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AN ICF-DH Based Checklist for Individuals with Dysphagia Following Stroke In Malayalam

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I. INTRODUCTION

Deglutition, more commonly referred to as swallowing, is defined as the semiautomatic motor action of the muscles of the respiratory and gastrointestinal tracts that propel food from the oral cavity into the stomach. (Miller, 1986) Dysphagia or difficulty in swallowing can present either as food getting stuck or as coughing spells during swallowing (Mankekar, 2015).

Dysphagia is the impairment of swallowing and is commonly associated with increased age, cerebro-vascular diseases, and dementia. The prevalence of dysphagia in those above 65 years is estimated at 15% and increases significantly to as high as 70% in patients with cerebro-vascular disease. Dysphagia increases the risk of aspiration pneumonia in 3–5 and is an important cause of morbidity and recurrent hospital admissions in older patients 6 – 10. Mortality rates can be as high as 65%. Up to 15% of community-acquired pneumonia results from aspiration.

Krishna and Goswami (2018) investigations show a growing interest in dysphagia research and the geographical values which illustrate that in India, Karnataka has more dysphagia research centers followed by Maharashtra compared to any other state. Hence the above data reveals that a majority of researches being done in Karnataka. With a rapidly ageing population and an increasingly complex chronic disease burden in Kerala, the prevalence of patients with dysphagia will increase. Family physicians will encounter more patients with dysphagia in various practice settings of primary, intermediate long term care and tertiary settings.

The application of the ICF-DH framework in the process of assessment and management of dysphagia has been documented in recent past (Threats, 2007; Worrall & Threats, 2007; Scarinci and Cartmill, 2014). It conceptualizes functioning as a dynamic interaction between a person's health condition, environmental factors and personal factors. Functioning is an umbrella term for body functions, body structures, activities and participation.

It denotes the positive aspects of the interaction between an individual (with a health condition) and that individual's contextual factors (environmental and personal factors). Disability is an umbrella term for impairments, activity limitations and participation restrictions. It denotes the negative aspects of the interaction between an individual (with a health condition) and that individual's contextual factors (environmental and personal factors). Kothari and Mall (2015) developed a questionnaire for assessing the quality of life in individuals with dysphagia, mainly focus on functional, eating, psychosocial and physical section.

Overall Cronbach's alpha coefficient was very high and shows that questionnaire had good reliability and retest study gives reliable clinical tool, D-QOL-QM help for assessing the impact of dysphagia on an individual's life in Indian. Kumaraswamy, Nayaka and Kumar (2019) developed a Kannada version of the ICF framework assessing the QOL under 3 subcategories involving body structure and function, activity and participation, social and environmental factors present during dysphagia or leading to Dysphagia. The study concluded that this version on the ICF framework questionnaire helped in not only assessing the QOL but also to bring long term positive outcomes for individual with dysphagia. Krishnamurthy, Prem kumar and Balasubramanium (2020) analyzed incidence of dysphagia and associated pneumonia in stroke patients from India using PRISMA methodology and GRADE approach.

They concluded that there is a significantly high incidence of dysphagia related to stoke. Cola, Daniels, Corey and Romero (2010) studied the relevance of subcortical stroke in dysphagia and found that Lesions to the left periventricular white matter (PVWM) may be more disruptive to swallowing behavior than similar lesions to the right periventricular white matter and Swallowing deficits involving oral control and transfer can be a marker of subcortical neural axis involvement. Aldridge and Taylor (2011) found that Dysphagia is a common and significant cause of morbidity and mortality in adults with mental illness and that there is a lack of studies evaluating the effectiveness of intervention techniques.

Teismann, Warnecke and Pantev (2011) measured brain activity by mean of whole-head MEG in 37 patients with different stroke localization 8.2 +/- 4.8 days after stroke to study changes in cortical activation

during self-paced swallowing and the results demonstrated strong bilateral reduction of cortical swallowing activation in dysphagic patients with hemispheric stroke. In hemispheric stroke without dysphagia, bilateral activation was found. In the small group of patients with brainstem stroke we observed a reduction of cortical activation and a right hemispheric lateralization concluding bulbar central pattern generators coordinate the pharyngeal swallowing phase.

The observed right hemispheric lateralization in brainstem stroke can therefore be interpreted as acute cortical compensation of subcortically caused dysphagia. The reduction of activation in brainstem stroke patients and dysphagic patients with cortical stroke could be explained in terms of diaschisis. Pin wan, Xuhuichen and zhu (2015) found that Subcortical and supratentorial stroke may result in pharyngeal dysphagia such as pyriform sinus residue (PSR) and pharyngeal delay. Pyriform sinus residue was mainly caused by (cricopharyngeal muscle achalasia) CMA.

Need for the study

The present study plays a significant role in the rehabilitation of individuals with dysphagia sequel to stroke ICF-DH framework. Application is extensively used to check the communication ability of stroke patients and their healthcare needs. Dearth with respect to research on swallowing abilities in stroke people within the ICF-DH framework is noticed from above literature review. Which enforces a need to develop different ways to measure swallowing skills and feeding activities to check the relationship between dysphagia related impairment.

Aim & Objectives

The aim of the study was to develop and standardize an international classification of function disability and health (ICF-DH) based protocol for comprehensive assessment among individuals with dysphagia sequel to stroke with following objectives. 1. To develop and standardize a protocol on Dysphagia using the ICF framework in Malayalam Language. 2. To validate the developed protocol for individuals with Dysphagia sequel to Stroke.

II. METHODOLOGY

The aim of the study was to develop and standardize an international classification of function disability and health (ICF- DH) based protocol for comprehensive assessment among individuals with dysphagia sequel to stroke.

The study was carried out in the following phases.

Phase 1: Translation and validation.

Phase 2: Subject selection.

Phase 3: Documentation of responses from the clinical population.

The newly framed questionnaire had relevant test item which were adapted and translated from the dysphagia handicap index (DHI), and the M D Anderson Dysphagia Inventory (MDADI). The test items were later given for the evaluation of appropriateness. A total of ten Speech- Language Pathologists rated the items for their appropriateness. The items which were rated as 'most appropriate' were used for the final study. The question items were further categorized into the body structure, function and activity and participation and environmental factors suiting to the ICF-DH framework.

The developed questionnaire consisted of a total of 45 questions which were subdivide into three sections containing 15 questions each. The questionnaire comprised of three aspects: (i) Body structure and function (ii) activities and participation and (iii) Environmental and personal factors.

Body structure and functions

This section comprised a total of 15 questions. It reflected the abnormal growth patterns to the disability and health in several aspects. A 5-point rating scale with a rating of 1- Strongly Agree 2- Agree 3- No Opinion 4- Disagree 5- Strongly Disagree was used to assess out the associated structural deficits. The caregivers were enquired regarding the current and previous significant details of the disabled person's health and milestones.

Activity and Participation

The section comprises of a total of 15 questions reflecting the functional abilities of disable person in various aspects. A 5-point rating scale with a rating of 1- Strongly Agree 2- Agree 3- No Opinion 4- Disagree 5- Strongly Disagree was used to assess the disable person's consistent ability to complete the task. The disabled persons were given a set of tasks to perform, which were rated by the clinician.

Environmental and personal factors

Environmental and personal factors comprised of 15 questions. The information provided is regarding the person's social and emotional status pertaining to the environment and several situations in swallowing. The questions are rated with a 5- point rating scale which contain 1- Strongly Agree 2- Agree 3- No Opinion 4- Disagree 5- Strongly Disagree that assess the reactions of the disabled person and their ability to solve or cope

towards them. The questionnaire is attached in Appendix 1.Validation of the questionnaire was carried out in two stages.

Stage 1: Familiarity check by practicing professionals

A set of five practicing professionals were provided with the translated the questionnaire with experience and knowledge of working with dysphagia for a minimum of 3 years, the task being an identification of the most probable aspects that state presence of dysphagia in stroke, with regard to swallowing difficulties.

Stage 2: Validation of the questions by experts

After familiarity check, the developed questionnaire was validated by ten Speech and Language Pathologists with a minimum experience of 5 years. It was made available in Google form and the responses were obtained via the survey and tabulated for further statistical analysis. It was then reduced into 36 items questionnaires having 12 items each with 5 points rating scales. The responses elicited were compared for test validation for items across all three sections were scrutinized and those with the highest frequency of the occurrence were considered and utilized for data collection. The second phase of the study involved data collection.

Participants

A total of 60 individuals in the age range of 18 to 85 years, further divided into 20 typical individuals in the age group 18 to 35years found a control group. A total of 40 individuals with Dysphagia sequel to cortical and sub-cortical stroke, 32 were males and 8 were females in the study as part of the clinical group. Participants were from Caritas hospital in Kerala and First- Neuro hospital in Mangalore. They were diagnosed to have cortical and subcortical strokes through radiological investigations. Participants were recruited with an inclusion criterion of the acute stage (within 28 days sequel to Dysphagia). Participants with medical complications like mechanical ventilators and non- stable medical condition were excluded in the study.

Inclusion and Exclusion Criteria

The study followed certain selection criteria to include participants. The typical adults screened with WHO–health screening for normalcy served as control group. The clinical population consisted of individuals with the history of stroke. All the participants were in the acute stage category i.e within the time frame of 28 days following the stroke episodes. Individuals with multiple strokes and bilateral hemispheric strokes were excluded from the study. The other exclusion of participants for the clinical population were (1) Patients with severe cardiopulmonary dysfunction or liver or kidney disorders; (2) Patients with any malignant, metabolic, or gastrointestinal disease, or pulmonary infection; (3) Patients with any disease that affected swallowing function, such as severe diabetic peripheral neuropathy, Alzheimer disease, myopathy.

Procedure

The sample for the study was collected using the developed questionnaire in three steps. The demographic information comprised of the information with respect to identification details of the participants and their previous and current medical history. All the participants were administered with the developed questionnaire. Responses obtained tabulated.

Statistical Procedure

Analysis of varies (ANOVA) was carried for the comparison of obtained response across both the groups. Kendal's tau- b was administered to document the internal variations of responses within the group. Mann Whitney test was administered to obtain the frequency scores of each group on selected test items and the extent of variation of responses across the group was measured.

III. RESULTS AND DISCUSSION

The study aimed to develop and standardize an international classification of function disability and health (ICF-DH) based protocol for comprehensive assessment among individuals with dysphagia sequel to stroke. The developed questionnaire consisted of a total of 36 questions sub divide into three sections containing 12 questions each.

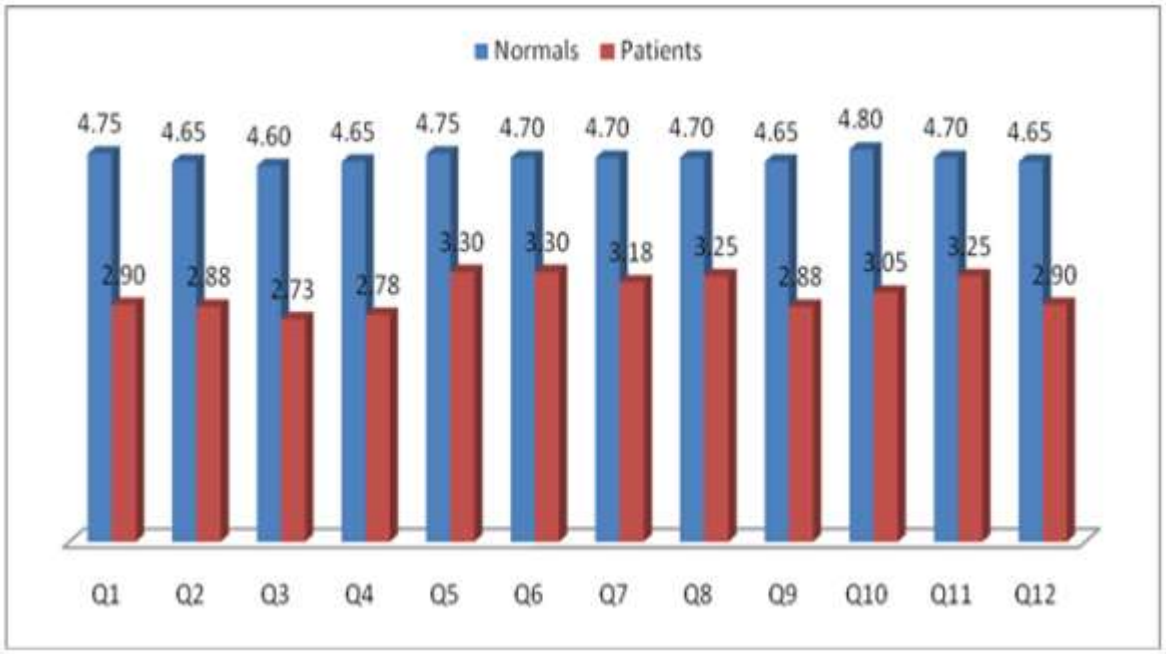
The questionnaire comprised of three aspects:

(i) Body structure and function
(ii) Activities and participation
(iii) Environmental and personal factors.

The obtained responses were tabulated and appropriate statistical analysis was done and the results of the findings are discussed.

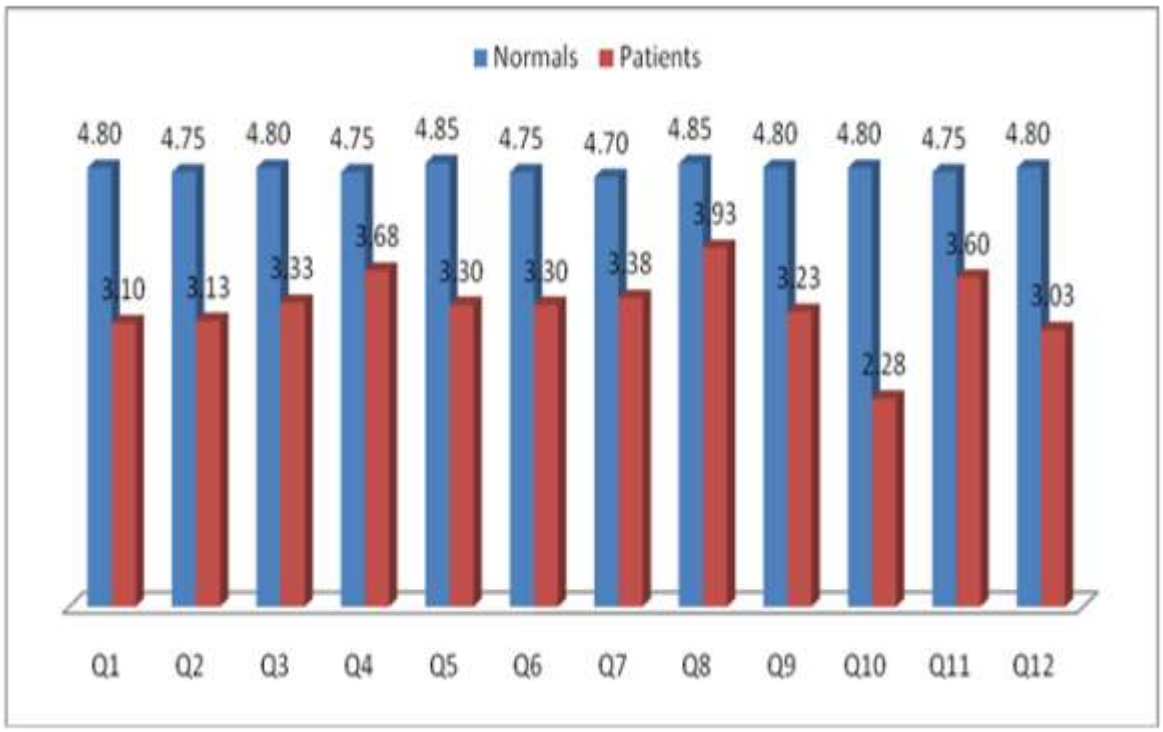
ACTIVITIES & PARTICIPATION

Fig 4.1: Depicts the performance of dysphagic patients and normals for questions on Activity and Participation.



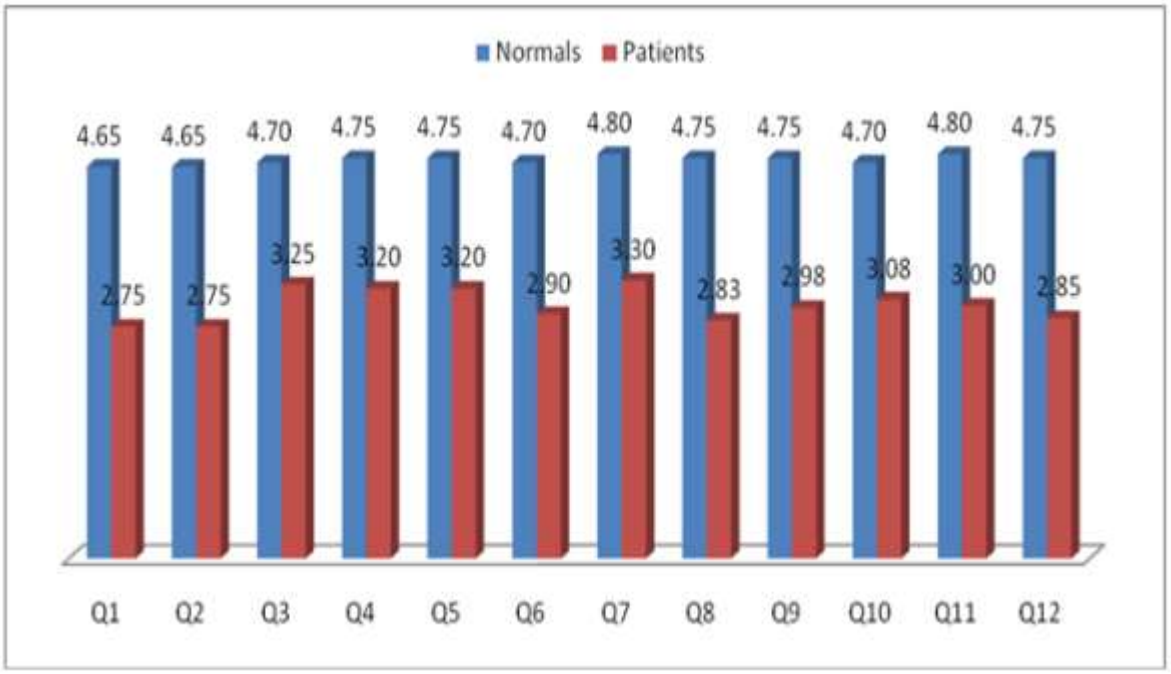
The above results prove the factor that Dysphagic people are more hindered in their daily Activity and Participation in terms of Cough, Eating Style and Time. It can concluded that Dysphagia is a major factor which can affect patients daily Activity and Participation

Fig 4.2: Shows the performance of Dysphagic patients and Normal in Body structure and Function.



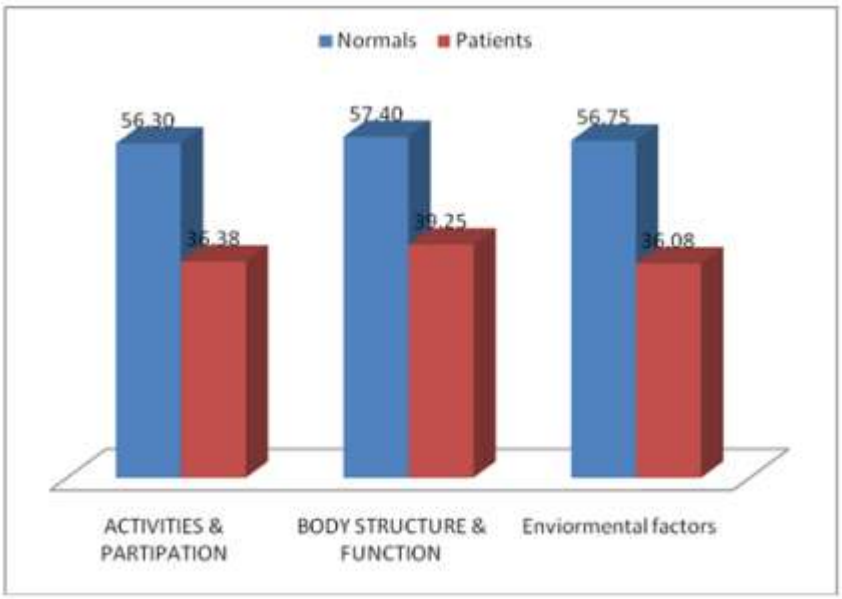
The study result illustrates that all the questions show statistically high significance. In the present result, it states that Taste and Gum color has higher importance in the occurrence of Dysphagia and the reference study has indicated the same factor.

Fig 4.3 : Illustrates the response rate of Dysphagic patients and Normal's in questions on Environmental Factors.



The results of the above Fig 4.3 depicts the Descriptive statistics of Environmental Factors in association with dysphagia, the statistical results indicate high significance between normal and individual with dysphagia.

Fig4.4: Showing the performance of Dysphagic Patients and normal's for Activity and Participation, Body structure and Function and Environmental and personal factors.



It is evident from the given data that Dysphagic patients submits difficulty in all the three parameters and in specific they shows more in Body Structure and Function in comparison with other and Normal's also shows the equal variance with Dysphagics. The statistical analysis revealed that the clinical population had significant parameters underbody structure and function parameters.

Under the Body structure and functional it was found that the tongue movements, jaw opening, the shape of the jaw, pain in velum, taste recognition and breathing problems while taking medication variables were highly significant among the individuals with dysphagia compared to Normal's. It was found that the lip

strength, pain during swallowing in larynx and color changes in gum these variables were with high significant different among the individuals with dysphasia compared to their counterparts.

The present study findings correlated with the earlier reported literature. Under the category of activities and personal factors the results revealed that tongue size, color changes due to dysphasia, eating style, difficult to prepare food to other big amount of food is difficult to swallow and more time consuming to have food then before these variables were highly significant differences among the individuals with Normal's.

There was also showed highly significant difference among the groups with respect more time is taken to have a meal than before and carrying out routine eating styles. The clinical population had difficulties to maintain weight, embarrassed to eat in front of the public and their productivity in terms of income generation was reported to be impacted negatively.

IV. SUMMARY AND CONCLUSION

Dysphagia or difficulty in swallowing can present either as food getting stuck or as coughing spells during swallowing (Mankekar, 2015) (Alex and Kumaraswamy, 2017) developed a questionnaire to measure the quality of life in Dysphagic patients in Cancer patients in Kerala and (Menon, Radhakrishnan and Sundaram, 2016) had analysed the reliability and validity of the questionnaire to assess Swallowing disorders in Parkinson Disease which states that the questionnaire is a valid and reliable tool for the assessment of swallowing disorder in Parkinson disorder and also this can be considered as a quick screening tool in neurology department. Since there are fewer researches are been done in Kerala in Dysphagia the present study aims to develop and standardize an international classification of function disability and health (ICF- DH) based protocol for comprehensive assessment among individuals with dysphagia sequel to stroke.

The study was carried out in three phases.

Phase 1: Translation and validation.

Phase 2: Subject selection.

Phase 3: Documentation of responses from the clinical population.

The newly framed the questionnaire had relevant test item which were adapted and translated from dysphagia handicap index (DHI), and the M D Anderson Dysphagia Inventory (MDADI). The test items were further evaluated for their appropriateness. The question items were further categorized into the body function and structure and activities and participation and environmental and personal factors suiting to the ICF-DH framework. Statistical analysis was carried out by the following tests Mean, Standard deviation and Mann-whitney test.

The first category was body structure and functional were limitations present and leading to dysphagia. The aspects of Oro-sensory and Oro-motor skills, peripheral and central nervous system factors represented in the category. Which is showing that the tongue movements, jaw opening, shape of the jaw, pain in velum, taste recognition and breathing problems while taking medication categorized under dependent variables were high significant differences among the individuals with dysphagia.

The second category under ICF-DH activity and participation aspects present and leading to dysphagia. It was show that jaw movement, chewing the food, difficult to intake liquids and after swallowing the food comes out through cough these variables were high significant differences among the individuals with dysphasia compared to their counterparts. It was found that tongue size, colour changes due to dysphasia, eating style, difficult to prepare food to other the big amount of food is difficult to swallow and more time taking to have food than before these variables were high significant differences among the individuals with typical individuals.

The third category under ICF-DH environmental and personal factors determining the quality of life among individuals with dysphagia sequel to stroke. There was a highly significant difference among the groups with respect factors of dining, social participation, self-respect, feeling himself as disable, himself getting angry due to swallowing problem, more time is taken to have a meal than before and carrying out routine eating styles. It was shown that not able to maintain weight, problem to mingle more with society and feeling shy to eat in front of the public and losing income these variables were high significant differences among the individuals with dysphasia compared with typical individuals. The study conclude that speech-language pathologist can use the ICF-DH framework in Malayalam beneficially to justify and strengthen their role in the management of individuals with dysphagia.

The statistical results revealed that clinical population had shown high significant parameters under Body structure and Function, Activity and Participation and Environmental issues. The clinical population had difficulties to maintain weight, embarrassed to eat in front of public and their productivity in terms of income generation was reported to be impacted negatively. These findings were in coherence with the earlier reported studies (Kothari, and Chandini, 2014).

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