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TRANSLATION AND VALIDATION OF DYSPHAGIA HANDICAP INDEX (DHI) IN HINDI SPEAKING PATIENTS

Prosthodontics

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ABSTRACT

Purpose: Translation and validation of Dysphagia handicap index (DHI) in Hindi speaking patients **Methodology:** Dysphagia handicap index (DHI) was translated to Hindi language (DHI-H) and assessment was done in 25 maxillectomy patients suffering from swallowing problems with 25 normal participants as control group. Internal consistency, validity and subscale correlation were assessed. **Results:** Overall Cronbach's alpha coefficient was 0.895. A statistically significant difference was noted between test and control groups for DHI scores as $p<0.001$. The subscale correlation was maximum for emotional and functional domains-0.686 and least for physical and emotional domains-0.181. **Conclusion:** DHI-H is a valid tool for assessing swallowing problems due to maxillectomy.

KEYWORDS

Dysphagia, Dysphagia handicap index, maxillectomy, Hindi language

INTRODUCTION

Extensive surgical excisions involving head and neck region are most demanding to rehabilitate with conventional treatment modalities. This can be majorly attributed to head and neck cancers, especially squamous cell carcinoma; fungal infections such as mucormycosis and aspergillosis; salivary gland disorders and impact trauma.

Resective surgeries involving maxilla give rise to defects causing difficulty in mastication, speech, phonation and oro-nasal regurgitation which thereupon render the patients morbid. Since the effect on swallowing food orally is arduous due to nasal regurgitation and reduced mouth opening in fresh cases, often nasogastric tubes are used to provide nutritional support. However, huge loss in weight causing malnutrition is inevitable in such cases. These patients are often prosthodontically rehabilitated with PMMA based obturators in order to close the defect and aid in deglutition and speech.

Dysphagia handicap index developed by Alice. K. Silbergleit et. al. (2011) [1] is a patient reported outcome tool developed to assess the effect of swallowing disorders on a 25-set self-assessment questionnaire. The higher the DHI value, the severe the patient's dissatisfaction with his/her swallowing problem. This index has been beneficial for a wide range of patients and has been translated to languages such as Hebrew, Persian, Arabic, Kannada and Japanese. [2-6]

Since, the patient cohort seeking treatment in the outpatient department included majorly North Indian Hindi speaking patients, it was untimely to not have this index in Hindi language. Therefore, this study was undertaken to translate DHI to Hindi (DHI-H) and assess its understandability in Hindi speaking population.

MATERIALS AND METHODS:

Methodology:

To begin with, DHI was translated to Hindi by the author. This was discussed between authors to ensure a correct translation and no dispute. This version was back translated to English with the aid of a school teacher specialising in Language studies to track down inaccuracies. After many thoughtful considerations and changes, the final version of DHI-Hindi was arrived at.

Subjects:

The patients seeking treatment for maxillectomy defects in the Department of Prosthodontics, Crown and Bridge with obturators were included in the study with frank oro-nasal communication causing difficulty in deglutition, who could read and understand Hindi. A total of 25 patients were included in this study (14 Males, 11 Females) with a mean age of 66±10.6 years. These were included after taking prior consent. Simultaneously, 25 subjects which were patients without maxillectomy defects (no swallowing problems) and students were recruited as Control group. They had a mean age of 40±20.9 years.

Procedure:

A short briefing about DHI-Hindi (DHI-H) and the responses was given. The subjects of both test and control groups were asked to fill the form independently with the help of pencil and paper and rate each question of the checklist according to severity of symptom.

Statistical Analysis:

Internal Consistency:

Cronbach's Alpha coefficient, a reliability coefficient was used to measure internal consistency.

Validity:

To assess validity, two factors were analysed. Spearman rank correlation coefficient was used to assess difference between overall DHI scores with individual scores. Further, each of the domain scores (P-Physical, E-Emotional and F-Functional) and total DHI scores of maxillectomy patients was compared with control group using the Kruskal-Wallis test.

RESULTS

The mean total DHI scores for the test and control groups were 12.7686±4.39973 and 1.00, respectively [Tables 1 and 2]. The mean of F-domain was slightly higher as compared to P- and E- domains.

Table 1: Average scores for the P, E and F domains and total DHI scores in Maxillectomy patients

	N	Minimum	Maximum	Mean	Std. Deviation
FUNCTIONAL	25	1.67	7.00	4.9600	1.62411
EMOTIONAL	25	1.57	6.14	4.1886	1.16768
PHYSICAL	25	1.00	6.50	3.6200	1.61394
Total DHI				12.7686	4.39973

Table 2: Average scores for P, E and F domains and total DHI scores in Control group

	N	Minimum	Maximum	Mean	Std. Deviation
FUNCTIONAL	25	1.00	1.00	1.0000	.00000
EMOTIONAL	25	1.00	1.00	1.0000	.00000
PHYSICAL	25	1.00	1.00	1.0000	.00000
Total DHI				1.0000	.00000

Internal Consistency:
Overall Cronbach's alpha coefficient was 0.895 which is almost excellent. (Table 3)

Table 3: Cronbach's alpha

Reliability Statistics	
Cronbach's Alpha	N of Items
0.895	25

Validity:
DHI scores showed a statistically significant difference between the test and control groups, for the overall DHI scores and each of the individual domains scores separately as p<0.001. (Table 4)

Table 4: Comparison between test and control groups for individual domain scores and total DHI scores

		Mean	N	Std. Deviation	Std. Error Mean	P VALUE
Functional domain	Patients	4.9600	25	1.62411	.32482	0.001
	Control	1.0000	25	.00000	.00000	
Emotional domain	Patients	4.1886	25	1.16768	.23354	0.001
	Control	1.0000	25	.00000	.00000	
Physical domain	Patients	3.6200	25	1.61394	.32279	0.001
	Control	1.0000	25	.00000	.00000	

DHI Subscale Correlation-
r-Spearman correlation coefficient was used to correlate within subscales. A very strong correlation has a score of 0.9-1 and no correlation is 0-0.09. The correlation was highest between the E and F subscales-0.686 and lowest between the P and E subscale-0.181. (Table 5)

Table 5: Spearman's correlation coefficient

DHI	Spearman's correlation coefficient	P value
Functional - Emotional	0.686	0.000*
Emotional - Physical	0.181	0.385
Functional- Physical	0.575	0.002*

DISCUSSION

Dysphagia is classified by where it occurs and whether it's caused by a mechanical or inflammatory problem hindering bolus movement. Initially, it's crucial to distinguish whether the issue stems from the oropharynx or below the upper esophageal sphincter. This differentiation is often discernible through a detailed history, noting symptoms like immediate aspiration or coughing during swallowing, along with other signs such as nasopharyngeal regurgitation, voice changes, or a feeling of a disordered swallow initiation. [7]

The maxilla, a paired jawbone fused at the center, articulates with nine different bones of the skull, forming key facial cavities and contributing to facial structure and function. Maxillectomy is the surgical removal of all or part of the maxilla (partial/total maxillectomy) and presents challenges in restoring function due to its vital role in facial stability and mobility. Addressing the resulting defects, it requires meticulous planning to minimize functional and aesthetic impairments, often involving prosthetic or surgical reconstruction for rehabilitation.

A defect in maxillary segment can profoundly affect crucial activities like chewing, speaking, and swallowing, potentially leading to issues such as oro-nasal or oral-antral communication. Additionally, the resulting facial deformity may subject individuals to societal prejudice, impacting their mental health negatively. [8] Moreover, the resultant oro-nasal regurgitation inhibits proper intake of food, causing nutritional imbalance and loss of weight.

Therefore, the extent of dysphagia caused due to such resections needs to be studied and the handicap caused my them evaluated in order to form a proper diagnosis and treatment.

Many diagnostic tools have been advocated for the same including computed tomography and endoscopy, however, none of them is based on patient reported outcomes and evaluate true handicap of the patient. The DHI identifies the most affected area-emotional, physical or functional on a self-marked questionnaire and helps in determining a plan of action accordingly. This study was undertaken to evaluate dysphagia handicap index in Hindi speaking population as no such tool was made for them.

It is pertinent that these tools are assessed for their internal consistency and validity after translation into new languages, such that the meaning of questionnaire-based items does not change. Validity aids in measuring the tool's efficiency for quantification accurately. In this study, validity helped in assessment of total DHI scores of patients and compared it with their self-appreciable difficulty in swallowing due to maxillectomy defects which was significant in this study as p<0.001.

The comparison between the maxillectomy group and the control group revealed significant difference in both the total DHI scores and the scores for the three domains. This indicates that the DHI effectively discerns individuals with swallowing issues from those without, affirming its validity as an assessment tool.

In our research, we evaluated the reliability of the questionnaire by using Cronbach's alpha, which yielded a score of 0.895, indicating its consistency. Furthermore, strong correlation was seen between the domains except for emotional-physical correlation as p=0.385.

Maxillectomy patients showed a slightly lower average score in the physical domain of the DHI compared to the functional and emotional domains. This pattern mirrors findings from prior studies, which suggest that patients may be more attuned to the physical symptoms of dysphagia. As a result, it highlights the importance of the physical domain in individuals' self-assessment of swallowing-related issues. [9]

Also, this study suggests that the Hindi version of the Dysphagia Handicap Index (DHI) is a dependable tool for evaluating how individuals perceive the severity of their swallowing issues especially due to maxillectomy defects in Hindi-speaking population. This can aid clinicians in understanding and work on the aspects crucial to this handicap and aid in rehabilitation of these patients. However, it's important to acknowledge the linguistic diversity among Hindi speakers across India, which could affect the tool's effectiveness due to variations in syntax, grammar, and word meanings. Addressing these limitations may require developing a more comprehensive tool that considers linguistic variations and can be orally administered for those who cannot read.

CONCLUSION

DHI-H is a valid tool for determining the effect of maxillectomy in deglutition and gives an easy leeway to patients to share their problem and quantify the severity posed by them.

Conflict Of Interest: No conflict of interest.

Annexure I

डिसफैजीया हैंडीकैप इंडेक्स (डी एच आई)

कृपया बॉक्स में एक चेक लगाएं जो आपकी निगलने में कठिनाई का वर्णन करता है।

		ठीक		मध्यम समस्या			गंभीर समस्या	
		1	2	3	4	5	6	7
1P	जब मैं तरल पदार्थ पीता हूं तो मुझे खांसी होती है।							
2P	जब मैं ठोस भोजन खाता हूं तो मुझे खांसी होती है।							
3P	मेरा मुंह सूख गया है/							
4P	मुझे भोजन को निगलने के लिए तरल पदार्थ पीने की आवश्यकता होती है/							
5P	निगलने की समस्या के कारण मेरा वजन कम हो गया है।							
1F	मैं अपनी निगलने की समस्या के कारण कुछ खाद्य पदार्थों से परहेज करता हूं/							
2F	मैंने निगलने का तरीका बदल दिया है ताकि खाना आसान हो/							
1E	मुझे सार्वजनिक रूप से खाने में शर्म आती है/							
3F	मुझे खाना खाने में पहले की तुलना में अधिक समय लगता है/							
4F	मैं निगलने की समस्या के कारण अधिक बार छोटा भोजन करता हूँ/							
6P	खाना नीचे जाने से पहले मुझे फिर से निगलना पडता है/							
2E	मैं उदास महसूस करता हूं क्योंकि मैं वह नहीं खा सकता जो मैं चाहता हूं/							
3E	मुझे खाने में उतना मज़ा नहीं आता जितना पहले था/							
5F	मैं निगलने की समस्या के कारण उतना सामाजिककरण नहीं करता/							
6F	मैं निगलने की समस्या के कारण खाने से बचता हूँ/							

7F	मैं अपने निगलने की समस्या के कारण कम खाता हूँ/							
4E	मैं अपने निगलने की समस्या के कारण घबरा जाता हू/							
5E	मैं निगलने की समस्या के कारण विकलांग महसूस करता हूँ/							
6E	मुझे निगलने की समस्या के कारण खुद पर गुस्सा आता है/							
7P	जब मैं अपनी दवा लेता हू तो गले में फंस जाता है/							
7E	मुझे डर है कि मेरी निगलने की समस्या के कारण मेरा दम घुट जाएगा और मेरी सांस रुक जाएगी/							
8F	मेरी निगलने की समस्या के कारण मुझे दूसरे तरीके से खाना पडता है/ (जैसे, फीडिंग ट्यूब)/							
9F	मैंने निगलने के कारण अपना आहार बदल दिया है /							
8P	जब मैं निगलता हू तो मुझे गला घोंटने का अहसास होता है /							
9P	निगलने के बाद खाना बाहर आजाता है/							

कृपया उस संख्या को गोल करें जो आपकी निगलने में कठिनाई की गंभीरता से मेल खाती है (1 = कोई कठिनाई नहीं; 4 = कुछ हद तक समस्या; 7 = जितनी अधिक समस्या आपको हो सकती है)

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