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IP Journal of Otorhinolaryngology and Allied Science

Journal homepage: https://www.joas.co.in/

Original Research Article

An inquisitive exploration on perceived dysphagia, cognition and health-related quality of life in geriatrics

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ARTICLE INFO

Article history:
Received 27-05-2023
Accepted 15-07-2023
Available online 11-08-2023

Keywords:
Dysphagia
Geriatrics
Cognition
Aging
Quality of life
Memory
and frailty

ABSTRACT

The increasing aging population worldwide is one of the main issues of today. According to the 2011 census, there were 103 million senior citizen i.e about 8.6% of the India's population. According to data from the U. N Department of Economic and Social Affairs (UNDESA), the proportion of people over 60 will increase from 7.5% in 2010 to 11.1% in 2025. The NSSO 2002 report, the old population is expected to increase to 158.7 million by 2025, rising at a rate that is roughly twice as fast as the general population associated with Perceived Dysphagia, Cognition and Health-Related Quality of Life in Geriatrics populations.

Dysphagia is becomes an important common problem for the geriatric population. While Presbyphagia is a term that refers to the distinctive age-related changes that occur in the swallowing mechanism of otherwise healthy older adults. It is well defined that in acutely ill elderly populations, the prevalence and quality-of-life changes associated with dysphagia remain unstable poor health conditions. The present study attempt "To investigate an Inquisitive Exploration on Perceived Dysphagia, Cognition and Health-Related Quality of Life in Geriatrics".

A total of 300 participants were included in the study. The participants within the study were all inhabitants of Pondicherry. The individual with geriatric inclusion was 70 years old and above at the time of participation. Two validated questionnaires were used namely the M.D. Anderson Dysphagia Inventory (MDADI) and the general health Short Form-12 survey (SF-12v2) was administered to assess the impact of dysphagia-age related aspects on overall health. Both the questionnaires were self-administered and widely used in assessing cognitive function among the elderly, it includes orientation, attention, memory, language, and visuospatial skills.

The study outcome concluded that there is a relatively high prevalence of dysphagia in the community-based geriatric population; significant quality-of-life impairment is a frequent finding. General health measures do not appear to be sensitive to swallowing-related quality of life but finally, individuals may inaccurately ascribe swallowing problems to normal aging, supporting the role of community education about dysphagia in the elderly.

1. Introduction

Presbyphagia is a term that refers to the distinctive age-related changes that occur in the swallowing mechanism of otherwise healthy older adults. With age, the anatomy and physiology of the head and neck change, affecting the aging swallow. Together with the increasing prevalence of age-related diseases, these changes make older adults more susceptible to dysphagia as a result of underlying sarcopenia and diminished functional reserve. [1]

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https://doi.org/10.18231/j.ijoas.2023.009

Within the next six years, India is expected to surpass the United States as the world's most populous country, with approximately 1.36 billion people in 2019. According to the 2011 census, people aged 60 and over constituted 8.6 percent of the total Indian population, with a total of 103 million elderly individuals. The proportion of the elderly population is predicted to extend even further, reaching 19.5 percent (319 million) by 2050. (UN Population Division, 2019).[2] Population aging has implications on the socioeconomic and health status of the elderly.

Dysphagia is a prevalent problem among elders which is primarily attributable to central nervous system neurodegeneration. The aging may be capable of adapting to the decline of function to a certain extent, but one's reserve capacity is substantially lower than those of younger generations. The diagnosis and treatment of dysphagia in the elderly necessitate an understanding of the biological aging process as well as prominent pathological processes in the elderly. The current evidence supports the premise that cognitive decline can cause dysphagia, and that dysphagia can cause cognitive decline, through an examination of anatomy, physiology, cellular architecture, and the basic homeostatic mechanisms of the body, metabolism, and nutrition.[3]

In the Indian scenario, while dysphagia is well-characterized in acutely-ill patients, the prevalence and quality-of-life changes associated with dysphagia remain poorly defined in the community geriatric population. To meet the needs of aging populations, significant changes in the structure and delivery of health care are required. Access and affordability are significant barriers to care in many places, particularly in low- and middle-income countries. In these settings, new services, and approaches will need to be developed, World Report on Aging and Health (WHO, 2015).[4]

Speech-language pathology practices must be re-evaluated to meet the needs of older clients. As professionals, we must be cognizant of the prevalence of dysphagia problems that can compromise the health of this subset of the population.[5] The present study explored the predominance of perceived dysphagia, cognition, and health-related quality of life within the community geriatric population.

2. Need of the Study

Due to natural aging and normal wear and tear on the esophagus as well as a greater risk of certain conditions, such as stroke or Parkinson's disease, geriatric and older adults are at higher risk of swallowing difficulties. During the aging process, the elderly population may undergo functional and structural changes in swallowing, which can lead to difficulty in eating and other complications such as malnutrition, dehydration and increased risk of aspiration pneumonia and mortality well noticed at least about 13 to 40% of the elderly population The need of the study is to examine the predominance of perceived dysphagia, cognition, and health-related quality of life of geriatric population in the community for SLPs to better manage a caseload of older adults with a range of requirements and enhance their quality of life and daily performance. Due to several changes in the aging brain that affect cognition, which is essential to human thinking and experiences and refers to a process of identifications, elections, interpretations, storing, and using the information to perform language for interaction with the physical and social world in daily activities, the current increased demographic transition in the older population is likely to present challenges of poor quality of life and increased dependency.

3. Aim of the Study

The study aimed to investigate the prevalence of perceived dysphagia concerning cognition and health-related quality of life in geriatrics.

4. Objectives of the Study

1. To define the prevalence of perceived dysphagia in the geriatric community.
2. To define the quality-of-life changes associated with perceived dysphagia in the geriatric population.
3. To compare the impact of changes in cognition with normal aging on dysphagia.

5. Materials and Methods

5.1. Participants

A total of 300 participants were included in the study. The participants within the study were all inhabitants of Pondicherry. The geriatric inclusion was 70 years old and above at the time of participation. Participants with comorbid conditions such as stroke and Parkinson's disease were excluded. Data were collected on-site at the location.

5.2. Materials & stimulus

The M.D. Anderson Dysphagia Inventory (MDADI) is a validated self-administered questionnaire that asks about the participant's views about swallowing ability. The questionnaire was used to understand how participants feel about swallowing ability. The questionnaire has a Global scale, along with functional, emotional, and physical sub-scales. The Global Score is not numbered and ranges from 1 (extremely low functioning) to 5 (high functioning). Functional, emotional, and physical sub-scales were used to assess the impact of dysphagia in accordance with the above-mentioned parameters. The overall score was obtained by adding the total scores of functional, emotional, and physical sub-scales. The

composite score obtained, (by dividing the overall score by 19 and multiplying by 20) was stratified into 0-20-profound impact, 21-40-severe impact, 41-60-moderate impact,61-80-mild impact, 81-100-minimal disability. The general health Short Form-12 survey (SF-12v2^{TM}) is a self-reported outcome measure assessing the impact of health on an individual's everyday life. The general health Short Form- 12 survey (SF-12v2^{TM}) was administered to assess the impact of dysphagia-related aspects on overall health factors. Both the questionnaires were self-administered. The Mini-Mental State Examination (MMSE) is widely used in assessing cognitive function among the elderly, it includes orientation, attention, memory, language, and visuospatial skills. This was used to assess the correlation between cognitive ability and dysphagia. MMSE was administered by the speech-language pathologist.

5.3. Procedure

After being informed of the study's goals and methodology, 300 participants were asked to provide their explicit consent. They had 30 to 45 minutes to complete two questionnaires after a brief introduction. MMSE was administered by the Speech-language pathologist.

5.4. Data analysis

Descriptive statistics was used to obtain mean and standard deviation. ANOVA was used to find out interaction between parameters- global, emotional, functional, and physical and age-groups. Chi-square test was used to find association between quality of life and perceived dysphagia and cognitive decline and perceived dysphagia.

6. Results and Interpretations

The present study aimed to investigate the predominance of perceived dysphagia, cognition, and health-related quality of life in the geriatric population for Speech-language pathologists to better manage a caseload of older adults and provide the requirements thus enhance the quality of life. The results are discussed as per the objectives of the study.

Total of 300 participants, 289 completed all three questionnaires. The rate of participation is 96 %, 11 were excluded from the final analysis for failing to complete the questionnaire. During statistical analysis, based on the minimum and the maximum number of participants, subjects were divided into three age categories, 70-72 years, 72-75 years, and 75-79 years. Out of 289 subjects, 129 (44.6%) were aged between 70 to 72 years and 114 (39.4%) were aged between 72 to 75 years. Only 46 (15.9%) were aged between 75 to 79 years (Figure 1).

Objective 1 was to define the prevalence of perceived dysphagia in geriatrics. The mean scores were greater for the global scale followed by functional, emotional, and physical scales. MDADI overall scores implied moderate

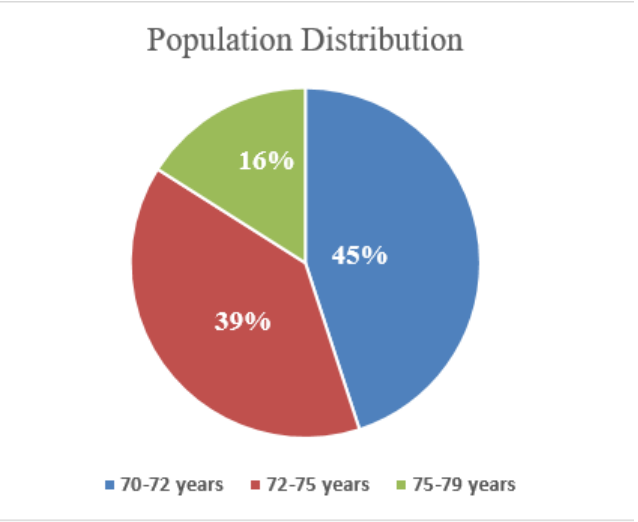

Fig. 1: Age-wise frequency distribution

to severe form of dysphagia with geriatric population aging above 70 years. 128 participants had global sub-scores that implied low-functioning ability (swallowing ability limits their day-to-day activities), 108 participants had functional and emotional sub-scores that implied moderate form, and 53 participants had physical sub-scores that implied a mild form of dysphagia. The results were found to be statistically significant. This shows the MDADI scores were statistically significant between the age categories (Table 1 a, b).

Table 1: a- MDADI mean scores and standard deviation

MDADI score	Mean	Standard Deviation
Global	2.36	1.44
Emotional	16.39	5.88
Functional	14.31	5.98
Physical	22.2	9.81
Composite	55.27	22.13

b- MDADI Across domains

Age	Global	Emotional	Functional	Physical
70-72	3.43±1.37	21.57±4.75	19.64±5.15	30.58±8.22
72-75	1.55±0.81	12.21±2.20	10.04±1.29	15.99±4.08
75-79	1.35±0.57	12.24±2.41	9.96±1.28	14.11±4.06
P-value	0.0001*	0.0001*	0.0001*	0.0001*

*Statistically significant at 5% level of significance

The results of ANOVA indicated that there is a significant effect of age on dysphagia. The swallowing -impairment was stratified into severe impact, moderate impact, mild impact, and minimal disability. Findings of the MDADI highlight that a significant number of the geriatric population (44%) is affected with oropharyngeal dysphagia.

Table 2: Association between age and dysphagia impact score

Age	Composite score				Total	P-value
	Severe impact	Moderate impact	Mild impact	Minimal disability		
70-72	13	12	20	84	129	0.0001*
72-75	30	16	0	0	46	
75-79	60	54	0	0	114	
Total	103	82	20	84	289	

*Statistically significant at 5% level of significance

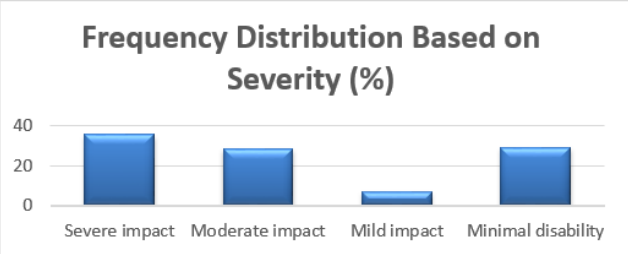

Fig. 2: Age-wise frequency distribution

A statistically significant association was found between age ad composite score on the chi-square test at a 5% significance level revealing that as age increases there is a moderate to severe impact of dysphagia (Table 2).

Objective 2 was to define the quality-of-life changes associated with perceived dysphagia in the geriatrics.

For assessing the quality-of-life impact, composite scores of MDADI were correlated with the SF-12v2™ health survey scores using the chi-square test. The study obtained a positive correlation (at 5% significance level) between dysphagia and the SF-12v2™ health survey.

Objective 3 was to compare the impact of changes in cognition with normal aging has an impact on dysphagia. On MMSE scores, revealed that 65.1% of the sample population had moderate cognitive impairment, and 21.1 % had mild cognitive impairment (Figure 3).

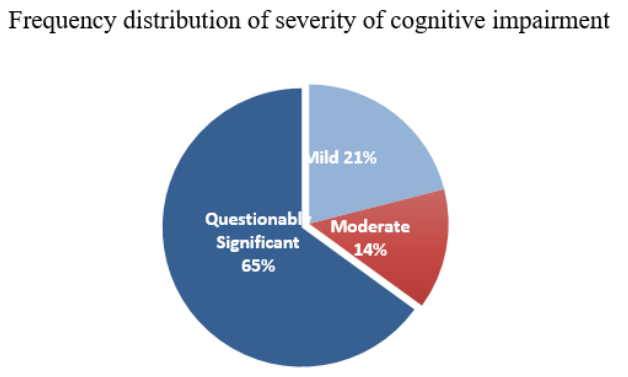

Fig. 3: MMSE Scores depicting the severity of impairment

The above results show a significant correlation between age and cognitive function decline. Mild-moderate cognitive impairment was obtained in the age-population 75-79 years of age. (Table 4)

Out of 289, 103 subjects with severe dysphagia impact, 62 were having a moderate degree of cognitive function, and 27 were having mild cognitive decline. Among 82 subjects with moderate dysphagia impact, 66 were having a moderate decline of cognitive function. Since P-value is less than 0.05, it was found that the composite scores were significantly associated with the degree of impairment (Table 5).

7. Discussion

The current study analyzed the prevalence of perceived dysphagia in geriatrics and defined the quality-of-life changes associated with perceived dysphagia (objectives 1 and 2). In the present study, 44% of the geriatric population reported experiencing difficulty in swallowing. In the study on the prevalence of swallowing difficulties among healthy elderly, which was determined using SDQ (Swallowing disturbance questionnaire), the prevalence was reported to be 20.1%, and additionally, the study also reported more dysphagia with the increase of age.[6]

The study done by Idah et al. reported dysphagia risk, low muscle strength, and poor cognition can predict malnutrition in the older population. The study highlighted the need for routine screening among the community-dwelling older population.[7,8] Identified risk factors for dysphagia include the history of clinical disease, age > 70 years, cognitive decline & physical frailty, including reduced ability to carry out independent activities.[9] In the present study, 28% of the participants with the severe impact of dysphagia reported poor overall health.

Dysphagia in the elderly might be misunderstood as a natural aspect of the aging process by both physicians and patients, resulting in the condition going undiscovered for long periods of time.[10] Similar findings were observed in the present study.

The quality-of-life and composite dysphagia score, obtained here showed a positive correlation which was contradictory to the finding obtained on the prevalence of perceived dysphagia and quality of life impairments in the

Table 3: Association between composite score and health survey

		Composite score				Total	P value
		Severe impact	Moderate impact	Mild impact	Minimal disability		
1) In general, would you say your health is:	Poor	80	66	7	38	191	0.0001*
	Fair	21	14	5	27	67	
	Good	2	2	8	19	31	
Total		103	82	20	84	289	
2. Moderate activities such as moving a table, pushing a vacuum cleaner, bowling, or playing golf.	Limited a little	2	2	5	10	19	0.0001*
	Limited a lot	101	80	15	74	270	
Total		103	82	20	84	289	
3. Climbing several flights of stairs	Limited a little	3	2	7	17	29	0.0001*
	Limited a lot	100	80	13	67	260	
Total		103	82	20	84	289	
4. Accomplished less than you would like.	No	2	1	0	6	9	0.086
	Yes	101	81	20	78	280	
Total		103	82	20	84	289	
5. Were limited in the kind of work or other activities.	No	2	2	8	18	30	0.0001*
	Yes	101	80	12	66	259	
Total		103	82	20	84	289	
6. Accomplished less than you would like.	No	2	2	6	15	25	0.0001*
	Yes	101	80	14	69	264	
Total		103	82	20	84	289	
7. Did work or activities less carefully than usual.	No	2	2	6	12	22	0.0001*
	Yes	101	80	14	72	267	
Total		103	82	20	84	289	
8. During the past 4 weeks, how much did pain- interfere with your normal work (including work outside the home and housework)?	A little bit	2	2	5	10	19	<0.001*
	Extremely	101	80	15	74	270	
Total		103	82	20	84	289	
9. Have you felt down-hearted and blue?	All of the time	1	0	0	0	1	<0.001*
	Most of the time	101	80	15	77	273	
	Some of the time	1	2	5	7	15	
Total		103	82	20	84	289	
10. During the past 4 weeks, how much of the time has your physical health or emotional problems interfered with your social activities (like visiting friends, relatives, etc.)?	All of the time	1	0	0	0	1	<0.001*
	Most of the time	101	80	15	76	272	
	Some of the time	1	2	5	8	16	
Total		103	82	20	84	289	

*Statistically significant at 5% level of significance

Table 4: Association between age and degree of cognitive impairment

Age	Degree Of Impairment			Total	P-Value
	Mild	Moderate	Questionably significant		
70-72	27	78	24	129	0.0001*
72-75	12	29	5	46	
75-79	22	81	11	114	
Total	61	188	40	289	

Table 5: Association between cognitive impairment and dysphagia

Degree Of Impairment	Composite score				Total	P-Value
	Severe impact	Moderate impact	Mild impact	Minimal disability		
Mild	27	10	2	22	61	0.004*
Moderate	62	66	16	44	188	
Questionably significant	14	6	2	18	40	
Total	103	82	20	84	289	

*Statistically significant at 5% level of significance

geriatric population.[11]

Dysphagia not only affects patients' quality of life but is also prone to severe complications such as malnutrition, dehydration, and aspiration- pneumonia resulting in worse long-term outcomes and increased mortality. Among these patient populations, pneumonia following aspiration is frequently the leading cause of death.[12]

In the present study, it was found that most of the individuals have not discussed their symptoms with a clinician and many could have treatable. Dysphagia aspects must be included in the health survey questionnaire. According to estimates, between 13% to 35% of senior adults who live independently suffer from dysphagia symptoms and the great majority do not seek treatment.[13–15]

Objective 3 was to study the impact of changes in cognition with normal aging on dysphagia. MMSE was used for this purpose. Cognitive impairment scores and dysphagia composite scores were computed using the chi-square test. Mild to moderate -cognitive issues are often ignored among the geriatric population. It is stated that cognitive-communication skills are the extremely sophisticated communication techniques that enable human cognitive processes and enable them to successfully communicate and obey social language norms. To make our speech effective, we use a variety of cognitive communication processes such as executive function, orientation, attention, memory, and problem-solving. When speaking about the function of cognition in speech, we use the phrase cognitive communication. Looking at public health, dementia, which affects 5 to 10% of the older population and manifests as people age and have a chronic, dysfunctional state brought on by neurodegenerative processes, is one of the key issues. There is currently no cure for dementia. Language problems, which indicate reduced word encoding in communication, are a common indication of dementia. A separate language from speech by considering the motor behaviour of the spoken language. Dementia symptoms include difficulty locating words (anomia), a loss of comprehension of the sentence, and a lack of discourse cohesiveness.

Elderly individuals with dementia show a slowing of the swallowing process. Slow swallowing processes may lengthen the time it takes to finish a meal, increasing the risk of poor nutritional status. Furthermore, older people frequently struggle with self-feeding. These issues could be related to cognitive impairment, motor deficits like weakness or apraxia, loss of appetite, and/or food avoidance.[16]

Oropharyngeal dysphagia is present in a significant number of cases with mild to moderate cognitive impairment. Oropharyngeal dysphagia also manifests as age-related dysphagia in elderly otherwise healthy people. Due to the growing aging population, a significant increase in the number of people over the age of 65 will almost certainly be encountered by the SLP working with adults.[17]

The most important changes in cognition with normal aging declines in performance on cognitive tasks that require one to quickly process or transform information to make a decision.[18] Cognitive strategies for executing neurological tasks, changing actions for safe deglutition under contexts, adjusting body positions, viewing the body as a unit, and perceiving the overall eating experience as a unit are all part of healthy cognitive function in deglutition. Evaluation of higher-level cognates, higher-level sensory reception and perception, attention, memory, cognitive organization, problem-solving/judgment, reasoning, executive function, and neuropsychiatric disturbances such as agitation, impulsivity/disinhibition, and apathy that may interfere with effective oral intake are all part of effectively managing cognitive dysphagia.

The study portrays the issues in swallowing in the aged population with mild to moderate cognitive impairment, and its effect on the quality of life. Most of the previous studies dealt with swallowing problems faced by patients with significant neurological issues. Although significantly affecting the quality of life, most swallowing issues the aging population faces with mild-moderate cognitive impairments are ignored. It signifies the importance of early identification of swallowing and cognitive issues in this subset of the population and the role played by SLP in diagnosing and guiding the management of such patients. The main challenge will be to enhance awareness and visibility of oropharyngeal dysphagia as a significant clinical syndrome and to persuade stakeholders of the importance of appropriate treatment. Development and validation of specific interventions for older adults,

systematic investigation of medication side effects on swallowing physiology, and elucidation of the effect of sarcopenia on swallowing function all have the potential to improve the situation and prognosis of this vulnerable patient group. [18]

8. Summary and Conclusion

To summarize, it is found in the present study that, perceived dysphagia, quality of life and cognitive function are interrelated. Dysphagia is a very common condition seen in elderly individuals. Age-related declination in cognitive function affects swallowing function. Even though multiple studies related to this aspect is reported in foreign population, in the Indian scenario there is a lack of such studies. The results of the present study warrant that along with general health screening, the screening of dysphagia must be mandatory. Most of the participants in the study felt swallowing problems as being a normal aspect of the aging process and did not seek treatment. This highlights the importance of educating the elderly and the community regarding swallowing problems. It is beneficial to screen elderly individuals on swallowing issues so that required assistance can be delivered to enhance their quality of life and daily functioning. The study also signified the importance of early identification of issues in this population and to provide proper diagnosis and intervention by Speech-language pathologists. The present study was restricted to limited number of participants within Pondicherry. The study can be carried out on a larger scale among the community-dwelling and within the general community geriatric population.

Language and cognition are closely related to one another. Language is a set of symbols used to convey ideas and thoughts between two or more people. It consists of some components of information or meaning that are linguistically expressed for usage in a specific context. Each component of language requires cognitive processing, and any impairment in this process can have an impact on any one or all of the language's components. There is dearth of research on aspects related to dysphagia and mild cognitive impairment and negative impacts it has on the quality of life in geriatric population, as is evident from the results of the above study. This warrants more research on the above aspects in Indian context.

In conclusion, Dysphagia is an important problem for the elderly population. It is well characterized in acutely ill geriatric populations, the prevalence and quality-of-life changes associated with dysphagia remain poorly defined in the community. There is a relatively high prevalence of dysphagia in the community-based geriatric population with a significant quality-of-life impairment frequently occurring in life. The general health measures do not appear to be sensitive to swallowing-related quality of life. However, individuals may inaccurately ascribe swallowing problems to normal aging, supporting the role of community education about dysphagia in the aging population.

9. Source of Funding

None.

10. Conflict of Interest

None.

Acknowledgment

Also, we would like to thank AVMC authorities, Pondicherry for providing the opportunity to conduct the study.

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Cite this article: Mohan R, Banik A, Rajan ND, Dalvi UA, Nithyasree A. An inquisitive exploration on perceived dysphagia, cognition and health-related quality of life in geriatrics. *IP J Otorhinolaryngol Allied Sci* 2023;6(2):35-42.