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Experiences of foot health in patients with rheumatoid arthritis: a qualitative study

Abstract

Purpose. The aim of the study was to explore the experiences of foot health and the factors that hinder or facilitate foot health self-care in patients with RA.

Materials and methods. A descriptive qualitative study design was used. Individual interviews were conducted with patients who had been diagnosed with RA (n=20). The interview data were analysed using inductive content analysis.

Results. The participants highly valued their foot health. The factors that hindered their foot health included physical characteristics (such as the progression of RA), personal traits (such as lack of motivation), inequalities in access to professional foot care and problems with finding suitable shoes. The factors that facilitated their foot health included professional care, physical activity and practising foot self-care.

Conclusions. Patients with RA value their foot health. It is important to identify the factors that hinder or facilitate this in order to support their rehabilitation and respond to their foot-health needs. Patients' foot health should be promoted, and equal access to professional foot care should be provided.

Keywords: foot health, interview, rheumatoid arthritis, shoes, qualitative study

Implications for Rehabilitation

- Active foot self-care supported by professional health are facilitating factors for foot health.
- Maintaining and promoting physical activity is integral part of foot health.
- Regular assessments of foot health in patients with RA in addition to an evaluation of their footwear and education about caring for their own feet is needed.

Introduction

Rheumatoid arthritis (RA) is long-term immune-mediated inflammatory rheumatic disease in which foot problems are prevalent. The onset of the disease is commonly diagnosed on the basis of hand and foot pain, with problems identified in the forefoot [1]. Due to the damage that RA causes to the joints in the foot, forefoot disorders (such as flat foot, hallux valgus, hammer toes and overlapping toes) and hindfoot disorders (such as valgus heel) are common [2]. It is estimated that patients with RA have twice as many foot problems as people in the general population [3]. Many of these problems are associated with disability; thus, they hamper safe walking [4] and possibly reduce patients' independence.

It is important to consider patients' perspectives on foot health in order to understand their experiences of living with foot problems. The global focus in foot health is strongly oriented towards diabetic foot care. Due to severe diabetic-related foot problems, such as diabetic foot ulcers, the majority of patients with diabetes need podiatric services [5]. Patients with diabetic foot ulcers have reported significant consequences for their physical, social and psychological well-being [6]. Among patients with RA in particular, foot problems are often a major concern; however, they are often ignored by health-care professionals [7] and patients' foot-health needs go unmet [8]. Therefore patients with RA often need to seek themselves for professional care and purchase services from private podiatry clinics [9,10].

Professional foot care in RA is important for preventing new foot problems and managing existing ones. However, there are variations in how the feet are assessed and what kind of foot care is provided to patients with RA [11]. It has been reported that rheumatology clinicians often ignore patients' feet and that patients are not receiving the care they need [12]. Those patients with RA who are receiving podiatric care have reported that they are not satisfied with the care. They feel that the care focuses on skin and nails only, without relief

for joint pain, education in foot self-care or a comprehensive assessment of their foot health, which would include a biomechanical and gait analysis [10,12]. Assessing the current status of a patient's foot health is important for detecting potential problems and monitoring the health of the feet [13]. To support the clinical assessment of patients' feet, there are several patient-reported outcome measures for feet and ankles [14].

Wearing the correct shoe size is important for maintaining foot health, reducing the risk of falls and promoting balanced walking. However, when a person has foot problems it can be difficult to find suitable shoes, and patients with RA have reported that it is hard to find shoes that are both comfortable and aesthetically pleasing [12]. Retail footwear is often ill-fitting, and not being given a choice about footwear has a negative effect on patients' emotions, well-being and quality of life [15]. Female patients in particular would like to be able to choose retail shoes that have adequate cushioning, are wide enough, are lightweight and are easy to put on and take off [16]. To support the foot structure and enable patients to walk without pain, patients are prescribed therapeutic custom-made footwear that is measured to fit their feet. This footwear can decrease foot pain and be less limiting for activities [17]. Despite the anticipated positive outcomes, however, patients with RA are often unsatisfied with custom-made shoes. And even if the therapeutic footwear is provided through the health services, there are still issues with aesthetics and acceptance [18].

Although foot problems are common in patients with RA, research has not fully explored patients' perspectives on the importance of foot health and the factors that facilitate or hinder it. This study intended to provide different, Nordic country, perspective and further information of this topic and therefore the aim of the study was to explore the experiences of foot health and the factors that hinder and facilitate foot health in patients with RA. The

ultimate goal was to provide evidence that could help to develop foot health and foot care services targeted at patients with RA.

Materials and methods

A descriptive qualitative study design with individual interviews was used.

Data collection

To collect the data for this study, individual interviews with patients with RA were held on May-June 2019. The interviews were conducted by one researcher (A-ML). The researcher followed a predefined interview guide consisting of questions about foot health. The interview guide was developed based on previous literature in the field [2] and expertise of the research team. The interview guide was pilot tested with two patients with RA to assess the clarity and appropriateness of questions. After the pilot test no changes were made and these two interviews were included in the data. The questions focused on the patient's foot health at the time of the interview, what it means to have healthy feet, factors facilitating or hindering foot health, foot self-care activities, and foot care received as part of public health care. In addition, sociodemographic questions were asked. These covered the patient's age, gender, education, self-reported diagnosed rheumatic disease and employment status.

Data analysis

The data were analysed using an inductive content analysis [19]. Manifest content was used for the analysis. In the first stage of the analysis, the interviews were transcribed verbatim. This produced 163 pages of single-spaced 12-point font. To gain an understanding of the content, the transcripts were read and re-read. Next, the phrases or sentences (referred to as units) containing words related to the research questions (such as foot care, podiatry, walking, skin care and shoes) were organised in a tabulated format. The sentences that had been identified were then classified under the corresponding research questions. The units of

meaning were condensed, further abstracted and named with codes. Codes with common content were grouped (subcategories) and named. Finally, the categories were combined under theme names. The research team continuously discussed the category names and codes during the data analysis (Table 1).

<insert Table 1 here>

Participants

The participants were recruited from a third-sector patient association for people with rheumatic diseases. A contact person from the association distributed a letter with information about the study to people who attended meetings and events that were organised by the association. If a person was willing to take part in interviews, they contacted a researcher (MS or A-ML) to arrange a time for the interview. The contact person in the organisation arranged a private room for the interviews. In total, 50 cover letters were distributed and 20 people agreed to participate. The interviews lasted from 13 minutes to 58 minutes (mean 27, SD 10).

Most of the participants were female (n=18). The median age was 68 years (mean 64, range 24–83, SD 13). The participants' basic level of education was either elementary school (n=15) or high school (n=5). Their professional level of education was mostly short vocational education (n=6) or secondary vocational education (n=6). Some participants had a degree from a university of applied sciences (n=2) or an academic university (n=2). Two participants had no professional education. Most of the participants were retired, but one was an employed and other was an entrepreneur. Most of them had been diagnosed with RA (n=13) or juvenile RA (n=7). In addition, some participants reported other diagnosed rheumatic diseases: osteoporosis (n=5), osteoarthritis (n=3), fibromyalgia (n=2), psoriatic arthritis (n=1) and Sjögren's syndrome (n=1).

Ethical considerations

The study followed good scientific practice during every phase [20]. Ethical approval (code: 8/2018, date: 29.1.2018) and permission to conduct the study were obtained. The participants received a letter that explained the purpose of the study, the data collection procedure, confidentiality and anonymity in interviews and reporting, and confidentiality in data management. The same information was repeated before the interviews, and the participants were given an opportunity to ask questions before they provided their informed oral consent to participate the study.

Results

In general, foot health was seen as an important part of general health (Table 2). In particular, it was considered to be crucial to the ability to walk, even for short distances, and it was seen to support independent living and functional activity. Having RA for decades had taught the participants to live with long-term disease, to listen to their body, including the feet, and to be aware of its constantly changing condition. The participants described many factors that hindered or facilitated their foot health.

<insert Table 2 about here>

The hindering factors for foot health

The factors that hindered foot health were ***physical factors, personal factors, inequalities in access to professional foot health care*** *and* ***problems with finding suitable shoes.***

The physical factors included the progression of the patient's RA, the inability to cut toenails independently, and body stress (particularly in the lower extremities) resulting from daily activities. The participants stated that as their RA progressed, it affected their ability to look after their feet. They had lived with RA for many decades and knew that at some point they could be less able to care for themselves. In the case of foot self-care, stiffness in the joints

and not being able to bend down were major restrictions. Moreover, existing foot problems (such as minor toe deformities or overlapping toes) also hampered foot self-care. Thickening and ingrowing toenails were difficult to cut due to limited manual dexterity and hand muscle strength. Spouses, children or grandchildren tried to help, but their skill in managing thickened toenails was limited. Ingrown toenails were painful, and lack of hand and finger coordination made self-care impossible. The stress caused by performing daily activities affected the whole body, particularly lower extremities, leading to exhaustion. Long walk and standing long time made their feet hurt, thus limiting functional ability.

> *"It is this rheumatoid arthritis which has affected my health, and when you get older stiffness and slowness increases" (P113, person over the mean age, diagnosed with RA)*

> *"I can't reach my toes." (P124, person over the mean age, diagnosed with juvenile RA)*

> *"My toenails, particularly on the big toes, are so thick that I cannot cut them myself" (P123, person over the mean age, diagnosed with RA)*

Foot problems related to RA had forced the participants to give up hobbies and minimise the amount of time that they spend standing up. The participants said that staying at home and doing only the most necessary daily tasks was affecting their social relationships and their independence. They tried to live as normally as possible in spite of their foot problems.

> *"Having rheumatoid arthritis for over 40 years, I have learnt to live with it and I know how it affects my functional ability and walking and daily life." (P117, person under the mean age, diagnosed with juvenile RA)*

"Despite my foot problems, I have tried to live a normal life" (P119, person over the mean age, diagnosed with RA)

"I would love to walk, but I can't because I have no muscle strength in my feet and my feet do not sustain my body weight" (P112, person over the mean age, diagnosed with RA)

The personal factors that hindered the participants' foot health were a lack of motivation to care for their feet, fear of falling, and negative views about the appearance of their feet. The participants were aware of their lack of motivation, and some felt guilty about not being more interested in foot self-care. Some stated that they knew that they were not currently performing foot self-care frequently enough and blamed themselves for being lazy. Their motivation was also affected by the appearance of their feet. Foot and toe deformities and swollen joints were considered unattractive; therefore, their care was neglected. Many participants stated that they were not willing to show their feet to people they were unfamiliar with or their friends and relatives. For example, they considered that toe deformities (such as hallux valgus and hammer toes), swollen joints and oedema made their feet look ugly, which led to feelings of embarrassment. However, revealing their feet to health-care professionals, such as podiatrists, was not a problem. They were willing to show their feet to a podiatrist because they knew that a podiatrist would have the competence to assess and care for their feet. The participants also linked the fear of falling to a slow walking pace. They favoured walking unhurriedly to avoid accidents or falls. This slow pace made them feel more secure.

"I don't have the kind of interest in my feet that I should have. But I have lived with it." (P131, person under the mean age, diagnosed with juvenile RA)

"My feet have undergone several surgical procedures, my toes are crossed and I cannot spread them out, my big toe grows against the other toes. I don't

like to look at them, or care for them." (P122, person over the mean age, diagnosed with RA)

"I walk with short steps so that I can feel more secure." (P127, person under the mean age, diagnosed with juvenile RA)

The inequalities in access to professional foot health care (provided by a chiropodist or a podiatrist) included variations in the distribution of podiatric care and a lack of choice of care methods. The distribution of podiatric care was considered to be unequal and dependent on which municipality a patient lived in. Some participants were living in a municipality where patients with RA were given podiatric care free of charge if they had been referred by a physician. Other participants lived in municipalities where podiatric care was not offered. They were disappointed and demanded equal services regardless of the area in which they lived. These participants had purchased private chiropodist or podiatric care because they understood the value of foot care. Some participants were annoyed that physicians in primary or specialised health care were not interested in their foot health or their need for podiatric care. The participants related that they needed to complain about their foot problems to their physician, because their physician would not ask them about their foot health. Moreover, they found it difficult to get a referral to podiatric care.

Lack of choice of care methods was related to podiatric care. Those who did have the opportunity to access podiatric care reported that the care methods remained the same from one year to the next. They hoped to benefit from innovative methods rather than the same ones that had been used for years. They also mentioned the competence of the podiatrist and the requirement for lifelong learning. Because they attended the same events, the participants had shared their care experiences with each other; therefore, they knew what methods had been used to help other patients with RA. Comparing their experiences led to the suggestion

that podiatrists should develop their care methods and use new ones to support patients' foot health. The provision of effective podiatric care was challenged and requested.

> *"… this is a bit unfair that patients with rheumatoid arthritis in some cities receive it [podiatric care] free of charge, the city takes care of the costs with a voucher." (P118, person under the mean age, diagnosed with juvenile RA)*

> *"I have found myself a podiatrist who looks after my feet; nobody has ever asked me in health-care services if I need foot care." (P117, person under the mean age, diagnosed with juvenile RA)*

> *"Care methods should be developed. If you need care for the skin between your toes, it is always sterilised lamb's wool or some kind of orthosis made of silicone. These methods should be developed, offer more choice and be innovative." (P112, person over the mean age, diagnosed with RA)*

The problems with finding suitable shoes included not being able to wear custom-made shoes, a lack of choice, and mismatches between the foot and the shoe. Some participants had received custom-made shoes but reported not wearing them because they caused more problems. They considered that custom-made shoes were heavy (in weight), which impeded walking and caused pain. It was impossible to lace up the shoes due to stiffness in the joints and dysfunction in the fingers.

The lack of choice was related to the desire to have many pairs of shoes instead of wearing one pair all year round. The participants did not like the appearance of custom-made shoes. They thought that the shoes were big and ugly and made it obvious that they needed to wear special shoes. The appearance of the shoes also influenced the participants' choice of clothing. Women reported not wearing skirts or shorts because they did not want to show

their unattractive shoes. They thought that the custom-made shoes were unfashionable. They wanted attractive, chic custom-made shoes, but these were impossible to find. Tendering has led to a situation in which custom-made shoes, depending on where a person lives, must be obtained from a single company. The participants stated that a previous company had provided shoes that were far more suitable and of higher quality than those provided by the current company. Some participants reported having broad feet, so shoes that could be purchased from a retail outlet did not fit. Others pointed out that due to having their toes amputated or shortened, their feet are shorter and they have to buy their shoes from the children's selection.

> *"I have received many pairs of custom-made shoes, but I cannot wear them. I do not know why. They are so heavy, all of them!" (P118, person under the mean age, diagnosed with juvenile RA)*

> *"I have problems with finding suitable shoes. It is very sad when I cannot find them. And it is also very sad that I would like to change my shoes every now and then, but there are no options for that." (P112, person over the mean age, diagnosed with RA)*

> *"Now I have this problem, that I have small and short feet, I need to buy shoes from the children's department." (P117, person under the mean age, diagnosed with juvenile RA)*

The facilitating factors for foot health

The facilitating factors for foot health were: ***professional care***, ***physical activity*** and ***active foot self-care***.

Professional care was considered important and consisted of medical RA care, podiatry and physiotherapy. Medical care included correct and effective medication, which made day-to-day life pain-free and motivated the participants to move around. In addition, the participants highlighted the benefits of knee and hip joint replacement surgery. The participants were satisfied with the joint replacements and reported being able to move without pain.

> *"Surgery and joint replacements have helped me to walk." (P116, person over the mean age, diagnosed with RA)*

Podiatric care was considered to be highly important. Some participants had received referrals to free podiatric care; for example, six times a year. This kind of care was highly appreciated, and the participants were satisfied that a professional was taking care of their feet. The participants were aware of the importance of podiatric care, and it was expressed that those who could not get referrals to podiatry because of differences in care pathways in different municipalities had purchased private podiatric care. The participants stressed that they needed to demand or ask for podiatry services; they were not offered them on a regular basis.

> *"Professional foot care is important; they know how to care for feet." (P112, person over the mean age, diagnosed with RA)*

> *"I have purchased foot care for myself." (P115, person over the mean age, diagnosed with RA)*

> *"If I feel that I need foot care or podiatry, I need to ask for it; they don't give it to you easily." (P124, person over the mean age, diagnosed with juvenile RA)*

Physiotherapy was also seen as important, especially for maintaining the ability to move. Many participants received physiotherapy through a referral from their physician; for example, once every two weeks or once a month. The participants received, for example, ultrasound, electrical stimulation or massage when necessary. They participated in group exercise sessions where a physiotherapist gave advice on, for example, foot stretching and muscle strength exercises. In addition, they were given advice and exercises to do at home.

> *"Regular physiotherapy and home exercises are good." (P113, person over the mean age, diagnosed with RA)*

The participants also highlighted the importance of professional assessments of foot health. They believed that all health-care professionals should be interested in the foot health of patients with RA and that they should at least ask these patients about the current status of their feet. Some reported that a rheumatologist assessed their feet during their annual medical appointment at the rheumatology clinic in specialised health care. However, some participants reported that during these annual appointments they only discussed changes or updates to their medication; no interest in their feet was expressed.

> *"Every time a patient has a health-care visit, the feet should be assessed or at least [patients should be] asked 'how are your feet?'" (P122, person over the mean age, diagnosed with RA)*

Physical activity and exercises were considered important, and the participants reported that they tried to exercise every day, even if it was just a small amount. The participants also highlighted that it took courage to start or keep moving when they experienced stiffness and pain in their joints. The participants' physical activity consisted of supervised group exercise and self-directed daily exercise.

Supervised group exercise included water-based exercise, water running, muscle strength exercises and dancing. Water as an exercising environment was considered beneficial for the foot joints and for reducing the strain on the body. The participants liked doing supervised group exercise sessions with other patients who had RA and felt that this motivated them to continue exercising. Being able to exercise with other people who had similar issues with their health and joints was important. Many participants reported not exercising with people who did not have health problems because they feared that they would be stigmatised or that they would not be able to do all the movements.

> *"Running in water is much better for my joints than walking on asphalt."*
> *(P113, person over the mean age, diagnosed with RA)*

The participants felt that it was important to do some self-directed exercise every day. Walking around the city or going to the shop and carrying their purchases home was seen as muscle strength exercise. The participants mentioned going to the gym, using an exercise bike and doing strength exercises at home. They also modified their exercise routine in accordance with the condition of their body on any given day. Some reported doing exercises while sitting on a chair instead of while standing. Some said that they did more muscle stretching on days when walking was painful or the weather was poor. They also emphasised the importance of resting and recovering from exercise. Listening to one's own body and state of health, not overdoing one aspect and pausing during exercises were crucial. In addition, maintaining a healthy body weight was considered important because this reduced pain in the foot joints and made moving around possible.

> *"It is so important to have enough muscle strength in your lower legs. Muscle strength supports your foot joints. It is crucial." (P117, person under the mean age, diagnosed with juvenile RA)*

The participants tried to walk and exercise as much as possible within the limits of RA. They wanted to walk, but stiffness in the foot joints, pain and limited muscle strength in the feet prevented them from walking for long distances. The participants reported staying in the home and not walking very far if their foot pain was intense.

Active foot self-care was considered to be essential for preventing foot problems. This consisted of assessing and caring for the feet every day and wearing suitable shoes. The participants felt that daily assessments were fundamental for being aware of their current foot health and for monitoring any changes. When the participants noticed problems, they either took care of these themselves or shared their concerns with a health professional.

The participants believed that assessing their own foot health was important in order to maintain the health of their feet for as long as possible. They emphasised the importance of dealing with minor foot problems in a timely manner, and they encouraged their friends and peers to monitor and care for their own feet. The participants had not recognised the importance of foot health until the condition of their feet worsened. When foot problems were present, these affected a participant's whole body and made it harder to walk and perform daily activities.

> *"I have said to my friend, that if you have minor foot problems or pain, go to see a physician. Go and ask for help when it is still possible to cure." (P112, person over the mean age, diagnosed with RA)*

> *"Foot health is very important and feet are almost the most important part of the body. Unfortunately, their importance is recognised only when they hurt." (P130, person over the mean age, diagnosed with RA)*

The participants also understood the importance of keeping the skin of the feet intact and avoiding inflammation if they had received a knee or hip joint replacement. The participants reported that daily hygiene, including washing and moisturising the feet, was important for maintaining healthy skin. Drying the feet after a shower was difficult due to the inability to bend down. However, the participants improvised to find tools and methods that supported them to dry their feet; for example, by using a long, thin piece of towel. Some participants had a personal carer who visited every day and helped with foot care, and others asked their spouse, daughter or grandchild to help.

> *"I have these artificial joints in my hip and knees, so it is important to check the skin between the toes to avoid any skin breaks or inflammation." (P117, person under the mean age, diagnosed with juvenile RA)*

Suitable shoes were considered vital because they made walking possible. The participants reported several characteristics that, in their opinion, a good shoe should have. They believed that a shoe should be soft, be lightweight, have a flexible but firm sole, have a wide fit, have enough space for the toes, be easy to wear, have a Velcro fastening and provide enough space for custom-made insoles. Some of the participants reported finding suitable shoes at a retail outlet, while others were satisfied with the custom-made shoes. Once the participants found a pair of shoes that fit, they usually wore them for as long as possible. Those who had suitable custom-made shoes reported that the choice of colours and materials was getting wider. They appreciated it when their custom-made shoes looked like normal shoes that did not highlight their problematic feet.

> *"I prefer shoes that I can put on by myself." (P125, person under the mean age, diagnosed with juvenile RA)*

"I have good custom-made shoes. They are supportive and suitable for me. Of course, I needed to get used to using them first." (P129, person over the mean age, diagnosed with RA)

"I only wear shoes that feel good and are suitable for my feet." (P115, person over the mean age, diagnosed with RA)

Discussion

This study described the experiences of foot health and the factors that hinder or facilitate foot health in patients with RA. The participants experienced foot health as an important part of their general health. Physical and personal issues, inequalities in access to professional foot health care, and problems with finding suitable shoes were experienced as hindering factors. Professional care, physical activity and active foot self-care were experienced as facilitating factors.

Several physical and personal factors that hindered foot health were noted. Physical factors, such as the inability to bend down or cut toenails, caused frustration for participants who were willing to care for their feet. This finding is in line with those of a previous study where limited physical ability restricted foot self-care [21]. The appearance of the participants' feet was also a personal factor that restricted foot self-care. Disorders of the foot, such as flat feet and overlapping toes, were considered unpleasant; therefore, the participants were not willing to show their feet to people they were unfamiliar with. The appearance of the feet was even affecting how the participants chose to dress. However, the participants were willing to reveal their feet to health-care professionals, which confirms the findings of Miikkola and colleagues [22]. In future, a patient-reported instrument that measures experiences related to the appearance of the feet could be developed and used alongside objective foot and ankle

measures. Subjective patient reported outcomes could provide additional information about patients concerns and perceptions related to their feet.

Access to professional foot health care was experienced as complicated. The participants reported differences at the municipal level in access to professional foot care; therefore, the distribution of foot care was considered unequal. This finding is in line with previous studies, which found that patients with RA reported limited access to podiatric care [12]. The participants who were receiving professional foot care were satisfied with it overall, but they challenged the professionals to develop their skills and find new ways of providing care for issues such as toe and foot deformities. This sort of challenge is needed in order to accelerate the innovation of new care methods. In future, health-care professionals' experiences of providing foot care and educating patients in foot self-care could be surveyed and provided more information of needs for further education, thus reinforcing previous research [23,24].

The participants were concerned about how difficult it was to find suitable shoes. Many reported having custom-made shoes but being unable to wear them because of pain, an ill-fitting style or the weight of the shoe. The unfashionable appearance of the custom-made shoes and the lack of choice about styles meant that the attractiveness of these shoes was limited. This finding confirms the results of the previous studies [12], but it also highlights that shoes are important part of self-image. Providing more choice of styles and colours could increase the use of custom-made shoes and support patients' self-confidence. In addition, health-care professionals should find ways to support people with RA to find suitable shoes. Developing patient-reported outcome measures to evaluate patients' experiences of wearing custom-made shoes could support product development and improve patients' adherence with wearing custom-made shoes.

The participants described many factors that facilitated their foot health. Professional care provided by multiple of health care professionals was highly appreciated. Multiprofessional approach in caring for patients with RA is important and should be developed in every organization. Already existing recommendations for diagnosis and treatment of foot problems in patients with RA [25] form a basis for multiprofessional care and thus, should be implemented worldwide. Self-care – in terms of physical activity and foot self-care – were considered as fundamental to maintaining the ability to move. Similar facilitating or promoting factors have also been described by nurses [26], who considered that taking care of their own physical ability and foot health contributed to their well-being at work. Developing interventions for education and physical exercise, including e-health interventions, could promote foot health and general well-being in patients with RA. Patients with RA could benefit from annual assessments of their foot health, including an evaluation of their footwear and education about caring for their own feet.

Trustworthiness of the study

The trustworthiness of this study was assessed by considering its credibility, reliability, confirmability and transferability [27].

The credibility of the study was improved by experienced researchers in the research team and using a peer-debriefing process. The research team consisted of two podiatrists and two physiotherapist, thus representing in-depth knowledge of the topic. The main researcher with background in podiatry (MS) was responsible of the research process and data analysis. The data were collected by a researcher (A-ML) with physiotherapy background who has a strong experience of conducting interviews with people. The research philosophy in this study lies in descriptive phenomenology which aligns with researchers' expertise and backgrounds. The data were analysed by one researcher (MS), and the researcher who was responsible for data

collection (A-ML) read the interviews and discussed the categories and themes with MS to form a consensus. A co-researcher (CB), with long experience of research using content analysis within rheumatology from patient perspectives, peer-reviewed the categories and themes, and a final version was agreed upon by all the researchers. To increase the credibility of the study, the analysis and interpretation of the data was constantly discussed within the research team during the research process.

The reliability of the study was ensured by using a well-known qualitative analysis method [19], reporting the research processes in detail and using the code-recode strategy [28]. Authentic excerpts from the original interviews were included in order to represent the participants' voices and support the findings. The same data were analysed by the same researcher (MS) twice after two weeks of initial coding. The two separate coding results were compared and similarities in the results was confirmed.

The confirmability of the study was strengthened by following consolidated criteria for reporting qualitative research (COREQ) [29]. The data were collected through face-to-face individual interviews, which was considered to be a suitable method. During the interviews, the participants provided extensive descriptions of their perceptions of foot health, which provided rich data. A trusting relationship between the researcher and the interview participants made them feel comfortable to speak in a relaxed manner. The researchers strove to achieve data saturation; this was accomplished when no more new perceptions or aspects of foot health or the hindering and facilitating factors were identified. One interview was very short (13 minutes). Nevertheless, it was included because it produced topical and cohesive information about foot health. To provide background, the participants were asked to self-report their diagnosed rheumatic disease. The participants had other long-term health problems too, which may also have affected their foot health.

Regarding transferability, the study provided a rich description of perceptions of foot health among patients with RA. The data were collected from participants who were members of one regional third-sector patient association. This limits the potential for generalising the results; for example, to patients with RA in other countries. Regardless of this limitation, the findings can be used to develop foot care services for patients with RA. They also serve as a starting point for future research.

Conclusions

This study adds a different perspective from a Nordic country to research about experiences of foot health in patients with rheumatoid arthritis and therefore builds up the knowledge in the field. The participants valued their feet and tried to maintain and promote their foot health by using several self-care methods. Access to professional foot care was seen as difficult and unequal. These patients with RA had a lot of respect for their feet and hoped to be able to function independently for as long as possible. They identified several hindering and facilitating factors for their foot health. Most of the facilitating factors were related to the patients' own foot care, which could be supported by patient education provided by health-care professionals. The hindering factors, such as limited access to professional foot care, could be overcome by restructuring the public system of foot care system so that every patient with RA has equal access to foot care. Personal factors that hindered foot health included a lack of motivation, fear of falling and embarrassment about the appearance of the feet. Health-care professionals could help patients to overcome these barriers.

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Declaration of interest statement

The authors declare that they have no competing interests.

Data availability statement

The datasets used and analysed during the current study are available from the corresponding author on reasonable request.

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Table 1. Example of the analysis process (according to Graneheim & Lundman, 2004)

Meaning unit	**Condensed meaning unit**	**Abstraction of the condensed meaning unit**	**Code**	**Subcategory**	**Category**	**Theme**
The nails in my first toes are so thick. Previously my husband cut my nails, but now even he cannot do it any more [because of the thickness]. 0123	Thickening of the toenail in the first toe impedes cutting; even spouse is unable to cut the nails	Thickened toenails makes cutting toenails difficult	Thickness and shape of nails	Inability to cut toenails independently	Physical factors	Hindering factors for foot health
I do not have the interest or habits in that way that I should have. 0132	Lack of the necessary interest or desire to carry out foot health care	Understanding of limitations in foot self-care	Lack of interest in foot health	Lack of motivation to perform foot self-care	Personal factors	
There are inequalities in foot care, not all patients with rheumatoid arthritis are receiving podiatric or chiropodist care, some cities have financial contracts with podiatrists and some do not. 0118	Foot care in some municipalities is offered and paid for through a financial agreement between a podiatrist and municipality	Discrepancies in the distribution of foot care between municipalities	Professional foot care is not offered equally	Variation in the distribution of podiatric care’	Inequalities in access to professional foot care	
I have had many custom-made shoes, but I cannot wear them. They are heavy and make my feet hurt. 0112	Custom-made shoes are provided, but they are not worn because they are ill-fitting	Custom-made shoes do not provide comfort	Ill-fitting custom-made shoes	Inability to wear custom-made shoes	Problems with finding suitable shoes	

Table 2. Experiences of foot health and the hindering and facilitating factors

Theme	Category	Subcategory
Hindering factors for foot health	Physical factors	Progress of RA
		Inability to cut toenails independently
		Stress on the body, especially the lower extremities, caused by daily activities
	Personal factors	Lack of motivation to perform foot self-care
		Ashamed of the appearance of the feet
		Fear of falling due to foot problems
	Inequalities in access to professional foot health care	Variation in the distribution of podiatric care
		Lack of choice in care methods
	Problems with finding suitable shoes	Inability to wear custom-made shoes
		Lack of choice in shoes
		Mismatch between the foot and the shoe
Facilitating factors for foot health	Professional care	Medical care for RA
		Podiatry
		Physiotherapy
	Physical activity	Supervised group exercise
		Self-directed exercises for the lower extremities
	Active foot self-care	Daily foot assessment and care
		Suitable shoes