

# Quality of Life in Geriatric Individuals with and without Swallowing Complaints

## Yutma Şikâyeti Olan ve Olmayan Geriatrik Bireylerde Yaşam Kalitesi

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**ABSTRACT Objective:** The aim of this study is to evaluate the quality of life levels of geriatric individuals with or without complaints of swallowing difficulties. **Material and Methods:** A total of 195 participants with (main group, n=112) and without (reference group, n=83) complaints of swallowing difficulties were included in the study. The Eating Assessment Tool (T-EAT-10) and The Quality of Life Scale in Older People (CASP-19) were applied to the participants. There are two sub-dimensions in CASP-19: Perception of Autonomy and Satisfaction (Factor 1) and Perception of Obstacles (Factor 2). **Results:** The average age of participants in the main group is 70.78±5.286, while in the reference group, it is 72.25±7.583. The main and reference groups were similar in demographic and clinical characteristics (p>0.05). The mean T-EAT-10 score for the main group was 6.80±6.130, while it was 0.51±0.787 in the reference group (t=10.753, p<0.001). A statistically significant difference was found between the CASP-19 the main group (20.51±8.282) and reference group (23.55±8.090) (t=2.564, p=0.011). A correlation analysis revealed a weak, negative statistical correlation between T-EAT-10 and the CASP-19 subscale the Factor 1 (r=-0.211, p=0.025), the Factor 2 (r=-0.222, p=0.019), and the CASP-19Total (r=-0.237, p=0.012). **Conclusion:** In this study, it was determined that geriatric individuals with complaints of swallowing difficulty have a lower quality of life compared to those without such complaints. It was determined that as the severity of dysphagia increased, the overall quality of life decreased. It is recommended that screening for dysphagia in geriatric individuals be increased and longitudinal follow-up studies be conducted in larger populations.

**Keywords:** Deglutition disorders; quality of life; geriatrics

**ÖZET Amaç:** Yutma güçlüğü şikâyeti olan veya olmayan geriatrik bireylerin yaşam kalitesini değerlendirmektir. **Gereç ve Yöntemler:** Yutma güçlüğü şikâyeti olan (ana grup, n=112) ve olmayan (referans grup, n=83) toplam 195 katılımcı çalışmaya dâhil edilmiştir. Katılımcılara Yeme Değerlendirme Aracı [The Eating Assessment Tool (T-EAT-10)] ve Yaşlı Bireylerde Yaşam Kalitesi Ölçeği [The Quality of Life Scale in Older People (CASP-19)] uygulanmıştır. CASP-19'da Özerklik ve Doyum Algısı (Faktör 1) ve Engel Algısı (Faktör 2) olmak üzere 2 alt boyut vardır. **Bulgular:** Ana gruptaki katılımcıların ortalama yaşı 70,78±5,286 iken referans grubunda bu değer 72,25±7,583'tür. Ana ve referans grupları demografik ve klinik özelliklerde benzerlik göstermiştir (p>0,05). Ana grubun ortalama T-EAT-10 puanı 6,80±6,130 iken referans grubunda bu puan 0,51±0,787 olarak bulunmuştur (t=10,753, p<0,001). CASP-19 ana grup (20,51±8,282) ve referans grubu (23,55±8,090) arasında istatistiksel olarak anlamlı bir fark vardır (t=2,564, p=0,011). Korelasyon analizi sonucunda, T-EAT-10 ile CASP-19 alt boyutları Faktör 1 (r=-0,211, p=0,025), Faktör 2 (r=-0,222, p=0,019) ve CASP-19toplam (r=-0,237, p=0,012) arasında zayıf ve negatif yönlü istatistiksel olarak anlamlı bir ilişki vardır. **Sonuç:** Bu çalışmada, yutma güçlüğü şikâyeti olan geriatrik bireylerin, yutma şikâyeti olmayanlara göre daha düşük yaşam kalitesine sahip olduğu belirlenmiştir. Disfaji şiddeti arttıkça yaşam kalitesinin düştüğü tespit edilmiştir. Geriatrik bireylerde disfaji taramalarının artırılması ve daha geniş popülasyonlarda uzunlamasına takip çalışmalarının yapılması önerilmektedir.

**Anahtar Kelimeler:** Yutma bozuklukları; yaşam kalitesi; geriatri

People worldwide are living longer. Today most people can expect to live into their sixties and beyond. By 2030, it is estimated that 1 in every 6 peo-

ple worldwide will be aged 60 and over.<sup>1</sup> A similar situation is observed in Türkiye as well. The proportion of the population aged 65 and over increased

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from 8.8% in 2018 to 10.2% in 2023.<sup>2</sup> The increase in the elderly population indicates that individuals in this group will have a greater presence in the health-care system, and their issues will take on greater prominence.<sup>1</sup> Aging brings about numerous changes in tissues and organs. One of these changes is swallowing difficulty, which is a concerning issue for the elderly population.<sup>3</sup> Dysphagia, a common challenge encountered in the aging population, is influenced by subtle physiological alterations in swallow function associated with advancing age.<sup>4,5</sup> During the aging process, several anatomical and physiological changes occur that affect eating and swallowing function, such as ossification of the hyoid bone, thyroid, and cricoid cartilages, atrophy of intrinsic laryngeal muscles, dehydration of the laryngeal mucosa, loss of elasticity in the laryngeal ligaments, reduced biting force and tongue muscle activity, decreased salivary flow rate, reduced number of teeth, and a decline in orosensory receptors.<sup>6-12</sup> Additionally, the literature reports that although swallowing difficulty is a common symptom in the elderly population, they rarely complain about it spontaneously.<sup>13-15</sup> Dysphagia can be anatomically categorized into oropharyngeal or esophageal types.<sup>16</sup> Oropharyngeal, also known as transfer dysphagia, pertains to the commencement of the swallowing process, specifically the transit of a food bolus from oral to hypopharynx to the esophagus. On the other hand, esophageal dysphagia originates within the esophageal body and is associated with challenges in propelling food towards the stomach. The genesis of dysphagia may be attributed to either mechanical impediments or disruptions in motor function within the alimentary passage.<sup>3,17</sup> Dysphagia is identified in approximately 2% to 4% of the entire population; however, its incidence increases with age, reaching up to 15%.<sup>18-20</sup> Among individuals receiving home care services, the prevalence of dysphagia rises substantially to 68%.<sup>20-22</sup> As a result, effective treatment may not be provided systematically and timely, leading to potential complications such as aspiration pneumonia, respiratory tract infections, etc. In order to provide better service to this patient group, healthcare professionals should question the existence of dysphagia and have sufficient knowledge about the processes and physiology of dysphagia.<sup>23,24</sup> In recent

years, clinical swallowing assessments have predominantly incorporated quality of life (QoL) evaluations and patient-centered questionnaires. Noteworthy among these assessments are the Eating Assessment Tool (T-EAT-10), the Sydney Swallow Questionnaire and the Swallow Quality of Life Questionnaire, which stand out as frequently employed tools in the context of swallowing evaluation.<sup>25-27</sup> The T-EAT-10, in particular, exhibits distinct advantages relative to other questionnaires, characterized by its simplicity, ease of scoring, and broad applicability across a spectrum of swallowing disorders. Although the T-EAT-10 is a symptom questionnaire, it has demonstrated predictive capabilities for objective evidence of swallowing dysfunction in determining baseline dysphagia symptom severity and determining efficacy from treatment. Furthermore, investigations have identified the T-EAT-10's capacity to predict aspiration risk, substantiating its clinical efficacy.<sup>28,29</sup> T-EAT-10 demonstrates high internal consistency and criterion-related validity. A score of 3 or higher on the T-EAT-10 indicates the presence of an abnormal condition in the individual, warranting further clinical investigation.<sup>28,30</sup> In 2016, Demir et al. confirmed the validity and reliability of the T-EAT-10 test in Turkish and adapted it specifically for symptomatic assessment for dysphagia.<sup>31</sup> QoL is characterized as "a condition of holistic physical, mental, and social well-being, extending beyond the mere absence of disease or infirmity." Speyer et al. propose that, in the quantification of patients' present health status, it is crucial to incorporate a rigorously validated QoL measure tailored to their specific health conditions.<sup>32</sup> Several tests have been developed to assess QoL. Research involving elderly individuals has indicated that the concept of QoL extends beyond just health, emphasizing the importance of assessing social conditions and functional constraints in any measurement. Among these tests, the Quality of Life Scale in Older People (CASP-19) stands out as a valid and reliable scale employed for measuring the QoL in individuals aged 65 and older.<sup>26,33-35</sup> Difficulty in swallowing is an important health problem that negatively affects the general health and well-being of individuals.<sup>36,37</sup> It is known that individuals with dysphagia experience social and psychological problems related to having a swallowing disorder, and it

has been emphasized that swallowing difficulty can have negative effects on QoL.<sup>36</sup> When swallowing disorders occur, individuals are also affected socially. Individuals' own perceptions play an important role in determining how and to what extent swallowing disorders affect life.<sup>38</sup> QoL is important for individuals with swallowing difficulties. The aim of this study is to evaluate the QoL levels of geriatric individuals with or without complaints of swallowing difficulties.

## MATERIAL AND METHODS

This comparative cross-sectional research received approval from the Non-Interventional Research Ethics Committee of Çankırı Karatekin University Health Sciences (date: October 16, 2023, no: 9). The study was conducted in accordance with the principles outlined in the Declaration of Helsinki. Written permission was received from Çankırı State Hospital on November 06, 2023 (E-64943697-799-228455506). Written permission was obtained from the authors for the use of the scales. Written informed consent was obtained from all participants for participation in this study.

### PARTICIPANTS

The sample size was determined using the G-Power software with the t-test method for two independent groups, applying a significance level of 0.05 and an effect size 0.5. The resulting sample power was determined as 92%. There are two groups in this study. In this study, 112 geriatric elderly with swallowing complaints were included in the main group, and 83 geriatric elderly without complaints of swallowing difficulties were included in the reference group. Between November 15, 2023, and February 28, 2024, individuals over 65 years old admitted to the internal medicine outpatient clinics of Çankırı State Hospital, a secondary healthcare institution, were included in the study. Inclusion criteria encompassed a lack of diagnoses such as head and neck cancer, cerebrovascular disease, oropharyngeal or esophageal or neurological swallowing and feeding difficulties. Randomly, individuals were asked if they had any difficulty swallowing. Those who answered yes formed the main group, and participants who did not have difficulty swallowing formed the reference group. The inclusion criteria for the main group are;

a) having difficulty swallowing complaints, b) having received 3 points or more from the T-EAT-10, c) is being over 65 years of age. The inclusion criteria for the reference group are a) not having difficulty swallowing complaints, b) having a score of less than 3 on the T-EAT-10 test, c) being over 65 years of age. Exclusion criteria for both groups included diagnoses such as head and neck cancer, cerebrovascular disease, Parkinson's, oropharyngeal or esophageal or neurological swallowing, psychogenic dysphagia, prolonged entubation, laryngopharyngeal reflux and feeding difficulties. The responses of the included participants to the items on the CASP-19 scales were recorded. Participants were included on a voluntary basis.

**Data Collection Tools:** To gather information about the participants' demographic characteristics, we employed survey questions developed by the researchers, along with the T-EAT-10 and the CASP-19.

**T-EAT-10:** The scale, which was developed by Belafsky et al. in 2008 with 10 questions and 5-point Likert type, was introduced into Turkish by Demir et al. in 2016.<sup>28,31</sup> The total score derived from the scale varies between 0 and 40, with no reverse items. A score of 3 or more on the scale indicates abnormal swallowing, and as the score increases, the severity of the individual's swallowing disorder also increases.<sup>31</sup>

**CASP-19:** This scale was developed by Hyde et al. to assess the QoL of elderly individuals. The validity and reliability study in Turkish language was conducted by Türkoğlu and Adıbelli.<sup>34,35</sup> The original scale comprises 19 items and 4 subscales ("Control", "Autonomy", "Pleasure", "Self-realization").<sup>34</sup> The version adapted for use in our country includes 13 items and two subscales: Perception of Autonomy and Satisfaction (Factor 1), and Perception of Obstacle (Factor 2).<sup>35</sup> This scale is a 4-point Likert scale. Certain items in the scale are reverse-coded, and scores for scale items range from 0 to 3 points. An increase in the total score indicates an improvement in the QoL.<sup>35</sup>

### DATA ANALYSES

The statistical evaluation utilized the SPSS Statistics software package (Version 26.0, IBM, USA). Numerical variables were reported as mean±standard deviation, accompanied by minimum and maximum

values, as well as frequencies and percentages. The distribution of variables was assessed using the Kolmogorov-Smirnov test, a statistical method. Parametric test analyses were employed for normally distributed data, with an independent Simple t-test used to compare two independent groups. In correlation analyses, Pearson correlation analysis was chosen due to the normal distribution of the data. An overall p value of less than 0.05 was considered to show a statistically significant result.

## RESULTS

A total of 195 participants with (main group, n=112) and without (reference group, n=83) complaints of swallowing difficulties were included in the study. The main group and the reference group are similar in terms of demographic and clinical characteristics ( $p>0.05$ ). The average T-EAT-10 score for the group with perceived dysphagia is  $6.80\pm 6.130$ , while the average score for the group without perceived dysphagia is  $0.51\pm 0.787$  ( $t=10.753$ ,  $p\leq 0.001$ ). For those with perceived dysphagia, the average age is  $70.78\pm 5.286$  (min=65, max=90), with 52.7% being female, 88.4% married, 58.9% having equal income, 51.8% being primary school graduates, and a body mass index (BMI) of  $27.68\pm 4.46$ . Additionally, 49.1% live with their spouses, and 24.1% stated that their swallowing problem negatively affects their QoL, leading to stress and anxiety. Comparatively, individuals without perceived dysphagia have an average age of  $72.25\pm 7.583$  (min=65, max=97), with 54.2% being female, 91.6% married, 72.3% having equal income, 47% being primary school graduates, and a BMI of  $28.18\pm 4.67$ . Moreover, 79.5% of them live with their spouses (Table 1).

A statistically significant difference was found in the comparison of CAPS-19 score averages in the main and reference groups ( $p\leq 0.05$ ). This difference was evident in the mean scores of both the Factor 1 ( $p\leq 0.001$ ) and the Factor 2 ( $p=0.018$ ) subscale and the overall CASP-19<sub>Total</sub> score ( $p=0.011$ ) (Table 2).

There was a significant correlation between the mean T-EAT-10 scores of the main group partici-

**TABLE 1:** Demographic characteristics of the participants.

Variable		n	Group		p value
			Main Group	Reference Group	
Sex	Female	n	59	45	0.831
		%	52.7	54.2	
	Male	n	53	38	
		%	47.3	45.8	
Marital status	Single	n	13	7	0.629
		%	11.6	8.4	
	Married	n	99	76	
		%	88.4	91.6	
Income level	Low	n	8	5	0.525
		%	7.1	6	
	Equal	n	66	60	
		%	58.9	72.3	
	Excess	n	38	18	
		%	33.9	21.7	
Education level	Primary school	n	58	39	0.549
		%	51.8	47.0	
	Middle school	n	20	13	
		%	17.9	15.7	
	High school	n	17	18	
		%	13.4	21.7	
	Associate degree	n	2	2	
		%	1.8	2.4	
	Bachelor	n	15	11	
		%	15.1	13.3	

**TABLE 2:** Comparison of CASP-19 results between groups.

Index	Group	n	$\bar{X}\pm SD$	Test value	p value
Factor 1	Main group	112	15.68 $\pm$ 6.854	3.671 <sup>a</sup>	0.001 <sup>**</sup>
	Reference group	83	19.52 $\pm$ 7.691		
Factor 2	Main group	112	4.83 $\pm$ 2.332	-2.382 <sup>a</sup>	0.018 <sup>*</sup>
	Reference group	83	4.04 $\pm$ 2.260		
CASP-19Total	Main group	112	20.51 $\pm$ 8.282	2.564 <sup>a</sup>	0.011 <sup>*</sup>
	Reference group	83	23.55 $\pm$ 8.090		

CASP-19: The Quality of Life Scale in Older People; SD: Standard deviation; <sup>a</sup>Independent t-test; <sup>\*</sup> $p\leq 0.05$ ; <sup>\*\*</sup> $p\leq 0.005$ .

**TABLE 3:** Correlation of EAT-10 and CASP-19 results of main group participants.

Variables	n	EAT-10	
		R	p value
Factor 1	112	r=-0.211	0.025*
Factor 2	112	r=-0.222	0.019*
CASP-19 <sub>Total</sub>	112	r=-0.237	0.012*

EAT-10: The Eating Assessment Tool; CASP-19: The Quality of Life Scale in Older People; Pearson correlation test; \*p≤0.05.

pants and both the subscale and total scores of CASP-19 ( $p \leq 0.05$ ). A statistically significant relationship was found between T-EAT-10 and Factor 1 ( $r = -0.211$ ), Factor 2 ( $r = -0.222$ ) and CASP-19<sub>Total</sub> score ( $r = -0.237$ ). These findings indicate that as the severity of dysphagia increases, there is a corresponding decrease in the overall QoL (Table 3).

## DISCUSSION

Dysphagia is prevalent among the elderly, affecting approximately one-third of community-dwelling geriatric individuals, nearly half of geriatric patients, and over half of those residing in nursing homes.<sup>13,39,40</sup> Anatomical and physiological changes associated with aging affect the biomechanics of movement and overall swallowing function.<sup>41</sup> Some normal changes that occur with the aging process can lead to difficulty swallowing. The susceptibility of the geriatric individuals to oropharyngeal dysphagia (OD) is influenced by various factors, including a decline in cortical plasticity, sensory capacity, olfactory and taste senses, dental status, muscle function, saliva and tissue elasticity, as well as skeletal changes.<sup>6,7,10-13,42-44</sup> These changes in swallowing functions are particularly critical for elderly individuals who experience involuntary weight loss. Along with changes in eating and swallowing functions, tooth loss and chewing fatigue lead elderly individuals to prefer soft foods.<sup>12</sup> While limiting food options may reduce the risk of choking, it can negatively affect the elderly individual's QoL. In addition to the nutritional issues caused by dysphagia, complications such as dehydration, aspiration pneumonia, weakness, and involuntary weight loss may also occur.<sup>20</sup>

In our study, we questioned the QoL of patients over 65 years of age who applied to the outpatient

clinic for reasons other than dysphagia according to the complaint of difficulty swallowing. CASP-19 was applied to the participants who met the study inclusion criteria according to the T-EAT-10 scale and the cut-off score in the elderly with and without difficulty swallowing for the assessment of QoL. The present findings showed that geriatric participants with dysphagia had poorer QoL outcomes than participants without dysphagia. Furthermore, a significant association was observed between T-EAT-10 scores and CASP-19 subscale and total outcomes in elderly patients with dysphagia. Participants with dysphagia were referred to a higher-level hospital facility.

The global average life expectancy was recorded at 73.4 years in 2019, whereas it was determined to be 66.8 years in 2000. This expectancy has shown an upward trend over time. Projections indicate a further escalation in this figure by the year 2050, wherein approximately one-sixth of the global population will be aged 65 years or older.<sup>45,46</sup> As in the world, the elderly population in our country is increasing day by day. The proportion of the population aged 65 and over in the total population increased from 8.8% in 2018 to 10.2% in 2023.<sup>2</sup> This means that problems specific to geriatric individuals are given more importance. The World Health Organization, in defining the concept of QoL, includes individuals' perceptions related to their goals, expectations, and interests within the context of their cultural and value systems. QoL is defined as a broad concept that encompasses an personal belief environment, individual's physical and psychological health, social relationships, and level of independence.<sup>47,48</sup> Some factors that reduce the QoL in geriatric individuals include advanced age, poor subjective health status, insufficient monthly income, lack of leisure activities, and problems with access to the health system.<sup>49</sup> In particular, the presence of health problems negatively affects the QoL in the elderly.<sup>50</sup> Studies have shown that one of the factors affecting QoL is difficulty swallowing.<sup>51</sup>

In our study, none of the patients presented to the outpatient clinic with symptoms of dysphagia. Physicians and researchers, during routine consultations, inquired about swallowing issues in patients who did not mention any symptoms related to swal-

lowing difficulties. From one perspective, as previously discussed in the literature, many geriatric individuals perceive swallowing problems as a part of the normal aging process.<sup>20,52,53</sup> In this study, individuals who applied to outpatient clinics and did not have specific symptoms were questioned about whether they had difficulty swallowing and those who scored three or higher on the T-EAT-10 scale were found to have lower levels of QoL. In a meta-analysis conducted by Jones et al. in 2017, which examined health-related QoL (HRQoL) in OD through the evaluation of 35 studies, a bidirectional inverse relationship was identified between decreasing HRQoL and increasing severity of OD. Following medical interventions for oropharyngeal strictures, subsequent changes were notably evident through improvements in HRQoL and a reduction in the severity of OD. The findings of this article underscored the importance of targeting HRQoL in patients with OD.<sup>51</sup> In our study group, all subcategory assessment scores of the CAPS-19 index, evaluating the QoL in geriatric individuals with a T-EAT-10 score of 3 or higher, were found to be significantly lower compared to the reference group. Difficulty swallowing in geriatric individuals creates negative consequences on QoL. In these individuals, the increase in the level of difficulty swallowing is related to QoL levels. This study has some limitations. First, it was not possible to perform advanced examinations and diagnostic swallowing instrumental evaluations due to the lack of sufficient facilities in the hospital environment, and the second limitation is that comprehensive follow-up examinations could not be obtained. It is important to note that the selected patient group accessible for our study consisted of individuals who could go to an outpatient clinic. This restriction resulted in the exclusion of geriatric populations receiving home health care, living in nursing homes, hospitalized or bedridden at home, especially the debilitated groups; these patients are often overlooked in clinic-based studies due to their lack of opportunities for hospitalization and their lack of noticeable illness. Although the frail elderly group was not included, the rate is quite high. This situation shows that healthcare professionals should be more careful about swallowing difficulties in the geriatric group.

## CONCLUSION

In conclusion, our study was designed to assess the QoL changes in the group identified as needing further investigation for dysphagia, defined by scores of three or more on the T-EAT-10 scale. While our study did not include definitively diagnosed dysphagia patients, the results were consistent with literature findings showing a decline in QoL among geriatric individuals diagnosed with OD. Complaints of difficulty swallowing are reflected in the individual's QoL. It is thought that early intervention may have an effect without increasing the severity of complaints of difficulty swallowing and without increasing the negative effects on QoL. In geriatric patients with complaints of difficulty swallowing, it is recommended that screening for specific swallowing disorders be performed through a combination of examination and potentially instrumental assessment of swallowing. Future studies evaluating the results of patients who underwent T-EAT-10 index application will contribute more significantly to the literature. Future studies are recommended to increase awareness and screening of swallowing difficulties in geriatric individuals and to conduct longitudinal follow-up studies in larger populations.

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### **Conflict of Interest**

*No conflicts of interest between the authors and / or family members of the scientific and medical committee members or members of the potential conflicts of interest, counseling, expertise, working conditions, share holding and similar situations in any firm.*

### **Authorship Contributions**

**Idea/Concept:** Emel Arslan Sarımehtemolu, Seher Gönen Şentürk; **Design:** Emel Arslan Sarımehtemolu, Seher Gönen

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Sarımehtemolu, Seher Gönen Şentürk, Ömer Küçükdemirci; **Writing the Article:** Emel Arslan Sarımehtemolu, Seher Gönen Şentürk, Ömer Küçükdemirci; **Critical Review:** Emel Arslan Sarımehtemolu, Seher Gönen Şentürk, Ömer Küçükdemirci.

## REFERENCES

1. World Health Organization [Internet]. [Cited: December 01, 2024]. Ageing and health. Available from: <https://www.who.int/news-room/fact-sheets/detail/ageing-and-health#:~:text=At%20this%20time%20the%20share,2050%20to%20reach%20426%20million>
2. Türkiye İstatistik Kurumu [Internet]. [Erişim tarihi: 01 Aralık 2024]. İstatistiklerle Yaşlılar. 2023. Erişim tarihi: <https://data.tuik.gov.tr/Bulten/Index?p=Istatistiklerle-Yasli-2023-53710>
3. Humbert IA, Robbins J. Dysphagia in the elderly. *Phys Med Rehabil Clin N Am*. 2008;19(4):853-66, ix-x. PMID: 18940645; PMCID: PMC3182519.
4. Tamine K, Ono T, Hori K, Kondoh J, Hamanaka S, Maeda Y. Age-related changes in tongue pressure during swallowing. *J Dent Res*. 2010;89(10):1097-101. PMID: 20530725.
5. Castell MV, Sánchez M, Julián R, Queipo R, Martín S, Otero Á. Frailty prevalence and slow walking speed in persons age 65 and older: implications for primary care. *BMC Fam Pract*. 2013;14:86. PMID: 23782891; PMCID: PMC3691628.
6. Bakke M, Holm B, Jensen BL, Michler L, Möller E. Unilateral, isometric bite force in 8-68-year-old women and men related to occlusal factors. *Scand J Dent Res*. 1990;98(2):149-58. PMID: 2343274.
7. Palinkas M, Nassar MS, Cecilio FA, Siéssere S, Semprini M, Machado-de-Sousa JP, et al. Age and gender influence on maximal bite force and masticatory muscles thickness. *Arch Oral Biol*. 2010;55(10):797-802. PMID: 20667521.
8. Hatch JP, Shinkai RS, Sakai S, Rugh JD, Paunovich ED. Determinants of masticatory performance in dentate adults. *Arch Oral Biol*. 2001;46(7):641-8. PMID: 11369319.
9. Navazesh M, Mulligan RA, Kipnis V, Denny PA, Denny PC. Comparison of whole saliva flow rates and mucin concentrations in healthy Caucasian young and aged adults. *J Dent Res*. 1992;71(6):1275-8. PMID: 1613175.
10. Mioche L, Bourdiol P, Peyron MA. Influence of age on mastication: effects on eating behaviour. *Nutr Res Rev*. 2004;17(1):43-54. PMID: 19079914.
11. Smith A, Weber CM, Newton J, Denny M. Developmental and age-related changes in reflexes of the human jaw-closing system. *Electroencephalogr Clin Neurophysiol*. 1991;81(2):118-28. PMID: 1708714.
12. Cichero JAY. Age-related changes to eating and swallowing impact frailty: aspiration, choking risk, modified food texture and autonomy of choice. *Geriatrics (Basel)*. 2018;3(4):69. PMID: 31011104; PMCID: PMC6371116.
13. Rech RS, de Goulart BNG, Dos Santos KW, Marcolino MAZ, Hilgert JB. Frequency and associated factors for swallowing impairment in community-dwelling older persons: a systematic review and meta-analysis. *Aging Clin Exp Res*. 2022;34(12):2945-61. PMID: 36207669.
14. Marik PE, Kaplan D. Aspiration pneumonia and dysphagia in the elderly. *Chest*. 2003;124(1):328-36. PMID: 12853541.
15. Achem SR, Devault KR. Dysphagia in aging. *J Clin Gastroenterol*. 2005;39(5):357-71. PMID: 15815202.
16. Gallegos C, Turcanu M, Assegehegn G, Brito-de la Fuente E. Rheological issues on oropharyngeal dysphagia. *Dysphagia*. 2023;38(2):558-85. PMID: 34216239.
17. Abu-Ghanem S, Chen S, Amin MR. Oropharyngeal dysphagia in the elderly: evaluation and prevalence. *Curr Otorhinolaryngol Rep*. 2020;8:34-42. <https://doi.org/10.1007/s40136-020-00258-x>
18. Adkins C, Takakura W, Spiegel BMR, Lu M, Vera-Llonch M, Williams J, et al. Prevalence and characteristics of dysphagia based on a population-based survey. *Clin Gastroenterol Hepatol*. 2020;18(9):1970-9.e2. PMID: 31669055; PMCID: PMC7180111.
19. Almario CV, Ballal ML, Chey WD, Nordstrom C, Khanna D, Spiegel BMR. Burden of gastrointestinal symptoms in the United States: results of a nationally representative survey of over 71,000 Americans. *Am J Gastroenterol*. 2018;113(11):1701-10. PMID: 30323268; PMCID: PMC6453579.
20. Barczi SR, Sullivan PA, Robbins J. How should dysphagia care of older adults differ? Establishing optimal practice patterns. *Semin Speech Lang*. 2000;21(4):347-61. PMID: 11085258.
21. Bhattacharyya N. The prevalence of dysphagia among adults in the United States. *Otolaryngol Head Neck Surg*. 2014;151(5):765-9. PMID: 25193514.
22. Mehraban-Far S, Alrassi J, Patel R, Ahmad V, Browne N, Lam W, et al. Dysphagia in the elderly population: a Videofluoroscopic study. *Am J Otolaryngol*. 2021;42(2):102854. PMID: 33482586.
23. Aslam M, Vaezi MF. Dysphagia in the elderly. *Gastroenterol Hepatol (N Y)*. 2013;9(12):784-95. PMID: 24772045; PMCID: PMC3999993.
24. Speyer R, Cordier R, Farneti D, Nascimento W, Pilz W, Verin E, et al. White paper by the European society for swallowing disorders: screening and non-instrumental assessment for dysphagia in adults. *Dysphagia*. 2022;37(2):333-49. PMID: 33787994; PMCID: PMC8009935.
25. Leow LP, Huckabee ML, Anderson T, Beckert L. The impact of dysphagia on quality of life in ageing and Parkinson's disease as measured by the swallowing quality of life (SWAL-QOL) questionnaire. *Dysphagia*. 2010;25(3):216-20. PMID: 19680723.
26. Chen AY, Frankowski R, Bishop-Leone J, Hebert T, Leyk S, Lewin J, et al. The development and validation of a dysphagia-specific quality-of-life questionnaire for patients with head and neck cancer: the M. D. Anderson dysphagia inventory. *Arch Otolaryngol Head Neck Surg*. 2001;127(7):870-6. PMID: 11448365.
27. Audag N, Liistro G, Goubau C, Vandervelde L, Poncin W, Toussaint M, et al. Screening for oropharyngeal dysphagia in adult patients with neuromuscular diseases using the Sydney Swallow Questionnaire. *Muscle Nerve*. 2021;64(3):277-84. PMID: 33890683.
28. Belafsky PC, Mouadeb DA, Rees CJ, Pryor JC, Postma GN, Allen J, et al. Validity and reliability of the Eating Assessment Tool (EAT-10). *Ann Otol Rhinol Laryngol*. 2008;117(12):919-24. PMID: 19140539.
29. Schindler A, de Fátima Lago Alvite M, Robles-Rodríguez WG, Barcons N, Clavé P. History and science behind the Eating Assessment Tool-10 (Eat-10): lessons learned. *J Nutr Health Aging*. 2023;27(8):597-606. PMID: 37702330.
30. Florie M, Pilz W, Kremer B, Verhees F, Waltman G, Winkens B, et al. EAT-10 scores and fiberoptic endoscopic evaluation of swallowing in head and neck cancer patients. *Laryngoscope*. 2021;131(1):E45-E51. PMID: 32246779; PMCID: PMC7754346.

31. Demir N, Serel Arslan S, İnal Ö, Karaduman AA. Reliability and validity of the Turkish Eating Assessment Tool (T-EAT-10). *Dysphagia*. 2016;31(5):644-9. PMID: 27405421.
32. Speyer R, Heijnen BJ, Baijens LW, Vrijenhoef FH, Otters EF, Roodenburg N, et al. Quality of life in oncological patients with oropharyngeal dysphagia: validity and reliability of the Dutch version of the MD Anderson Dysphagia Inventory and the Deglutition Handicap Index. *Dysphagia*. 2011;26(4):407-14. PMID: 21279522; PMCID: PMC3224721.
33. Netuveli G, Blane D. Quality of life in older ages. *Br Med Bull*. 2008;85:113-26. PMID: 18281376.
34. Hyde M, Wiggins RD, Higgs P, Blane DB. A measure of quality of life in early old age: the theory, development and properties of a needs satisfaction model (CASP-19). *Aging Ment Health*. 2003;7(3):186-94. PMID: 12775399.
35. Türkoğlu N, Adıbelli D. Yaşlılarda Yaşam Kalitesi Ölçeğinin (CASP-19) Türk toplumuna adaptasyonu [Adaptation of Quality of Life Scale in Older People (CASP-19) to Turkish Society]. *Akad Geriatri*. 2014;6:98-105. [https://toad.halileksi.net/wp-content/uploads/2022/07/yasli-larda-yasam-kalitesi-olcegi-casp-19-toad\\_0.pdf](https://toad.halileksi.net/wp-content/uploads/2022/07/yasli-larda-yasam-kalitesi-olcegi-casp-19-toad_0.pdf)
36. Davis LA. Quality of life issues related to dysphagia. *Topics in Geriatric Rehabilitation*. 2007;23(4):352-65. doi: 10.1097/01.TGR.0000299163.46655.48
37. Arslan SS, Demir N, Karaduman AA. The relationship between patient reported dysphagia symptom severity and swallowing related quality of life in patients with neurological disorders. *Clinical and Experimental Health Sciences*. 2019;9(1):53-6. <https://doi.org/10.33808/marusbed.546658>
38. Bengisu S, Turan Z. Baş boyun kanser cerrahisi uygulanmış hastalarda yutma terapisinin yutma bozukluğu şiddeti ve yaşam kalitesi düzeyine olan etkisinin belirlenmesi [The effects of swallowing therapy on the severity of swallowing disorder and quality of life in patients with head and neck cancer surgery]. *Dil Konuşma ve Yutma Araştırmaları Dergisi*. 2019;2(3):300-14. <https://dergi-park.org.tr/tr/download/article-file/930077>
39. Park YH, Han HR, Oh BM, Lee J, Park JA, Yu SJ, et al. Prevalence and associated factors of dysphagia in nursing home residents. *Geriatri Nurs*. 2013;34(3):212-7. PMID: 23528180.
40. Bayar R, Türkoğlu H. The relationship between living environment and daily life routines of older adults. *ITU AİZ*. 2021;18(1):29-43. <https://doi.org/10.5505/ituja.2021.43410>
41. Kletzien H, Cullins MJ, Connor NP. Age-related alterations in swallowing biomechanics. *Exp Gerontol*. 2019;118:45-50. PMID: 30633957; PMCID: PMC6430567.
42. Chen Y, Li C, Fan Y, Jiao L, Silverman M, Ishimaru M, et al. Associations of oral health status and swallowing function with cognitive impairment in the aging population: a cross-sectional study. *BMC Oral Health*. 2023;23(1):912. PMID: 37993856; PMCID: PMC10666324.
43. Baijens LW, Clavé P, Cras P, Ekberg O, Forster A, Kolb GF, et al. European Society for Swallowing Disorders - European Union Geriatric Medicine Society white paper: oropharyngeal dysphagia as a geriatric syndrome. *Clin Interv Aging*. 2016;11:1403-28. PMID: 27785002; PMCID: PMC5063605.
44. Feng HY, Zhang PP, Wang XW. Presbyphagia: dysphagia in the elderly. *World J Clin Cases*. 2023;11(11):2363-73. PMID: 37123321; PMCID: PMC10131003.
45. Doan TN, Ho WC, Wang LH, Chang FC, Nhu NT, Chou LW. prevalence and methods for assessment of oropharyngeal dysphagia in older adults: a systematic review and meta-analysis. *J Clin Med*. 2022;11(9):2605. PMID: 35566731; PMCID: PMC9104951.
46. United Nations, Department of Economic and Social Affairs, Population Division. *World Population Ageing 2017 (ST/ESA/SER.A/408)*. 2017. [https://www.un.org/en/development/desa/population/publications/pdf/ageing/WPA2017\\_Report.pdf](https://www.un.org/en/development/desa/population/publications/pdf/ageing/WPA2017_Report.pdf)
47. The World Health Organization Quality of Life Assessment (WHOQOL): development and general psychometric properties. *Soc Sci Med*. 1998;46(12):1569-85. PMID: 9672396.
48. World Health Organization. Division of Mental Health and Prevention of Substance Abuse. WHOQOL: measuring quality of life. Geneva: World Health Organization; 1997. <https://iris.who.int/handle/10665/63482>.
49. Kim BR, Hwang HH. Analysis of major factors affecting the quality of life of the elderly in Korea in preparation for a super-aged society. *Int J Environ Res Public Health*. 2022;19(15):9618. PMID: 35954970; PMCID: PMC9367845.
50. Ahmadi M, Kazemi-Arpanahi H, Nopour R, Shanbehzadeh M. Factors influencing quality of life among the elderly: an approach using logistic regression. *J Educ Health Promot*. 2023;12:215. PMID: 37545996; PMCID: PMC10402806.
51. Jones E, Speyer R, Kertscher B, Denman D, Swan K, Cordier R. Health-related quality of life and oropharyngeal dysphagia: a systematic review. *Dysphagia*. 2018;33(2):141-72. PMID: 28866854.
52. de Lima Alvarenga EH, Dall'Oglio GP, Murano EZ, Abrahão M. Continuum theory: presbyphagia to dysphagia? Functional assessment of swallowing in the elderly. *Eur Arch Otorhinolaryngol*. 2018;275(2):443-9. PMID: 29124360.
53. Namasivayam-MacDonald AM, Riquelme LF. Presbyphagia to dysphagia: multiple perspectives and strategies for quality care of older adults. *Semin Speech Lang*. 2019;40(3):227-42. PMID: 31158906.