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Research Article

Patient Reported Experience Measures (PREMs) of Multi-Disciplinary Outpatient Diabetic Foot Ulcer (DFU) Care

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ABSTRACT

Background and Aims: Diabetic foot ulcers (DFU) are significant diabetes-related complications which lead to increased healthcare utilization and costs. Patients with DFUs encounter challenges navigating the healthcare system. Understanding patient experiences is crucial for improving healthcare delivery, as it helps to identify gaps in patient care and allow for improved care coordination in a multidisciplinary care setting. This study evaluates patients' perceptions of their outpatient DFU care using the Outpatient Experience Questionnaire (OPEQ).

Methods: A cross-sectional study was conducted on 50 patients with DFUs at a multidisciplinary podiatry clinic in a tertiary hospital in Singapore from January 2023 to April 2023. Baseline clinical and socio-demographic data were collected, and the OPEQ was administered.

Results: All 50 patients completed the OPEQ. The majority were male (76%), with a mean age of 64.8 ± 10.24 years, mean diabetes duration of 21.4 ± 12.04 years and mean HbA1c of 8.1 ± 1.85%. Over the past 12 months, the patients had an average of 6.4 podiatry visits, 12.7 hospital specialist outpatient clinic visits, and 18.2 primary care clinic visits. High satisfaction was reported for clinic facilities, organization, and consultations (mean scores 8.00-9.20). However, poor contactability of the clinic (mean score 4.45) and lower patient activation (mean score 7.43) were significant issues. Most patients had low educational backgrounds and limited income, potentially contributing to poor health literacy.

Conclusion: Patients generally had positive experiences with their DFU care, particularly with respect and care, organization, and clinic environment. Patient education was also shown to play a key role in creating a positive experience. However, improvements are needed in the clinic's contactability and communication regarding appointment changes, to enhance patient activation, patient confidence as well as healthcare satisfaction.

Keywords

Diabetic foot ulcers, Multidisciplinary care, Patient-reported experience measures, Podiatry, Vascular surgery.

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Introduction

Diabetes mellitus (DM) is a metabolic disorder affecting approximately 529 million people worldwide. With an age-standardized prevalence of about 6.1% globally in 2021, DM is one of the most pressing global health challenges today [1]. In Singapore, an estimated one in nine individuals (11.3%) suffer from DM [2], almost double the global prevalence rate. Worryingly, the total prevalence of Singaporean adults with type 2 diabetes mellitus (T2DM) is projected to rise to 15% in 2050. This increase is largely associated with the consumption of high-calorie diets and sedentary lifestyles of the population [3].

Diabetic foot ulcers (DFUs) are wounds on the feet that develop in patients with DM and are one of the most significant complications of the disease. They occur due to neuropathy and/or ischaemia, which can lead to major lower limb amputations. DFUs affect approximately 9.1 to 26.1 million people with diabetes globally each year. The risk of developing a DFU among patients with diabetes is estimated to be between 19% and 34% during their lifetime [4,5]. With the rising incidence of DM, the rates of DFU have also been increasing globally, with Singapore having one of the highest age-sex-standardized diabetes-related major lower extremity amputation (LEA) rates among developed nations [6]. In 2021, Singapore had 12.1 major LEAs per 100,000 Singaporeans, compared to 7.5 per 100,000 adults in the general population among the Organisation for Economic Cooperation and Development's (OECD) countries [7].

DFU complications result in an increased frequency of outpatient and emergency department presentations, and hospital admissions, along with a heightened demand for home health care. Consequently, this leads to an increase in diabetes-associated care expenditure by 50-200% beyond the usual baseline for patients [8]. Psychological and emotional consequences, ranging from frustration to anger and guilt, arise from social isolation, activity limitations, negative self-image, and feelings of becoming a burden to society, which are common among patients living with DFU [9].

Despite the clinician's awareness of the challenges faced by patients with DFUs, there remains a significant lack of understanding regarding each patient's experience. Limited literature exists on their everyday experience, the standard of healthcare they receive, as well as the specific aspects of care that hold significance for each patient. The healthcare experience of the patient plays an important role in influencing patient outcomes, especially given the chronic nature of DFUs, where ulcers could take months to heal. Even when they do heal, it is estimated that 40% of patients will experience a DFU recurrence within one year [10].

Background

The Outpatient Experience Questionnaire (OPEQ)

The use of Patient Reported Experience Measures (PREMs) can help improve both healthcare delivery and patient outcomes by enhancing treatment adherence, utilization of healthcare services, and patient involvement in their own care [4]. The OPEQ (Annex B) is a self-reported survey of patients' experiences in outpatient clinics and day wards. It includes questions regarding patients' experiences before coming to the outpatient clinic, availability and reception at the clinic, organization of the clinic, the actual consultation, conditions of the clinic, after consultation experience, as well as some background questions. Most questions are answered on a scale of 10, with endpoints differing for each question. The OPEQ has been validated as a self-administered PREMs questionnaire in both Western [11] and Chinese study populations [12], involving close to 20,000 outpatients. It was found to be a useful instrument that provided acceptable, consistent, and reliable evaluations of patients' experiences. However, a large proportion of existing studies are conducted outside of Asia, and there is no data in the current literature regarding the use of PREMs in patients with DFUs in the outpatient setting. As such, we aim to evaluate patients' perceptions of their outpatient DFU care experience at a multidisciplinary podiatry clinic in a tertiary hospital in Singapore using the OPEQ. We have excluded questions 11 and 43 from our questionnaire as they were not relevant to the local context (Annex B).

With the increasing prevalence of diabetes worldwide, lessons learned from Singapore's healthcare challenges can provide valuable insights for developing more effective multidisciplinary DFU care models in the global setting.

Methods

A cross-sectional study was conducted on 50 patients with DFUs who were reviewed at an outpatient multidisciplinary podiatry clinic within a tertiary hospital in Singapore from January 2023 to April 2023 [13-15]. Baseline clinical and socio-demographic data from the participants were collected (Annex A) and the OPEQ was administered (Annex B) by a research coordinator from the study team. Inclusion criteria were patients with a definitive diagnosis of DM and a foot ulcer (at or distal to the malleolus), male or female, aged between 21 and 90 years, able to provide written informed consent, and able to communicate in English or with family members as translators. Exclusion criteria were patients without a clinical diagnosis of DM, without a foot ulcer, unable to provide consent or who did not consent to participate in the study, unable to communicate in English or did not have family members who could translate, and/or were cognitively impaired.

All factors and variables were evaluated using descriptive statistics. Categorical data were expressed as percentages (%). Continuous data were expressed in box and whisker plots showing the mean, median, range, and interquartile range (IQR). Continuous data consisted of patient experience scores on the OPEQ which ranged from zero to 10, with zero being the least satisfactory and 10 being the most satisfactory score. Statistical analysis was performed using the IBM SPSS® Statistics software (Version 27, IBM). This study has been approved by the institutional ethics review board (National Healthcare Group Domain Specific Review Board 2022/00743).

Results

A total of 50 patients participated in this study (Table 1). Seventy-six percent were male, with a mean age of 64.8 ± 10.24 years. The mean BMI was 26.8 ± 4.66 kg/m², and the mean duration of DM and HbA1c among the study participants was 21.4 ± 12.04 years and 8.1 ± 1.85%, respectively. Over the past 12 months, the patients had an average of 6.4 podiatry visits, 12.7 hospital specialist outpatient clinic visits, and 18.2 primary care clinic visits.

Table 1: Patient demographics and clinical characteristics.

Baseline Demographics (n= 50)	
Characteristic	**n (%) or Mean ± SD**
Age, years	64.8 ± 10.24
BMI, kg/m²	26.8 ± 4.66
Gender	
Male	38 (76)
Female	12 (24)
Ethnicity	
Chinese	21 (42)
Indian	14 (28)
Malay	13 (26)
Marital status	
Single	3 (6)
Married	40 (80)
Divorced/ Widowed	7 (14)
Smoking history	
Non-smoker	21 (42)
Smoker	9 (40)
Ex-smoker	20 (18)
Education level[a]	
Primary or below	20 (40)
Secondary/ GCE O-Levels	18 (36)
ITE/ Diploma/ GCE A-Levels	12 (24)
Bachelor or above	0 (0)
Accommodation[b]	
Rental flats	5 (10)
HDB flat (3-room or smaller)	8 (16)
HDB flat (4-room or bigger)	33 (66)
Condominium	1 (2)
Landed property	0 (0)
Others	3 (6)
Average monthly personal income (S$1 = USD$0.77)	
None/ Retired	38 (76)
< S$1000	1 (2)
S$1000-$1999	2 (4)
S$2000-$2999	4 (8)
S$3000-$3999	4 (8)
S$4000 or more	1 (2)
Primary carer	
Self	18 (36)
Spouse	13 (26)
Family member	13 (26)
Domestic helper	3 (6)
Family member & Domestic helper	1 (2)
Others	2 (4)
DM duration, years	21.4 ± 12.04
HbA1c, %	8.1 ± 1.85
Microvascular DM complications (excluding current DFU)	
Nil	12 (24)
Nephropathy	11 (22)
Neuropathy	27 (54)
Retinopathy	7 (14)
DM foot complications	
Nil	6 (12)
History of DFU	35 (70)
History of minor amputations	30 (60)
History of major amputations	4 (8)
History of revascularization	15 (30)
Cardiovascular risk factors (excluding DM)	
Nil	3 (6)
Hypertension	40 (80)
Hyperlipidaemia	39 (78)
ESRF	18 (36)
IHD	19 (38)
History of stroke	8 (16)
Healthcare utilisation (Mean visits in preceding 12 months)	
Podiatry (Range)	6.4 (0-22)
Hospital specialist outpatient clinic (Range)	12.7 (0-45)
Primary care (Range)	18.2 (0-90)
WIfI Scoring (n=43)[c]	
Wound	
0	1 (2)
1	31 (72)
2	10 (23)
3	1 (2)
Ischaemia	
0	24 (56)
1	10 (23)
2	2 (5)
3	7 (16)
Foot infection	
0	35 (81)
1	3 (7)
2	5 (12)
3	0 (0)
WIfI 1-year major amputation risk	
Very low (Stage 1)	25 (58)
Low (Stage 2)	5 (12)
Moderate (Stage 3)	7 (16)
High (Stage 4)	6 (14)

Abbreviations: BMI: Body Mass Index; DFU: Diabetic Foot ulcer; DM: Diabetes Mellitus; ESRF: End Stage Renal Failure; GCE: General Certificate of Education; HDB: Housing and Development Board; IHD: Ischaemic Heart Disease; ITE: Institute of Technical Education; WIfI: Wound, Ischaemia, foot Infection

[a]GCE O-Levels & A-Levels: Annual national examinations used for academic qualification. O-Levels are taken by students aged 16 years old; A-Levels are taken by students aged 18-19 years old.

[b]HDB flats: High-rise public housing flats where the majority of Singapore residents reside; Constructed by the Housing and Development Board (Singapore's public housing authority)

[c]7 missing data points

Eighty-eight percent of the recruited patients experienced DM foot complications including previous DFU (70%), previous

minor amputations (60%), previous major amputations (8%), and previous revascularization (30%). Prior to this DFU, 76% experienced microvascular DM complications. Neuropathy was the most common microvascular DM complication (54%), followed by nephropathy (22%) and retinopathy (14%). In terms of cardiovascular risk factors (CVRF), excluding DM, 94% of patients had CVRFs, including hypertension (80%), hyperlipidaemia (78%), ischaemic heart disease (38%), end-stage renal failure (36%), and a history of stroke (16%). Additionally, 40% were smokers, 18% were ex-smokers, and 42% were non-smokers. Wound, ischaemia and foot infection (WIfI) scores were calculated for each patient [16]. The majority of patients had very low 1-year major amputation risk (58%).

Most of the participants were Chinese (42%), followed by Indians (28%), and Malays (26%). Seventy-six percent of patients reported no monthly personal income, while the remaining reported an average monthly personal income ranging from <S$1,000 to >S$4,000 (S$1 = USD$0.77). Among those with a monthly income, the majority fell below Singapore's 2023 national median monthly household income per capita of S$3,500 (USD$2682) [17].

More than 90% of the patients lived in public housing. The most common dwelling type was 4-room or larger Housing and Development Board (HDB) flats (66%), followed by 3-room or smaller HDB flats (16%), rental flats (10%), other types (6%), and condominiums (2%); none lived in landed property. HDB flats are high-rise public housing flats where the majority of Singapore residents reside. They are constructed by the Housing and Development Board, Singapore's public housing authority. Educational attainment among patients was as follows: up to primary school or below (40%), secondary school or General Certificate of Education (GCE) O-Levels (36%), and Institute of Technical Education, Diploma, or GCE A-Levels (24%); none had a bachelor's degree or higher. The GCE O-Levels and A-Levels are annual national examinations used for academic qualification. The O-Levels are taken by students aged 16 years old, while the A-Levels are taken by students aged 18-19 years old. Thirty-six percent of patients were primarily cared for by themselves, 26% by their spouse, 6% by domestic helpers, 2% by both family members and domestic helpers, and 4% by others.

OPEQ Results

Responses to the OPEQ and descriptive statistics are shown in Table 2 and Figures 1 to 6. In general, mean scores reflected positive experiences among patients in their DFU care experience. In the last six months, most patients had more than five (74%) or two to five (24%) outpatient clinic visits. In evaluating their health, the majority felt that they were in good, pretty good or very good health (66%). Most of the patients were retired (72%) and lived with other people in the same household (90%).

Table 2: OPEQ Analysis for Categorical Variables.

OPEQ Analysis (Categorical) (n=50)	
Question	**n (%)**
Background questions	
How many times in the last 6 months have you had an outpatient appointment?	
Only this once	1 (2)
2-5 times	12 (24)
More than 5 times	37 (74)
Generally, you will say that your health is:	
Very good	1 (2)
Pretty good	20 (40)
Good	12 (24)
Bad	17 (34)
What are you currently doing on a daily basis?	
Working	9 (18)
Retired	36 (72)
On sick leave/ rehabilitation	4 (8)
Disabled	1 (2)
How many people live in your household?	
I live alone	5 (10)
2 people	8 (16)
3 or more people	37 (74)
Before coming to the outpatient clinic/ day ward:	
Why did you have an appointment at the outpatient clinic this time?	
Follow-up after treatment	6 (12)
Investigation	4 (8)
Investigation, Treatment	1 (2)
Treatment	20 (40)
Treatment, Follow-up after treatment	19 (38)
Who determined the time of your appointment?	
Outpatient clinic	45 (90)
Yourself	5 (10)
Was it easy for you to change the time of your appointment if you needed to? (n=27)[d]	
Yes	15 (56)
No	12 (44)
Did you experience the incidence of your appointment being postponed or moved without you requesting? (n=44)[e]	
Yes	6 (14)
No	38 (86)
How long did it take from when you were told an appointment was necessary, until you actually showed up for one?	
On the same day	1 (2)
Under 2 weeks	10 (20)
About 2-4 weeks	32 (64)
About 1-3 months	4 (8)
About 4-6 months	3 (6)
Availability and reception at the outpatient clinic/ day ward:	
How long does the journey from home to the outpatient clinic/ day ward take you?	
Less than 1 hour	44 (88)
About 1-2 hours	6 (12)
How did you get to the outpatient clinic?	
Public mass transport (Bus, Train)	32 (64)
Private hire car/ Taxi	27 (54)
Own transport	3 (6)
Others	6 (12)

Did you arrive at your appointment time, or did you have to wait?	
I came in at the agreed time	13 (26)
I waited less than 15 minutes	13 (26)
I waited 15-30 minutes	16 (32)
I waited 30 minutes - 1 hour	7 (14)
I waited more than 1 hour	1 (2)
Organisation of the outpatient clinic/ day ward:	
Was your appointment booked with someone you have seen before?	
Yes, I have been seen by the same person before	17 (34)
No, it was with a new person	31 (62)
I have not been there before	2 (4)
About the actual consultation at the outpatient clinic/ day ward:	
Who did you have an appointment with when you visited the outpatient clinic/day ward?[f]	
Doctor	10 (20)
Doctor and Allied Health	18 (36)
Allied Health only	22 (44)

[d]23 missing data points

[e]6 missing data points

[f]All patients are seen by both doctors and allied health podiatrists during their initial consultation. However, for follow-up consultations, patients with stable wound conditions may only need to see the allied health podiatrist, without requiring a doctor's review. As a result, clinic attendance varies between the two specialties.

During the visit when they completed the OPEQ, most respondents were attending the clinic for treatment (40%), follow-up (38%), or both (38%). Eight percent were present for investigations alone, and 2% for both investigations and treatment. Ninety percent of appointment timings were allocated by outpatient clinic staff, and 64% of patients got an appointment within two to four weeks. Fifty-six percent of patients could easily make changes to their appointment timings, while 44% faced difficulty. Additionally, 14% of patients had their appointments postponed or changed without their request.

Upon their arrival, patients were well received at the clinic reception (Figure 1), as evidenced by the high mean score of 8.52. The majority of patients experienced waiting times of 15-30 minutes (32%) or less than 15 minutes (52%), with only a small proportion having to wait up to 30 minutes or more (16%).

With regards to clinic accessibility (Figure 2), the outpatient clinic was conveniently located for patients, with 88% able to reach it in under an hour. Patients rated the ease of locating the clinic a mean score of 8.32, and the ease of navigating through the clinic a mean score of 8.64, suggesting overall satisfaction with clinic accessibility.

In terms of the workflow at the outpatient clinic (Figure 3), patients generally had a positive experience, giving a mean rating of 8.32. Most patients agreed that important information about themselves was passed on to the appropriate clinic staff and that the staff cooperated well in connection with their appointment, rating a mean score of 8.50 and 8.48 respectively. Any tests or trials that they completed were well arranged with their appointments, as evidenced by a high mean score of 9.20. Patients also felt that sufficient time was set aside for conversation during their consultation, giving a mean score of 8.45 in this aspect.

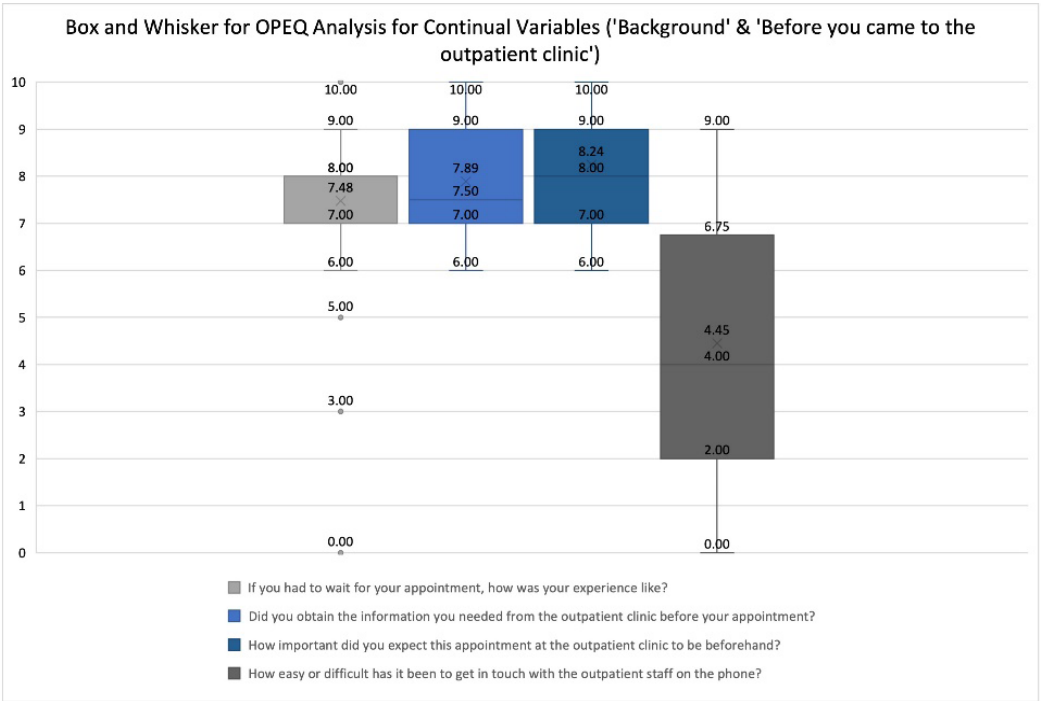

Figure 1: OPEQ Analysis for Continuous Variables ('Background' & 'Before you came to the outpatient clinic').

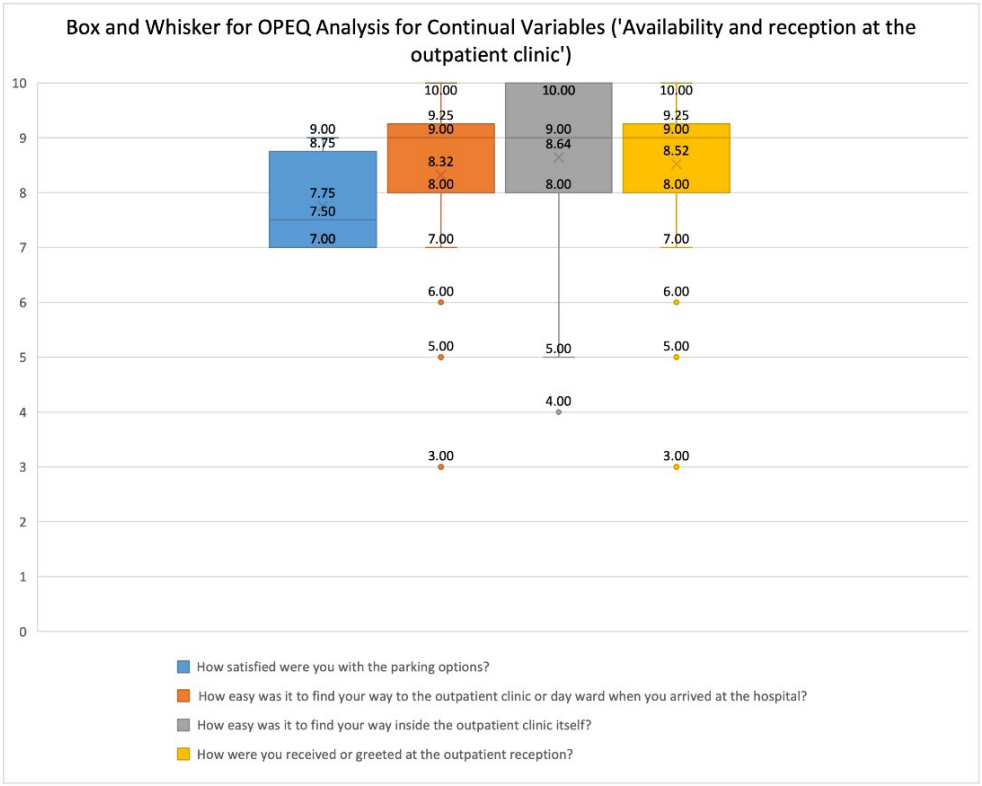

Figure 2: OPEQ Analysis for Continuous Variables ('Availability and reception at the outpatient clinic').

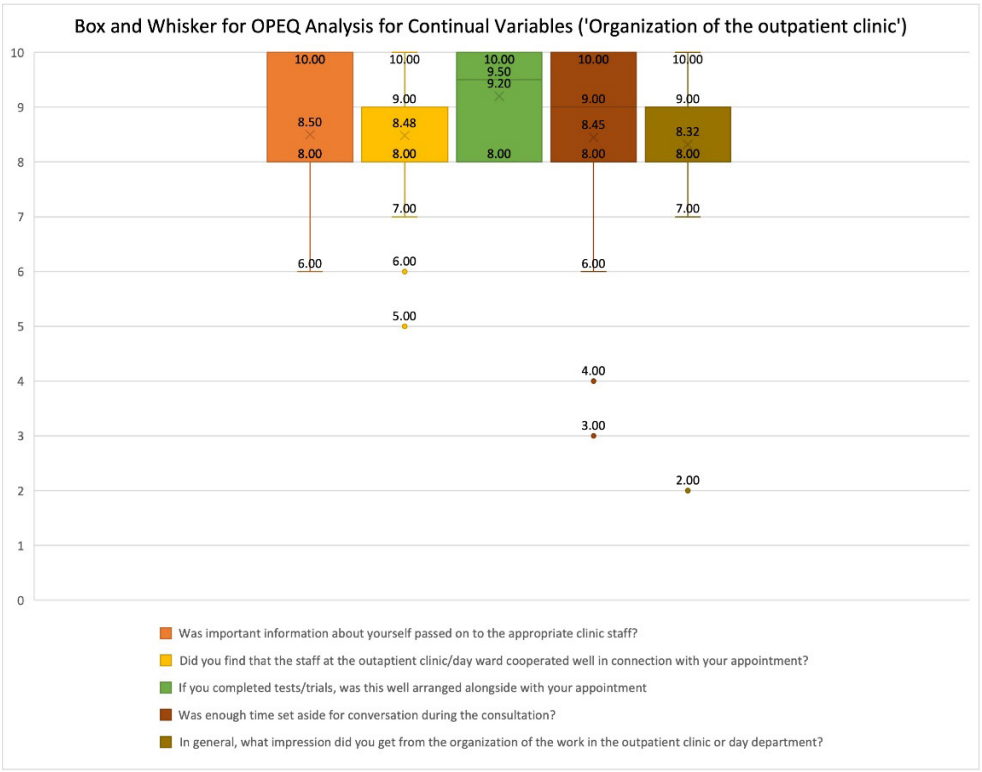

Figure 3: OPEQ Analysis for Continuous Variables ('Organisation of the outpatient clinic').

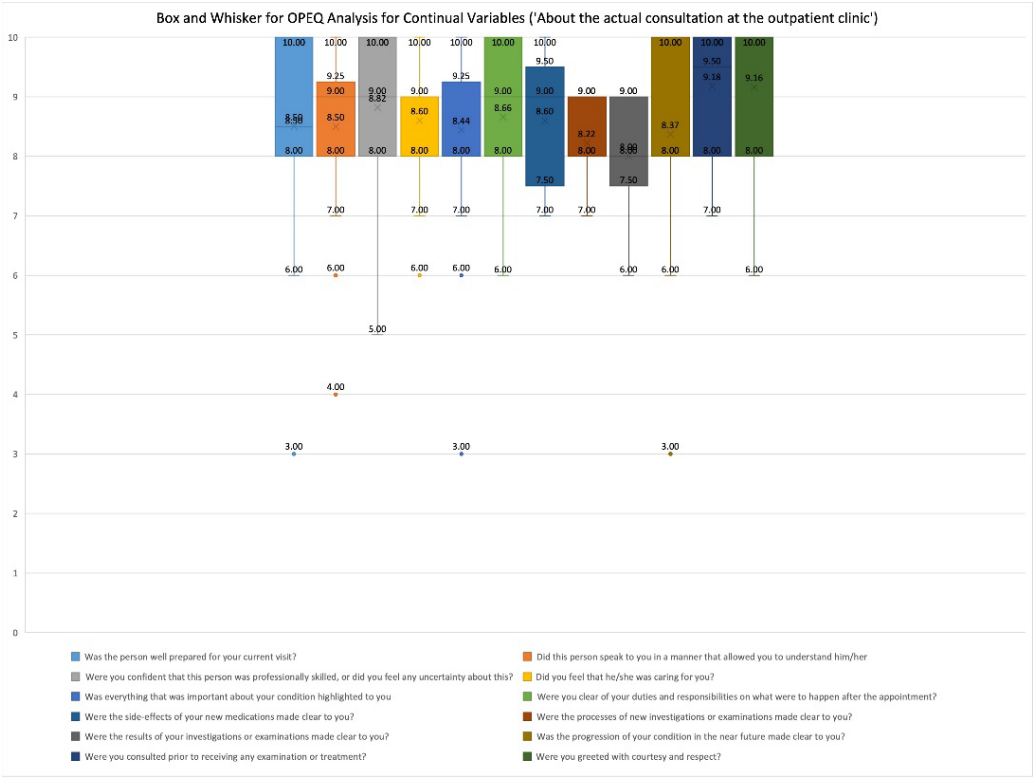

Figure 4: OPEQ Analysis for Continuous Variables ('About the actual consultation at the outpatient clinic').

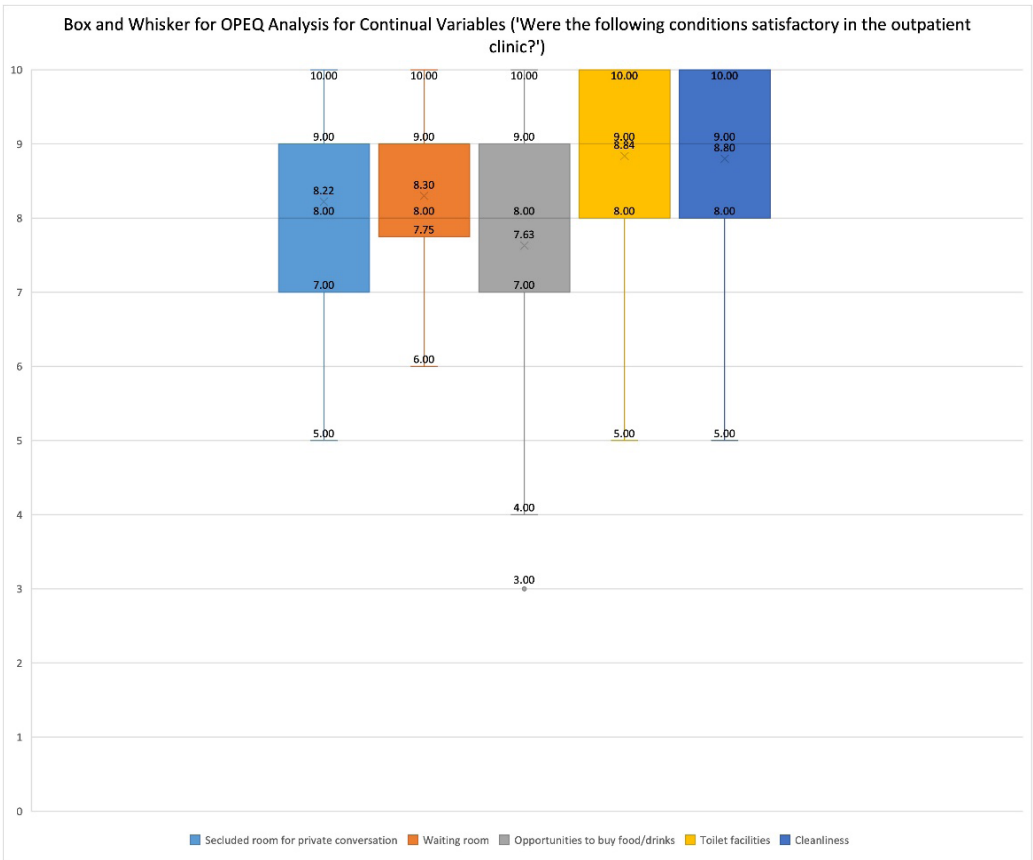

Figure 5: OPEQ Analysis for Continuous Variables ('Were the following conditions satisfactory in the outpatient clinic').

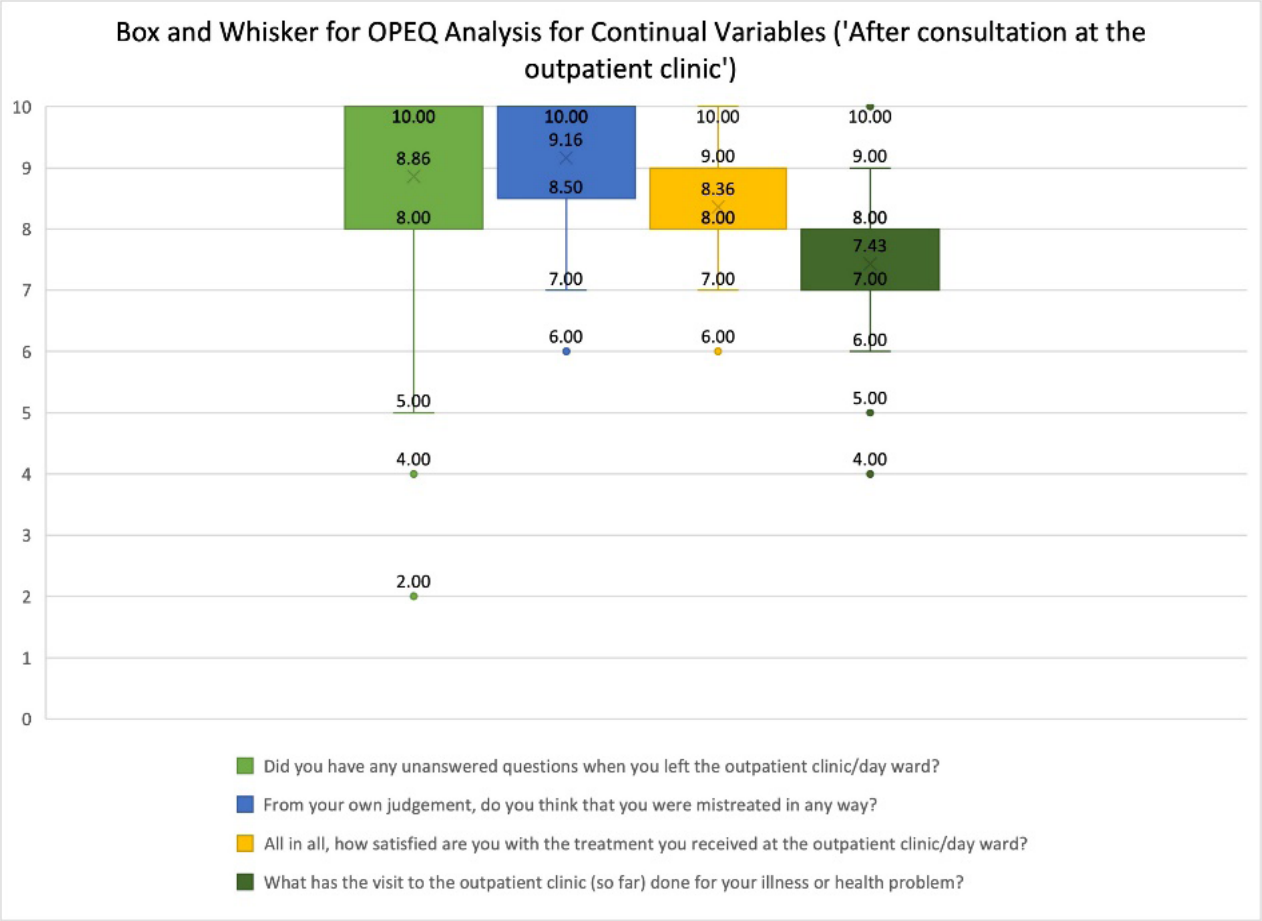

Figure 6: OPEQ Analysis for Continuous Variables ('After consultation at the outpatient clinic').

During the consultation (Figure 4), patients expressed satisfaction with the preparedness and communication skills of the healthcare provider, rating both aspects with a mean score of 8.50. Patients were confident in the professional competence of the person they consulted with, as evidenced by the high mean score of 8.82. Additionally, patients felt cared for by their healthcare provider and believed that crucial information about their condition was effectively conveyed, resulting in mean scores of 8.60 and 8.44, respectively. Clear patient guidance on duties and responsibilities post-appointment received a positive mean score of 8.66, while information regarding potential new medication side effects was well-communicated, earning a high mean score of 8.66. The process of new investigations or examinations and their subsequent results were thoroughly explained to patients, with mean ratings of 8.22 and 8.00 respectively. The healthcare provider also thoroughly discussed the future progression of patients' conditions, leading to a mean score of 8.37. Patients were consulted prior to undergoing examinations or treatments and were highly satisfied with this aspect, indicated by the high mean score of 9.18. Furthermore, patients were greeted with courtesy and respect while in the clinic, resulting in a favorable mean score of 9.16.

Within the outpatient clinic, patients expressed satisfaction with its condition and facilities (Figure 5). They were particularly pleased with the cleanliness and availability of toilet facilities, as reflected by the positive mean scores of 8.80 and 8.84 respectively. Patients also rated the condition of the waiting room favorably, giving it a mean score of 8.30, and appreciated the presence of secluded rooms for private conversations, rating this aspect with a mean score of 8.22.

After their consultation (Figure 6), patients generally had few unanswered questions and expressed overall satisfaction with the treatment they received, as indicated by the mean score of 8.86 and 8.36 respectively. Furthermore, patients reported that they did not feel mistreated in any way while in the clinic, as evidenced by the high mean score of 9.16.

Discussion

Patient experience scores reflect patients' perceptions of the quality of healthcare they receive. This study evaluated patients' perceptions of their experience while receiving outpatient DFU care by administering a validated PREMs questionnaire, the OPEQ. Analysis of the baseline demographics of our study population revealed that the majority of patients who received DFU care were male, had low education background, and were of low socioeconomic status, mainly living in public housing. Within our study population, Indians and Malays formed a greater proportion

of DFU patients than Chinese. This aligns with Singapore's national statistics, where the prevalence of DM among Indians and Malays has consistently been higher than among Chinese, despite Chinese being the majority in Singapore's multi-ethnic society [18]. A large proportion of these patients had pre-existing cardiovascular risk factors which increase the risk of diabetes. Poor diabetic control also increases the risk of diseases such as stroke, myocardial infarction, and chronic kidney disease stage 5 (CKD5). In Singapore, it was found that 30% of patients with hemorrhagic stroke and 46% of patients with ischemic stroke had diabetes [19]. Additionally, 41% of patients with ST elevation myocardial infarction (STEMI) and 56% of patients with non-ST elevation myocardial infarction (NSTEMI) had diabetes [20]. Annually, an estimated 2 in 3 dialysis patients in Singapore were found to have CKD5 due to diabetes. In 2020, Singapore was reported to have the highest proportion of CKD5 patients starting treatment after developing kidney failure due to diabetes globally [21]. It is hence essential to work towards improving patients' diabetes control and outcomes, so as to reduce the risk of developing other associated diseases.

In this study, analysis of the OPEQ results revealed several findings. In general, most patients had positive experiences in their DFU care journey, and encouraging results emerged from the OPEQ analysis, highlighting the positive aspects of the outpatient clinic. The clinic's facilities, organization, workflow, and patient experience during consultations received notably positive ratings. Specifically, patients expressed high satisfaction with the cleanliness and availability of toilet facilities within the outpatient clinic. OPEQ categories assessing the organization of the outpatient clinic and the actual consultation garnered the highest mean scores. The positive scores revealed that being treated with respect and care, having a well-organized clinic visit, and having a pleasant clinic environment were important to patients. In addition, patient education also seemed to be a crucial factor in fostering a positive patient experience. High mean scores were consistently reported when patients had their questions answered during the consultation, were thoroughly informed of their post-appointment duties and responsibilities, received clear explanations about the potential side effects of their new medications, and were communicated with in an easily comprehensible manner. This is similar to what was identified in a review done by Willliams et al., which found that information provision to patients during consultations was positively associated with patient satisfaction [22].

The most significant finding identified for improvement was the poor contactability of the outpatient clinic (Figure 1), as evidenced by the low patient-rated mean score of 4.45. Current available means for contacting the clinic and rescheduling appointments include the clinic hotline and HealthHub, a national digital platform where patients can access their medical records and manage their medical appointments. Though 90% of appointment timings were allocated by the outpatient clinic staff, 44% of patients encountered difficulty in contacting the outpatient clinic, and 14% of patients experienced appointment postponements or changes without their request. In addition, the impact of the visit on the patient's illness or health problem also scored poorly (Figure 6), suggesting a lack of patient activation. Despite high mean scores for the consultation and overall outpatient clinic experience, patients rated a comparatively lower mean score of 7.43 regarding the perceived benefit of the consultation to their health issues. This diminished patient activation may stem from poor health literacy, particularly among those with a limited educational background [23]. Seventy-six percent of patients received only up to secondary school education, and none received tertiary education. Prior studies have shown that patient education increases treatment adherence through improved knowledge and awareness of the disease. This contributes to an increased understanding of the benefits of treatment follow-ups, which consequently promotes self-efficacy, empowerment, and a sense of responsibility to take charge of their own care [24]. By equipping patients with knowledge of proper foot care, potential risk factors, early warning signs of ulceration, and the importance of treatment adherence, patients have an increased awareness, and are more likely to monitor their symptoms, seek timely medical care, and engage in shared decision-making with their healthcare providers. This active involvement supports better self-care practices and enhances communication with healthcare providers, leading to improved outcomes and reduced risk of major complications like infections or amputations. Ultimately, patient education lays the foundation for sustained engagement and the eventual long-term success of DFU care [20]. In this study, patient education was shown to play an essential role in creating a positive experience, highlighting its importance. Additionally, the chronicity of DFUs may also contribute to this diminished perceived benefit, as patients possibly face treatment fatigue and may not be able to appreciate the immediate benefits of treatment [24].

Though the reliability and validity of the OPEQ has been evaluated in Norway [11] and China [12] for other medical conditions, this is the first study to utilize the OPEQ to evaluate patient experience for outpatient DFU care. The results of this study, like other PREMs studies, can be used to further improve services in clinical settings by addressing the shortcomings identified through patient feedback [26]. This can aid in enhancing patient experience as well as patient outcomes in the long run [10].

However, this study has some limitations. The OPEQ is a generic non-disease specific questionnaire, so responses may vary depending on the chronicity and condition for which patients are attending the outpatient clinic for. Additionally, there is a risk of response bias, as patients were selected during their outpatient clinic visit, and had to consent before completing the questionnaire. Despite assurances of confidentiality, some patients may also have felt that their future care could be impacted by negative feedback, potentially influencing their responses. While the small sample size is another limitation of this study, findings from this study can still be applied to the global setting. Awareness of the gaps in patient satisfaction ultimately serves as the basis for which interventions

will be built upon. The lessons learnt from Singapore's healthcare challenges can hence provide valuable insight for developing more effective multidisciplinary DFU care models globally.

Conclusion

In our study, OPEQ analysis revealed that patients generally had a positive experience with their outpatient DFU care. Patient experience scores, which reflect patients' perceptions of the quality of healthcare they receive, were influenced by various factors including clinic environment, workflow, and interactions with hospital staff. The outpatient clinic performed well in several areas that contributed positively to patient satisfaction. These included treating patients with respect and care, having well-organized clinic visits, and maintaining a pleasant clinic environment. However, despite the encouraging results, poor health literacy and the chronicity of DFUs likely hindered patient activation [23,24], resulting in diminished perceived benefit from their DFU consultations despite overall satisfaction with the consult and their clinic experience. Patient education was shown to play a key role in creating a positive experience in this study, and can help to promote patient activation [27], treatment adherence [24] and positive patient outcomes [28].

Additionally, there is room for improvement in the clinic's contactability and communication with patients regarding appointment changes. Given that patients with DFUs may encounter foot wound deteriorations which require timely intervention, improvements in clinic contactability is essential, and will also help to improve patient activation, patient confidence and healthcare satisfaction.

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