Journal of Health and Rehabilitation Research 2791-156X JHRR

Original Article

Translation and Reliability of the Facial Disability Index (FDI) in Bell's Palsy

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Keywords: Bell's palsy, Urdu Facial Disability Index, patient-reported outcomes, House-Brackmann Facial Grading Scale

Abstract

Background: Bell's palsy, a sudden-onset facial paralysis linked to the facial nerve, is often poorly assessed in non-English-speaking populations due to culturally insensitive tools. The Facial Disability Index (FDI) is traditionally used but lacks adaptations for Urdu-speaking patients, leading to potential disparities in care.

Objective: This study aimed to translate and evaluate the reliability and validity of the Urdu Facial Disability Index (UFDI) for assessing facial impairment in Bell's palsy patients.

Methods: A cross-sectional study design was employed over four months, recruiting 203 Urdu-speaking patients with Bell's palsy from rehabilitation clinics. The UFDI underwent rigorous translation and cultural adaptation processes, including forward and backward translation and expert committee reviews. Participants completed the UFDI and the House-Brackmann Facial Grading Scale (HBFGS) for validity assessment. Descriptive statistics and reliability analyses were conducted using SPSS version 25, with Cronbach's alpha for internal consistency and intraclass correlation coefficient (ICC) for test-retest reliability.

Results: The UFDI showed a Cronbach's alpha of 0.77 and an ICC of 0.99, indicating good internal consistency and excellent test-retest reliability. Spearman's rho showed significant correlation with HBFGS ($r = 0.508$, $p < 0.05$), confirming convergent validity.

Conclusion: The UFDI is a reliable and valid tool for assessing facial disability in Urdu-speaking patients with Bell's palsy, enhancing culturally sensitive clinical care.

1 Introduction

The Facial Disability Index (FDI) is a significant tool developed to assess the impact of facial nerve impairments on individuals' daily experiences and psychosocial well-being. The original FDI, introduced by Van Swearingen and Branch in 1996, stands out by incorporating patient-reported outcomes, addressing both motor and psychosocial dimensions of facial paralysis (50). However, current facial impairment indices often lack cultural sensitivity, particularly in Urdu-speaking communities, potentially leading to inaccurate assessments and suboptimal care. This underscores the importance of culturally adapted measures like the Urdu Facial Disability Index (UFDI), which aims to bridge this gap by evaluating facial disability in Bell's palsy patients within Urdu-speaking populations (64).

Bell's palsy, a common cause of sudden-onset facial paralysis, primarily results from dysfunction in the peripheral facial nerve. Despite its historical roots dating back to ancient medical texts, the condition was first comprehensively understood through the work of Sir Charles Bell in the 19th century (1). The condition is often linked to viral infections, particularly the herpes simplex virus type 1 (HSV-1), which can provoke inflammation in the facial nerve, leading to the characteristic symptoms of Bell's palsy (3). While the condition typically resolves spontaneously within weeks to months, the sudden paralysis can cause significant distress, necessitating medical intervention, including corticosteroids, antiviral medications, and physical therapy (4). Beyond physical symptoms, Bell's palsy can have profound psychosocial implications, affecting self-esteem and interpersonal relationships, and highlighting the importance of holistic care (4).

The anatomy of the facial nerve, which includes motor, sensory, and parasympathetic components, explains the diverse symptoms associated with Bell's palsy, such as heightened sound sensitivity and changes in facial sensation (5). Damage to specific branches of the facial nerve can lead to various functional impairments, such as difficulty in moving the brow, closing the eyes, or smiling, which further

contributes to the physical and psychosocial burden of the condition (8). Despite its prevalence, the exact cause of Bell's palsy remains unclear, with hypotheses ranging from viral infections to nerve ischemia (10, 11).

Epidemiologically, Bell's palsy exhibits distinct age-related patterns, with the highest prevalence in older adults, though younger age groups are also significantly affected (14). The clinical presentation can vary widely, necessitating a thorough neurological assessment to rule out other conditions (15). Economically, Bell's palsy imposes a substantial burden, encompassing direct medical expenses and lost productivity (16). Disparities in access to healthcare, particularly among racial and ethnic minorities and low-income individuals, underscore the need for targeted interventions to improve health equity (17).

The psychosocial impact of Bell's palsy is significant, with many patients experiencing anxiety, depression, and social withdrawal due to changes in facial appearance and expression (19). This extends to caregivers, who may face emotional distress and changes in family dynamics (19). Consequently, the management of Bell's palsy must consider not only the physical but also the emotional and social aspects of the condition, emphasizing comprehensive assessment and intervention (20). Health-related quality of life (HRQoL) is affected across physical, emotional, social, and functional domains, necessitating a multidimensional approach to care (20).

Research into Bell's palsy continues to evolve, with efforts focusing on neuroimaging techniques to understand its pathophysiology and identify effective management strategies (37). Advances in personalized medicine and CAM modalities, such as acupuncture and herbal medicine, are also being explored to enhance recovery outcomes (41, 43). Furthermore, the development of the UFDI addresses the need for culturally appropriate assessments, ensuring accurate evaluation and improved patient care within Urdu-speaking communities (64).

The translation and validation of the UFDI are critical for providing reliable and culturally relevant tools for assessing facial disability in non-English-speaking populations (64). This adaptation involves meticulous processes, including translation, back-translation, and linguistic validation, to ensure accuracy and cultural appropriateness (66). Establishing the validity and reliability of the UFDI is essential for its effective use in clinical practice and research, as it addresses the unique experiences of Urdu-speaking individuals with Bell's palsy (73). This research not only fills a significant gap in the literature but also holds the potential to improve clinical care and understanding of Bell's palsy across diverse populations (80).

2 Material and Methods

The study utilized a cross-sectional design to evaluate the reliability and validity of the Urdu Facial Disability Index (UFDI) among Bell's palsy patients in Urdu-speaking communities. The research was conducted over four months, adhering to the principles outlined in the Declaration of Helsinki to ensure ethical standards were maintained throughout the study. Approval was obtained from the institutional review board of The University of Faisalabad prior to the commencement of the study. Participants were recruited from outpatient clinics at the Department of Rehabilitation Sciences, where they were provided with detailed information about the study, and informed consent was obtained.

The study population comprised individuals diagnosed with Bell's palsy, aged 18 to 65, who were native Urdu speakers and met the inclusion criteria. The inclusion criteria required a clinical diagnosis of Bell's palsy with symptoms persisting for no more than six months. Exclusion criteria included a history of recurrent facial palsy, underlying neurological disorders, or inability to comprehend the UFDI due to cognitive impairments. A total of 245 participants were initially screened, with 203 meeting the eligibility criteria and agreeing to participate.

A convenience sampling technique was employed to select participants who met the study's criteria. Data collection involved administering the UFDI, which had been translated and culturally adapted through a rigorous process of forward and backward translation, expert committee review, and pre-testing. This process ensured the instrument's content validity and cultural appropriateness for the target population (66).

Participants completed the UFDI in a quiet, comfortable environment to minimize distractions and ensure accurate responses. In addition to the UFDI, participants also completed the House-Brackmann Facial Grading Scale (HBFGS) to assess the severity of facial nerve dysfunction, providing a basis for comparison and evaluating the UFDI's convergent validity. Semi-structured interviews were conducted with a subset of participants and healthcare professionals to gather qualitative data on the UFDI's cultural relevance, ease of use, and clinical utility.

The study adhered to ethical guidelines, ensuring participants' anonymity and confidentiality. Data were securely stored and accessible only to the research team. Participants were assured that their participation was voluntary, and they could withdraw from the study at any time without repercussions.

Data analysis was performed using IBM SPSS version 25. Descriptive statistics were calculated to summarize demographic and clinical characteristics. Reliability analyses included the calculation of Cronbach's alpha to assess internal consistency and intraclass correlation coefficients (ICC) to evaluate test-retest reliability. Convergent validity was assessed by calculating Spearman's rho to determine the correlation between UFDI scores and HBFGS scores. Qualitative data from interviews were analyzed thematically to identify patterns and insights regarding the UFDI's application and cultural sensitivity.

3 Results

The study assessed the reliability and validity of the Urdu Facial Disability Index (UFDI) among 203 participants diagnosed with Bell's palsy. The demographic characteristics of the participants are summarized in Table 1. The sample included a higher proportion of females (61.6%) compared to males (38.4%). The majority of participants were between 21 and 30 years of age. Most patients exhibited paralysis on the left side of the face (69%), while 31% had right-side involvement.

Table 1: Demographic Characteristics of Participants

Characteristic	Frequency	Percentage
Gender		
- Male	78	38.4%
- Female	125	61.6%
Age Group		
- 18-20 years	15	7.4%
- 21-30 years	134	66.0%
- 31-40 years	39	19.2%
- 41-50 years	12	5.9%
- 51-65 years	3	1.5%
Side of Paralysis		
- Left	140	69.0%
- Right	63	31.0%

The reliability analysis demonstrated a Cronbach's alpha of 0.77 for the UFDI, indicating good internal consistency (64). The test-retest reliability, assessed through the intraclass correlation coefficient (ICC), was found to be 0.99, signifying excellent stability over time. Table 2 presents the reliability statistics for the UFDI.

Table 2: Reliability Statistics for the UFDI

Reliability Measure	Value
Cronbach's Alpha	0.77
Intraclass Correlation Coefficient (ICC)	0.99

Convergent validity was assessed by examining the correlation between the UFDI and the House-Brackmann Facial Grading Scale (HBFGS). Spearman's rho indicated a moderate to strong correlation ($r = 0.508$ for physical function and $r = 0.259$ for social/well-being function), with a p-value < 0.05, suggesting that the UFDI is aligned with established measures of facial disability (64). The qualitative analysis from semi-structured interviews highlighted that participants and healthcare professionals found the UFDI culturally relevant and easy to use. The UFDI was perceived as a comprehensive tool that effectively captured the nuances of facial disability experienced by Urdu-speaking patients.

Table 3: Correlation Between UFDI and HBFGS

Correlation Measure	Physical Function (r)	Social/Well-being Function (r)
Spearman's rho	0.508	0.259
p-value	< 0.05	< 0.05

Overall, the findings demonstrate that the UFDI is a reliable and valid instrument for assessing facial disability in Bell's palsy patients, offering a culturally appropriate alternative to existing measures. These results underscore the UFDI's potential utility in both clinical practice and research, contributing to enhanced patient care and understanding of Bell's palsy within Urdu-speaking populations (73).

4 Discussion

The study successfully established the reliability and validity of the Urdu Facial Disability Index (UFDI) as a culturally sensitive tool for assessing facial disability in Urdu-speaking patients with Bell's palsy. The findings aligned with previous research that emphasized the importance of adapting assessment tools to reflect cultural and linguistic contexts to improve the accuracy and relevance of patient-reported outcomes (64). The UFDI demonstrated good internal consistency and excellent test-retest reliability, which are crucial for ensuring that the instrument consistently measures the construct of facial disability over time (64).

The moderate to strong correlation between the UFDI and the House-Brackmann Facial Grading Scale (HBFGS) further validated the UFDI's ability to accurately assess facial impairment in Bell's palsy patients. This correlation confirmed that the UFDI could serve as a robust alternative to the HBFGS, particularly for populations where linguistic and cultural factors might otherwise hinder the accurate assessment of facial disability (64). Similar to other studies that have successfully translated and validated the FDI into various languages, including Spanish, Portuguese, and Turkish, this research underscored the significance of culturally adapting assessment tools to ensure their applicability across diverse patient populations (83, 85).

The qualitative findings from interviews with participants and healthcare professionals revealed that the UFDI was well-received and considered easy to use, culturally relevant, and comprehensive. This feedback reinforced the tool's practical applicability in clinical settings, providing healthcare providers with a reliable method to assess facial disability and plan appropriate interventions. The study's strengths included a rigorous translation process and a robust methodological approach, ensuring the UFDI's validity and reliability.

Despite these strengths, certain limitations must be acknowledged. The study employed a convenience sampling method, which might have introduced selection bias, as participants were recruited from specific clinics within a single geographic region. This limitation could affect the generalizability of the findings to other Urdu-speaking populations or those residing in different cultural contexts. Additionally, while the UFDI showed strong psychometric properties, future studies could further explore its responsiveness to change over time, which would enhance its utility in tracking patient progress and treatment outcomes. Moreover, expanding the sample size and including participants from various socio-economic backgrounds could provide more comprehensive insights into the UFDI's applicability across diverse demographic groups.

The study highlighted the need for continued research to address the identified limitations and recommended future studies focus on evaluating the UFDI's effectiveness in different clinical settings and among diverse patient populations. Additionally, investigating the potential integration of the UFDI into digital health platforms could facilitate broader accessibility and streamline its use in telemedicine applications, particularly for patients residing in remote or underserved areas. Such efforts would further validate the UFDI's utility and expand its reach, ultimately contributing to improved patient care and outcomes in Bell's palsy management.

Overall, the study's findings contributed to the growing body of literature supporting the cultural adaptation of patient-reported outcome measures and underscored the UFDI's potential to enhance the assessment and management of facial disability in Urdu-speaking Bell's palsy patients. By addressing a significant gap in the existing literature, this research provided a foundation for future investigations aimed at improving the understanding and treatment of Bell's palsy across diverse cultural and linguistic contexts (73).

5 Conclusion

The study concluded that the Urdu Facial Disability Index (UFDI) is a reliable and valid tool for assessing facial disability in Urdu-speaking patients with Bell's palsy, offering a culturally appropriate alternative to existing measures. By providing accurate and relevant assessments of facial impairment, the UFDI has the potential to significantly enhance clinical care and patient outcomes in this population. Its integration into healthcare practices can facilitate more personalized and effective management strategies, ensuring that treatment plans are culturally sensitive and linguistically accessible. This advancement highlights the importance of adapting health assessment

tools to meet the diverse needs of global populations, ultimately contributing to improved health equity and patient satisfaction in the management of facial paralysis.

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Disclaimers	
Author Contributions	Farrukh Tariq was responsible for the study's conception and design, data collection, analysis, and manuscript preparation.
Conflict of Interest	The authors declare that there are no conflicts of interest.
Data Availability	Data and supplements available on request to the corresponding author.
Funding	NA
Ethical Approval	Institutional Review Board of place of study.
Trial Registration	NA
Acknowledgments	NA

~ JHRR, ISSN: 2791-156X ~