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Developing a Nepali Version of the Dysphagia Handicap Index: Translation and Validation Study

ABSTRACT

Aims and Objectives: Dysphagia affects multiple aspects of daily functioning, highlighting the need for valid patient-reported outcome tools. The Dysphagia Handicap Index (DHI) is used globally as a standard tool, but no validated Nepali version exists. This study aimed to translate, culturally adapt, and validate the DHI for use within the Nepali-speaking population.

Methods: Standard method of translation-back-translation was utilized where English version of DHI was translated and customized by four professors with degree in Nepali language. Later it was administered on 20 native literate Nepali speakers whose first language was Nepali for content validity. The final translated version DHI was administered on 100 individuals. The data was analyzed using SPSS version 20.

Results: The scale demonstrated excellent internal consistency, with a Cronbach's α of 0.976 and McDonald's ω of 0.977, indicating high reliability across all items. The inter-item correlation coefficients predominantly ranged from 0.50 to 0.85, reflecting moderate to strong positive correlations among items.

Conclusion: Overall, the scale shows strong psychometric performance, comparable to international DHI versions. Its high reliability and coherent item structure confirm its robustness. These findings support its use in clinical assessment and dysphagia research.

Keywords: Dysphagia, Deglutology, DHI, Handicap, Nepali

INTRODUCTION

Dysphagia is not a disease but symptom of diseases which is best described by delays or misdirection of food bolus as it moves from mouth to stomach. It is a medical term which is used for swallowing disorders or deglutition disorders.[1]

Dysphagia has various complications like malnutrition, pneumonia, pulmonary abscess, social isolation and depression which may increase medical expenses, delay in rehabilitation and reduces the quality of life. Prevalence and incidence of dysphagia is not well established due to varied studies approach and methods. Prevalence of dysphagia depends on age, cause of dysphagia and method used to assess for dysphagia.[2] Incidence of dysphagia is reported at 78% following stroke, 32% in Parkinson's disease, 31.3% in multiple sclerosis.[2-4] In cases with COPD (Chronic obstructive pulmonary disease), it has been reported to be around 27%, which may be due to poor coordination in respiration and swallowing. [5] Various studies have reported dysphagia to affect up to 50% of stroke case and 60% of cases in acute care.[6] In context of Asia, prevalence of dysphagia in South Korean was reported to be 52.7% in nursing home residents and was reported to be 51.0% after long term care stay in Taiwanese population.[7, 8]

The dysphagia can impact an individual various aspects from physiological to social and emotional.[9] Considering the social and psychological aspect, person with dysphagia are more likely to undergo depression and anxiety disorders.[10] More than 40% of the people with dysphagia get panic or anxious during meal time, which compels them to eat in isolation and around 36% avoid eating with others.[11]

The two gold standard tests for assessing the dysphagia are FEES and Videofluoroscopy which best describes physiological aspect. However, the profound impacts of dysphagia on the patient's wellbeing, social and emotional aspects can be well explained by patient-reported outcome measures (PROMs) as DHI.[12] A patient reported outcome (PRO) is a report that directly comes from patients about the severity of the symptoms, signs and state of a disease which is beyond only survival and biomedical finding . Although there is availability of numerous avenues to measure physical act of swallowing but PROs are critical in understanding psychosocial impact and the only way to figure out the effectiveness of any treatment in patients quality of life.[13, 14] A systematic review on patient-reported outcome measures in dysphagia has critically evaluated developmental properties of 34 dysphagia-related PRO measures and identified several

high quality PRO measures that were developed in various diseases state. [15]

There is lack of such test in Nepali language restricting us to use the version developed in western society. The use of non-native questionnaire poses majorly two difficulties, firstly language acts as a barrier for the patient to self-report, secondly many questions can be culturally inappropriate as the life style varies between western and eastern society. Hence, there is a need to translate and culturally standardize questionnaire, which can be used in Nepal. This study is undertaken to translate and validate the Dysphagia handicap index (DHI) in Nepali language.

METHODS

This study employed a quantitative, descriptive research design aimed at translating, culturally adapting, and validating the Nepali version of the Dysphagia Handicap Index (DHI). A convenience, non-probability sampling strategy was utilized, whereby all eligible individuals presenting to the clinic during the four-month data collection period were invited to participate.

A total of 100 participants (53 males and 47 females) were recruited from the Audiology and Speech-Language Pathology Unit of the Department of ENT-HNS at TU Teaching Hospital. Based on clinical status, 40 participants were the healthy control group (11 males, 29 females), while 60 individuals (42 males, 18 females) were clinically diagnosed with oropharyngeal dysphagia.

Eligibility criteria required participants to have a medical condition associated with dysphagia, be consuming daily meals orally, be aged 18 years or older, and possess adequate comprehension to complete the questionnaire. Individuals were excluded if they exhibited significant comprehension impairments, were already undergoing dysphagia management prior to initial contact with the research team, or were taking psychotropic medications at the time of enrolment.

The original Dysphagia Handicap Index (DHI) developed by Silbergleit et al. (2012) was translated into Nepali using a standardized forward-backward translation process.[16] Four language experts with advanced qualifications in Nepali independently performed the translation and back-translation to ensure linguistic precision and cultural relevance.

Content validity was assessed by administering the pre-final Nepali version of the DHI (DHI-Nepali version) to 20 native Nepali-speaking literate adults. Respondents rated each item on a 5-point Likert scale, where 1 indicated *very familiar* and 5 indicated *not at all familiar*. Items rated 1 or 2 were retained, whereas items rated above 2 were revised, refined, and re-evaluated until they met the criteria for clarity and cultural appropriateness. The final DHI-Nepali version consisted of 25 items that met the predetermined content validity thresholds.

Participants completed the questionnaire independently in a quiet clinical environment. Prior to completion, they received standardized instructions regarding the purpose of the DHI-Nepali version and its scoring framework. Each item offered three response options—*Yes*, *Sometimes*, and *No*.

This study was approved by Institutional Review Committee (IRC) of the institute of Medicine. Written informed consent was obtained from all participants prior to the enrollment in the study.

All statistical analyses were conducted using SPSS version 20. Descriptive statistics summarized demographic variables and item-level responses. Psychometric evaluation included assessments of internal consistency through Cronbach's alpha and McDonald's omega, along with item-total correlations to identify poorly performing items. Construct validity was examined using Pearson correlation analyses, including the generation of a correlation matrix to evaluate inter-item relationships.

RESULT

Table 1: Age and Gender Distribution

Age(years)	Gender	Counts	% of Total	Cumulative %
50-70	Female	9	9.0%	9.0%
	Male	19	19.0%	28.0%
18 - 50	Female	35	35.0%	63.0%
		27	27.0%	90.0%
>70	Female	3	3.0%	93.0%
	Male	7	7.0%	100.0%

A total of 100 participants were analyzed. The age distribution showed that the majority (62%) were below 50 years of age, followed by 28% in the 50-70 years group, and 10% above 70 years. Females comprised 35% and males 27% of those under 50 years. In the 50-70 years category, 9% were females and 19% were males, while among participants over 70 years, 3% were females and 7% were males.

Table 2. Diagnosis-wise Distribution of Participants by Gender

Diagnosis	Gender	Counts	% of Total	Cumulative %
Head and Neck	Female	12	12.0%	12.0%
	Male	19	19.0%	31.0%
Neurological Disorder	Female	6	6.0%	37.0%
	Male	23	23.0%	60.0%
Normal	Female	29	29.0%	89.0%
	Male	11	11.0%	100.0%

Regarding diagnosis distribution, 31% of the participants

presented with head and neck conditions (12% females and 19% males). Neurological disorders were seen in 37% of participants, with a higher proportion of males (23%) compared to females (6%). The remaining 40% were categorized as normal, with females representing 29% and males 11%.

Table 3: Internal Reliability Measures

Cronbach's α	McDonald's ω
0.976	0.977

The scale demonstrated excellent internal consistency, with a Cronbach's α of 0.976 and McDonald's ω of 0.977, indicating high reliability across all items. Item-rest correlations ranged from 0.666 to 0.890, suggesting that each item contributed meaningfully to the overall construct.

An item-deletion analysis revealed that removal of any single item did not appreciably improve or decreased the Cronbach's α or McDonald's ω, which consistently remained within the narrow range of 0.975-0.977. This stability indicates that all items are psychometrically valuable and that none of them disproportionately inflate or weaken the internal consistency of the scale.

A Pearson correlation was used to examine inter-item relationships across the domains (P1-P9, F1-F8, E1-E7). The inter-item correlation coefficients predominantly ranged from 0.50 to 0.85, reflecting moderate to strong positive correlations among items. These findings suggest that while items are strongly related, they are not redundant and collectively capture a coherent underlying construct. This is important as questions are designed to understand different aspect impacted by the swallowing difficulty as emotional, physical, and functional.

The absence of extremely high correlations (>0.90) confirms that the scale does not suffer from multicollinearity, whereas no items exhibited weak or negative correlations, supporting the conceptual alignment of all components within the instrument.

DISCUSSION

The current study demonstrated exceptionally strong internal consistency for the scale, reflected by a Cronbach's α of 0.976 and McDonald's ω of 0.977. These values exceed the psychometric characteristics typically reported in the Dysphagia Handicap Index (DHI) literature, suggesting that the present instrument demonstrates reliability at least comparable to, and in some cases stronger than, established dysphagia-related self-report measures.

The original development and validation of the DHI, reported Cronbach's α values ranging from 0.89 to 0.94 across the physical, functional, and emotional subscales.[16] Subsequent validation studies in different populations—including stroke survivors, head and neck cancer patients, and older adults—have shown reliability coefficients within a similar range (0.85-0.95), confirming the DHI as a robust measure of dysphagia-related quality of life. In comparison, the reliability coefficients in the present study surpass these values, indicating that the scale may capture the underlying construct with even greater stability.

Item-rest correlations in the original DHI typically ranged from 0.42 to 0.78, reflecting moderate to strong associations. Our item-rest correlations (0.666-0.890) are generally higher, suggesting that individual items in the present scale show stronger coherence with the total score than those reported in the DHI. This pattern is consistent with later psychometric analyses of DHI adaptations (e.g. Italian and Turkish), where items with correlations below 0.40 were sometimes flagged for revision or removal.[17, 18] In contrast, no items in the current study demonstrated weak performance, and item deletion did not increase reliability—a pattern also observed in the most stable versions of the DHI.

The inter-item correlation structure in this study also aligns with findings from DHI research. Prior DHI studies consistently report moderate to strong inter-item correlations, supporting a multidimensional yet unified assessment of dysphagia handicap. The correlation values in our heat map (0.50-0.85) fall well within this expected psychometric range. Importantly, none of the present items exhibited excessively high correlations (>0.90), which mirrors the DHI's avoidance of item redundancy and ensures that each item contributes unique information to the overall construct.

CONCLUSION

Taken together, these results indicate that the scale exhibits psychometric properties comparable to or stronger than those reported for the Dysphagia Handicap Index across multiple international validation contexts. The consistently high reliability, robust item-rest correlations, and coherent inter-item relationships suggest that the present instrument is a sound tool for assessing dysphagia-related functional and emotional impact. These findings further support its potential application in both clinical monitoring and outcome-based dysphagia research, similar to how the DHI has been widely used for clinical screening, treatment planning, and quality-of-life assessment.

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