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Reliability and validity of Gujarati version of Victorian institute of sports assessment for patellar tendinopathy questionnaire

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Abstract

Patellar tendinopathy is an injury related patellar tendon among sports players particularly in athletes. VISA-P is designed to quantify the severity of pain and disability in people with patellar tendinopathy. For the usage of Gujarati version of VISA- P questionnaire in clinical practice and research, cultural adaptation and validation of the questionnaire is paramount. Aim is to translate VISA-P questionnaire into Gujarati language to study reliability and validity of VISA-P Gujarati version. Translation and cross-culture adaptation was performed according to the guidelines followed internationally. The psychometric properties were tested by administering the questionnaire to 55 participants. Validity assessed by 15 subject experts. The test-retest reliability for VISA-P Gujarati was good ICC 0.886 and Cronbach's alpha 0.751. The VISA-P Gujarati translation and adaptation processes were successfully adapted. The VISA-P Gujarati has proven to be reliable and valid questionnaire and can be used in the Gujarati speaking patients with patellar tendinopathy.

Keywords: Patellar tendinopathy, VISA-P Gujarati, cross-cultural adaptation, single leg decline squat test, reliability, validity

Introduction

Patellar tendinopathy or 'jumper's knee' is a non-inflammatory condition related to structural damage in the proximal and distal region in patellar tendon among sports particularly in athletes who involved in running and jumping [1, 2, 3, 4]. Patellar tendinopathy is overuse injury which is characterized by load dependent pain especially eccentric loading at the inferior pole of patella [4, 6, 7]. Patients with patellar tendinopathy usually present with anterior knee pain and tenderness to palpation over the tendon [8, 9]. The overall prevalence of current jumper's knee was 14.2%. Where at the elite players level highest prevalence in volleyball (44.6% ± 6.6%) and basketball players (31.9% ± 6.8%) [10, 11]. The prevalence of patellar tendinopathy in nonelite athletes ranges from 11.8% to 14.4% [5, 10]. Intrinsic and extrinsic risk factors contribute to patellar tendinopathy. Extrinsic factors like improper training surfaces, insufficient footwear and high intensity training whereas Intrinsic factors like strength imbalance, improper posture, foot malalignment, reduced ankle dorsiflexion and lack of flexibility [2, 7]. Patellar tendinopathy decreases the work and sports performance [11, 12, 13]. The Victorian Institute of Sport Assessment-Patella developed a brief self-administered questionnaire called the VISA-P in 1998 developed by the VISA Tendon Study Group (Visentini and Khan KM *et al.*) to quantify the degree of symptoms caused by patellar tendinopathy [1, 3, 4, 14]. The Victorian Institute of Sport 6 Assessment (VISA-P) was used to assess symptoms, simple tests of function and ability of subjects to undertake sport and treatment effects [1, 15, 16]. VISA-P scale consists of eight items and is a self-administered outcome measure. The maximum VISA-P score for an asymptomatic athlete is 100 points and minimum score of VISA-P questionnaire is 0 points. Khan K M reported that single decline squat test is positive functional test in Patellar tendinopathy [17]. The VISA-P and single decline squat tests traditionally used to evaluate patellar tendinopathy. From total population of India 4.48% population using Gujarati language [18]. Clinical and research implementation of the VISA-P scale for the Gujarati speaking population requires a systematic process of cultural adaptation and validation [2, 6].

VISA-P questionnaire has been translated, adopted and validated for Spanish, Dutch, German, Brazil, Kannada and many other populations. For the usage Gujarati version of VISA- P questionnaire in clinical practice and research, cultural adaptation and validation of translated version of the questionnaire is paramount. To translate VISA-P into Gujarati language, validate and check the reliability of the VISA-P Gujarati from the original English version of VISA-P questionnaire.

Materials and Methods

Institutional ethical committee approved the study protocol and procedure. The study conducted between January 2020 to march 2021. For this descriptive analytical study Symptomatic patellar tendinopathy participants were taken from Sports Authority of Gujarat, Vadodara.

Materials

- Therapeutic wedge
- Consent form
- VISA-P questionnaire: It consists of eight item questionnaire. Six out of eight questions rate pain during activities of daily living and simple functional tests on an inversed visual analogue scale. Last two questions are related to the ability to participate in sporting activities. The maximum VISA-P score for an asymptomatic athlete is 100 points. Before initiating the study, prior consent from Dr. Karim Khan & Dr. Jill Cook, co-developers of the VISA-P questionnaire, has been received for the usage of VISA-P questionnaire for translation.

Inclusion and Exclusion Criteria

Inclusion criteria

- Age between 18 and 35 years
- Knee pain in the patellar tendon or its insertion
- Tenderness at patellar tendon
- Positive single leg decline squat test¹⁵

Following Clinical features for symptomatic participants of patellar tendinopathy according to Khan KM.¹⁷

- Knee pain in patellar tendon or its insertion, especially inferior pole of patella aggravated by running and jumping.
- Tenderness at patellar tendon sometimes associated with tendon thickening.
- Generally, quadriceps wasting or generalizes quadriceps weakness.
- In some cases, painful quadriceps contraction.
- Positive single leg decline squat test.

Exclusion criteria

- Conditions causing anterior knee pain like fat pad syndrome, Patellofemoral Pain Syndrome (PFPS), signs

and symptoms of knee pathologies

- Any knee surgery or injection therapy in the past one year

Methodology

Cross - cultural adaptation: The term “cross-cultural adaptation” is used to incorporate a process that looks at both language (translation) and cultural adaptation issues in the process of preparing a questionnaire for use in another setting. The English VISA-P was translated in VISA-P Gujarati language according to the method described by Beaton *et al.* 30 This method includes mainly 5 stages: (1) Translation (2) Synthesis (3) Back translation (4) Expert committee review (5) Pre-testing (Table 1)

Stage-1 Forward translation

Initial translation of VISA-P questionnaire was done into Gujarati languages from original English version of VISA-P. Two bilingual individuals whose native language is Gujarati, translate the VISA-P into Gujarati languages. One of them was Physiotherapist by profession with sound knowledge and experience in musculoskeletal conditions and another one was language expert. One translator was aware of the concepts being examined in the questionnaire being translated.

Stage-2 Synthesis: The two translators synthesize the results of the translations. They reviewed and final translated questionnaire formed.

Stage-3 Back translation

Working from the synthesized version of the questionnaire and totally blind to the original version, a translator then translates the questionnaires back into the original English language from the synthesized version Gujarati language. This is a process of validity checking to make sure that the translated Gujarati version was reflecting the same item content as the original English version.

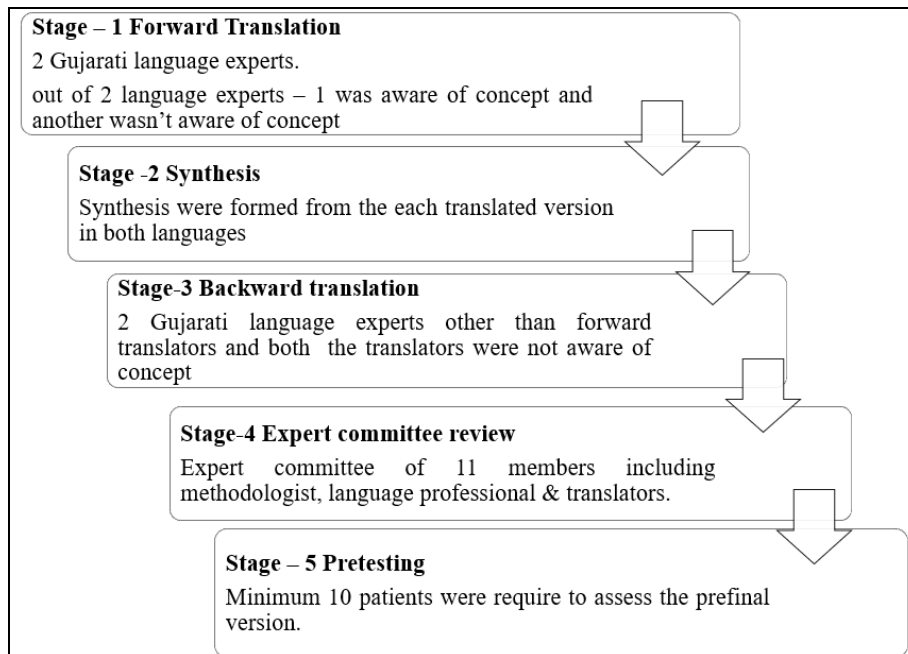
Stage-4 Reviewers committee

The composition of this committee was crucial to achieve the cross-cultural equivalence. The minimum composition of committee involved methodologist, health professional, language professional and translators. They developed pre final version of VISA-P emphasizing on semantic, idiomatic, experimental and conceptual equivalence in relation to original back translated VISA-P versions.

Stage-5 Pretesting

The final stage of adaptation process is the pre-test. The main objective of the test was to check whether the translated questionnaire of Gujarati language is understandable, the vocabulary and the meaning was relevant for Gujarati culture.

Table 1: Translation process



Procedure

After getting the permission from Sports Authority of Gujarat, Vadodara, we met the different sports players like football players, volleyball players, tennis players, hockey players etc. After receiving the consent form and demographic details from 61 participants, assessed the clinical features of the participants to check the inclusion criteria. To confirm the patellar tendinopathy diagnosis functional test named Single leg decline squat test was performed by the participants.

Single leg decline squat test aggravate the patellar tendinopathy pain. Out of 61 participants, 6 participants were excluded due to not matching the inclusion criteria. After confirming the inclusion criteria 55 participants were requested to fill the VISA-P questionnaire VISA-P Gujarati along with VISA-P English questionnaire. To check the test-retest reliability participants were asked to fill the VISA-P Gujarati after the days of interval from the first assessment.

Table 2: Procedure

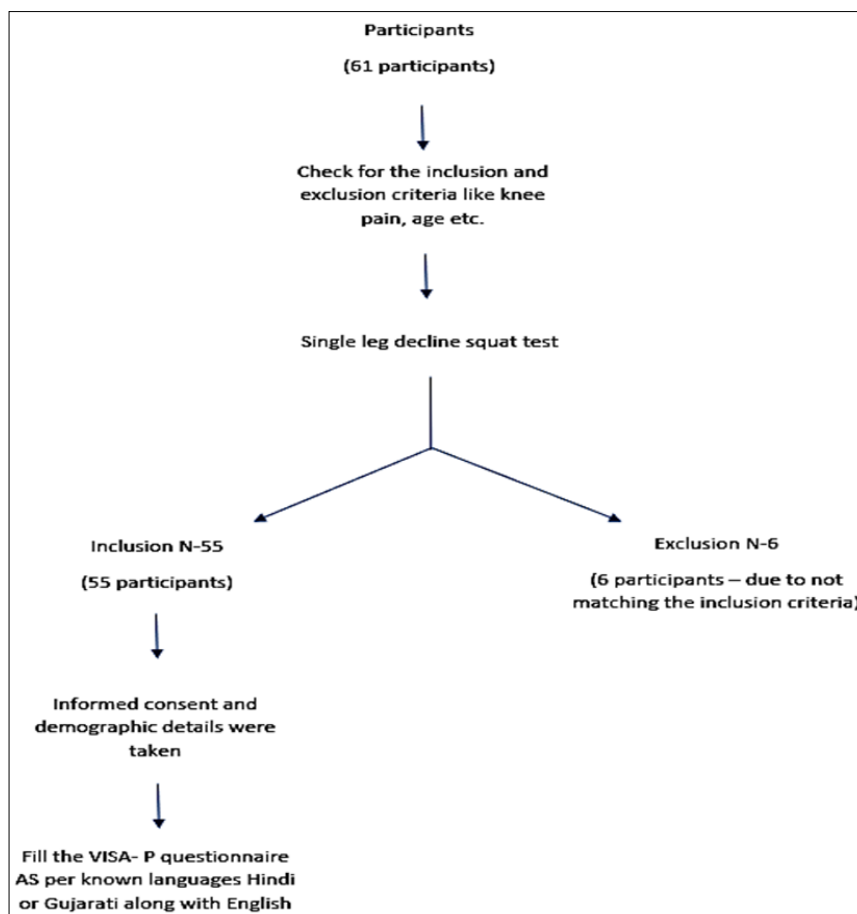




Fig 1: Consent form & data filling



Fig 2: Functional single leg decline squat test

Validity

Concurrent validity was demonstrated by comparing / correlating outcome scores of VISA-P English questionnaire with VISA-P Gujarati. Minimum 10 subject experts (Physiotherapist) were required to compare and correlate the translated version of questionnaire with original English VISA-P questionnaire by shuffling the questions. Total 15 subject experts participated in the study to validate the translated VISA-P questionnaire in Gujarati language.

Reliability

Internal consistency was assessed by using the Cronbach alpha. This process was useful to determine whether a specific question affects the consistency of the questionnaire. The recommended value for Cronbach alpha (α) is between 0.70 and 0.95.3 Parallel form method was to obtain to check reliability of VISA-P Gujarati version of VISA-P questionnaire with VISA-P English questionnaire by shuffling the questions. All the 55 participants filled the VISA-P questionnaires of English and Gujarati languages. Test-retest reliability was assessed using intraclass correlation coefficients (ICC). The minimum value recommended for this measurement property is 0.70 [3]. To assess the test-retest reliability, the subjects were asked to fill the questionnaire twice within one week. Questionnaires were given at 2 days of interval.

Result and Discussion

After the first review during the translation process, the research team made some changes in the questionnaire to improve understanding. When testing the prefinal version, none of the subjects had difficulty in understanding the questionnaire. The participants consisted of 69.1% male and

30.9% female participants out of 55 participants; their mean age was 21.75 years, height was 167.29 cm, and weight was 60.42 Kg. Patellar tendinopathy was diagnosed based on their history and physical examinations. (Table -3, Fig-3)

Table 3: Descriptive characteristics of participants

	Mean	Std. Deviation	Mean \pm Std. Deviation
Age	21.75	4.120	21.75 \pm 4.1196
Height(cm)	167.2909	10.32558	167.29 \pm 10.3256
Weight (Kg)	60.4182	11.82894	60.42 \pm 11.8289
BMI(Kg/m ³)	21.5145	3.45272	21.51 \pm 3.4527

Patellar tendinopathy can be seen more in female than the male. In our study out of 55 participants 69.1% were male and 30.9% were female. (Fig. – 4)

Reliability

VISA-P Gujarati questionnaire Cronbach alpha at the time of first assessment or attempt and second assessment or attempt respectively 0.749 and 0.751. When ICC_{2,1} was 0.886(CI 0.837-0.926).

Concurrent Validity

The validity VISA-P Gujarati with original VISA-P English for patellar tendinopathy was correlated by correlation coefficient. Concurrent validity was demonstrated by a high level of association between the VISA-P Gujarati and the VISA-P English original questionnaire scores. ($\rho=0.887$, $p<0.001$) All the questions of VISA-P Gujarati questionnaire were significant at the 1% level of significant except question 7. Question 7 was significant at the 5% level of significant. (Table 4)

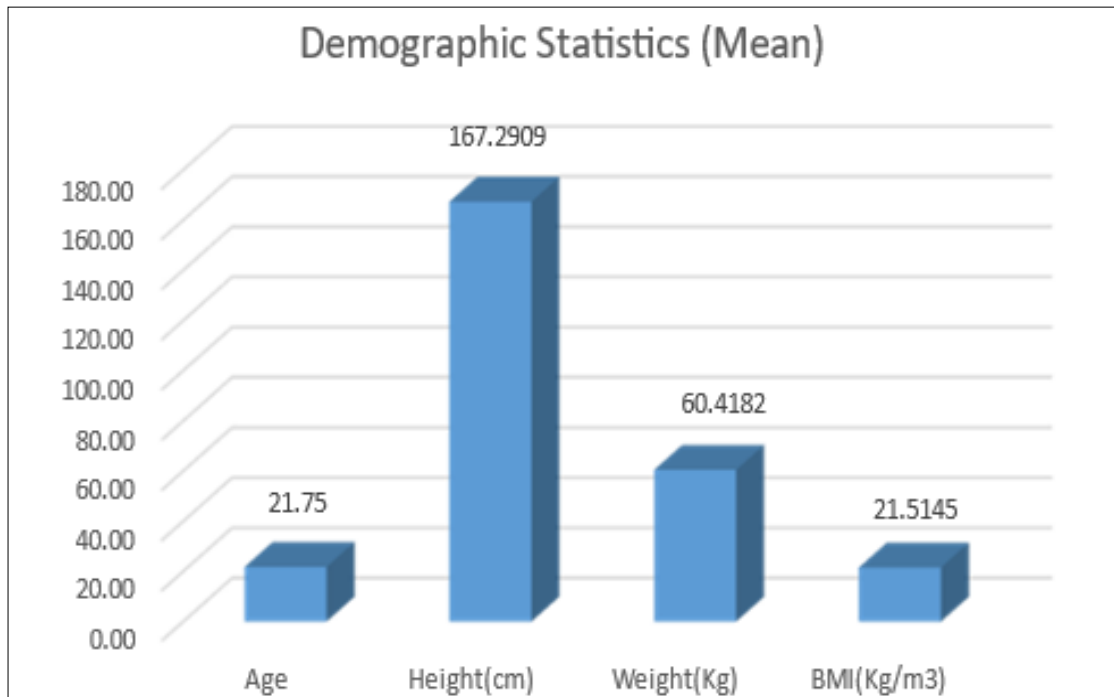


Fig 3: Descriptive characteristics of participants

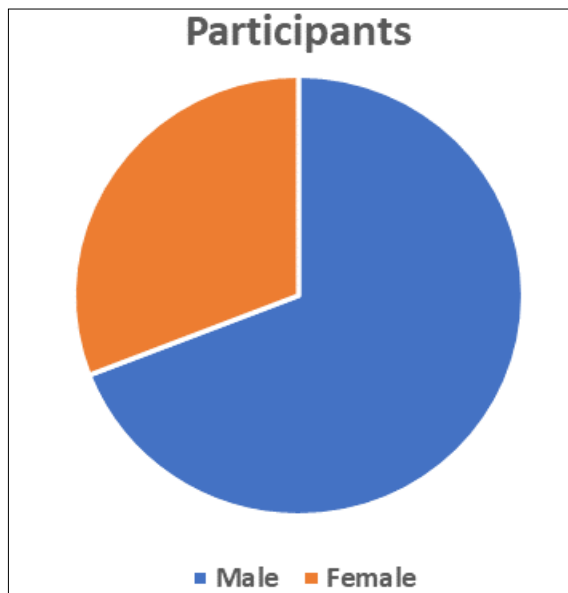


Fig 4: Gender Ratio for patellar tendinopathy

The translation or cross-cultural adaptation of VISA-P Gujarati questionnaire was encountered well. During the translation procedure of the VISA-P, the translation for "Weight bearing lunges and Squat" was debated. Same kind of disagreement were seen in previously done studies on "Weight bearing lunges and Squat" [3, 4]. Some of them used diagrams of squat and lunge for the better understanding. Eventually, we adopted a similar term which was understandable by athletes. In pretesting of the questionnaire these words highly accepted and understandable.

VISA-P Gujarati questionnaire Cronbach alpha at the time of first assessment or attempt and second assessment or attempt respectively 0.749 and 0.751. When ICC was 0.886 (ICC2, 1 0.837-0.926, CI-95%). The recommended value for Cronbach alpha is between 0.70 and 0.95 which suggest good to excellent reliability. The minimum value recommended for ICC measurement property is 0.70 which also suggest good test-retest reliability. In our study the Cronbach alpha (α) and ICC (Intraclass correlation) were within the normal limits.

These values of the properties in our study suggest the VISA-P Gujarati have good reliability and validity.

Table 4: Correlation coefficient for concurrent validity $p < 0.001$ is 1% level of significant, $p < 0.005$ is 5% level of significant

Questions	Gujarati	Level of significance
1	0.887	$p < 0.001$
2	0.957	$p < 0.001$
3	0.957	$p < 0.001$
4	0.957	$p < 0.001$
5	0.957	$p < 0.001$
6	0.957	$p < 0.001$
7	0.534	$p < 0.001$
8	0.957	$p < 0.001$

In Previous studies like the VISA-P Korean version, the test-retest showed good reliability and it was significant (ICC2,1 0.96, $p < 0.001$) [4]. In this study, VISA-P-Kannada questionnaire was administered twice within a week for athletes with PT and asymptomatic group and the results were excellent (ICC $\frac{1}{4}$ 0.97 and 0.96; $p < 0.001$). In Swedish version, the test-retest showed good reliability and it was significant (ICC2, 1 0.97, $p < 0.001$) [8]. Test-retest reliability of the German version of VISA-P was excellent and it was tested twice within a week for athletes with Patellar tendinopathy and asymptomatic group (ICC2,1 0.88, 0.87; $p < 0.001$) and concurrent validity was perfect [11]. On the other hand, the test-retest reliability of Greek version of VISA questionnaire was good despite being fifteen to seventeen days interval period (ICC $\frac{1}{4}$ 0.818, $p < 0.001$; CI-95%) and internal consistency was a $\frac{1}{4}$ 0.785 to 0.784. Concurrent validity showed high level of association between VISA-P-GR and Blazina classification ($r \frac{1}{4}$ 0.839, $p < 0.001$) [19].

Although the Reliability and validity of VISA-P Gujarati questionnaire was good but it was comparatively less than the other translated versions like Kannada version (VISA-P-K), German etc. There were many chances for less reliability and validity compared to the other languages. In our study we did not compare the questionnaire and their score between the symptomatic and asymptomatic patellar tendinopathy

participants. We have not compared with any other group like asymptomatic or normal healthy individual or other conditions.

Limitation

There were some limitations of the study. The athletes suffering from patellar tendinopathy had not undergone Doppler ultrasound or MRI investigations for further confirmation of patellar tendinopathy. Instead, we were solely dependent on history and clinical examination findings. For reliability we did not compare the questionnaire and their score with asymptomatic and /or healthy individual and/or other condition patients. We had only assessed symptomatic patellar tendinopathy group.

Conclusion

The VISA-P Gujarati was successfully cross-culturally adapted and validated for use in Gujarati speaking populations. The VISA-P Gujarati can be recommended as an assessment tool for assessing the impact of symptoms on function and ability to play sport in Gujarati speaking patients with patellar tendinopathy. The results of the present study indicate that the translated Gujarati version of the VISA-P questionnaires are equivalent to its original version, has satisfactory test-retest reliability, and is a valid tool to assess patellar tendinopathy.

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