



The Effect of Dysphagia on Quality of Life in Stroke Patients

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Purpose: Dysphagia is a prevalent condition following a stroke. Dysphagia and its implications negatively affect quality of life (QOL) aspects. The purpose of this study was to measure the effect of dysphagia on QOL aspects, and to explore its association with sociodemographic factors.

Methods: This cross-sectional study included 31 stroke patients with dysphagia. The effect of dysphagia on QOL aspects was measured using the Dysphagia Handicap Index (DHI). Demographic variables included gender, age, educational level, annual family income and the time of onset of dysphagia.

Results: The majority of the participants (61.3%) were male, and 67.7% were between 60-70 years old. The onset of dysphagia was less than three months for most of the patients (61.3%). The mean $\pm$ SD of the DHI total score was 53.5 ± 9.6 . Furthermore, the study's findings revealed significant mean differences in the physical subscale ($p=0.003$), emotional subscale ($p=0.020$), and the DHI total score ($p=0.005$) between groups with different onsets of dysphagia. This means that the effect of dysphagia on physical and emotional aspects, as well as overall quality of life, diminishes over time following a stroke.

Conclusions: This study's results underscore the adverse effect of dysphagia on QOL aspects in stroke patients, with a gradual reduction in this impact over the post-stroke period.

Keywords: Dysphagia, Swallowing disorders, Stroke, Quality of life



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INTRODUCTION

Stroke is one of the most debilitating neurological disorders affecting the elderly population, and is now a public health problem [1]. This neurological disorder causes many disabilities in affected patients, including dysphagia, a disease that leads to difficulty in transferring food and liquids from the mouth to the stomach safely [2,3].

Dysphagia is a disorder characterized by difficulty in executing a swallow, resulting in further deterioration of patient's health issues. Dysphagia affects 50% to 80% of stroke patients [4-9]. Dysphagia patients could recover in a matter of weeks after a stroke or it could be a prolonged illness. Prolonged dysphagia can affect the quality of life (QOL) and psychological health [10,11]. Furthermore, serious complications like pneumonia, dehydration, nutritional deficits, and even death can result from it [12].

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Previous research revealed that dysphagia impairs QOL aspects Terre et al. [13] found that dysphagia following a stroke negatively affects the physical aspect. Patients reported that they had a weak gag response, coughed while eating orally, and their voices changed after swallowing. Moreover, Pontes et al. [14] found that dysphagia has negative effects on the functional aspect. Patients reported that they took longer than usual to finish a meal. Additionally, in a study conducted by Perry et al. [15], stroke patients with dysphagia expressed that they suffer from feelings of despair, dismay, and bewilderment while eating with others, which means that dysphagia negatively affects the emotional aspect. Furthermore, several studies have demonstrated that the effect of stroke on quality of life varies depending on factors such as gender, age, education level, and social support [16-18]. However, these studies have not reached a conclusive conclusion, and even their findings are conflicting in part, because the quality of life is a multidimensional and complex concept.

Additionally, a number of tools were developed to investigate the effect of dysphagia on QOL aspects. Silbergleit et al. [19] developed the Dysphagia Handicap Index (DHI) in 2012. It is a self-administered instrument to measure the effect of dysphagia on physical, functional and emotional aspects of patient's lives.

Although previous research found that dysphagia negatively affects physical, functional and emotional aspects of QOL after a stroke, the specific variations in this effect concerning sociodemographic factors remain unclear. Thus, there is a need to investigate the role of demographic variables on the negative effect of dysphagia on QOL aspects in stroke patients with dysphagia. Moreover, due to the high prevalence of dysphagia in stroke survivors and the absence of a study in Jordan that investigates the effect of dysphagia on QOL aspects, it is crucial to carry out research in this area.

This study has two main purposes (i) to measure the effect of dysphagia on QOL aspects, and (ii) to investigate variations in the effect of dysphagia on different aspects of QOL between sociodemographic variables.

METHODS

Study design and patients

This study was approved by the Research Ethics Committees of Universiti Sains Malaysia with the reference number USM/JEPeM/22050285, and the Jordanian Ministry of Health. The study objectives were first explained to the patients and their

caregivers, and then they filled out the consent form.

This study was a cross-sectional study. A total of 31 stroke patients with dysphagia were recruited from a number of outpatient rehabilitation facilities in Amman-Jordan between August 2022 and December 2022. The judgmental or purposive sampling method was used in this study. Inclusion criteria included a medically-confirmed diagnosis of stroke induced oropharyngeal dysphagia, at least two weeks after a stroke, and over 60 years old. Moreover, the exclusion criteria involved a history of other disorders that have an impact on swallowing (e.g., laryngectomy), feeding through a feeding tube, and extremely severe levels of depression, anxiety, and stress. Because not all stroke patients could communicate, read, and write well, caregivers were included in this study. Including caregivers ensured that all stroke patients were included and that any dysfunction detected was fairly representative of this specific group.

Patients with extremely severe depression, anxiety, or stress were excluded because their responses would indicate that dysphagia had a worse impact on QOL aspects due to their psychological state rather than their swallowing disorder. Levels of depression, anxiety and stress were determined by the Arabic version of the Depression Anxiety Stress Scales-21 (DASS-21) [20]. After evaluating patient's depression, anxiety and stress, and excluding patients with extremely severe levels of depression, anxiety and stress, the effect of dysphagia on QOL aspects was determined using the Arabic version of the DHI [21].

Instruments

Arabic version of the Depression Anxiety Stress Scales-21 (DASS-21)

The DASS-21 is a set of three self-report scales designed to assess the emotional states of depression, anxiety and stress. The three DASS-21 scales each have seven items. Response options are on a 4-point scale: (0 = did not apply to me at all; 1 = applied to me to some of the time or some degree; 2 = applied to me to a good part of the time or a considerable degree; and 3 = applied to me most of the time). The DASS-21 divides patients' levels of depression, stress, and anxiety into five categories: normal, mild, moderate, severe, and extremely severe [20].

Arabic Dysphagia Handicap Index (DHI)

The Arabic version of the DHI is an instrument to measure the impact of dysphagia on the emotional, functional, and physical aspects of QOL. It is a 25-item questionnaire divided into three subsections: physical (9 items), Functional (9 items), and emotional (7 items). The total score of the DHI ranges from 0 to 100,

and a higher score indicates that dysphagia has a worse effect on the patient's QOL. Moreover, the physical subscale ranges from 0-36, the functional subscale from 0-36, and the emotional sub-scale from 0-28 [21].

Table 1. Demographic and clinical characteristics of the participants

Characteristics	Category	Frequency	Percentage (%)
Gender	Male	19	61.3
	Female	12	38.7
Age	60-70 yr	21	67.7
	≥ 70 yr	10	32.3
Annual income	Less than 500 JOD	7	22.6
	500-1,000 JOD	13	41.9
	1001-1,500 JOD	5	16.1
	1501-2,000 JOD	4	12.9
	Over 2,000 JOD	2	6.5
Educational level	High school or lower	17	54.8
	University	14	45.2
Onset of dysphagia	3 months or less	19	61.3
	More than 3 months	12	38.7

≥: More than or equal.

Statistical analysis

Data input and analysis were carried out using IBM SPSS statistics software version 28. The normality of the distribution of each variable was examined. The mean and its standard deviation (SD) were reported for numerical variables. The frequency and its proportion were supplied for categorical variables. The two groups were compared using the independent t-test. Moreover, ANOVA was used to compare three groups or more.

RESULTS

Participant's characteristics

Thirty-one stroke patients with dysphagia met all the inclusion criteria. Most of the patients (61.3%) were male, and 67.7 %

Table 2. DHI total and subscales scores

Subscale	Min-Max	Mean	SD
Physical	12-28	19.8	5.4
Functional	14-28	20.8	4.1
Emotional	6-18	12.9	3.5
DHI total score	34-68	53.5	9.6

SD, Standard deviation.

Table 3. Association between the effect of dysphagia on QOL aspects and sociodemographic factors

Characteristics	DHI total and subscales scores							
	Physical subscale		Functional subscale		Emotional subscale		DHI total score	
	Mean (SD)	p-value	Mean (SD)	p-value	Mean (SD)	p-value	Mean (SD)	p-value
Gender		0.579		0.884		0.763		0.839
Male	19.4 (3.8)		20.7 (3.5)		13.1 (2.7)		53.2 (8.4)	
Female	20.3 (4.7)		21.0 (3.7)		12.6 (4.8)		54.0 (11.7)	
Age, yr		0.468		0.417		0.581		0.422
60-70	19.4 (3.7)		20.5 (3.5)		12.6 (3.4)		52.5 (9.2)	
≥ 70	20.6 (4.9)		21.6 (3.6)		13.4 (3.2)		55.6 (10.5)	
Annual income, JOD		0.701		0.404		0.772		0.704
Less than 500	19.1 (2.8)		22.6 (2.8)		12.9 (2.5)		54.5 (7.0)	
501-1,000	20.5 (3.7)		21.1 (3.7)		13.1 (3.3)		54.6 (8.9)	
1,001-1,500	20.4 (6.7)		19.2 (3.9)		12.8 (4.3)		52.4 (14.1)	
1,501-2,000	20.0 (4.9)		20.5 (3.7)		14.0 (3.7)		54.5 (11.1)	
Over 2,000	16.0 (2.8)		18.0 (2.8)		10.0 (6.6)		44.0 (11.3)	
Educational level		0.686		0.164		0.783		0.669
High school or lower	19.5 (3.1)		21.6 (3.8)		13.1 (3.1)		54.2 (8.7)	
University	20.1 (5.2)		19.8 (2.7)		12.7 (3.7)		52.7 (10.8)	
Onset of dysphagia		0.003		0.058		0.020		0.005
3 months or less	21.5 (3.7)		21.8 (3.5)		14.0 (2.9)		57.3 (9.4)	
Over 3 months	17.2 (3.5)		19.3 (3.2)		11.2 (3.5)		47.6 (7.7)	

were between the ages of 60-70. Additionally, 17 patients (54.8%) had a high school degree or less, and the annual family income for 41.9% of the patients was 501-1,000 JOD. Furthermore, the time post-onset of dysphagia for the majority of the patients (61.3%) was less than 3 months (Table 1).

Effect of dysphagia on QOL aspects

The results of the DHI showed that the mean $\pm$ SD of the DHI total score was 53.5 ± 9.6 , indicating that dysphagia negatively affects QOL in stroke patients. Table 2 shows the mean $\pm$ SD of the DHI total score and its subdomain scores.

Variations in the effect of dysphagia on different aspects of QOL depending on sociodemographic factors.

The findings revealed no significant mean differences in the DHI total and its subscales based between male and female, age groups, annual income brackets, or educational levels. However, significant mean differences were observed in the emotional subscale ($p=0.020$), physical subscale ($p=0.003$), and the DHI total score ($p=0.005$) among groups categorized by time elapsed since the onset of dysphagia (Table 3).

DISCUSSION

This study aimed to investigate the effect of dysphagia on QOL aspects in stroke patients and to investigate the variations in the effect of dysphagia on different aspects of QOL depending on sociodemographic factors. The results indicated that dysphagia negatively affects the physical, functional and emotional aspects and the severity of the effect of dysphagia on the physical and emotional aspects score decreases with increasing time following a stroke.

Effect of dysphagia on QOL aspects in stroke patients

The DHI is an effective tool because it is regarded as the gold standard for measuring the many aspects of QOL in individuals with dysphagia. Moreover, it involves a thorough evaluation of dysphagia, regardless of the cause, as well as monitoring the effectiveness and progress of rehabilitation from the patient's viewpoint. Using the DHI in conjunction with the medical diagnosis could provide a thorough, relevant picture of the patient's health. It can help healthcare professionals in the decision-making process for care.

Our findings indicated that dysphagia negatively affects emotional, functional, and physical aspects, indicating that dysphagia reduces the QOL of stroke patients. Our findings were in

line with previous research that measured the impact of dysphagia on QOL components. Although different studies have used different methods to examine how dysphagia affects the various QOL components, dysphagia has consistently had a negative influence on all areas of QOL. Therefore, early diagnosis and treatment are crucial for stroke patients with dysphagia to minimize disability and improve QOL.

Variations in the effect of dysphagia on different aspects of QOL depending on sociodemographic factors.

Our findings did not reveal significant mean differences in the DHI total score and its subscale scores between male and female. This finding was in line with Bakhtiyari et al. [22]. Moreover, the results did not show significant mean differences between age groups, indicating that the effect of dysphagia on QOL aspects does not change with age. This finding was consistent with [23,24]. However, Pontes et al. [1] found a negative correlation between age and the "selection of food" domain of the Swallowing Quality of Life questionnaire (SWAL-QOL). Pontes et al. interpreted this observation in terms of altered chewing function, which is typically linked to periodontal disease, and decreased salivation, which lessens the sensitivity of fundamental flavors like acid, bitterness, and sweetness. The nutritional status of the elderly is influenced by age-related and stroke-related factors, in addition to socioeconomic and psychological issues.

Our findings did not reveal any significant mean differences among groups with varying annual income levels. However, Alshahrani, AM [25] observed that stroke patients with higher annual incomes tend to experience a better quality of life. This could be because individuals with higher annual incomes might have greater access to healthcare resources and support services, which could contribute to an overall improved quality of life. It's worth noting that this apparent discrepancy in results may be attributed to differences in the populations we studied in addition, our findings revealed no significant mean differences in the DHI total score and subscale between educational levels, which means that the effect of dysphagia on QOL aspects does not differ based on the educational level. This result contradicts Bakhtiyari et al. [22] found that the effect of dysphagia on the functional aspect increases with increasing educational level. On the other hand, Mercier et al. [26] demonstrated that stroke patients with a higher level of education have a higher QOL. Each study has been conducted in a different geographical region or population, which may explain why their results varied.

Additionally, the findings of this study showed significant mean differences in the physical subscale, emotional subscale, and DHI total score between groups with various onsets of dysphagia, demonstrating that the effect of dysphagia diminishes with longer post-dysphagia periods. This is due to the fact that dysphagia therapy and rehabilitation interventions after a stroke significantly minimize dysphagia severity.

Therefore, it would be helpful to use the DHI during treatment to measure the efficiency of dysphagia therapy and rehabilitation in decreasing the effect of dysphagia on the physical, functional, and emotional aspects and in improving QOL.

This outcome was consistent with some earlier studies [27-30], which discovered that as post-stroke duration increased, its effect on patients' QOL diminished.

The main objective of rehabilitation and treatment for patients with dysphagia following a stroke is to improve their QOL. Therefore, clinicians should consider several QOL aspects besides clinical and instrumental dysphagia assessments.

Limitations of the study

This study has some limitations. Stroke patients with dysphagia who use a feeding tube were excluded. Thus, the findings of this study couldn't be generalized. Moreover, the judgmental or purposive sampling method was used in this study, which may cause some bias. Furthermore, there was no control group to compare QOL between stroke patients with dysphagia and those without dysphagia.

CONCLUSION

In conclusion, dysphagia negatively affects QOL aspects in stroke patients. Moreover, the negative effect of dysphagia on the physical aspect and overall QOL decreases with increasing time following a stroke. Further studies would be necessary to determine the effect of dysphagia on QOL aspects based on the type of feeding and dysphagia severity.

Conflict of interest

The authors declare no conflict of interest.

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REFERENCES

1. Pontes ÉS, Amaral AK, Rêgo FL, Azevedo EH, Silva PO. Quality of life in swallowing of the elderly patients affected by stroke. *Arq Gastroenterol*. 2017 Jan-Mar;54(1):27-32.
2. Onofri SM, Cola PC, Berti LC, da Silva RG, Dantas RO. Correlation between laryngeal sensitivity and penetration/aspiration after stroke. *Dysphagia*. 2014 Apr;29(2):256-261.
3. McCarty EB, Chao TN. Dysphagia and swallowing disorders. *Med Clin North Am*. 2021 Sep;105(5):939-954.
4. Kidd D, Lawson J, Nesbitt R, MacMahon J. The natural history and clinical consequences of aspiration in acute stroke. *QJM*. 1995 Jun; 88(6):409-413.
5. Mann G, Hankey GJ, Cameron D. Swallowing disorders following acute stroke: prevalence and diagnostic accuracy. *Cerebrovasc Dis*. 2000 Sep-Oct;10(5):380-386.
6. Martino R, Foley N, Bhogal S, Diamant N, Speechley M, Teasell R. Dysphagia after stroke: incidence, diagnosis, and pulmonary complications. *Stroke*. 2005 Dec;36(12):2756-2763.
7. Meng NH, Wang TG, Lien IN. Dysphagia in patients with brainstem stroke: incidence and outcome. *Am J Phys Med Rehabil*. 2000 Mar-Apr;79(2):170-175.
8. Nilsson H, Ekberg O, Olsson R, Hindfelt B. Dysphagia in stroke: a prospective study of quantitative aspects of swallowing in dysphagic patients. *Dysphagia*. 1998 Winter;13(1):32-38.
9. Finizia C, Rudberg I, Bergqvist H, Rydén A. A cross-sectional validation study of the Swedish version of SWAL-QOL. *Dysphagia*. 2012 Sep;27(3):325-335.
10. Lam PM, Lai CK. The validation of the chinese version of the swallow quality-of-life questionnaire (SWAL-QOL) using exploratory and confirmatory factor analysis. *Dysphagia*. 2011 Jun;26(2):117-124.
11. Lim KB, Lee HJ, Yoo J, Kwon YG. Effect of low-frequency rTMS and NMES on subacute unilateral hemispheric stroke with dysphagia. *Ann Rehabil Med*. 2014 Oct;38(5):592-602.
12. Cha TH, Jung MY, Chung BI, Lee TY. The correlation between dietary stages and quality of life assessed by SWAL-QOL in patients with dysphagia. *J Korean Soc Occup Ther*. 2010;18:63-75.
13. Terré R, Mearin F. Oropharyngeal dysphagia after the acute phase of stroke: predictors of aspiration. *Neurogastroenterol Motil*. 2006 Mar;18(3):200-205.
14. Alali D, Ballard K, Bogaardt H. The frequency of dysphagia and its impact on adults with multiple sclerosis based on patient-reported questionnaires. *Mult Scler Relat Disord*. 2018 Oct;25:227-231.
15. Perry L, McLaren S. Coping and adaptation at six months after stroke: experiences with eating disabilities. *Int J Nurs Stud*. 2003; 40(2):185-195.
16. Rochette A, Desrosiers J, Noreau L. Association between personal and environmental factors and the occurrence of handicap situations following a stroke. *Disabil Rehabil*. 2001 Sep 10;23(13):559-569.
17. Sturm JW, Donnan GA, Dewey HM, Macdonell RA, Gilligan AK, Thrift AG. Determinants of handicap after stroke: the North East Melbourne stroke incidence study (NEMESIS). *Stroke*. 2004;35(3):

- 715-720.
18. Suenkeler IH, Nowak M, Misselwitz B, Kugler C, Schreiber W, Oertel WH, et al. Timecourse of health-related quality of life as determined 3, 6 and 12 months after stroke. Relationship to neurological deficit, disability and depression. *J Neurol.* 2002;249(9): 1160-1167.
19. Silbergleit AK, Schultz L, Jacobson BH, Beardsley T, Johnson AF. The Dysphagia handicap index: development and validation. *Dysphagia.* 2012 Mar;27(1):46-52.
20. Ali AM, Ahmed A, Sharaf A, Kawakami N, Abdeldayem SM, Green J. The arabic version of the depression anxiety stress scale-21: cumulative scaling and discriminant-validation testing. *Asian J Psychiatr.* 2017 Dec;30:56-58.
21. Farahat M, Malki KH, Mesallam TA, Bukhari M, Alharethy S. Development of the arabic version of dysphagia handicap index (DHI). *Dysphagia.* 2014 Aug;29(4):459-467.
22. Bakhtiyari J, Dadgar H, Maddah M, Ghorbani R, Charkhi F, Rezaee Z. The effects of dysphagia on quality of life in stroke survivors. *Middle East J Rehab Health Stud.* 2020;7(4).
23. Cassol K, Galli JFM, Zamberlan NE, et al. Qualidade de vida em deglutição em idosos saudáveis, *J Soc Bras Fonoaudiol.* 2012;24: 223-32.
24. Ura L, Madhavan A, Carnaby G, Crary MA. Dysphagia in the elderly: management and nutritional considerations. *Clin Interv Aging.* 2012;7:287-298.
25. Tang T. Income and quality of life: does the love of money make a difference? *journal of business ethics.* 2007;72.4:375-393.
26. Patti F, Pozzilli C, Montanari E, Pappalardo A, Piazza L, Levi A, et al. Effects of education level and employment status on HRQoL in early relapsing-remitting multiple sclerosis. *Mult Scler.* 2007;13(6): 783-791.
27. Van Rhijn BD, Smout AJ, Bredenoord AJ. Disease duration determines health-related quality of life in adult eosinophilic esophagitis patients. *Neurogastroenterol Motil.* 2014;26(6):772-778.
28. Kong KH, Yang SY. Health-related quality of life among chronic stroke survivors attending a rehabilitation clinic. *Singapore Med J.* 2006;47(3):213.
29. Mayo NE, Wood-Dauphinee S, Cote R, Durcan L, Carlton J. Activity, participation, and quality of life 6 months poststroke. *Arch Phys Med Rehabil.* 2002;83(8):1035-1042.
30. Bahceci K, Umay E, Gundogdu I, Gurcay E, Ozturk E, Alicura S. The effect of swallowing rehabilitation on quality of life of the dysphagic patients with cortical ischemic stroke. *Iran J Neurol.* 2017; 16(4):178-184.