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## Original Research Article

## Translation and psychometric properties of the Gujarati version post-COVID functional status scale

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## ABSTRACT

**Background:** The 'Post COVID Functional Status Scale' (PCFS) is an ordinal scale concentrating on the functional limitations to view the variety of post-COVID 19 outcomes and to measure the consequence of the infection other than death

**Aims:** The adapted version of the PCFS Scale will be useful in tracking the post COVID functional status in the individuals who can comprehend the scale better in the Gujarati language.

**Design & Settings:** This study was carried out in a post-COVID-19 patient population at a government tertiary care hospital. The study was carried out according to the guidelines given by the American Association of Orthopaedic Surgeons.

**Materials and Methods:** The methodology consisted of 3 Phases. Forward and backward translation, expert committee review, and usability testing on the participants who were asked to fill out the Gujarati version of the PCFS scale twice in Phase 1, 2, and 3 respectively.

**Statistical analysis:** 30 participants, both males, and females participated in the study. Cronbach's  $\alpha$  was used to calculate the internal consistency of the scale.

**Results:** The ICC was 0.99, which interprets as a very high correlation and stability of the scale.

The Cronbach's alpha was calculated for a population of 30 participants. On test 1 the value for Cronbach's Alpha ( $\alpha$ 1) was 0.821 and on the second test, the value was ( $\alpha$ 2) 0.866.

**Conclusions:** A linguistically and practically identical Gujarati PCFS Scale was formulated after a careful and systematic process, which offers a viable and trustworthy method for assessing the functionality of post-COVID-19 patients.

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## 1. Introduction

The beginning of the year 2020, has marked an outbreak of Severe Acute Respiratory Syndrome from a novel coronavirus (SARS-CoV 2). COVID-19 has been labeled a global pandemic by the World Health Organization (WHO) for two years, as of January 2022.<sup>1,2</sup>

Previous studies suggest that symptoms such as fatigue, dyspnea, cough, and headache were present even after

testing negative for the virus.<sup>3,4</sup> This phenomenon where symptoms persisted even months after the infection is termed 'Post COVID Syndrome'.<sup>5</sup> Due to this reason, there is a limitation in the functional capacity of the infected population.<sup>6,7</sup> A recent patient coined term 'long COVID' is in use which refers to a condition in which the people recovered from COVID-19 still report lasting effects from the disease or have suffered from the usual symptoms for longer than the average population.<sup>8-10</sup>

An ordinal scale with functional limitations, the 'Post COVID Functional Status scale', is a scale to capture the

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heterogeneity of the post-COVID-19 outcomes and measure the consequence of the disease apart from binary outcomes such as mortality. It is an easy and reproducible instrument to identify and check the prognosis of COVID-19 survivors suffering from slow or incomplete recovery. The Post-COVID-19 Functional Status (PCFS) Scale can be assessed upon discharge from the hospital, at another 4- and 8-weeks post-discharge to monitor direct recovery, and at 6 months to assess functional sequelae.<sup>11,12</sup> The increasing number of long COVID cases or post COVID-19 syndrome among COVID-19 survivors necessitates the use of this scale among the wide population to keep a check on the prognosis of the patient post-infection.

Gujarati is the native language of the state of Gujarat in India. It is the sixth most common language spoken in India and the 26th most common language spoken in the world and is spoken by more than 55 million people across the globe.<sup>13</sup> It is also the fastest-growing Indian language in various continents such as North America and Europe.<sup>14</sup>

As of 10th January 2022, India has reported 34.5 million recovered cases, out of which the state of Gujarat has reported 8.2 million recovered cases.<sup>15</sup> The adapted version of the PCFS Scale will be useful in the tracking of the post COVID-19 functional status in the individuals who can comprehend the scale better in the Gujarati language.

## 2. Materials and Methods

Prior to the commencement of the study, along with the Institutional Ethics committee approval, valid permissions were sought from the authors of the original scale. The authors were communicated about each step of the translation via electronic mail medium.

According to the guidelines given by the American Society of Orthopaedic surgeons, the study commenced in three phases (16). The first phase included lingual forward and backward translation of the Post-COVID-19 Functional Status (PCFS) scale to Gujarati. The second phase comprised an expert committee that reviewed the language and accuracy of the Gujarati version of the PCFS scale. Finally, in the third phase, the scale was given to a population of post-COVID-19 patients to test the psychometric properties like test-retest reliability and internal consistency.

### 2.1. Phase I- linguistic translation

In this phase, a set of guidelines for translation and cross-cultural adaptations given by Beaton et al. (16). These guidelines included 5-steps to translate the scale.

Step 1: 2 translators whose mother tongues were Gujarati were asked to translate the scale to Gujarati from its original English language (T1 and T2). Out of the two translators, one was well aware of the measures of the PCFS scale, and the other was from a non-medical background.

Step 2: In this stage, the forward translated versions were synthesized after a conciliation meeting with the translators and the authors.

Step 3: Other two translators whose mother tongues were Gujarati were asked to back translate (BT1 and BT2) the synthesized forward-translated versions from the previous stage (T12). Both these translators were unfamiliar with the original version of the scale.

Post this step; both the back-translated versions were compared to the original English scale by a native English speaker and the research coordinator. The thus found inconsistencies were corrected in the Gujarati Translation (T12) for the next step.

### 2.2. Phase II- expert committee review

In this phase, an expert committee of seven members was chosen to review the linguistic accuracy, layout, and ease of understanding of the questionnaire. This committee included members who played roles such as the Coordinator, Methodologist, Researcher, professional translators, and experienced physiotherapists. The expert committee suggested certain minor changes in the T12 version of the scale, which were finally inculcated in the Pre-final version of the Post-COVID functional status scale. This version of the scale was used on the patient population.

### 2.3. Phase III- psychometric property evaluation

The pre-final version of the scale was given to a sample population of 30 post-COVID-19 patients. This pre-final version also included the demographic questions, which asked name, age, sex, and a brief history of symptoms. A google form of the questionnaire was sent to these 30 individuals, twice with an interval of 48 hours so that clinical changes in the health status could be avoided.

The entire procedure is explained in Figure 1.

## 3. Results

### 3.1. Face and content validity

The expert committee comprised a total of seven members, and the pre-final scale was presented to them, wherein they approved of the initial translation, and suggested minor grammatical changes in the few items, as stated in Figure 2. No changes in the cross-cultural adaptation were suggested by the committee.

### 3.2. Internal consistency and test-retest reliability

Thirty participants both males and females, participated in the study with a mean age of  $37.16 \pm 14.54$ . Cronbach's alpha ( $\alpha$ ) was used to calculate the internal consistency of the Gujarati translation of the scale, and to calculate the test-retest reliability ICC was calculated. The ICC was 0.99, which interprets as a very high correlation and stability

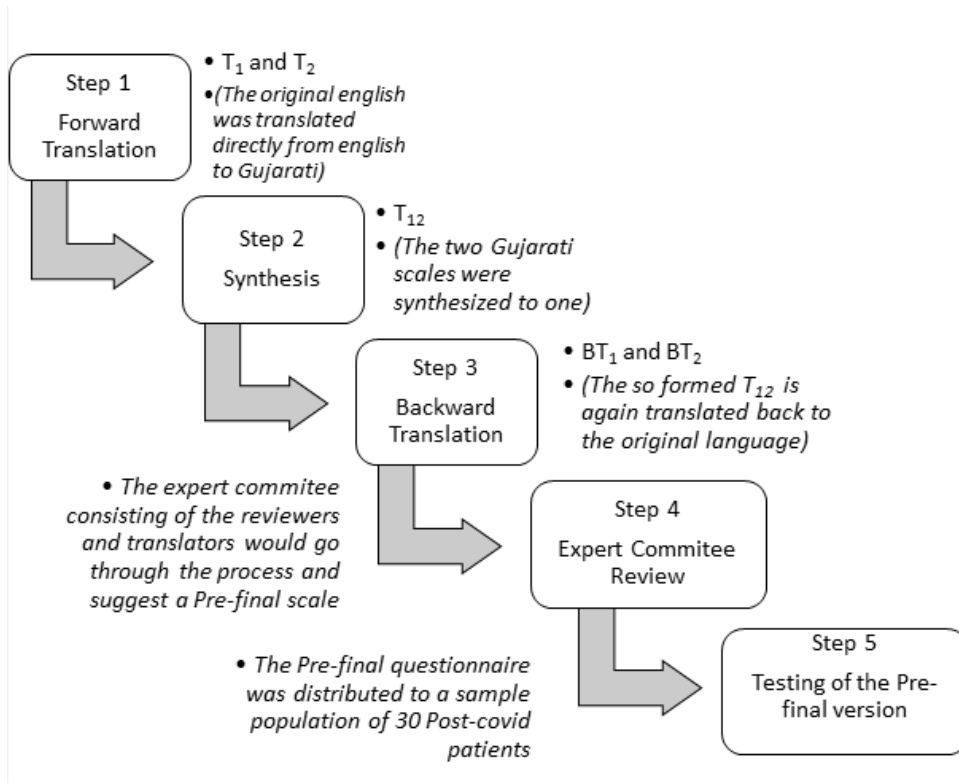


Fig. 1: Procedure of translation of the English version of the Gujarati Post-COVID Functional Status Scale.<sup>16</sup>

Original Scale	Gujarati Translation	Changes suggested by the committee
Can you live alone without any assistance from another person? (independently able to eat, walk, use the toilet, etc)	તમે કોઈ અન્ય વ્યક્તિની સહાયતા વગર એકલા રહી શકો છો? (ઉદાહરણ તરીકે: સ્વતંત્ર રીતે ખાવા, ચાલવા, શૈયાલયનો ઉપયોગ કરવામાં અને રોજિંદા સ્વચ્છતાનું સંચાલન કરવામાં સક્ષમ)	તમે કોઈ અન્ય વ્યક્તિની સહાયતા વગર એકલા રહી શકો છો? (ઉદાહરણ તરીકે: સ્વતંત્ર રીતે ખાવામાં, ચાલવામાં, શૈયાલયનો ઉપયોગ કરવામાં અને રોજિંદી સ્વચ્છતાનું પાલન કરવામાં સક્ષમ છો)
Do you suffer from symptoms, pain, depression or anxiety?	તમે કોઈ લક્ષણ, દુખાવો, હતાશા અથવા અસ્વસ્થતા અનુભવ કરો છો?	તમે કોઈ લક્ષણ, દુખાવો, હતાશા અથવા બેચેની અનુભવ કરો છો?
Do you need to avoid or reduce duties/activities or spread them over time?	તમારે તમારા ફરજો / પ્રવૃત્તિઓને ટાળવા અથવા ઘટાડવાની જરૂર છે અથવા તમારે સમય જતાં એને ફેલાવવાની જરૂર છે?	તમારે તમારા ફરજો / પ્રવૃત્તિઓને ટાળવા અથવા ઘટાડવાની જરૂર છે અથવા અને કરવામાં લાંબો સમય લાગે છે?
I suffer from limitations in my everyday life as I occasionally need to avoid or reduce usual duties/activities or need to spread these over time due to symptoms, pain, depression or anxiety. I am, however, able to perform all activities without any resistance.	જીવનમાં મર્યાદાઓથી પીડિત છું. કારણ કે મારે ક્યારેક ક્યારેક સામાન્ય ફરજો / પ્રવૃત્તિઓને ટાળવા અથવા ઘટાડવાની જરૂર પડે છે અથવા લક્ષણો, પીડા, હતાશા અથવા અસ્વસ્થતાને કારણે સમય જતાં એ ફેલાવવાની જરૂર પડે છે. પરંતુ હું બધી પ્રવૃત્તિઓ કોઈ ના સહાયતા વગર કરી શકું છું.	હું જીવનમાં મર્યાદાઓથી પીડાવ છું કારણ કે મારે ક્યારેક ક્યારેક રોજિંદી ફરજો / પ્રવૃત્તિઓને ટાળવા અથવા ઘટાડવાની જરૂર પડે છે અથવા લક્ષણો, પીડા, હતાશા અથવા બેચેનીને કારણે અને કરવામાં લાંબો સમય લાગે છે. પરંતુ હું બધી પ્રવૃત્તિઓ કોઈ ના સહાયતા વગર કરી શકું છું.

Fig. 2: Changes in the construct of the scale after expert committee review

**Table 1:** Test-Retest Results

		Test	Retest
Can you live alone without any assistance from another person? (independently able to eat, walk, use toilet, etc)	Yes	29	30
	No	1	0
Are there any duties at home or at work which you are no longer able to perform yourself?	Yes	2	3
	No	27	27
Do you suffer from symptoms, pain, depression or anxiety?	Yes	2	2
	No	25	26
Do you need to avoid or reduce duties/activities or spread them over time?	Yes	0	0
	No	2	2
Mean Grade in P1		0.466	0.433
Mean Grade in P2		0.34	0.30

**Table 2:** Internal Consistency results

Items	Test 1	Test 2
Sum of variances	2	2
Variance of total scores	1.89	4.16
Cronbach's Alpha ( $\alpha$ )	3.18	7.34
	0.81	0.86

of the scale. The Cronbach's alpha was calculated for a population of 30 post-COVID-19 participants. On test 1 the value for Cronbach's Alpha ( $\alpha_1$ ) was 0.821 and on the second test, the value was ( $\alpha_2$ ) 0.866. As seen in Tables 1 and 2. This was interpreted as good-to-excellent statistical reliability.

#### 4. Discussion

India is a country of diverse cultures and this leads to the existence of several languages across the country. India currently has more than 250 scheduled and unscheduled mother tongues out of which only 22 are the official languages of India. Since a major population of India is from rural areas, they tend to understand their native languages only. Gujarati has been spoken by more than 4.58% population of the country. Since the Post-COVID Functional Status Scale is a quick self-administered tool for the assessment of the limitation of the functional capacity of patients, it is important to employ a validated translated version of a local language to be able to cover a wide range of the population. This scale has already been translated to various Indian languages such as Farsi, Hindi (which covers 57.1% of the Indian population) Kannada (covers 4.9% of the Indian population), Urdu (covers 5.2% of the Indian population), Telugu (covers 7.8% of Indian population), Marathi (covers 8.2% of Indian population) and Bengali (covers 8.9% of Indian population) versions are still in process.<sup>17</sup>

This study shows that the translation and adaptation of the 'Post COVID Functional Status scale' to the Gujarati language is successful. The Face and Content Validity, Internal Consistency, and Test-Retest reliability of the translated version of the Post COVID Functional Status

Scale were good and comparable with the properties of the original version. The guidelines of the American Association of Orthopaedic Surgeons were used to preserve the essence of the original scale to the translated version. Since no cultural adaptations were required for Indian society, the scale has only been linguistically adapted.

In this study, the authors found that the Gujarati Version of PCFS provided reliable results of the Functional Status in post COVID patients. The Cronbach alpha values of 0.821 and 0.866 for internal consistency suggest good to excellent reliability. The ICC value of 0.99 suggests a very high correlation and stability of the scale.

#### 5. Conclusions

In conclusion, the Gujarati Version of the PCFS Scale provides a valid and reliable tool to assess functional status among post COVID-19 patients. The translated version will help improve health care and the quality of life of patients who live in the native lands of Gujarat.

#### 6. Acknowledgements

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#### 7. Conflict of Interest

The authors declare that there is no conflict of interest.

#### 8. Source of Funding


None.


## References

1. WHO Coronavirus (COVID-19) Dashboard Available from URL:- <https://COVID19.who.int>. Last accessed 2022 on January 1.
2. Johns Hopkins Coronavirus Resource Center. Available from URL:- <https://coronavirus.jhu.edu/>. Last accessed 2022 on January 1.
3. Li LQ, Huang T, Wang YQ, Wang ZP, Liang Y, Huang TB, et al. COVID-19 patients' clinical characteristics, discharge rate, and fatality rate of meta-analysis. *J Med Virol*. 2020;92(6):577–83.
4. Guan WJ, Ni ZY, Hu Y, Liang WH, Ou CQ, He JX. Clinical Characteristics of Coronavirus Disease 2019 in China. *N Engl J Med*. 2020;382(18):1708–20.
5. Goërtz YMJ, Van Herck M, Delbressine JM, Vaes AW, Meys R, Machado F. Persistent symptoms 3 months after a SARS-CoV-2 infection: the post-COVID-19 syndrome?. *ERJ Open Res*. 2020;6(4):00542–2020. doi:10.1183/23120541.00542-2020.
6. Taboada M, Cariñena A, Moreno E, Rodríguez N, Domínguez MJ, Casal A, et al. Post-COVID-19 functional status six-months after hospitalization. *J Infect*. 2021;82(4):31–3.
7. Garrigues E, Janvier P, Kherabi Y, Bot AL, Hamon A, Gouze H, et al. Post-discharge persistent symptoms and health-related quality of life after hospitalization for COVID-19. *J Infect*. 2020;81(6):4–6.
8. Mahase E. COVID-19: What do we know about “long COVID”? *BMJ*. 2020;370:m2815. doi:10.1136/bmj.m2815.
9. Long COVID in a prospective cohort of home-isolated patients. *Nature Medicine*. Available from URL:- <https://www.nature.com/articles/s41591-021-01433-3>. Last accessed 2022 on January 1.
10. Ngai JC, Ko FW, Ng SS, To KW, Tong M, Hui DS, et al. Ngai JC, Ko FW, Ng SS, To K-W, Tong M, Hui DS. The long-term impact of severe acute respiratory syndrome on pulmonary function, exercise capacity and health status. *Respirol Carlton Vic*. 2010;15(3):543–50.
11. Klok FA, Boon G, Barco S, Endres M, Geelhoed JJM, Knauss S, et al. The Post-COVID-19 Functional Status scale: a tool to measure functional status over time after COVID-19. *Eur Respir J*. 2020;56(1):2001494. doi:10.1183/13993003.01494-2020.
12. Simpson R, Robinson L. Rehabilitation After Critical Illness in People With COVID-19 Infection. *Am J Phys Med Rehabil*. 2020;99(6):470–4.
13. Hermes. Gujarati: The language spoken by more than 55 million people | The Straits Times [Internet]. 2017. Available from: <https://www.straitstimes.com/singapore/gujarati-the-language-spoken-by-more-than-55-million-people> [Last accessed 2022 on Jan 10].
14. Hindi & Gujarati, fastest growing Indian languages in the US [Internet]. The American Bazaar. 2013. Available from: <https://www.americanbazaaronline.com/2013/08/14/hindi-and-gujarati-fastest-growing-indian-languages-in-the-us/> [Last accessed 2022 on Jan 10].
15. MoHFW | Home. Available from URL:- <https://www.mohfw.gov.in/>. Last accessed 2022 on January 1.
16. Beaton DE, Bombardier C, Guillemin F, Ferraz MB. Guidelines for the Process of Cross-Cultural Adaptation of Self-Report Measures. *Spine*. 2000;25(24):3186–91.
17. Census of India Website : Office of the Registrar General & Census Commissioner, India. Available from URL:- [https://censusindia.gov.in/2011Census/Language\\_MTs.html](https://censusindia.gov.in/2011Census/Language_MTs.html). Last accessed 2022 on January 1.

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