Opportunities for foot health education may be missed if it is only provided when a patient has been established in a treatment plan, is asking for information, and/or is presenting with a foot issue. The findings showed that HCPs were concerned about overwhelming patients with information and, in contrast, patients and support persons wanted to know about foot health

and potential complications earlier such as when they were diagnosed. Considering this, HCPs should follow the IWGDF guidelines for prevention and management of diabetic foot disease and regularly assess knowledge and provide teaching about caring for feet tailored to the patient's needs [6]. It is up to the patient whether or not they follow the direction provided. A HCP can quickly assess the patient's foot knowledge and behaviors using three priority questions based on recommended guidelines and build on the answers to these questions: 1) Do you look at your feet and moisturize your feet daily?; 2) Do you smoke?; 3) Do you wear supportive footwear? [17]. Responses to these questions would provide an opportunity to address a lack of knowledge and discuss risky behavior and appropriate actions. Models or posters that show foot complications could be incorporated into teaching. As well, the provision of reliable resources to patients and support persons that can be referenced later, such as the Diabetes Canada handout *Foot care: A step towards good health*, is vital [18].

Third, *reinforcement* of key messages related to foot health by HCPs would convey that foot health is important. Asking patients and support persons if they have a concern about foot health provides an opportunity not only for assessment, but for reinforcement of positive foot health and teachable moments. As well, checking to ensure that patients and support persons understand content and correcting misconceptions is key. One of the behaviors identified to be a resource by a patient was the “gentle reminders” about caring for her feet that she received from her HCP. All HCPs have a role in reinforcing these messages. Therefore, whatever the reason for a patient's visit it is important to ask about foot health and reinforce healthy behaviors.

In addition to clinical practice, this study also is important for HCP curricula, policy, and research. Information regarding foot health and potential barriers and challenges to foot health for people with diabetes needs to be present in HCP curricula. Policy makers need to consider funding for education initiatives to support self-management as well as access to foot health services and supports such as orthopedic shoes. These policies would help overcome many of the physical and financial barriers

identified in this study. Finally, further research needs to focus on whether barriers to foot health vary across Canada with different populations, such as indigenous and immigrant populations, in order to develop relevant programs. As well, research needs to move beyond description and focus on the development of strategies that support positive foot health.

This study demonstrates the criteria required for credibility in Interpretive Description [10]. Representative credibility was achieved by capturing the experience of foot self-management from three different perspectives. Other major strengths related to representative credibility were that patients with type 1 and type 2 diabetes with varying length of time since diagnosis were interviewed, as were participants from rural and urban areas. Achieving analytic logic was addressed through the use of an audit trail and verbatim in-depth description. Finally, interpretive authority was addressed through the use of regular reflexive journaling during data collection. One important limitation to note is that Canada has universal health care and the delivery of care varies across provinces so the challenges and resources related to diabetes self-management may not be transferable to other provinces and health care systems.

Conclusions

The 3Rs, *rapport, readiness, and reinforcement*, reflect simple strategies that can potentially save feet. Even though foot self-management for patients with diabetes is complex and impacted by many factors, the 3Rs are strategies that HCPs can incorporate into clinical practice that can support foot health. First, build *rapport* with patients and support persons. This establishes a connection and enables better and clearer communication regarding foot health needs. Second, regularly assess for the level of *readiness* and use this information to tailor patient education about foot health. Third, view foot health education as a responsibility of all HCPs. Utilize every opportunity with patients and support persons for *reinforcement* of key messages about foot health. With more attention to the 3Rs, positive foot-self-management can be promoted with patients with diabetes.

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Author Disclosures

Conflict of Interest: None.

Author Contributions

DM and KS contributed to conception and research design. DM guided the research study. KS contributed to data collection, analysis, and interpretation and wrote the manuscript. SE contributed to data analysis. DM, CM, and SE reviewed and revised the manuscript and gave final approval for the version to be published.

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Table 1 *Interview guides for patients, support persons, and health care providers*

Patients	Support Person	Health Care Provider
1. Tell me about looking after your feet.	1. Tell me about helping your family member/friend/client to look after their feet.	1. Tell me about caring for people with diabetes in relation to foot management.
2. Do you know when you should rest?	2. What do you do to help your family member/friend/client?	2. In your experience is the patient's support system helpful in foot management?
3. How confident do you feel about looking after your feet?	3. How often do you help them?	3. In relation to foot management what do you think patients with diabetes find most helpful?
4. What do you look for when you check your feet?	4. Do you find it time consuming to help your family member/friend/client with their feet?	4. Are there any barriers that make it difficult for patients with diabetes to look after their feet?
5. How often do you look at your feet?	5. Do you find it stressful to help your family member/friend/client with their feet?	5. What suggestions do you have for helping patients improve foot self-assessment?
6. What do you do if you find something wrong with your feet?	6. What do you find helpful?	6. Do you educate your patients about foot health and self-management?
7. What do you think are risk factors for ulceration?	7. What did you find least helpful?	7. Do you follow-up with your patients?
8. Have you had education related to foot management?	8. Are there any challenges that make it difficult for you to help look after your family member/friend/client's feet?	8. What do you tell your patients about foot ulcers?
9. What kind of footwear do you wear?	9. What suggestions do you have for helping people with diabetes improve foot self-assessment?	9. What is the role of different health providers in relation to feet?
10. Does anyone help you care for your feet?		10. Do you have any suggestions for making it easier for patients to talk to their health care provider?
11. Are there any challenges that make it difficult for you to look after your feet?		
12. Who do you go to if you have a problem?		
13. What suggestions do you have for helping people with diabetes that would make checking their feet easier?		

Table 2 *Patient Characteristics* (N=11)

Characteristic		#s
Setting	Urban	7
	Rural	4
Gender	Male	5
	Female	6
Type of Diabetes	Type 1	3
	Type 2	6
	Unclear	2
Age Range Years (mean 64.6)	50-54	1
	55-59	1
	60-64	4
	65-69	2
	70-74	3
Time Since Diagnosis (years)	1-9	2
	10-19	4
	20-29	1
	30-39	3
	40-44	1

Table 3: *Supporting Quotes of Subthemes of Readiness to Self-Manage Feet and Communicating with Healthcare Providers*

Quote Number	Quote
Theme: Readiness to Self-Manage Foot Health	
Quote #1	Some patients are asking questions more about how can I and when should I? As opposed to what's the information? Like some people just want the information and they want to leave and they'll do what they want with it when they're ready. But some people you can tell are taking it and their wheels are spinning like how can I apply this to myself and how should I apply this. (HCP)
Quote #2You know after 22 years of dealing with this but what I do with my feet is I shower practically daily and I have a pumice stone in my shower so while I'm in the shower I will always you know touch them up and get rid of any additional you know skin that's there. And then when I get out of the shower like they're the first thing that I moisturize you know when they're still wet...that's been my routine. (Patient)
Quote #3	You know some people...they take the information and they run with it.... So I think the suggestions help. I think some people do take heed to it. Some more might not. Some more might think that it's not beneficial to them (HCP)
Quote #4	I find once people have a wound they're more likely to self-manage, right because they know what they went through for to heal a wound before so they're more likely to try to prevent having another one especially when they know the percentage of people who end up with amputations. (HCP)
Theme: Communication between Patients and HCPs	
Quote #5feet aren't something you're thinking about all the time but when my nurse or my doctor says to me, like how are your feet? Have you had any issues? Then I'll be like, oh yeah! It's been awhile. I should probably do a check. So I would say most helpful would probably be like the gentle little reminders from my health care team. (Patient)
Quote #6 first session I went to I should have stayed home because the lady that was doing it, she wouldn't even make eye contact with you. She was one of these ladies who was looking at the ceiling all the time and before she finished up, she reached in her bag, in her purse and hauled out a tin of regular Coke. (Patient)
Quote #7	every time they come in we have a little chat and you know basically building a rapport and then they become more comfortable with asking questions and I think they overall feel more comfortable coming back because they know I'm checking their foot or their feet and they know if they're noticing anything appear on their foot that they can call and come in. (HCP)