

BMJ Open Healthcare workers' perceptions on diabetic foot ulcers (DFU) and foot care in Fiji: a qualitative study

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ABSTRACT

Objectives To explore the perception of healthcare workers (HCWs) on diabetic foot ulcers (DFU) and foot care in Rotuma, Fiji.

Design Using a qualitative study design, two focus group discussions (FGDs) were conducted among HCWs. A semistructured open-ended questionnaire was used to guide the discussion session. Each FGD was audiorecorded and was transcribed. The transcriptions were then manually analysed using thematic analysis.

Setting Rotuma hospital, Fiji.

Participants HCWs who were working in Rotuma hospital for at least a year and were involved in clinical foot care of type 2 diabetes mellitus patients were included.

Results There were five main themes, namely, depth of knowledge, quality of care in practice, factors of influence on practice, lack of resources and capacity building. Participants had superficial knowledge that showed lack of in-depth scientific knowledge. A lack of staffing in the clinics affected the delivery of service. Additionally, patients defaulting clinics, late presentations with DFU and traditional medicine also affected the quality of healthcare service in clinics. There was also a need for a multidisciplinary team to prevent and manage DFU. HCWs mostly advised on glycaemic control and ignored offering foot care advice in clinics due mainly to the lack of sound knowledge on foot care. There was also a lack of resources, infrastructure, space and professional development opportunities, which negatively impacted how HCWs deliver foot care services to patients.

Conclusion HCWs lack significant in-depth knowledge on DFU and foot care. In addition, these are the availability of traditional medicine that delays presentations to hospital, further reducing the quality of services. HCWs need to keep their knowledge and skills updated through regular in-service training on foot care. Resources, infrastructure and supply chains need to be maintained by those in power to ensure HCWs deliver quality foot care services.

BACKGROUND

Diabetes mellitus (DM) has become a very important public health problem globally due to the steady rise in prevalence rates for the past decades.^{1,2} The WHO estimated that of all cases of DM worldwide, about 90% are type 2 DM (T2DM) and have predicted a worrying trend for T2DM in the future.³ People with T2DM are at risk of developing

STRENGTHS AND LIMITATIONS OF THIS STUDY

- ⇒ To our knowledge, this is the first qualitative study to be conducted in Rotuma, Fiji that explored perceptions of healthcare workers (HCWs) on diabetic foot ulcer (DFU).
- ⇒ The study uses focus group discussion among HCWs, which motivates them to be engaged in discussions on their perceptions about DFU.
- ⇒ This study provided a detailed report of its methodology which can be used by future researchers and readers when determining transferability of the study to their settings.
- ⇒ This study may be limited to its setting in rural Rotuma having only one rural hospital.
- ⇒ The lockdown restrictions of COVID-19 reduced the number of participants. Several foot care nurses were stranded in the mainland and were not included as they were not on the island during the study period.

foot complications with a lifetime risk of 25% and somewhere around the world; someone is losing his or her lower limb simply because of diabetes foot complications.⁴⁻⁶

The overall burden of foot complications is estimated to increase rapidly in the future because more than 10% of people already have peripheral neuropathy and vascular disease at the time of diagnosis.⁷ Diabetic foot ulcers (DFU) significantly causes morbidity with prolonged hospitalisations. Additionally, mortality is also high due to DFU and is estimated to be approximately twice as high compared with patients with no DFU.⁸ This DFU eventually end-up with lower limb amputations (LLA) and on a global scale, about 70% of LLA surgeries were related to T2DM and this figure is somewhat consistent throughout studies conducted in some Pacific Island Countries like Tonga, Nauru and Fiji.⁹

With the alarming rate of diabetes in Fiji, complications are also expected to increase with foot complications as being top of the list of complications. Kumar *et al* from 2010 to 2012 gave a crude estimation of LLA due



to DFU to be 180 per 100 000 populations, a rate somewhat similar to developed countries. The study also noted the lack of awareness being done on foot complications, health seeking behaviour and patient's perceptions on DFU which further added to the growing problem of DFU in Fiji.¹⁰

The cornerstone to the prevention of this DFU is quality of engagement of healthcare workers (HCWs) dealing with patients with diabetes. Singh *et al* noted that prevention and awareness on foot care seems to be done only after the initial DFU has developed. In primary healthcare (PHC), patients have their first contact with HCWs and is the most important level of care as it moulds the foundation of care that the patient with diabetes will be receiving.¹¹ For this reason, it is paramount that HCWs must be well versed and well trained in diabetes and foot care to enable them to appropriately deliver quality foot care service to patients with diabetes.^{11 12} Understanding the perspectives of HCWs in the promotion of engagement in foot care is therefore important in formulating prevention programmes because so far, studies have shown that existing interventions are ineffective since it does not consider the behaviours and perceptions of HCWs on diabetic foot care disease.^{6 13}

Furthermore, no studies have been done locally that explored perceptions of HCWs on DFU and foot care. Therefore, this study is aimed at exploring the perceptions of HCWs working at Rotuma Hospital on DFU and foot care. The results of this study would help in the formulating and planning of future prevention strategies to prevent and reduce cases of DFU.

METHODS

Study design and setting

This was a qualitative study conducted in the special outpatient department (SOPD) of Rotuma Hospital, Fiji, from July to September 2021. Rotuma, the furthest island from the mainland of Viti Levu in Fiji, is a small island with a population of less than 2000. Rotuma Hospital is the only hospital on the island with 26 HCWs working there. It is the only healthcare facility offering medical services to all patients with T2DM on the island.

Study sample

These 26 HCWs were purposively sampled based on their work areas to become participants of the study resulting in 9 HCWs being included in the study. Inclusion criteria included: working in Rotuma Hospital for at least a year and their area of work must involve clinical foot care of patients with T2DM. Both male and female HCWs were included in the study, HCWs who work on shifts as well as those on 8:00–16.30 hours daily were included too. HCWs can either be a local Rotuman, Fijian or an expatriate HCWs working in Rotuma Hospital. Exclusion criteria included any HCWs who have T2DM as their perceptions may be mixed up between being a patient and a HCW; excluded HCWs included those not involved in the

clinical foot care of patients with diabetes such as dentists, cooks, cleaners, laundry maids or adolescent health officers; those who refused voluntary participation and those with medical conditions that may be worsened by being a participant in the study.

Nine HCWs were involved in focus groups discussions (FGDs) in order for data to be collected. FGD is a method where participants share common ground and are interviewed together in focused groups. It is effective among those who are comfortable with each other in talking and sharing about a common topic. It can also generate adequate quantities of data in a short period of time and the data can be presented in a simple non-technical way with the use of lay-words and simple sentences and quotations from participants.^{14 15}

There were two FGDs with one group having four participants and the second group having five participants. Their allocation into their focus groups was purposively done to ensure that there was a good representation of staff from different work areas in each group.

Data collection tool

An English semistructured open-ended questionnaire was used to conduct the FGD (online supplemental file). The questionnaire included demographic details of the participant, questions of DM, DFU and foot care and foot wear practices. A pilot test was conducted prior to the actual data collection to test and finalise the questions. It also allowed the interviewer to have a true-time sense of what the discussions will be like and how long will each sessions run for. The pilot sessions also allowed for questions to be modified and edited before being finalised for the actual FGDs.

Study procedure

Following approval from the ethics committee of the Fiji National University and MHMS, HCWs were approached during their working hours and verbally informed about the research project and they were asked if they were interested in participating. Participant information sheets were then distributed to those showing interest in the study. Those who met the inclusion criteria were given consent forms to sign which were then collected before data collection began proper. The recruitment and FGD were conducted by a peer counsellor who has experience in motivational interview and counselling. This was done to avoid bias since the primary investigator is also the doctor for these participants. Both sessions were audiorecorded using a voice recorder and each sessions lasted for about 45–50 min and the sessions were conducted in the conference room of the Rotuma hospital.

Patient and public involvement

No patient involved.

Data management and analysis

The FGDs were audiorecorded that were transcribed by the interviewer and the primary investigator at the end of every session. The recordings were heard over and

over again to ensure all data is captured in the transcriptions. The transcribed data were then printed and analysed manually using thematic analysis. The steps in the analysis were familiarisation, coding, theme generation, review themes, define and name of themes and then write-up.^{16 17}

Study rigor

To ensure this study was conducted with rigour, four criterion were used and they were transferability, credibility, dependability and confirmability.^{18 19} Transferability is when the finding of the study can be applied in another setting or in the future. In this study, comprehensive descriptions of the study background, significance and study design, participants and study method were provided and these will allow the reader to make assessments if it can be applied to their setting. Credibility refers to the true study variables being a true representation of participants' real life and was ensured in this study through recruitment of participants and reviews from the research team. Dependability is the availability of enough information in the study to allow another researcher to conduct a similar study and in this study, this was ensured through providing a detailed writing of the methodology of the study. Lastly, confirmability is how the study reduced investigator bias and was done in this study by recruiting an independent interviewer as well as peer reviews from the research team.^{18 19}

RESULTS

Characteristics of participants

Nine HCWs participated in the FGDs with more females than males; an equal distribution of i-taukeis and Rotumans with 1 Fijian of Indian Descent. The age group of the HCWs ranges from 25 to 45 years. Only two were still single and all of them have been in the service for more than a year. Two had completed postgraduate training while the other seven had completed their undergraduate training. The HCWS area of work were : one was a nurse practitioner (NP), two were nursing managers, one was a supervisor dietician and five were registered nurses. **Table 1** summarises the general characteristics of HCWs.

Themes identified

Five themes were synthesised from the data collected and they were depth of knowledge, quality of care in practice, factors of influence on practice, lack of resources and capacity building. There were 12 subthemes which are summarised in **table 2**. The participants were coded P1 as participant 1, P2 as participant 2 and so on.

Theme 1: depth of knowledge

Theme 1 presents the depth and level of scientific knowledge of HCWs regarding DM including its pathophysiology, causes, risk factors, complications and also DFU; its pathophysiology, management and prevention. It has

Table 1 General characteristics of HCWs (n=9)

Personal information	No	%
Gender		
Male	3	33.3
Female	6	66.7
Age (years)		
25–35	5	55.6
36–45	4	44.4
Ethnicities		
i-taukei	4	44.4
Rotuman	4	44.4
FID	1	11.1
Marital status		
Single	2	22.2
Married	7	77.8
Years of service		
>1–10 years	5	55.6
>10 years	4	44.4
Educational level		
Post graduate	2	22.2
Under graduate	7	77.8
Area of work/roles		
NP	1	11.1
NM	2	22.2
SD	1	11.1
RN	5	55.6

FID, Fijian of Indian Descent; HCWs, healthcare workers; NM, nursing managers; NP, nurse practitioner; RN, registered nurses; SD, supervisor dietician.

three subthemes namely DM knowledge, DFU knowledge and foot care knowledge.

DM knowledge

The majority of the participants were not able to clearly explain the pathophysiology of DM and T2DM. The common knowledge was that DM is when the blood glucose levels are high:

To be honest, I am not really sure how to explain diabetes but to put it simply; it is the excessive glucose that is running around in the blood. It is a non-communicable disease and one of the major causes of death. P1 (a 36-45 year old female)

Another participant said that when the blood sugar level is as high as 10, it could mean that the patient is diabetic:

For me, diabetes is when the Capillary Blood Glucose (CBG) that we test is high and I tell the patient that he or she could be diabetic. The values for cut off are

Table 2 Theme and subtheme identified

Themes	Subthemes
Depth of knowledge	DM knowledge
	DFU knowledge
	Foot care knowledge
Quality of care in practice	Multiteam approach
	Lack of time
	Glycaemic control versus foot care advice
Factors of influence on practice	Environmental and social factors
	Personal factors
	Lack of staffing
	Level of insight
	Lack of social support
	Traditional herbal medicine
	Compliant patient
	Staff treating family members
	Differences in signs and symptoms
	Life priorities
	Access to available resources
	Stigma associated with the hospital
	Footwear practices
	Lack of resources
Supplies	
Human resources	
Capacity building	Development opportunities
	Clinic attachments

DFU, diabetic foot ulcers; DM, diabetes mellitus.

somewhere around 10...I think... P2 (a 36-45 year old male)

Further describing DM, another participant added that DM harms people silently:

It is a silent killer . P3 (a 25 - 35 year old female)

One of the participants explained the chronicity of the natural history of DM stating that it does not happen suddenly, it develops as a process over the lifetime of a person before being diagnosed as diabetic:

Diabetes is a chronic disease that happens to develop over a period of time... and when they get older, the effects of unhealthy eating and drinking can result in diabetes... P2 (a 36-45 year old male)

Another participant added further and explained the role of endogenous insulin in the uptake of glucose at cellular level:

...Endogenous insulin is needed to facilitate the uptake of glucose in the body but when the body is unable to produce insulin, than this glucose won't

be able to be used up in the body and so will float around in the blood and when tested, will show a high reading of CBG. P9 (a 25-35 year old male)

There were differences noted in the participant's response regarding the normal values for random blood sugars (RBS) and fasting blood sugars (FBS). One of the participants mentioned the two different values of RBS and FBS.

RBS should be less than 7 and FBS should be less than 6. P8 (a 36 - 45 year old male)

Another participant mentioned a different value for RBS and FBS:

The cut-off is 10 for fasting blood sugars and if more than 6.5 for random sugars, that is high. P7 (a 25-35 year old female)

However, two of the participants managed to correctly mention the values of RBS and FBS that is accepted as within normal ranges:

If the fasting blood sugar is less than 6 and random blood sugar is less than 6.5, then that is considered to be normal and not diabetic. P3 (a 25-35 year old female)

Similarly, the second one stated the range for FBS and the ideal time it should be measured:

FBS must be done in the morning as soon as the patient wakes up and before drinking or eating anything, it should be around 4 to 6. P4 (a 25-35 year old female)

The three types of DM were generally well understood by all participants:

There are 3 types of diabetes... type 1, type 2 and gestational diabetes. Type 1 diabetes is insulin dependent...and gestational diabetes is only happen during pregnancy...and they must be advised that they are at risk of developing Type 2 diabetes if they are not careful with their lifestyle. P5 (a 36-45 year old female)

Risk factors associated with development of DM were well explained by all participants. One of the participants stated that poor lifestyle such as unhealthy eating, smoking and lack of exercises can lead to DM:

There are a lot of factors that work together to cause diabetes like unhealthy eating, smoking, lack of exercises. P1 (a 36-45 year old female)

Additionally, another participant explained further on diet and what she has observed among the patients with T2DM eating more than one type of carbohydrate food in one meal. The participant explained that such eating habits can increase levels of glucose in the blood:

Mostly diabetic patients use more than 1 type of starch in one meal...which leads to high levels of glucose in the blood... P3 (a 25-35 year old female).

Another participant explained a positive family history of DM is also a predisposing factor to DM, particularly if one is not careful of his or her lifestyle habits:

Those with positive family history of diabetes are also at risk of getting diabetes and if they are not careful with their lifestyle, then they have a high chance of getting diabetes. P8 (a 36-45 year old male)

Furthermore, another participant explained that certain medical conditions can impair the ability of the pancreas to produce endogenous insulin which can lead to high glucose levels in the blood:

There are some of the medical conditions that can cause the pancreas to stop producing insulin which can cause glucose levels to increase in the blood. P9 (a 25-35 year old male)

When it comes to complications of T2DM, all the participants were able to correctly name some complications. One of the participants mentioned the eyes can be affected as well the nerves leading to decrease sensation in the legs and feet:

... I think diabetes can affect the eyes and cause blindness. It also affects the nerves because...many of them say they can't feel anything and their feet are always numb. P4 (a 25-35 year old female)

Another participant added to the discussion that uncontrolled sugar levels can also lead to kidney problems, amputations and skin itchiness:

...it can lead to complications like eye damage causing blindness, nerve damage, amputations and kidney problems... skin itchiness and their random blood sugar is always high. P5 (a 36-45 year old female)

Moreover, another participant rounded up the complications and said that DM basically affects every organs of the human body even when patients with DM manage their diabetes well:

Diabetes basically affects nearly every organ in the human body even with good control of their sugars, some will have some complications. P7 (a 25-35 year old female)

The management of T2DM was well-explained and discussed by the participants. One of the participants explained that when a patient comes in for screening for the first time and was found to have high levels of RBS, the patient will first have a trial of lifestyle modification therapy through smoking cessation tips; eating healthy foods; reduction in the consumption of alcohol; and physical activity, otherwise known as smoking, nutrition, alcohol and physical activity (SNAP) therapy:

With diabetes, when patients come in and their first reading of CBG is high, we advise on repeating their test by doing fasting blood sugars...we start the patient on SNAPs clinic...We give them time to practice

the advice and when we review them again usually after 4 to 6 months and their readings are still high, I refer them to the doctor for medications. P6 (a 25-35 year old female)

Another participant explained the holistic approach to managing a patient with diabetes whenever they come in for clinics:

...for me holistically, I will look at the patient when they come in for diabetic clinic, first their vitals especially CBG, BP and height and weight. Then will advise them on what their results are and from there will do a general physical examination before counselling them on compliance to medications and replenish their medications. P1 (a 36-45 year old female)

Diet control is also an important part of managing DM and here in Rotuma where the study is done, diet control is one of the most challenging aspects to implement in patients with T2DM since patients mostly eat whatever is available at home:

For us here in Rotuma, it's the diet management that's the hardest part because for patients and people to change their diet according to our advice, they will just nod their heads but when they go home, they eat whatever they want so it is hard to change their diet to manage their diabetes. P7 (a 25-35 year old female)

To address and strengthen diet control, it is useful to assess what the patients have at home and from what is available, a diet plan is drawn up and tailored to each patient depending on what they have available. This is one of the ways diet control can be effectively implemented:

I normally take their diet history and while taking their diet history, I note down all the foods that they take in a particular meal...They just make use of what is available at home and teach them on portioning of carbohydrates especially... P3 (a 25-35 year old female)

Managing T2DM is also about ensuring that appropriate equipment, guidelines and medical supplies are available to be used by the clinical staff:

...ensure that there is always the diabetic management guidelines are always available in the ward and the SOPD and Foot Clinic for the nurses to follow when managing a diabetic patient. P5 (a 36-45 year old female)

DFU knowledge

Generally, all participants lack in-depth scientific knowledge on the pathophysiology of DFU:

When I hear foot complications, I think of foot amputations....so I think poor glycaemic control is the root cause of DFU. P1 (a 36-45 year old female)

As explained by one participant, numbness felt by patients is due to uncontrolled sugars:

...it's the uncontrolled sugars that are causing all the numbness. P4 (a 25-35 year old female)

In addition, it was furthermore highlighted that uncontrolled sugars can also slow the healing process which can ultimately cause a small cut to develop into full blown foot sepsis:

...the uncontrolled sugar contributes to the slow healing process and soon after some time, you can see the ulcers spreading all over the foot. P3 (a 25-35 year old female)

Furthermore, when the nerves are damaged, patients with diabetes will not be able to feel anything on their feet as sensation decreases and this can lead to unnoticed cuts and wounds that can become infected:

The complications that will arise is when the nerve endings are damaged so they cannot feel their feet. They have to be very careful with their feet as it can lead to wounds that will be hard to heal leading to foot sepsis and then amputations. P5 (a 36-45 year old female)

Another participant highlighted the functionality of the feet and legs and expressed what could happen if the feet are injured:

The legs are a very important part of the body including the feet as it is where we stand and if the injury is on the foot, it affects their mobility and balance and will need assistance so that they can offload their feet. P6 (a 25-35 year old female)

High glucose levels leads to slow wound healing, further leading to DFU and ultimately amputations:

Because of the high glucose level, this slows down wound healing so it might take time for the wounds to heal developing into DFU ...and will lead to amputations. P7 (a 25-35 year old female)

Another participant added and explained that arterial damage and nerve damage are the two main factors that lead to DFU:

I think the two main factors that works together to trigger the development of DFU are damage to the arterial walls of the feet coupled with nerve damage...which will lead to the development of DFU. P9 (a 25-35 year old male)

The concept of the management and prevention of DFU were well discussed by all the participants. High glucose levels are managed with exogenous insulin to get them down before their feet are examined for any ulcers or callous:

...if their sugar is very high on triage...I will first ask doctor for some immediate treatment like insulin

and then will repeat again after 30minutes... I check their feet and I advise them on how to look after their feet and appropriate foot wear... P4 (a 25-35 year old female)

Another participant explained the effectiveness of motivational interviewing when counselling patients with diabetes on foot care:

...Motivational interviewing of patients must be done in the foot clinics to diabetic patients to motivate them on foot care... P2 (a 36-45 year old male)

Another participant further added the care and management of DFU when patients with diabetes with DFU are discharged from the hospital:

...if they are discharged home with DFU, I follow them up at home and visit them daily to do their dressing... I always discuss the progress with the doctor and I must make sure that all diabetic feet with DFU is saved from being amputated through proper dressing, foot care and good hygiene. P7 (a 25-35 year old female)

For the prevention of DFU, a few of the participants (4) mentioned how regular foot examinations conducted either in foot clinics or the outpatients' department is important in prevention strategies. Regardless of the presence of DFU or not, every patient with diabetes must have their feet checked and assessed:

I think every diabetic patient who comes through our doors, regardless whether they have any DFU or not, must get feet examinations. Particularly important are those diabetics who have not yet developed any ulcers on their feet. P8 (a 36-45 year old male)

Prevention of DFU includes appropriate foot examination before any ulcers developed to ascertain patients' risk level of developing foot ulcers:

...if we only examine the foot of those with DFU, than there is no prevention the ulcer is already there... P9 (a 25-35 year old male)

Furthermore, another participant stressed that all HCW must start practicing feet examinations on all patients with diabetes who come in through General Outpatient Services (GOPD):

Feet checks for all our diabetic patients must be practiced regularly in outpatient so that we can be used to doing regular feet checks. P1 (a 36-45 year old female)

The examinations of the feet must be done by HCW who have been trained in foot care and who know what to look for in a diabetic foot:

Feet examinations must be done properly by a trained foot care nurse who knows what he or she is doing..... P6 (a 25-35 year old female)

In addition to foot examinations, foot care education and advice must also be part of the package and patients with diabetes should be advised on how to take care of their feet at home:

I think it is also important to educate our diabetic patients of how to look after their feet at home and offer them advice on proper foot wear because if we don't then they won't know what they need to do. They will always depend on us at the hospital to do it for them. P2 (a 36-45 year old male)

Similarly, another participant agreed with the concept of foot care advice in addition to foot exams and assessment and added that the mode of advising and educating the patients is also important:

...foot care advice must be given every time a diabetic patient comes into the hospital, and I believe with the use of pictures, they will be able to better grasp the concept of how to do proper foot care at home. P6 (a 25-35 year old female)

Another participant went on further to discuss the challenges with washing of feet at home and how it should be done:

...many times, even us when we have our bath, we tend not to really bend down and wash our feet, so it is important that we be clear and specific to explain to diabetic patients how to wash their feet properly, not just wet it with water... P9 (a 25-35 year old male)

Foot care knowledge

Generally the depth of scientific knowledge of foot care had a lot of gaps. Participants were aware of washing the feet and wearing proper foot wear as a means of taking care of the feet. Regarding washing of the feet, participants highlighted use of soap and water, appropriate water temperature and the timing of washing the feet:

All I know is that we advise the patients to wash their feet with soap and water when they have their bath and then dry them with a towel... P8 (a 36-45 year old male)

Another participant highlighted the times when diabetic patients must wash their feet in addition to their bathing times:

...whenever they come back from the bush or from doing anything outside, they must wash their feet... am not really sure if there are any guidelines on how to perform the washing of the diabetic feet... P7 (a 25-35 year old female)

Another participant further explained the water temperature which must first be tested using the hands before washing their feet:

...they must thoroughly clean and wash their feet with water and soap, water must be luke-warm and they must first test the temperature of the water with their hands and not their feet... P6 (a 25-35 year old female)

The wearing of appropriate footwear was mentioned during the discussions to protect the feet:

Appropriate shoes they should wear must cover all the feet with straps... P5 (a 36-45 year old female)

The definition of proper foot wear was discussed by one of the participants as well as the need to wear socks when wearing closed shoes:

The foot wear they choose must fit them perfectly with some space in front if it is a closed shoe and some gap at the heel as well... they also must wear socks to avoid blisters and skin breaks... P3 (a 25-35 year old female)

Timing of when it is best to buy shoes was also mentioned yet the reason behind it remained unknown among the participants:

I have heard some nurses in foot care when they advise their diabetic patients to go and buy shoes in the afternoon... I don't know the reason though. P5 (a 36-45 year old female)

Theme 2: quality of care in practice

This theme is comprised of three subthemes, namely multiteam approach, lack of time and glycaemia control over foot care advice.

Multiteam approach

This subtheme portrays the responses of the participants regarding the approach in taking care of a diabetic patient's feet. All HCWs agreed that there is a need for a multidisciplinary team when it comes to diabetes and foot care management and they each described their roles as being part of the team in Rotuma hospital. They went on to explain some of the roles of other disciplines that should be part of the team:

For effective care and management of a diabetic patient, not only do we need doctors and nurses, we also need a dietician, a physiotherapist, a pharmacist, a lab technician, a scan technician and a counsellor especially in a rural hospital setting like Rotuma.... so that it makes our work easier. P1 (a 36-45 year old female)

Another participant highlighted the need for a physiotherapist to be part of the team:

...and here in Rotuma, we do not have a physiotherapist who is equally important in the foot care practice... P2 (a 36-45 year old male)

Furthermore, one of the participants also stated that Rotuma Hospital needs another foot care nurse who must

only focus on conducting foot care so that the clinic is not disrupted.

...there is a need for a foot care nurse in Rotuma who will be responsible only for the foot examinations and care... P4 (a 25-35 year old female)

Unit managers and supervisors also play an important role in the multi-team approach to ensure that instruments, guidelines and supplies are always available:

As a Nursing Supervisor, I must ensure that the nursing staff follow the proper protocols and ensure that all the orders given by the doctors are followed through... P5 (a 25-35 year old female)

In addition, another participant highlighted the same concepts regarding roles of unit managers:

As a manager in public health nursing, my role is to ensure that my 2 community zone nurses have all the supplies and equipment that they need to attend to DFU patients in the community that has been discharged from the hospital... P2 (a 36-45 year old male).

Lack of time

Three of the participants expressed their frustrations with regards to time. They mentioned that there is usually not enough time to perform proper foot care advice and sometimes even to do feet examinations.

...for foot care, we really need time to sit down and spend with them on assessing and examining their feet...here in Rotuma Hospital, I am the only nurse who does triage for SOPD cases like high blood pressures, cardiac, diabetics and other medical cases and the only time that they have been scheduled to come for clinics is only Thursdays and Fridays of every week and most of them don't have time to wait. P4 (a 25-35 year old female)

A separate day for foot care only was brought up during the discussions since Thursdays and Fridays are always crowded with all other SOPD patients:

...we need to have a separate day for foot care so that we don't crowd up here on Thursdays and Fridays since other SOPD clinics are also running on those days.... P1 (a 36-45 year old female)

Another participant shared the same sentiments regarding diabetic patients who came in for SNAPs clinic on Thursdays and Fridays and due to the overcrowding of patients, she is unable to refer them for foot assessments:

... I also have SNAPs clinics on Thursday and Fridays and it is usually crowded and sometimes diabetic people have no time to wait...they said that they have to go since the transport is about to go back to their village. P3 (a 25-35 year old female)

Glycaemic control versus foot care advice

All of the HCWs admitted that they do not routinely offer foot care advice to patients with diabetes who do not have DFU when they come in for their clinics. Foot care advice is usually given to those who have already developed DFU on their feet:

...I hardly offer foot care advice when am attending to a diabetic patient especially when they do not present with anything related to the feet... P1 (a 36-45 year old female)

Another participant admitted to not giving foot care advice to those patients with diabetes who do not have any DFU:

...if they do not have any foot complications or problems when they come to the hospital, I don't give them any foot care advice... P5 (a 36-45 year old female)

Another participant realised from the discussions that foot care advice is something not routinely done in the triage areas of GOPD and SOPD. She added that the focus of care was always on the chief complaint during that particular visit:

... Many times we just focus on what they present with and our thinking and focus of care is limited only to what brought them to the hospital, especially diabetics that we tend to forget about the other aspects of diabetes care and foot care... P6 (a 25-35 year old female)

On the other hand, all participants admitted that they always offer advice on controlling of the CBG to anyone who is diabetic regardless of their reason of coming to the hospital. Any diabetics who present, whether it is for routine medical check, they are sick or they come in for their scheduled clinics, glycaemic control is always the first advice given to them, so much so that it is offered more than foot care advice:

...for me whenever they come in for clinics, I just look at the CBG results and start my advice on how to control their sugars through nutrition and diet therapy... I never look at other vitals on the patients' folder and hardly offer them any foot care advice... P3 (a 25-35 year old female)

The same practice was shared by another participant whereby glycaemic control dominated the consultation with the patient with diabetes:

when they come with their folder from the triage nurse, I'll just check if he or she is a diabetic patient, I same time focus my attention on the CBG reading...hardly offer foot care advice...just mainly glycaemic control. P1 (a 36-45 year old female)

Additionally, another participant shared how in practice, advice on glycaemic control dominates the approach

to a patient with diabetes regardless of their chief complaint:

... And if they come in complaining of numbness or tingling sensation in the feet, I straight away start telling them about glycaemic control, ask about their medications and send them back home...I forget to even check their feet, examine their feet or offer any advice regarding foot wear or foot care at home... P9 (a 25-35 year old male)

Another participant admitted to not giving foot care advice to patients:

...for me, I advise on diet control to bring their sugar down but foot care advice...not really. P7 (a 25-35 year old female)

Participants were probed as to what could be the possible reasons for them routinely offering and placing emphasis on glycaemic control but overlooking foot care advice among patients with diabetes. One of the participants said that it is how things are usually done in Rotuma Hospital:

...it's what I have observed to be the normal way of doing things here in the triage area or in SOPD especially for us nurses... P7 (a 25-35 year old female)

As mentioned by one of the participants, their lack of knowledge on foot care is a major hindrance to them offering foot care advice to patients for fear that they might give wrong advice:

For me... I always feel uncomfortable talking about foot care or giving advice on foot care because I know I am not trained in foot care.... P5 (a 36-45 year old female)

Another participant concurred with the concept of lack of knowledge which demotivated him from offering foot care advice:

...I think because most of us haven't been trained in foot care... I usually give advice on things I know a lot about ...to be safe...otherwise I might spew out some wrong information to the patient... P3 (a 25-35 year old female)

Additionally, another participant stated that if one is not well versed with foot care, he or she would avoid the topic altogether:

...most of the nurses are not carefully trained in foot care and this will affect their foot care counselling as they would lack the confidence to do something that they are not well versed with ... P2 (a 36-45 year old male)

Theme 3: factors of influence on practice

This theme discusses the factors that influence how the participants perceive the delivery of foot care to their patients. There were 13 subthemes that describe these

perceptions, namely, environmental and social factors; personal factors; lack of staff; patients' insight level; lack of social support; traditional herbal medicine; compliant patients; staff treating family members; differences in signs and symptoms; life priorities; access to available resources; stigma associated with hospitals and footwear practices.

Environmental and social factors

Participants highlighted that situations and conditions at home influence their mood and attitude which is sometimes unconsciously projected towards service delivery in the clinic:

...sometimes, I come to work with a bad mood because of something that might have happened at home or outside the hospital and I do admit that I unconsciously project my unhappy mood to my diabetic patient.... P7 (a 25-35 year old female)

Personal factors

Another participant also shared that personal commitments sometimes affect how well she conducts foot care on patients with diabetes:

...sometimes if I have some other personal errands or commitments that I need to attend to...it affects the quality of the foot care I will offer that day... P3 (a 25-35 year old female)

One of the participants stated that if the patients he is seeing has defaulted scheduled clinics on many occasions, he is usually in a bad mood and he is annoyed by the attitude of that patient not coming for scheduled clinics:

...when I see their clinic card and they have defaulted so many scheduled clinics, man it usually make me angry and sometimes like I feel like I don't want to attend to them or triage them for the doctor to see him or her. P9 (a 25-35 year old male)

Three of the participants mentioned that if the patient they are seeing is their relative or they know each other well, than the level of care that will be offered will be different:

sometimes when I see my family members, especially my father and my sister who are both diabetics sitting in the waiting area, I always go and pull out their folders and triage them first even though some of the patients who are also waiting came before them. P6 (a 25-35 year old female)

In addition, another participant expressed the same attitude:

...if I see my close relatives and friends, I quickly attend to them and sometimes fast-track their folders to the doctor to see them first. P8 (a 36-45 year old male)

Lack of staff

The lack of HCWs manning the SOPD and foot care clinics affect the way healthcare services is delivered to patients with DM and compromises the quality of care given:

...we should have two nurses in SOPD clinic especially on Thursdays and Fridays because these two days, we have pressure clinic, diabetes clinic, foot care clinic, SNAPs clinic and only one nurse doing all this clinics and triaging SOPD cases, then goes and attends to foot care... P1 (a 36-45 year old female)

Another participant mentioned the same issue and highlighted the need for more staff on the deck during busy periods:

...we need 2 nurses to help each other out, one to do SOPD triaging and registering, the other one to focus only on foot care... P3 (a 25-35 year old female)

Level of insight

A participant explained an issue about patients lacking insight about their diabetes and foot ulcers and hence takes their illness lightly because they do not fully grasp the gravity of their illness:

...you can see that if they understand their diabetes and foot complications, there will be a change in their self-care at home. It is important that we as HCWs ensure that they understand what is going on, why they have diabetes and why we are telling them to do this and what is going to happen if they don't follow our advice....once we do this and they have good insight, our work will be really easy. P2 (a 36-45 year old male)

Another participant explained how following whatever the patient says or believes to have been the cause of the problem sometimes stops her from doing the usual foot exams and assessment:

Some of them come in with numbness on their feet and they think it is okay because it is just due to the cold. At times, I go with what they say and I don't do my foot assessment...until they return again then when I do my foot assessment and examination than I noticed that they have high risk of developing DFU... P4 (a 25-35 year old female).

Lack of social support

Two participants highlighted how some patients do not follow what is being done to them especially when they are admitted for glycaemic control in the hospital. Coupled with lack of family support, these patients neglect the health advice and carried on with their lives:

... Some patients we give them the right amount of food, we take care of their wound on time, we give them the right medications on time but all these thing once they go home, we are not really sure

whether they continue at home or no... P3 (a 25-35 year old female)

Another participant emphasised the importance of HCW engaging relatives and caretakers when patients with T2DM are admitted or attending SOPD clinics in the counselling sessions, management and diet preparations:

I just want to add on the relative side...when we advise patients on diet, medications, risk factors and foot care, some of the patients are old and we must always include their families in our counselling sessions... families and relatives support will keep them following advice from the hospital. P5 (a 36-45 year old female)

Traditional herbal medicine

Most patients, despite being advised on early presentation to hospital if they have a cut on their feet, still take herbal medicine first:

....they will try to treat it first at home for a week or two and when it does not work...it is usually late and sometimes... and we refer them for amputations. If they had come in earlier, our care and the case outcome might have been better. P4 (a 25-35 year old female)

Another participant explained the behaviour of Rotumans when they become sick or injured that going to hospital is the last resort. This is worsened by the fact that some diabetics have foot numbness and do not realise that they have sustained a cut to their foot:

Here in Rotuma, people tend to do herbal medicine first and when their cut or ulcers does not heal then they come to the hospital ... Most of them do not realize that they have a cut in their feet until it is bleeding or its swollen or it starts to pain which is usually a few days later. P6 (a 25-35 year old female)

Compliant patients

There are, however, some patients who are aware of the dangers of being a diabetic and having a cut or an ulcer on their foot and present to hospital on time:

....there are a few patients who do present early to the hospital and always inform us that they are worried about their diabetes and want their leg to be treated early before the cut becomes infected... P5 (a 36-45 year old female)

Staff treating family members

On the concept of having relatives and personal relationships with patients with diabetes, one of the participants explained that some of her family members are diabetics and the challenges she faces with trying to provide care for them in terms of glycaemic control:

I live with my family here in Rotuma and my father and one of my sisters have diabetes... when I tell them to go to the hospital to be seen by the doctors, they always say ...you just take care of us at home and bring our medications here. P6 (a 25-35 year old female)

Differences in signs and symptoms

One of the participants made a point about how patients perceive their diabetes and foot complications and relate it to how they actually feel physically as a factor determining the timing of presentation to hospitals:

...they say that they are 100% fine and healthy even though you have glimpsed at their blood sugars and it is very high....people only come to hospital when they feel the pain or they can see physical signs of illness ... P3 (a 25-35 year old female)

Life priorities

Two participants added that many patients have different life priorities and health is not on the top of their priority list. Many make health their priority once they have developed complications like DFU:

...I feel that health is not the people' priority until ...they get really sick ... P1 (a 36-45 year old female)

Similarly, another participant mentioned that patients would rather spend money and resources in other areas pertaining to livelihood if their sickness or wounds are still small:

...many of them would rather spend the money on buying food for the families or other things.... spend the time on their farm or fishing or attending to their livestock...if they feel body weakness...pain on the leg from the foot ulcer that has developed then they'll come up to the hospital. P2 (a 36-45 year old male)

Access to available resources

Three of the participants expressed their thoughts on why patients go elsewhere when they incur a foot injury instead of attending hospital. One of them explained that it could be due to where they live and what is available around them:

...some Rotumans stay and live on their farms and so when they get a cut on their feet, they just use the plants around them in the farm and plus they might be too far away from the main road... P1 (a 36-45 year old female)

Stigma associated with hospitals

Another participant explained that there can be a fear of attending hospital and the stigma may prevent patients or delay them from attending hospital:

I believe it's the lack of knowledge and the fear of amputations... so they may go for herbal medicine...

what they don't know is that they need to come in early so that we avoid amputations... P5 (a 36-45 year old female)

Furthermore, another participant added that fear of needles may deter patients from attending hospital:

...some are scared of needles when they come to the hospital so they will stay away as long as possible until they can't heal the wound themselves. P6 (a 25-35 year old female)

Footwear practices

One of the participants mentioned how the practice of not wearing shoes as contributing to DFU among patients:

...In the village, like it is a custom and has been the practice for a long time for people not to wear foot wears in their homes, around their compounds and even when walking around the village and this is like a social norm. P4 (a 25-35 year old female)

Theme 4: lack of resources

All nine participants expressed how there is lack of essential resources in Rotuma hospital that are crucial to the prevention and management of DFU. This theme has two subthemes namely infrastructure and resources, with resources covering equipment, supplies and human resources.

Infrastructure

Rotuma subdivisional hospital was completely demolished in 2015 when the Fiji government undertook a capital project of building a new Rotuma hospital. However, up until 2021, the new hospital has so far not been completed. With the demolition, the Rotuma hospital was temporarily moved to the Rotuma Council Building, the current location of Rotuma hospital (at 2021) and because this building was not designed to be a hospital, lack of space is a major issue in the daily running of healthcare service delivery. All the HCW participants shared the same sentiments when discussing the need for more space in the hospital:

We need a proper foot care clinic in Rotuma Hospital...If we have to be more vigilant with our diabetic feet surveillance through assessments, risk classification and feet exams, then we need a proper room designated to be the foot clinic with a proper examination bed and foot stools or foot rests. P1 (a 36-45 year old female)

Another participant mentioned how she always finds it hard to conduct adequate foot care because of lack of space:

Sometimes I am unable to do any feet assessment because there is no beds available for me to do my assessments. The room that we are currently using is shared by NP, dietician and is open to anybody...we

need a room with some curtains to do proper feet assessment. P4 (a 25-35 year old female)

Supply

All participants again shared the same perceptions regarding the lack of proper equipment, examination beds and lack of foot care nurses in Rotuma hospital. They all agreed that these are some reasons why foot care and feet examinations are not being done properly in Rotuma and may reflect in the number of patients with diabetes having DFU:

...There is no proper examination bed in Rotuma Hospital, no foot rests or foot stools, only 1 foot tray which limits the number of patients I see in a day for foot care... sometimes I lose hope...I have to look around for space or equipment. P4 (a 25-35 year old female)

Human resources

Another participant explained how having a lack of foot care nurses in Rotuma hospital greatly affects foot care clinics:

We only have 2 foot care trained nurses...they have other responsibilities as well like ward work, other SOPD clinics and community outreach so foot clinic staffing is really affected and we need to have a foot care nurse just to look after foot care. P5 (a 36-45 year old female)

Another participant mentioned that there is no physiotherapist in Rotuma and also highlighted the important role physiotherapists have in foot care:

...we also don't have a physiotherapist who is important in managing the physical activity component as well as shoe-fitting measurements, a pharmacist to help in the education of medications, lab technicians to help the doctor with blood tests to monitor the patients... (a 36-45 year old male)

Theme 5: capacity building

All participants voiced their concerns regarding the lack of pathways and opportunities for them to attend workshops and training on diabetic management and diabetic foot care in Suva. This theme has two subthemes explaining the lack of opportunities to attend workshops and training as well as the lack of opportunities for staff to be attached to the Diabetic Foot Clinic Hub in Colonial War Memorial Hospital (CWMH).

Development opportunities and workshops

HCWs at Rotuma Hospital feel they are always left out during workshops and training organised at national and divisional levels, especially workshops on DM and foot care. One of the participants shared that possibly Rotuma is too far and travel too costly to bring HCW across to the mainland for training and workshops:

...it's like every now and then, we hear our colleagues in Suva attending diabetic foot workshops and when we ask about us here in Rotuma, they always say that we are too far away and too costly to bring us over to Suva for the workshops. P9 (a 25-35 year old male)

Another participant said that there is a lack of opportunity given to them to further their knowledge and update their skills from workshops and training:

I have been in the service for 20 years and I think I have only been to one symposium on Diabetic foot care and that was like 10 years ago... P2 (a 36-45 year old male)

If it is too costly for HCWs to travel from Rotuma to Suva for workshops or to attend training on foot care, then possibly, as one participant suggested, those in higher offices could make arrangements for one of the foot care staff from the Diabetic Hub in CWMH to come and travel to Rotuma and conduct foot care training:

...maybe our headquarters can arrange and send one of the specialised foot care staff in the diabetic hub in CWMH to come and stay with us for a week or two and run the foot care clinic with the nurses here, nurses can learn firsthand how to do proper foot care... P3 (a 25-35 year old female)

Specialised clinical attachment opportunities

Two participants mentioned that nurses should be given the opportunities to go for attachment at the Diabetic Hub in Suva to learn more on diabetic foot care:

...before, like 10 years ago, they use to send us nurses especially out in the island like this for a 1 month attachment at the Diabetic Hub in CWMH and we do feet exams and foot care and when we return, we share our knowledge with the nurses on the ground. However, I have noticed that it is no longer done for the past couple of years...it was a good experience. P8 (a 36-45 year old male)

Another participant added that such arrangements used to take place before which was arranged by the divisional officer:

...it used to be done before but now like it's difficult to arrange for one nurse to go for a month's attachment because divisional office is supposed to do the arrangements at management level... P3 (a 25-35 year old female)

DISCUSSION

This qualitative study aimed to explore the perceptions of HCWs on DFU, working at Rotuma hospital SOPD clinic. There were five main themes, namely; depth of knowledge; quality of care in practice; factors of influence on practice; lack of resources and capacity building.

Participants in this study lacked adequate scientific knowledge about DM, DFU and foot care practices. They had a general knowledge but the specific details of DFU and foot care were lacking. This is worrisome because HCWs must have adequate scientific knowledge about DM, DFU and foot care so they can be confident in disseminating such information and advice to patients. They must also be able to demonstrate the correct techniques of foot care to patients and possess the skills and knowledge to conduct foot examinations in order to diagnose them based on their risk level of developing DFU.^{20–23} Two studies showed nurses possess more practical knowledge on DFU than theoretical knowledge.^{12 23} A few other studies however have also highlighted the gaps in the knowledge of HCWs and recommended ways of improving HCWs' level of knowledge. With greater knowledge, HCWs would be more empowered to provide effective education to their patients and empower their patients.^{21 23 24}

Maintaining delivery of quality diabetic foot care services was also noted to be challenging for HCWs. Lack of qualified HCWs in DM care and foot care can cripple the delivery of service to patients with diabetes. Short-staffed clinics also affect time spent with each patient leading to rushed sessions, resulting in missing out on important advice like foot care. Coupled with a staff shortage, HCWs also highlighted the lack of time to allow them to properly perform foot examinations and provide advice. This was mainly due to the scheduling of foot care clinics which were scheduled together with other special clinics all managed by the same staff. By the time they finished from their other special clinics and then attended to foot care patients, most patients were leaving to take transport back to their communities.

A study conducted in Nigeria found that patients spent less than 5 min of consultations in each clinic and was attributed to shortage of staff, lack of resources and patient load.²⁴ A multiteam approach was highlighted in the study as a necessity to improve service delivery of foot care and DM care to patients with T2DM. The overall management of a patient with diabetic with DFU needs an integrated approach that includes the involvement of a clinician, a podiatrist, counsellors, foot care nurses, a dietician, physiotherapists and so on to holistically manage the diabetic feet and optimise glycaemic control. This was also mentioned in several other studies supporting the approach of having a multiteam approach in the management of patients with DM and foot care.^{20 21} HCWs attitudes towards patients can also affect the quality of foot care they give. This study found that HCWs sometimes assume the worst for patients with diabetes for defaulting their DM clinic or foot care clinic appointments without asking patients reasons and thus may treat them indifferently. McInnes *et al* affirmed that HCWs must always try to understand the patients' perspectives on health behaviour and foot care so that they can effectively educate and promote healthy behaviour.²⁵

Foot care advice was not routinely offered to all patients with diabetes by HCWs in this study. Instead, emphasis was placed on glycaemic control advice rather than advice on foot care. Foot care advice was only given to those patients with DM presenting with a DFU. A consensus statement of a multidisciplinary expert panel that reviewed several relevant clinical papers stated that DM is a silent disease until symptoms appear which usually signals complication onset. Because of this characteristic of DM, patients lack the motivation to take care of themselves and look after their feet well since there are no symptoms in the early stages of the disease. In this situation, the value of target foot care education and advice cannot be over-emphasised and HCWs must include foot care advice in their prevention techniques.²⁵ This study shows that patient education centred on local traditional settings could address the stigmatisation issues and the health-seeking behaviour of local favouring herbal medicines and barefoot walking. Patient education must be culture-specific in order to effectively contribute to changing the mindsets and perceptions of patients. These sentiments were also shown in several studies.^{6 23 26–28}

Lack of a proper foot care clinic room and a lack of surgical supplies and consumables were identified in this study as barriers to the delivery of foot care services to patients with diabetes. To conduct foot examinations, it is important to have a proper room with the proper examination couch and equipment. The practice from this study showed that feet examinations were conducted in the same room with other special clinics and this may compromise the privacy of patients with diabetes. Many patients with diabetes are uncomfortable having their feet or ulcers attended to in front of other patients and this deters them from attending foot care clinics. As highlighted by Tol *et al*, numerous studies have shown that special diabetic foot clinics leads to a reduction in the number of new cases of serious foot complications.²²

HCWs must be exposed to regular training, workshops and skills sessions on DM and foot care to update their knowledge and skills with the latest guidelines on diabetic foot care practice. Such opportunities were lacking as found in this study which placed the HCWs at a great disadvantage. This study identified the need for HCWs to attend workshops and training on diabetic foot care to update their knowledge and skills in foot care. The training of HCWs must include the strengths and limitations of herbal medicine and how herbal medicine may not cure chronic diseases like diabetes and its complications. These findings were consistent with what Jahan *et al* mentioned that HCWs need to continue learning through reading current literature, discussions with professional workmates, CME, medical workshops and symposiums to help develop their experience and knowledge in the management of DM foot care services.²⁹ This was also consistent with what Van Nieuwenborg *et al* stated that HCWs need CMEs to upgrade their knowledge and skills in the field of medicine.³⁰ Two studies mentioned that HCWs need adequate updated knowledge and skills



in foot care to identify high risk foot, prevent them from developing DFU, identify and diagnose DFU and manage them appropriately to avoid LLA. Hence, it is paramount that HCWs foot care knowledge be supported with practical hands-on training.^{29–32}

This study is the first qualitative study to be conducted in Rotuma, Fiji that explored perceptions of HCWs on DFU. It uses FGD among HCWs which motivates them to be engaged in discussions on their perceptions about DFU. The study provides a detailed report of methodology and it also includes ethical considerations taken for the protection of participants. The whole process of the study was also reviewed, criticised and edited by the research team. Participants were purposively sampled to provide rich-relevant information to the study.

Limitations include the setting of the study being conducted in a maritime island with only one hospital. The lockdown restrictions of COVID-19 reduced the number of participants as a number of foot care nurses were stranded on the mainland during the study period and not included.

CONCLUSION

This study found that HCWs had a general knowledge on DM, DFU and foot care but lacked the specific details of theory and practical knowledge. They were confident in discussing risk factors, glycaemic control and nutritional management but were not well-versed with the specifics of DFU pathogenesis and detailed foot care practices and footwear. Foot care advice was used more as a treatment tool rather than to prevent DM and was only given to those patients who presented with DFU. It is recommended that foot care advice be given to those who have not had any DFU so that it can assist in preventing DFU from developing. It is also important to develop and implement interventions that are tailored based on the patients' culture. Lack of resources to support foot care and prevention programmes was a major set-back in the delivery of quality healthcare.

The study would also recommend that policy and decision-makers at national level upgrade existing structures to support the need for space to conduct foot care clinics in PHC. Thus, the perceptions of HCWs influence healthcare services in SOPD and foot clinics, It is vital to understand these perceptions to provide guidance on the best way forward for public health interventions and prevention programmes regarding DFU.

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REFERENCES

- International Diabetes Federation. *What Is Diabetes*. Belgium IDF; 2020. <<https://www.idf.org>> [Accessed 01 Oct 2020].
- CDC. What is diabetes? U.S; 2020. <<https://www.cdc.gov>> [Accessed 01 Oct 2020].
- Galicia-Garcia U, Benito-Vicente A, Jebari S, et al. Pathophysiology of type 2 diabetes mellitus. *Int J Mol Sci* 2020;21:6275.
- WHO. *Global Report On Diabetes*. Geneva World Health Organization; 2016.
- van Dieren S, Beulens JWW, van der Schouw YT, Susan van D, Yvonne T. van der S, et al. The global burden of diabetes and its complications: an emerging pandemic. *Eur J Cardiovasc Prev Rehabil* 2010;17 Suppl 1:s3–8.
- Coffey L, Mahon C, Gallagher P. Perceptions and experiences of diabetic foot ulceration and foot care in people with diabetes: a qualitative meta-synthesis. *Int Wound J* 2019;16:183–210.
- Zhang P, Lu J, Jing Y, et al. Global epidemiology of diabetic foot ulceration: a systematic review and meta-analysis †. *Ann Med* 2017;49:106–16.
- Banik PC, Barua L, Moniruzzaman M, et al. Risk of diabetic foot ulcer and its associated factors among Bangladeshi subjects: a multicentric cross-sectional study. *BMJ Open* 2020;10:e034058.
- Kool B, Ipil M, McCool J. Diabetes mellitus-related foot surgeries in the republic of the marshall islands in micronesia. *Hawaii J Med Public Health* 2019;78:13–18.
- Kumar K, Snowdon W, Ram S, et al. Descriptive analysis of diabetes-related amputations at the colonial war memorial hospital, Fiji, 2010–2012. *Public Health Action* 2014;4:155–8.
- Singh S, Jajoo S, Shukla S, et al. Educating patients of diabetes mellitus for diabetic foot care. *J Family Med Prim Care* 2020;9:367–73.
- Hajos TRS, Polonsky WH, Twisk JWR, et al. Do physicians understand Type 2 diabetes patients' perceptions of seriousness; the emotional impact and needs for care improvement? cross-national survey. *Patient Educ Couns* 2011;85:258–63.
- Matricciani L, Jones S. Who cares about foot care? barriers and enablers of foot self-care practices among non-institutionalized older adults diagnosed with diabetes: an integrative review. *Diabetes Educ* 2015;41:106–17.
- Dilshad R, Latif M. Focus group interview as a tool for qualitative research: an analysis. *Pak J Life Soc Sci* 2013;33:191–8.
- Basnet H. Focus group discussion: a tool for qualitative inquiry. *Researcher: A Research Journal of Culture and Society* 2018;3:81–8.

- 16 Vaismoradi M, Jones J, Turunen H, *et al.* Theme development in qualitative content analysis and thematic analysis. *J Nurs Educ Pract* 2016;6:100–10.
- 17 Caulfield J. How to do thematic analysis [Blog] Scribbr; 2020. <<https://www.scribbr.com/methodology/thematic-analysis/>> [Accessed 13 Oct 2020].
- 18 Cypress BS. Rigor or reliability and validity in qualitative research. *Dimensions of Critical Care Nursing* 2017;36:253–63.
- 19 Maher C, Hadfield M, Hutchings M, *et al.* Ensuring rigor in qualitative data analysis. *Int J Qual Methods* 2018;17:160940691878636.
- 20 Bakker K, Apelqvist J, Schaper NC, *et al.* Practical guidelines on the management and prevention of the diabetic foot 2011. *Diabetes Metab Res Rev* 2012;28 Suppl 1:225–31.
- 21 Sari Y, Yusuf S, Haryanto H, *et al.* The barriers and facilitators of foot care practices in diabetic patients in Indonesia: a qualitative study. *Nurs Open* 2021;00:1–11.
- 22 Tol A, Pourreza A, Shojaezadeh D, *et al.* The assessment of relations between socioeconomic status and number of complications among type 2 diabetic patients. *Iran J Public Health* 2012;41:66–72.
- 23 Alotaibi A, Gholizadeh L, Al-Ganmi A, *et al.* Examining perceived and actual diabetes knowledge among nurses working in a tertiary hospital. *Appl Nurs Res* 2017;35:24–9.
- 24 Ekore RI, Ajayi IO, Arije A, *et al.* Knowledge of and attitude to foot care amongst type 2 diabetes patients attending a university-based primary care clinic in Nigeria. *Afr J Prim Health Care Fam Med* 2010;2:1–3.
- 25 McInnes A, Jeffcoate W, Vileikyte L. Foot care education in patients with diabetes at low risk of complications: a consensus statement. *DIABETICMedicine* 2010;28:162–7.
- 26 Indrayana S, Guo S-E, Lin C-L, *et al.* Illness perception as a predictor of foot care behavior among people with type 2 diabetes mellitus in Indonesia. *J Transcult Nurs* 2019;30:17–25.
- 27 Taksande BA, Thote M, Jajoo UN, Knowledge JU. Knowledge, attitude, and practice of foot care in patients with diabetes at central rural India. *J Family Med Prim Care* 2017;6:284–7.
- 28 Saeed N, Zafar J, Atta A. Frequency of patients with diabetes taking proper foot care according to international guidelines and its impact on their foot health. *J Pak Med Assoc* 2010;60:732–5.
- 29 Jahan F, Al-Kiyumi A, Shaikh Z. The Cinderella of diabetes management: health care workers perception regarding diabetic Foot-care and barriers in primary care. *International Journal Of Medical Science And Health Research* 2018;2:61–72.
- 30 VanNieuwenborg L, Goossens M, De Lepeleire J, *et al.* Continuing medical education for general practitioners: a practice format. *Postgrad Med J* 2016;92:217–22.
- 31 Zahide K, Anita K. Evaluation of Nurses' Knowledge levels of diabetic foot care management. *Nurs Res Pract* 2018:12.
- 32 Brewster S, Bartholomew J, Holt RIG, *et al.* Non-attendance at diabetes outpatient appointments: a systematic review. *Diabet Med* 2020;37:1427–42.