Gujarati translation, validity and reliability of Walking Impairment Questionnaire in people with intermittent claudication due to peripheral artery disease.

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Highlights

- Peripheral arterial disease (PAD) reduces walking ability.
- The walking impairment questionnaire is a patient-reported outcome measure that assesses walking ability in people with PAD.
- After translation and cultural adaptation, the Gujarati walking impairment questionnaire was comprehensible to people with PAD and Diabetes in India
- Gujarati walking impairment questionnaire distance and speed score had an excellent correlation with the 6-minute walk distance and speed.
- The Gujarati walking impairment questionnaire provides a short and easy-to-complete measure that clinicians can use to assess walking ability in people with PAD in India.

Title: Gujarati translation, Validity, and Reliability of Walking Impairment Questionnaire in people with intermittent claudication due to peripheral artery disease.

Abstract

Introduction:

The Walking Impairment Questionnaire (WIQ) is a common and easy-to-use assessment of walking incapacity in people with claudication due to peripheral artery disease (PAD). It has four subscales: pain severity, walking distance, walking speed, and ability to climb stairs. It has not been translated into Gujarati, which limits its use in Indian subjects.

Aim: This study aims to translate and assess the validity and reliability of a Gujarati version of WIQ.

Materials and Methods:

This study had three phases: 1. Forward and backward translation and Cultural adaptation of WIQ into the Gujarati language by two independent translators, 2. Face and content validation by six clinical reviewers and 10 participants with PAD and Type II diabetes, 3. Concurrent and construct validity, test-retest reliability, and internal consistency of Gujarati, the WIQ was assessed on 160 participants with PAD and Type II diabetes who had a mean Ankle Brachial Index (standard deviation) <0.40 (0.1). The concurrent and construct validity of the WIQ was analyzed by correlating the WIQ distance and speed score with 6-minute walk distance (6MWD) and speed and WIQ total score with the Medical Outcome Study Questionnaire Short Form 36 (SF-36) score using Pearson's correlation coefficient. Test-retest reliability was analyzed using an intraclass correlation coefficient (ICC) with a seven-day interval between two questionnaire applications. Internal consistency of the total WIQ score was determined using Cronbach's alpha.

Results:

Following translation, the Gujarati WIQ was considered acceptable and understandable by people with PAD. There was excellent correlation between the WIQ distance score and 6-minute walk test distance (r= 0.95, *P*<.05)), the WIQ speed score and 6-minute walk test speed score (r= 0.89, *P*<.05)) and the Gujarati WIQ total score and total score of physical functioning domain of SF- 36 (r= 0.99, *P*<.05).

There was excellent test-retest reliability over 7-days for total WIQ score (ICC=0.94). The Cronbach's alpha for internal consistency of 0.97 for the total WIQ score was excellent. This demonstrates the sufficient homogeneity of the total questionnaire.

Conclusion:

The Gujarati version of the WIQ is reliable and valid and can be used to assess self-reported walking impairment in Gujarati-speaking people with PAD and Type II Diabetes.

Keywords: Walking, peripheral artery disease, claudication, walking incapacity questionnaire, quality of life, Gujarati.

Introduction

Lower extremity peripheral artery disease (PAD) is a common atherosclerotic condition that affects over 236 million adults worldwide in 2015.[1,2] Of these individuals with PAD, 72.9% were from Low-income and middle-income countries (LMICs).[2] While there is limited data on the prevalence of PAD in India overall, the prevalence of PAD was 30% in people aged between 20-74 years in Gujarat, a region in west India[3,] and 26.7 % in people aged between 60-79 years in Kerala, North India with no difference between urban and rural populations.[4]

Age, female sex, smoking, physical activity, and diabetes are some of the risk factors for PAD[4]. PAD is one of the macro-vascular complications of type 2 diabetes mellitus (DM), which affects

17% Indian population.[5] It accounts for 50% of all non-traumatic amputations in India due to diabetic foot disease.[4] Claudication (leg pain on walking that is relieved by rest) is a symptom of PAD that leads to walking incapacity, which interferes with function and quality of life (QoL). Approximately 7-32% of people with PAD experience intermittent claudication.[6,7]

The treadmill-graded exercise test is often used to assess walking capacity in people with PAD, but it is time-consuming, costly, and not always feasible or accessible.[9] The Walking Impairment Questionnaire (WIQ) is a short and easy-to-complete patient-reported outcome measure that assesses the degree of walking limitation in people with PAD.[10] It has four subscales: pain severity, walking distance, walking speed, and stair climbing.[11]

The WIQ is validated in English,[11] Dutch,[12] Spanish,[13] Chinese Language,[14] and Brazilian Portuguese,[16] but has not been translated or validated in any languages commonly spoken in India, which limits its use. In India, approximately 55 million people speak Gujarati, and it is the 6th most widely spoken language.

Prior to applying a self-reported measure in clinical practice, it is important to translate the tool to establish the cultural relevance and psychometric properties of the translated questionnaire. This study aimed to translate English language the WIQ into Gujarati Language and to evaluate the reliability and validity of the Gujarati version of the WIQ.

Materials and methods

Participants

Potential participants were identified from two vascular clinics in Gujarat, West India. Eligibility criteria included age between 40-70 years old, being diagnosed with PAD (Ankle Brachial Index (ABI) $\leq$ 0.9), and type II diabetes as in India, the majority of the population people seen in

Vascular clinics had pre-existing DM and therefore, this population is representative of the typical Indian population and fluent Gujarati speaker.

Patients were excluded if they had neurological disorders (stroke, balance problems, movement disorders, neuromuscular diseases), respiratory complications (chronic obstructive pulmonary disease), musculoskeletal complications (recent trauma/fracture in lower limb) or cardiovascular conditions that made it unsafe for them to complete exercise testing as determined by their vascular clinician, and people who were completing supervised exercise program as this may influence their responses to the WIQ over the 7-day collection period. All participants received both verbal and written information about the study and provided written informed consent. Ethical approval was obtained from the institutional Ethics Committee _CHARUSAT (ARIP/IRB/16/74) dated on 22/09/2016.

Measures

Walking Impairment Questionnaire

The WIQ is a disease-specific questionnaire that has been validated for use in people with claudication to describe the level of walking impairment and to assess the effectiveness of interventions to relieve symptoms.[15,17] It contains 14 items (score range: 0 = “unable to do”4 = “no difficulty”) arranged in four subscales that assess pain severity and three important factors of walking limitation in people with PAD: distance, speed, and stair climbing ability. Subscale scores are determined by dividing the weighted answers by the maximum possible weighted score and multiplying by 100. Each score ranges from 0-100, with lower scores indicating lower performance. The overall and combined scores are calculated as the average of the sub-scores. The total score of WIQ is calculated as the average of the total scores of its three domains.

6 Minute Walk Distance and speed

The 6-minute walk distance (6MWD) is a measure of walking capacity with excellent test-retest reliability in people with PAD.[18] Following standardized protocol, participants walked around two cones placed 30 meters apart in a corridor for 6 minutes after instruction to cover as much distance as possible. The total distance walked after six minutes was recorded in meters. The test was conducted twice, with at least an hour interval between tests, and the highest 6MWD was used for analysis. Six-minute walking speed was calculated by dividing the distance (meters) covered by time (minutes), and later it was converted into miles/hour.

Medical Outcome Study Questionnaire Short Form 36 (SF-36)

The SF-36 is a generic indicator of health-related quality of life (HRQL). The eight subscales measured by the SF-36 include physical functioning, role limitation due to physical health, role limitations due to emotional problems, energy/fatigue, emotional well-being, social functioning, pain, and general health. All subscales are scored on a scale of 0 to 100, where 0 equals the worst health status, and 100 represents the best health status. For the purpose of this study, the physical functioning domain of SF 36 (Item no. 3-12) was used.

Methodology

This study had three phases.

Phase 1: Forward and backward translation and cultural adaptation of WIQ into the Gujarati language

The WIQ was translated and cross-culturally adapted into Gujarati using an accepted forward-backward method (Figure 1).[20,21] In stage 1, two native Gujarati speakers independently forward-translated the WIQ from English to Gujarati, creating WIQ versions Translation 1 (T1) and

Translation 2 (T2) (Figure 1). One native forward translator was a language professional with a Master of Arts in English literature who rendered the word “block” into “feet” as a layperson’s definition of distance. This translator was unaware of the concept being translated and had no medical or clinical background but offered a translation reflecting the language used in the general Gujarati population. The other forward – translator was a health professional and a researcher with a Ph.D. degree. This translator was aware of the concepts being translated and provided translation with a clinical perspective. The primary author facilitated a discussion between the two forward translators, resulting in the creation of a synthesized version of both T1 and T2 as T12. Queries were raised about the word “block,” which is used to estimate distance measures in the English WIQ. The non-clinical translator changed the word “block” into “feet” as a layperson’s definition of distance. After applying these changes, the final version of the Gujarati WIQ: Translation12, “T12,” was created.

In the second stage, two back translators who were masked to the original version of the WIQ independently translated T12 into English, creating versions Back Translation1 (BT1) and Back Translation 2 (BT2). The back translators were bilingual and had lived in Gujarat for over 15 years. One back translator had no medical or healthcare background, and the second back translator was a healthcare professional with a master’s degree in physiotherapy rehabilitation. However, neither translator was aware of the concepts being explored and had no clinical experience in managing people with PAD. The researcher reviewed translations and summarized differences between the BT1 and BT2.

In stage 3, an expert consensus meeting was arranged with the lead researcher, two forward translators, two backward translators, senior physiotherapist with 7 years of post-registration clinical experience in treating patients suffering from cardiovascular disease and PAD. At the

meeting, all the versions of the questionnaire (T1, T2, T12, BT1, BT2) were discussed and compared with the original text to identify any discrepancies. They reviewed each item and scored it as 1 = rejected (discrepancies identified), 2= accepted with modification, and 3= accepted (no discrepancies identified). The decision to achieve equivalence between the translated version and the original version was analyzed using the content validation ratio (CVR) and content validation index (CVI).[21,22] The Gujarati version of WIQ can be found in the figure 3.

Phase 2: Face and content validation

In Phase 2, the content validity and comprehensibility of the Gujarat WIQ were assessed to ensure equivalence with the Gujarati WIQ.[23,24]

A convenience sample of 10 participants were identified from vascular clinics using study eligibility criteria and provided written informed consent to participate. The lead author conducted in-person, individual interviews with each participant using a “think aloud” cognitive interviewing approach.[21] In the interview, participants read out each item of the questionnaire, and they verbalized their thoughts and understanding of the item as they answered each item. The lead author prompted the participants to continue speaking their thoughts using standardized probes (e.g., Tell me more about what you think mean about the word/question?) if needed. The participants were also asked to comment on items, identifying difficulties and suggesting terms that would be easier to understand. The lead author noted if participants had difficulty understanding any Gujarati WIQ items, what they understood by each Gujarati WIQ item, and the meaning of their chosen response and wrote down participant’s responses as they were

talking. Taking into account the suggestions made by the individuals, the questionnaire was amended by the researcher to improve the questionnaire comprehension.

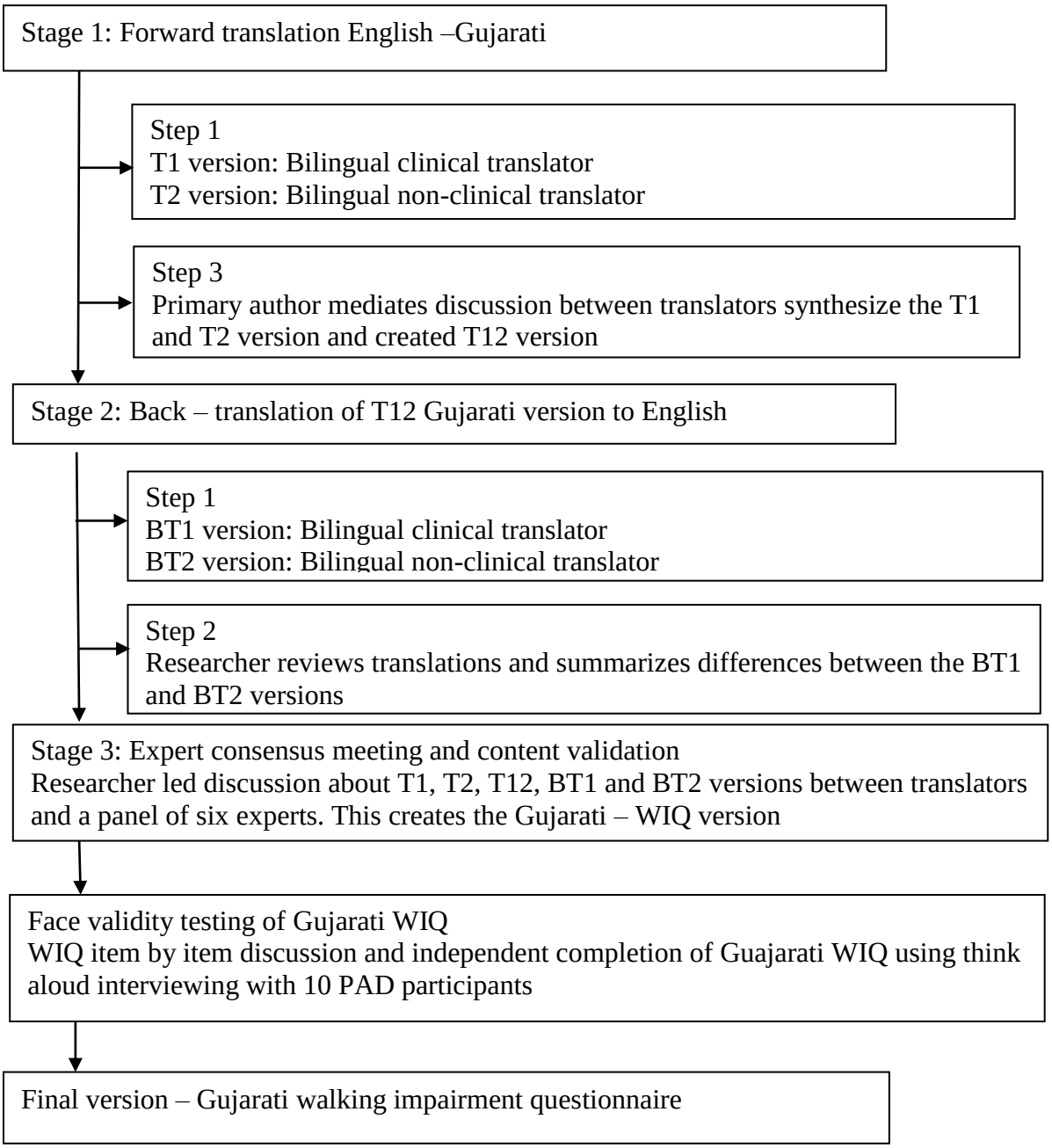
Phase 3: The validity and reliability of the Gujarati Walking Impairment Questionnaire

Participants were identified from vascular clinics in Gujarat using the study criteria (Figure 2).

Self-reported sociodemographic information such as age, gender, and diabetes duration was collected, and weight and height were measured to calculate the body mass index using the formula (weight/height^2) Ankle Brachial Index (ABI) was also obtained using standardized procedures.[25]

During routine vascular appointments, participants were invited to complete the 6-minute walk test in a quiet hospital corridor by a researcher. The researcher completed SF 36 whilst the participants rested between walking tests. The Gujarati WIQ was administered twice, one week apart, over the telephone. The researcher administered the WIQ on the same day as the 6MWD and SF 36 (Day 0), and the WIQ was administered again after 7 days (Day 7).

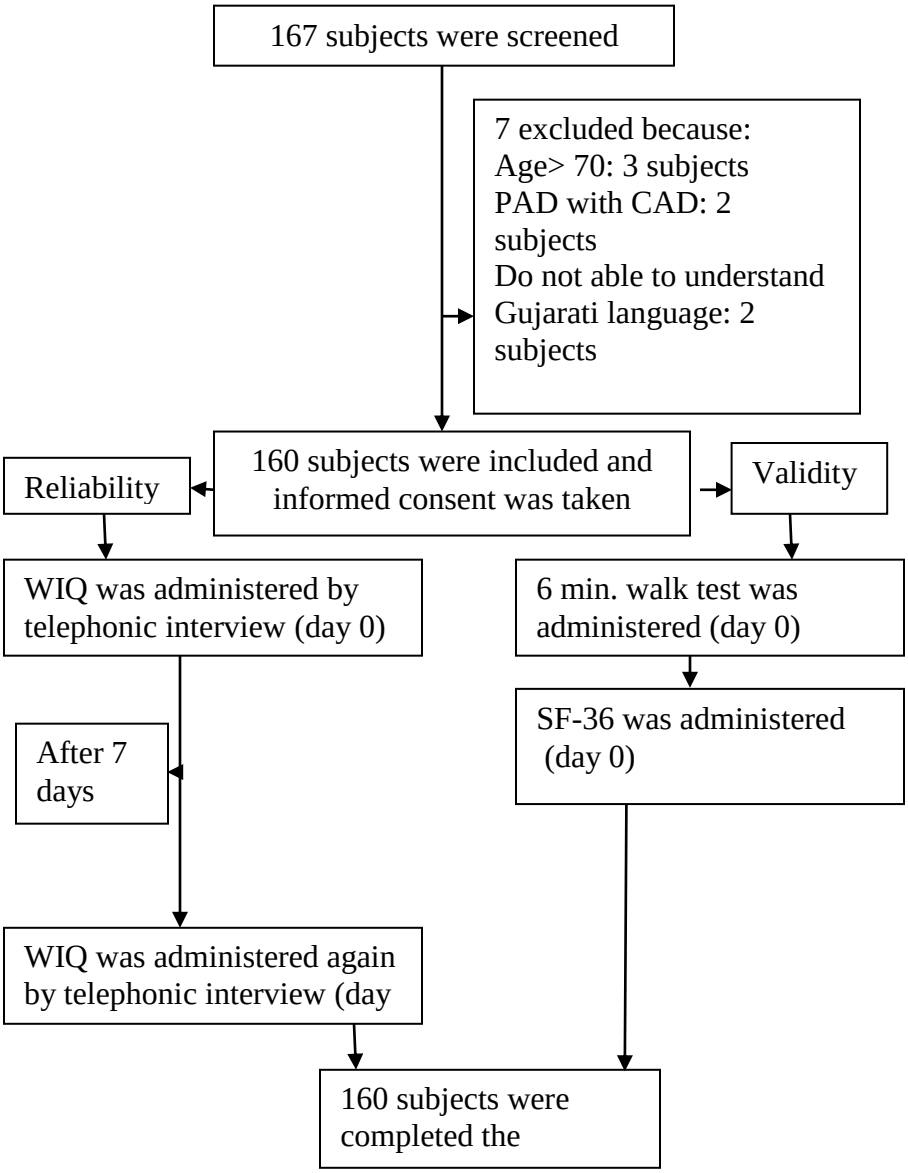
Figure 1: Cross- cultural translation and cultural adaptation process of the Walking Impairment Questionnaire from English language to Gujarati



Abbreviations

WIQ – Walking Impairment Questionnaire, T1 –Translation 1, T2- Translation 2, T12 – Translation 12, BT1 – Backward Translation 1, BT2- Backward Translation 2

Figure 2: Procedure to investigate the reliability and validity of the Gujarati Walking Impairment Questionnaire



Abbreviations

PAD - Peripheral Artery Disease, CAD - Coronary Artery Disease, WIQ - Walking Impairment Questionnaire

Figure 3: Gujarati WIQ

ચાલવાની ક્ષતિ પ્રશ્નાવલિ

નામ:_____કોડ:_____

તારીખ:_____ચકાસણી:_____

૧. ચાલવાની ક્ષતિ:આ પ્રશ્નો ચાલવાની તકલીફ ના કારણો જાણવાના છે. અમે જાણવા માંગીએ છીએ કે આ દરેક કારણો ને લીધે છેલ્લા એક મહીના માં તમને ચાલવા માં કેટલી તકલીફ પડેલ છે. તકલીફનો અર્થ અમારા મતે એ છે કે એ તમારા માટે કેટલું અઘરું હતુ અથવા એ દરેક તકલીફના લીધે તમને ચાલવામાં કેટલો શારીરિક શ્રમ પડ્યો.

અ.PAD ને લગતા ચોક્કસ પ્રશ્નો	પગ	તકલીફનું પ્રમાણ					પ્રામાંક
	ડાબો જમણો બંને	જરાયનહિ	નહિવત	થોડુ	વધુ	વધારે	
દર્દ, કળતર કે જકડણ પિંડીમાં? (કે બેઠકના ભાગે)		૪	૩	૨	૧	૦	

બ. તફાવતી નિદાન	તકલીફ નુંપ્રમાણ					પ્રામાંક
	જરાય નહિ	નહિવત	થોડુ	વધુ	વધારે	
૧. તમારા સાંધા માં દર્દ, જડતા કે કળતર? (ઘૂંટી, ઘૂંટણકેથાપામાં?)	૪	૩	૨	૧	૦	
૨. તમારા એક કે બંને પગમાં નબળાઇ?	૪	૩	૨	૧	૦	
૩. તમારી છાતીમાં દુખાવો કે અગવડતા?	૪	૩	૨	૧	૦	
૪. શ્વાસની તકલીફ? અથવા ટૂંકા શ્વાસ?	૪	૩	૨	૧	૦	
૫. હૃદયના ધબકારા વધી જવા?	૪	૩	૨	૧	૦	
૬.બીજી કોઇ તકલીફ? (કૃપયા જણાવો)	૪	૩	૨	૧	૦	

૨. ચાલવાનુંઅંતર :તમને સપાટી પર નીચે જણાવેલ અંતર માટે ઉભા રહ્યા વગર ચાલવા માં કેટલી મુશ્કેલી પડે છે એનું શારીરિક અગવડતા ક્રમાંકનું આલેખન કરો.

અંતર	શારીરિક અગવડતા ક્રમાંક					વજન(ફૂટમાં)	પ્રાપ્તાંક
	જરાય નહિ	નહિવત	થોડુ	વધુ	અસમર્થ		
૧. ઘરની અંદર ચાલવામાં?	૪	૩	૨	૧	૦	×૨0 =	
૨. ૫૦ ફૂટ ચાલવામાં?	૪	૩	૨	૧	૦	×૫૦ =	
૩. ૧૫૦ ફૂટ ચાલવામાં? (૧/૨બ્લોક)?	૪	૩	૨	૧	૦	×૧૫૦ =	
૪. ૩૦૦ ફૂટ ચાલવામાં? (૧બ્લોક)?	૪	૩	૨	૧	૦	× ૩૦૦ =	
૫. ૬૦૦ ફૂટ ચાલવામાં? (૨બ્લોક)?	૪	૩	૨	૧	૦	×૬૦૦ =	
૬. ૯૦૦ ફૂટ ચાલવામાં? (૩બ્લોક)?	૪	૩	૨	૧	૦	×૯૦૦ =	
૭. ૧૫૦૦ ફૂટ ચાલવામાં? (૫બ્લોક)?	૪	૩	૨	૧	૦	×૧૫૦૦=	
કુલઅંક							
%અંક (૧%-૧૦૦% સુધી) =(સરવાળો/૧૪,૦૮૦)×૧૦૦							

૩.ચાલવાનીઝડપ :નીચેના પ્રશ્નો તમે છેલ્લા મહિનામાં ૩૦૦ ફૂટ સપાટ સપાટી પર કેટલું ઝડપથી ચાલવામાં સક્ષમ હતા તે માટે છે. નીચે જણાવેલ દરેક ઝડપ પર આરામ કરવા રોકાયા વગર ચાલવા માટે તમને કેટલી શારીરિક અગવડ પડી તે અમને જણાવો.

ઝડપ	શારીરિકઅગવડતાક્રમાંક					વજન (માઈલ /કલાક)	પ્રાપ્તાંક
	જરાય નહિ	નહિવત	થોડુ	વધુ	અસમર્થ		
૧.૩૦૦ ફૂટ ધીમે ચાલો છો? (૧બ્લોક)	૪	૩	૨	૧	૦	× ૧.૫ =	
૨.૩૦૦ ફૂટ સામાન્ય ઝડપે ચાલો છો? (૧બ્લોક)	૪	૩	૨	૧	૦	× ૨.0 =	
૩. ૩૦૦ ફૂટ ઝડપથી ચાલો છો? (૧બ્લોક)	૪	૩	૨	૧	૦	× ૩.૦ =	
૪.૩૦૦ ફૂટ દોડો છો અથવા ધીમેથી દોડો છો? (૧બ્લોક)	૪	૩	૨	૧	૦	× ૫.૦ =	
કુલઅંક							
%અંક (૧%-૧૦૦% સુધી)=(સરવાળો/૪૬)×૧૦૦							

૪.દાદર ચડવા :નીચેના પ્રશ્નો તમે સીડી ના કેટલા પગથિયા ચડવા સક્ષમ છો એના માટે છે. નીચે જણાવેલ પ્રશ્નો મુજબ આરામ કરવા રોકાયા વગર સીડી ચડવામાં તમને પડેલી શારીરિક અગવડ અમને જ ણાવો.

સીડી/દાદરા	શારીરિક અગવડતા ક્રમાંક					વજન #સીડી	પ્રામાંક
	જરાય નહિ	નહિવત	થોડુ	વધુ	અસમર્થ		
૧. ૧૨ પગથિયા ચડવામાં (૧ સીડી)	૪	૩	૨	૧	૦	× ૧૨=	
૨. ૨૪ પગથિયા ચડવામાં (૨ સીડી)	૪	૩	૨	૧	૦	× ૨૪=	
૩. ૩૬ પગથિયા ચડવામાં (૩ સીડી)	૪	૩	૨	૧	૦	× ૩૬=	
કુલ અંક							
%અંક (૧%-૧૦૦% સુધી) =(સરવાળો/૨૮૮)×૧૦૦							

Statistical Analysis

Descriptive statistics (mean and standard deviation) were used to characterize the study populations. This comprised the one proportion agreement method in which the Content Validity Index (CVI), item level content validity (I-CVI), universal agreement (UA), Scale –content validity index (S-CVI/Ave) was computed to summarize the overall content validity of the questionnaire as well as a proportion of agreement between content experts.

To assess the concurrent and construct validity, the association between the three domains of the Gujarati WIQ (distance, speed, and total score) and 6-minute walk distance and speed as well as the physical functioning domain of the SF36 questionnaire, respectively. They were calculated

using Pearson's correlation coefficient. All tests were two-tailed, and statistical significance was accepted at $P < 0.05$.

Intraclass correlation coefficient (ICC) was calculated to find test-retest reliability of Gujarati WIQ over 7 days. The ICC value indicates reliability and is categorized as fair (<0.40), moderate (0.40-0.59), substantial (0.60-0.79), and excellent (≥0.80). A minimum acceptable level of reliability is ICC>0.70.[23,22,24]

Internal consistency was calculated by Cronbach's alpha. A Cronbach's alpha of 0.00 to 0.69 was identified as poor, 0.70 to 0.79 was identified as fair, 0.80 to 0.89 was identified as good, and 0.90 to 0.99 was identified as excellent. Statistical analysis was performed with Statistical Product and Service Solutions (SPSS) version 23.

Results

In phase 1, 13 out of 14 items had an I-CVI of 1, which showed complete agreement between the experts. Universal Agreement was 0.92 and showed excellent agreement between the experts. (Table 1) Overall, S-CVI/Ave was 0.99, which suggested excellent content validation of the questionnaire (Table 1).

Table 1: Values of Item Content Validation Index, probability of chance of agreement, and Scale level content validation index for each item of the Gujarati Walking Impairment Questionnaire

WIQ questionnaire item no.	Number of experts rating each WIQ Item as 3	I-CVI	Pc	S-CVI ave based on I-CVI	Comprehension of total instrument by universal agreement of experts
1	13	0.9	0.92	0.99	Proportions of consensus = 0.92
2 to 14	14	1	1		
I-CVI = Item Content Validation Index S-CVI/ave: Scale level content validation index Pc = probability of chance of agreement					

In phase 2, for the face validation, 10 participants with PAD and claudication (mean age of 59 years, 9 males) were recruited. Seven participants had previous revascularization procedures, and 3 participants were medically managed. No changes to the wording of the questionnaire were proposed.

In phase 3, a total of 160 participants were included (Table 2). The majority of the sample, 92%, were male, overweight, and had diabetes for a mean (standard deviation (SD)) duration of 8.5 (±6.7) years. (Table 2). They had a mean (SD) of ABI, 6MWD, 6-Minute walk test speed, total WIQ Score, and the physical functioning domain of SF 36 Score is 0.40±0.1,144.5±126.5 meters,0.9±0.7 mile/h, 22.6±20.9 and 26.0±19.5 respectively

Table 2: Demographic details of study participants.

Participants characteristics (n=160)	
Age (years)	57.2 (8.6)
Sex (n (%) men)*	147 (91.8%)
Weight (kg)	64.5 (10.3)
Height (meter)	1.7 (0.1)
BMI (kg/m^2)	23.6 (3.7)
Diabetes Duration (years)	8.5 (6.7)
Ankle-brachial index	0.4 (0.1)
Baseline 6MWD	144.5 (126.5)
Baseline walking speed	0.9 (0.7)
Baseline total WIQ	22.6 (20.9)
Baseline WIQ Distance	10.0 (15.7)
Baseline WIQ Speed	12.2 (15.3)
SF 36 Physical function score	26.0 (19.5)
All data mean (standard deviation) except*= number (%)	

There was an excellent correlation between the WIQ distance score and the 6-minute walk test distance (r = 0.95, *P*<.001)). There was an excellent correlation between the WIQ speed score

and the 6-minute walk test speed score (r = 0.89, *P*<.001)). There was an excellent correlation between the Gujarati WIQ total score and the total score of a physical functioning domain of SF-36(r = 0.99, *P*<.001).

There was excellent test-retest reliability over 7 days for the total WIQ score (ICC = 0.94). The Cronbach's alpha for internal consistency of 0.97 for the total WIQ score was excellent. This implies the sufficient homogeneity of the total questionnaire.

Discussion

This is the first study to translate and test the measurement properties of the WIQ for use in an Indian population. The Gujarati WIQ demonstrates excellent content, concurrent and construct validity, test-retest reliability, and internal consistency for evaluating walking impairment in people with peripheral artery disease in India. The distance and speed subscales of WIQ scores correlated well with six-minute walking distance and speed. Distance is particularly important because it is one of the WIQ's key efficacy variables.[27,28] The Total score of WIQ correlated well with the physical functioning domain of SF 36, which is an indicator of the overall health and function in people with PAD.

In Phase 1, there were minimal difficulties encountered during the translation and cross-cultural adaptation of the Gujarati WIQ, similar to the findings of other studies.[12] The only difficulty encountered was with the translation of the word "block" into Gujarati because this is not a commonly used term in India. After discussion, the word "block" was rephrased as "feet", a more commonly understood term for distance. This difficulty was similar to other studies, for example, when WIQ was translated into Chinese and Dutch.[12,14] Other studies have reported difficulty translating the phrase flight of stairs. However, this was not the case in our study, and our participants with PAD made no further changes to the Gujarati WIQ in Phase 2.[16]

To our knowledge, this is the first study where the comprehensibility of this questionnaire has been explored with patients with PAD using a cognitive interviewing approach and confirms that the Gujarati WIQ is an easily completed and understood assessment of walking impairment by people in India.

Our study found that the Gujarati WIQ had excellent construct and concurrent validity as well as excellent internal consistency to evaluate walking impairment.

The excellent concurrent validity between walking distance and total WIQ score is because the current study used a corridor-based six-minute walk test as a measure of walking ability, which more accurately reflects community-based walking in people with PAD than a treadmill-based 6MWD, commonly used in other studies.[19] For example, the concurrent validity of the Dutch WIQ was 0.52 for the total WIQ score compared with absolute claudication distance (maximal possible walking distance) and 0.48 between the total WIQ and the functional claudication distance (when the patient would want to stop walking due to pain) assessed using a treadmill walking test.[12]

As anticipated, we found an excellent correlation between the total Gujarati WIQ score and the physical functioning domain of SF36. This confirms previous research that reports a good correlation between WIQ distance, speed, and stair climbing score, with a total SF-36.[13]

Our study also found excellent test-retest reliability of the Gujarati version of WIQ. This reflects the findings of the validation study of the Dutch WIQ (ICC=0.89)[12] and suggests that the Gujarati WIQ is reproducible and meets the criteria for tool validation.

The WIQ is a disease-specific questionnaire that has been validated for use in people with claudication to describe the level of walking impairment and to assess the effectiveness of interventions to relieve symptoms. Screening for peripheral artery disease (PAD) can assist

vascular nurses in identifying early-stage walking impairments, enabling the development of walking interventions.[29]

Study strengths and limitations

This study has a number of strengths. The Gujarati WIQ is the first walking impairment questionnaire for people with PAD to be translated into an Indian language. A robust, standardized approach was used for translation and psychometric testing of the Gujarati WIQ, and our findings reflect the findings of other studies that translate and test the WIQ.[12,13,14,20] One limitation to consider is the inclusion of only participants with both PAD and Type II Diabetes without cerebrovascular disease, the results could be less generalizable to those with PAD alone. However, our sample was large and included people of different sexes and ranges of ages. The Gujarati WIQ is likely to be suitable to use with all Gujarati-speaking people with PAD and Type II diabetes.

Conclusion

The Gujarati version of the WIQ has excellent psychometric properties and is appropriate for assessing self-reported walking impairment in people with PAD and Type II diabetes. The use of WIQ can be recommended in clinical settings and future research in Gujarati-speaking subjects with PAD. Gujarati WIQ can contribute to a better understanding of walking impairment in Gujarati-speaking people with PAD and Type II diabetes.

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