Protocol for the evaluation of chewing among older adults

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Abstract

Objectives: To evaluate the functional and physiological structures of the stomatognathic system of the oral cavity of older adults based on self-perception, comparing the same with a professional clinical evaluation, and investigating the difficulties encountered when chewing. *Method:* An analytical cross-sectional study with a quantitative approach was conducted with a sample of 53 older adults aged 60 to 90 years. A protocol consisting of three questionnaires was used: a sociodemographic evaluation, a self-perception based interview with 19 questions on the chewing of the older adults and a clinical evaluation containing 30 questions covering aspects of the oral cavity tissue. The self-perception and clinical evaluation scores were compared using the Mann-Whitney test and the proportions observed for each item were compared by the binomial test. *Results:* It was found that the self-perception of older adults did not correspond to the result of the clinical evaluation. While 31 (58.5%) reported satisfaction with chewing, 16 (30.2%) had high/very high impairment and 14(26.4%) moderate impairment, based on the results of the clinical evaluation found. *Conclusion:* It was found that the chewing analysis process cannot be exclusively based on the answers provided by the older adults, and assessment proved to be more accurate when combined with a clinical evaluation performed by a professional.

Keywords: Geriatric Dentistry. Mastication. Self Concept. Stomatognathic System. Oral Health. Brazil.

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INTRODUCTION

Health promotion and the prevention of oral cavity disease should extend, without fail, to old age. In an attitude that differs from those of the past, the proper maintenance of the oral cavity has become a challenge for the older adult population and oral health professionals[1].

Chewing is an important function of the stomatognathic system, as it begins the digestive process. It is aimed at the mechanical degradation of food, reducing it to an appropriate size for swallowing[2]. However, the functionality of the system changes during the human aging process due to often irreversible anatomical, physiological and metabolic transformations[3,4]. This change is also evident in our day-to-day clinical approach when older adults begin to have discomfort when chewing[5,6]. The frequency of dental care and the availability of dental services can affect the number of teeth remaining in the later stages of life[7-9].

The availability of reliable assessment tools to identify the factors that influence dental practices is important for both understanding and designing effective interventions to promote the quality of life of the population[10].

In this context, the present study aimed to analyze the chewing physiology of older adults, based on their self-perception, and to compare this with a professional clinical assessment, as well as investigate the difficulties encountered when eating.

METHOD

The study had a quantitative, exploratory, descriptive, observational nature, involving the voluntary participation of a group of older adults receiving care at the Dentistry Clinic of the School of Dentistry and the Reference Center for the Health Care of Older Adults of the Antônio Pedro University Hospital of the Universidade Federal Fluminense (Fluminense Federal University), Niterói, Rio de Janeiro, Brazil.

The construction of the protocol for the assessment of the chewing of older adults was carried out in three stages: the first involved the construction of the protocol instruments, the second the application of the protocol and the third the analysis of the data of such application.

The protocol can be applied in hospitals, long-term care facilities, outpatient clinics and even during home visits, and requires a professional qualified in dentistry, preferably in dentistry for older adults. Individual, disposable protective material should be used in the clinical assessment (glove, cap, mask, tongue depressor), and there should be no need for a special environment or specific dental equipment.

The implementation process proposed by the protocol followed the sequence of the SB2000[11] examiner's manual, with an application time of 20 minutes for each session. The evaluating professional should obtain the information while avoiding unidirectional, dogmatic and authoritarian communication in decision making[12].

First stage: Construction of the instrument

The protocol designated as the test for the Clinical Assessment of the Chewing of Older Adults (or TAC-MI) is an instrument for the screening of the chewing of older adults, identifying difficulties and deficiencies resulting from the aging process. The protocol has three questionnaires: a) Patient identification; b) Self-Perception of Chewing Scale; c) Clinical Assessment of Chewing Scale.

The first questionnaire aims to obtain data of a sociodemographic nature. The second questionnaire corresponds to information on the chewing of older adults, consisting of a set of 19 items (questions aimed directly at older adults), all with dichotomous answers of equal weight (yes/no) generating a summative scale regarding the perception of the older adults themselves regarding their chewing.

The responses of each item were coded by the values 1 (yes) and 0 (no), indicating, respectively, the positive and the negative aspects of chewing. With the exception of items "A, J, K, L and R", the coded values of all the other items must be reversed. The scores of this scale range from 0 to 19, with the

lowest values indicating the reduction of chewing based on the responses of the older adults.

The third questionnaire consists of a clinical assessment (analysis obtained directly from the oral cavity of older adults) performed by a professional. Consisting of 30 items on a dichotomous scale of equal weight (yes/no), it is structured into six domains of the stomatognathic system: dental, soft tissue, salivation, swallowing, musculoskeletal-articular, and proprioceptive. Like the previous instrument, values 1 and 0 were used to encode the positive and negative responses, respectively. Except for the items "AA, AB, AC, DE, EA, FB, FC and FD", the coded values of all other items should be reversed. This step generates a summative scale, the impact score of which corresponds to the chewing of older adults from a technical perspective. The score on this scale ranges from 0 to 30, with the lowest values indicating the reduction of chewing from a clinical point of view.

In order to encourage the best possible interpretation by the professional practitioner, a symbology was incorporated for each question, where a positive answer was identified by a small green face and a cheerful expression, and a negative answer marked with a red face with a sad expression, next to the other face. No items that assessed chewing strength and its cycles were included, as the strategy adopted was aimed to the conditions of the included structures.

After applying the questionnaires, the subjective classification of the degree of chewing impairment of the older adults continues using a five-point Likert[13] scale ranging from 1 to 5 points, from the most impaired to the least impaired. At the end of the assessment, the individual is referred to an appropriate specialist, and the reasoning behind this decision is explained. The test can only be accessed through the link "<www.issuu.com/luizfelipeferreiradesouza>".

Second stage: Application of protocol

The TAC-MI methodology was applied in two phases: a Pilot Study and an Execution Phase.

When selecting patients for the application of TAC-MI, in both phases, the following criteria were considered: age from 60 to 90 years; literate; of both sexes; independent in basic activities of daily living (assessed by the Katz index)[14], independent in feeding oneself; having the cognitive ability to understand and answer the questions (verified based on the result of the Mini Mental State Exam[15] available in the patient's medical record). Older adults who had walking difficulties and used drugs that altered their cognitive state were excluded. Also excluded were those who had serious problems with chewing, such as: recent surgery or trauma; trismus of the jaw; birth defects; pain and/or discomfort that prevented the application of the test.

The Pilot Study was carried out in the premises of the Dentistry Clinic of the School of Dentistry of the Universidade Federal Fluminense. This phase was intended to adjust the instruments of the TAC-MI, and involved four professional dental surgeons and four older adult users of the clinical services. All professionals were trained and calibrated in the standard TAC-MI application procedure.

The adjustment of the protocol questionnaires, Self-Perception of Chewing Scale (chewing from the perspective of older adults) and the Clinical Assessment of Chewing Scale (chewing of older adults from a professional perspective) was performed based on agreement between the four dental students for each older adult, resulting in 16 applications.

Within the agreement criteria, it was established that if the average proportion of concordant evaluations per patient in each item was equal to or greater than 75%, the item would be accepted without change; proportions below this percentage should undergo revision of the item before it is accepted as an integral part of the scale.

The Execution Phase was performed by the relevant researcher in the Reference Center for the Health Care of Older adults, located in the University Hospital of the educational institution. The target population consisted of 84 older adults, according to the Reference Center records, who were invited to participate in the study. Participation was voluntary and generated a sample of 53 older adults who met

the inclusion criteria. There was no exclusion of volunteers who joined the project. Execution from the projects was methodologically limited, due to restrictions on the times when respondents were available in the health institutions.

Third stage: Data analysis

The collected data were obtained from October 2015 to March 2016 and stored on data sheets. The TAC-MI scale scores were statistically described as mean and standard deviation.

Comparisons of scores between the male and female sex variable were performed using the Mann-Whitney test. The relationship between the TAC-MI questionnaire scores was evaluated using the Spearman correlation coefficient (rs) and the internal consistency of these questionnaires was assessed by the Cronbach's alpha coefficient. Statistical decisions made in the hypothesis tests used a significance level of 5% (0.05).

The study was approved by the Research Ethics Committee of the Antônio Pedro University Hospital under Opinion No. 1,184,545 dated July 17, 2015. All ethical and legal aspects contained in the Declaration of Helsinki, Resolution No. 466/2012 of the National Health Council and Federal Council of Dentistry (CFO) Resolution No. 118/2012 were complied with. All the volunteer participants were informed in accessible language about the proposed study and signed a Free and Informed Consent Form.

RESULTS

The adequacy of the methodology was confirmed in the Pilot Study, where a level of agreement greater than or equal to 0.75% was found among all the data extracted and collected for all the items applied by the health professionals, without the need for adjustment.

The findings in the Execution Phase, in relation to sociodemographic profile, revealed a majority of women and retirees, with a low/medium level of education (Table 1).

Table 1. Sociodemographic profile of sample (N=53). Niterói, Rio de Janeiro, 2016.

Variables	n (%)
Age (mean and standard deviation)	73.8 (±6.6)
Sex	
Male	14 (26.4)
Female	39 (73.6)
Skin color/ethnicity	
White	28 (52.8)
Black	25 (47.2)
Schooling (years)	
<5	20 (37.7)
1-5	9 (17.0)
5-8	16 (30.2)
>8	8 (15.1)
Occupation	
Retired	37 (69.8)
Homekeeper	16 (30.2)
Marital status	
Single	7 (13.2)
Married	27 (51.0)
Divorced	5 (9.4)
Widowed	14 (26.4)

Of the responses collected from the Self-Perception Scale questionnaire, the majority said they were satisfied and did not experience difficulties, discomfort or insecurity when chewing. There were also high scores for the habit of breaking up foods, a preference for liquid and paste-based foods, and not suffering tiredness when or difficulties swallowing when chewing. The low frequency of dental appointments and the almost complete presence of prolonged medical treatment were also noteworthy (Table 2).

The scores produced, observing the coding reversals of the items, ranged from 5 to 19 points in the sample, with a mean of 13.8 (±3.4) and a median of 14 points. The distribution of scores did not include any scores indicating an atypical situation. There was no statistically significant difference in the scores between men and women, whose median values were 14 and 13.5 points, respectively (Mann-Whitney test U =236.5; *p*-value=0.459). The correlation between age and self-perception score was irrelevant (r_s=0.115) and not statistically significant (*p*-value=0.410). The Cronbach's alpha coefficient observed was 0.79, indicating good instrument reliability.

In the Clinical Assessment of Chewing Scale questionnaire, most individuals had a high percentage of tooth decay, maladjusted dentures, malocclusions, tooth wear, few teeth in their mouths, and soft tissue sagging. Percentage equality was observed in terms of the presence of choking, coughing and throat clearing when swallowing (Table 3).

Table 2. Percentages of responses by older adults in the Self-Perception of Chewing Scale (N= 53). Niterói, Rio de Janeiro, 2016.

Items	Description	n (%)*		*p*-value
		Yes	No	
A	Satisfaction with chewing	31 (58.5)	22 (41.5)	0.169
B	Difficulty chewing food	24 (45.3)	29 (54.7)	0.583
C	Preference for chewing liquid and paste-based foods	17 (32.1)	36 (67.9)	0.013**
D	Discomfort or insecurity when feeding	22 (41.5)	31 (58.5)	0.271
E	Difficulty swallowing food	19 (35.8)	34 (64.2)	0.053
F	Food escapes from mouth during chewing	8 (15.1)	45 (84.9)	<0.001**
G	Pain or burning during chewing	7 (13.2)	46 (86.8)	<0.001**
H	Heartburn after swallowing food	12 (22.6)	41 (77.4)	<0.001**
I	Previous occurrence of oral trauma	3 (5.7)	50 (94.3)	<0.001**
J	Perception of food taste	51 (96.2)	2 (3.8)	<0.001**
K	Food temperature recognition	53 (100)	0 (0)	<0.001**
L	Oral hygiene performed by individual	53 (100)	0 (0)	<0.001**
M	Habit of breaking food with hands	13 (24.5)	40 (75.5)	<0.001**
N	Feeling tired when chewing food	8 (15.1)	45 (84.9)	<0.001**
O	Currently undergoing prolonged medical treatment	49 (92.5)	4 (7.5)	<0.001**
P	Food remains in the mouth after eating	17 (32.1)	36 (67.9)	0.005**
Q	Bite tongue or cheek when chewing	18 (34.0)	35 (66.0)	<0.001**
R	Recent dentist appointment	19 (35.8)	34 (64.2)	0.053
S	Occurrence of food comes out of nose when swallowing	1 (1.9)	52 (98.1)	<0.001**

*Base percentage: older adults aged between 60 and 90 years; **p<0.05 (binomial test).

Table 3. Percentage of responses in the implementation of the Clinical Assessment of Chewing Scale (N= 53). Niterói, Rio de Janeiro, 2016.

Domains	Items	Description	n (%)*		*p*-value
			Yes	No	
Dental	AA	Presence of 20 natural/implanted intact and functional teeth in the mouth	16 (30.2)	37 (69.8)	0.013**
	AB	Use of well-fitted dentures in edentulous areas	15 (28.3)	38 (71.7)	0.002**
	AC	Occlusal aspect functioning harmoniously	22 (41.5)	31 (58.5)	0.272
	AD	Presence of impairing tooth-wear	10 (18.9)	43 (81.1)	<0.001**
	AE	Presence of tooth mobility	5 (9.4)	48 (90.6)	<0.001**
	AF	High level of impairment due to dental caries	12 (22.6)	41 (77.4)	<0.001**
Soft Tissues	BA	Presence of lesions in the buccal region	4 (7.5)	49 (92.5)	<0.001**
	BB	Presence of intraoral or extraoral area of edema	2 (3.8)	51 (96.2)	<0.001**
	BC	Presence of intraoral or extraoral bleeding	4 (7.5)	49 (92.5)	<0.001**
	BD	Presence of cut, perforated and/or torn tissue	0 (0)	53 (100)	<0.001**
	BE	Altered tissue color	3 (5.7)	50 (94.3)	<0.001**
Saliva	CA	Presence of dry mouth tissue	7 (13.2)	46 (86.8)	<0.001**
	CB	Habit of swallowing and/or spitting saliva	3 (5.7)	50 (94.3)	<0.001**
	CC	Highly viscous-looking saliva	5 (9.4)	48 (90.6)	<0.001**
	CD	Presence of large amount of tartar	17 (32.1)	36 (67.9)	0.013**
	EC	Presence of generalized mouth ulcers	8 (15.1)	45 (84.9)	<0.001**
Swallowing	DA	Presence of choking. coughing and throat clearing when swallowing	24 (45.3)	29 (54.7)	0.583
	DB	Presence of generalized irritation in posterior tissues of oral cavity	6 (11.3)	47 (88.7)	<0.001**
	DC	Presence of halitosis while talking	17 (32.1)	36 (67.9)	0.013**
	DD	Frequent mouth breathing habit	13 (24.5)	40 (75.5)	<0.001**
	DE	Sealed lips when swallowing, blowing or sucking	40 (75.5)	13 (24.5)	<0.001**
Muscle/ Skeletal/ Articular	EA	Coordinated performance of jaw movements while chewing or speaking	51 (96.2)	2 (3.8)	<0.001**
	EB	Presence of crackling, looseness or clicking in the TMJ region	19 (35.8)	34 (64.2)	0.053
	EC	Some difficulty speaking	10 (18.9)	43 (81.1)	<0.001**
	ED	Soft tissue sagging in mouth	36 (67.9)	17 (32.1)	0.013**
	EE	Absence of muscle tone in the face	42 (79.2)	11 (20.8)	<0.001**
Proprioceptive	FA	Presence of pain or burning on chewing	11 (20.8)	42 (79.2)	<0.001**
	FB	Presence of sensitivity in act of tactioceptive, stretching and flexor reflex	53 (100)	0 (0)	<0.001**
	FC	Presence of sensitivity when perceiving salty, sweet, bitter and acidic foods	52 (98.1)	1(1.9)	<0.001**
	FD	Presence of sensitivity to perception of hot and cold foods	53 (100)	0 (0)	<0.001**

*Base percentage: older adults aged between 60 and 90 years; **p<0.05 (teste binomial).

The scores produced, observing the coding reversals of the items, varied in the sample from 16 to 27 points with a mean of 21.8 (±3.2) and a median of 22 points. The distribution of scores did not include any scores indicating an atypical situation. There was no statistically significant difference in the scores between men and women, whose median values were 22 points in both groups (Mann-Whitney test U=265; *p*-value=0.438). The correlation between age and clinical assessment score was irrelevant (r_s=0.119) and without statistical significance (*p*-value=0.397). The Cronbach's alpha coefficient observed was 0.63. Based on the Spearman coefficient, the results of both scales showed a strong correlation (*p*<0.001).

Having constructed the previously defined categories of analysis, the test perceptions were transformed into quantitative indicators, allowing the final perception of the status of the oral cavity of the older adults in relation to chewing. Table 4 shows the distribution of the results of the clinical analysis regarding the level of chewing impairment of the evaluated older adults.

After the application of the TAC-MI and considering the degree of impairment found, a referral flow was established for each patient (Figure 1).

Table 4. Percentage of distribution of degree of chewing impairment (N=53). Niterói, Rio de Janeiro, 2016.

Degree of impairment	n (%)*
Very severe	6 (11.3)
Severe	10 (18.9)
Moderate	14 (26.4)
Mild	12 (22.6)
Very mild	11 (20.8)

*Base percentage: older adults aged between 60 and 90 years.

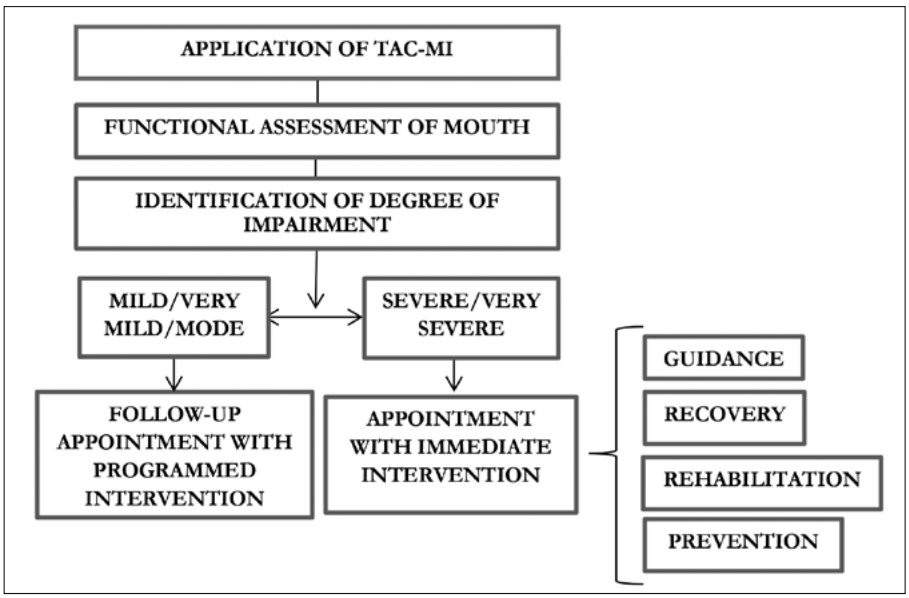

Figure 1. Flowchart of process of assessment of chewing of older adults. Niterói, Rio de Janeiro, 2016.

DISCUSSION

Considering the difficulties, impacts and corresponding complaints reported by older patients in our daily clinical care, the aim of the present study was to assess the dissatisfaction of these patients with the proper chewing of food[2].

There was a predominance of women over men, a reflection of the permanent care women take of their health throughout life[16]. No discrepancies were found between the categories of ethnicity observed, however.

During the application of the Self-Perception of Chewing Scale, most respondents said they were satisfied with their chewing, with no preference expressed for chewing liquid or paste-based foods, and no reports of discomfort or insecurity when eating, as identified in items "A, C and D" respectively. However, when applying the Clinical Assessment of Chewing Scale, some disorders were observed, such as ill-fitting dentures, malocclusion and the lack of the minimal number of teeth required to perform proper chewing, according to items "AB, AC and AA", respectively.

The high rate of edentulism stems from the fact that, for many years, the poor oral conditions of this population group were considered a normal part of advancing age[17], something which is exacerbated over the age of 70[18]. A lack of teeth is not perceived by most as a detrimental factor for their ability to chew, with such non-perception caused by the adaptation of diet and the incorrect use of dentures, even though this condition does not allow satisfactory chewing[19].

It is often observed that the need for denture replacement only occurs due to the presence of a soft tissue injury or improper application caused by prolonged excessive use[20]. It is possible that Brazilian edentates do not have satisfactory information about the need for regular dentist consultations to evaluate and maintain their dentures[21,22].

In keeping with the findings in this study, some authors also noted the predominance of edentulism and the need for the replacement of dentures, denoting the precarious condition of the interviewed older adults, although they reported an excellent or good perception of their oral health[23,24].

Although most older adults assessed the condition of their teeth, gums and dentures as good or excellent, it was concluded that self-perception had little influence on clinical conditions, probably because acute pain is their main reference point regarding deterioration, and correlates with a favorable or non-favorable view of their chewing. This fact is easily considered a natural process of adaptation during the course of life, when restricting food choices and using inappropriate eating habits[25,26].

Another correlation observed was that most respondents did not experience difficulties in swallowing food when eating, according to item "E" of the Self-Perception of Chewing Scale. However, items "ED" and "DA" of the Clinical Assessment of Chewing Scale identified a significant percentage of respondents who experienced soft tissue sagging in the mouth and choking, coughing and clearing of the throat when swallowing.

Based on the results of the TAC–MI, it was observed that 30.2% of the sample had a very severe and severe degree of impairment when chewing. However, over time, if those with a moderate degree of impairment do not undergo dental intervention, a new, impaired, clinical situation may affect approximately 56.6% of the older adults investigated. This possibility is observed when a large number of people confirm that they have not recently sought dental treatment, more often seeking medical services to treat existing chronic diseases, as was the case in items "R" and "O" of the Self Perception Scale.

Although the increase in life expectancy of the older adult population is an important indicator of improved quality of life, the aging process is linked to physiological and structural losses, which culminate in the decline of the functional capacity and dependence of such individuals[27]. This fact becomes more worrisome when they disassociate themselves from oral healthcare, turning instead to medical services while rarely seeking dental care[28].

According to the results of instruments used and validated in other countries for assessing oral health,

questions only relate to the functional, psychological, social, pain and limitation of quality of life aspects, and are answered only through the self-perception of older adults, something which may not portray the reality of the clinical findings regarding chewing. This can include the Social Impacts of Dental Disease (SIDD); Geriatric Oral Health Assessment Index (GOHAI); Dental Impact on Daily Living (DIDL); Oral Impacts on Daily Performances (OIDP); Oral Health Impact Profile (OHIP); Oral Health-related Quality of Life (OHRQoL).

There is also a limitation on the applicability of these indices, as they sometimes only partially evaluate the tissue structures of the mouth, or the patient's subjective feelings regarding quality of life, resulting in an important gap regarding the real difficulties and conditions of chewing food and having a proper diet. Another aspect observed is the socioeconomic and cultural differences among older adults, as they have difficulties in interpreting some of the questions in these indices[29], due to inadequate technical knowledge on the subject[30].

It is important to identify the reality of the oral health of older adults, the instruments used for such assessment, and the dental factors that can directly interfere with the chewing of this population[31].

Based on existing studies that use self-perception to assess the oral health and quality of life of older adults, the findings of the present study contradict the results obtained through the assessment of the stomatognathic system[32]. Future studies should follow the clinical condition of these patients[33], since there is still a lack of effective standardization regarding the most appropriate method of understanding these characteristics[34]. The FDI World Dental Federation[35] defines oral health as multifaceted, providing various capabilities to be evaluated and compared as a group and developing a solid foundation of standard measurements.

The TAC-MI not only provides questions aimed at various aspects of self-perception, but also a structure focused on a clinical assessment performed by a professional, allowing the reality of the oral cavity to be compared and verified, and not limiting it to the patient's opinion.

When designing the test application, the emergence of several impacting changes that had gone unnoticed by older adults was identified. These are characterized as a normal part of the losses that accumulate during life, showing that the dental care service was either non-existent or had failed.

There is an evident need to use geriatric assessment tools as early auxiliary means of allowing specific screening, better decision making regarding care and arrangements linked to future planning, as well as the possibility of minimizing or eliminating the difficulties presented.

It is therefore hoped that the results of the present study represent a valid and strategic support indicator for maintaining the chewing of older adults, guiding evidence-based clinical actions.

CONCLUSION

It is important to focus on the dental care of older adults, considering their increased life expectancy and the possible problems common to aging that may affect them, making chewing a good indicator for a successful and healthy aging.

Regarding the divergences in the information provided, it was found that a professional cannot conclude the chewing analysis process by relying exclusively on the answers provided by the older adults themselves, based on their self-perception, as this may result in the provision of inaccurate information.

Therefore, the need for a gerontological perspective aimed at the chewing of older patients is emphasized, as is the need for a professional support that ensures such patients are received by the health care service and that promotion, prevention and protection of their oral health is performed, avoiding risk situations and vulnerability to the frailty that may develop in the future.

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REFERENCES

1. Bulgarelli AF, Mestriner SF, Pinto IC. Percepções de um grupo de idosos frente ao fato de não consultarem regularmente o cirurgião-dentista. Rev Bras Geriatr Gerontol. 2012;15(1):97-107.
2. de Oliveira BS, Delgado SE, Brescovici SM. Alterações das funções de mastigação e deglutição no processo de alimentação de idosos institucionalizados. Rev Bras Geriatr Gerontol. 2014;17(3):575-87.
3. Dantas EHM, Santos CAS. Aspectos biopsicossociais do envelhecimento e a prevenção de quedas na terceira idade. Joaçaba: Unoesc; 2017.
4. Feijó AV, Rieder CRM. Distúrbios da deglutição em idosos. In: Jacobi JS, Levy DS, Silva LMC. Disfagia: avaliação e tratamento. Rio de Janeiro: Revinter; 2004. p. 225-32.
5. Santiago LM, Graça CML, Rodrigues MCO, dos Santos GB. Caracterização da saúde de idosos numa perspectiva fonoaudiológica. Rev CEFAC. 2016;18(5):1088-96.
6. Jales MA, Cabral RR, Silva HJ, Cunha DA. Características do sistema estomatognático em idosos: diferença entre instituição pública e privada. Rev CEFAC. 2005;7(2):178-87.
7. Chae S, Lee Y, Kim J, Chun KH, Lee JK. Factors associated with perceived unmet dental care needs of older adults. Geriatr Gerontol Int. 2017;17(11):1936-42.
8. Hamano T, Takeda M, Tominaga K, Sundquist K, Nabika T. Is accessibility to dental care facilities in rural areas associated with number of teeth in elderly residents? Int J Environ Res Public Health. 2017;14(3):1-6.
9. Lutfiyya MN, Gross AJ, Soffe B, Lipsky MS. Dental care utilization: examining the associations between health services deficits and not having a dental visit in past 12 months. BMC Public Health. 2019;19(1):1-13.
10. Moysés SJ, Goes PSA, Organizadores. Planejamento, gestão e avaliação em saúde bucal. São Paulo: Artes Médicas; 2012.
11. Brasil. Ministério da Saúde, Secretaria de Atenção à Saúde, Secretaria de Vigilância em Saúde. SB Brasil 2010: Pesquisa Nacional de Saúde Bucal: resultados principais. Brasília, DF: MS; 2012.
12. Serviço Social do Comércio, Departamento Nacional. Manual técnico de educação em saúde bucal [Internet]. Rio de Janeiro: SESC; 2007 [acesso em 22 out. 2016]. Disponível em: https://pt.scribd.com/doc/ 315186267/Manual-Tecnico-de-Educacao-em-Saude-Bucal
13. Likert R. A technique for the measurement of attitudes. Arch Psychol. 1932;22(140):5-55.
14. Katz S, Ford AB, Moskowitz RW, Jackson BA, Jaffe MW. Studies of Illness in the Aged: the Index of ADL: a Standardized Measure of Biological and Psychosocial Function. JAMA. 1963;185(12):914-9.
15. Folstein MF, Folstein SE, McHugh PR. "Mini-mental state": a practical method for grading the cognitive state of patients for the clinician. J Psychiatr Res. 1975;12(3):189-98.
16. Choi SH, Kim BI, Cha JY, Hwang CJ. Impact of malocclusion and common oral diseases on oral health-related quality of life in young adults. Am J Orthod Dentofacial Orthop. 2015;147(5):587-95.
17. Pucca JP, Alredo G. Saúde bucal do idoso: aspectos sociais e preventivos. In: Netto MP. Gerontologia: a velhice e o envelhecimento em visão globalizada. São Paulo: Atheneu; 2002. p. 297-310.
18. León S, Bravo-Cavicchioli D, Giacaman RA, Correa-Beltrán G, Albala C. Valiation of the Spanish version of the oral health impact profile to assess an association between quality of life and oral health of elderly Chileans. Gerodontology. 2016;33:97-105.
19. Rosendo RA, Sousa JNL, Abrantes JGS, Cavalcante ABP, Ferreira AKTF. Autopercepção de saúde bucal e seu impacto na qualidade de vida em idosos: uma revisão de literatura. Rev Saúde Ciênc. 2017;6(1): 89-102.
20. Petry J, Lopes AC, Cassol K. Autopercepção de condições alimentares de idosos usuários de prótese dentária. CoDAS. 2019;31(3):1-9.
21. Silva DA, Freitas YNL, Oliveira TC, Silva RL, Pegado CPC, Lima KC. Condições de saúde bucal e atividades da vida diária em uma população de idosos no Brasil. Rev Bras Geriatr Gerontol. 2016;19(6):917-29.
22. Kreve S, Anzolin D. Impacto da saúde bucal na qualidade de vida do idoso. Rev Kairós Gerontol. 2016;19(22):45-59.
23. Nogueira CMR, Falcão LMN, Nuto SAS, Saintrain MVL, Veira-Meyer APGF. Autopercepção de saúde bucal em idosos: estudo de base domiciliar. Rev Bras Geriatr Gerontol. 2017;20(1):7-19.
24. Ribeiro MGA, Sant'ana LLP, Souza LTR, Prado JP. Uso de prótese e autopercepção de saúde bucal entre idosos. ID Online. 2018;12(42):1203-14.
25. Melo LA, Sousa MM, Medeiros AKB, Carreiro AFP, Lima KC. Fatores associados à autopercepção negativa da saúde bucal em idosos institucionalizados. Ciênc Saúde Colet. 2016;21(11): 3339-46.

26. Medeiros SL, Pontes MPB, Magalhães Jr HV. Autopercepção da capacidade mastigatória em indivíduos idosos. Rev Bras Geriatr Gerontol. 2014;17(4):807-17.

27. Matsudo SMM, Matsudo VKR, Araújo TL. Perfil do nível de atividade física e capacidade funcional de mulheres maiores de 50 anos de idade de acordo com a idade cronológica. Rev Bras Ativ Fis Saúde. 2001;6(1):12-24.

28. Bulgareli JV, Faria ET, Cortellazzi KL, Guerra LM, Meneghim MC, Ambrosano GMB, et al. Fatores que influenciam o impacto da saúde bucal nas atividades diárias de adolescentes, adultos e idosos. Rev Saúde Pública. 2018;52(44):1-9.

29. Bianco VC, Lopes ES, Borgato MH, Silva PM, Marta SN. O impacto das condições bucais na qualidade de vida de pessoas com cinquenta ou mais anos de vida. Ciênc Saúde Colet. 2010;15(4):2165-72.

30. Brasil. Centro Internacional de Longevidade. Envelhecimento ativo: um marco político em resposta à revolução da longevidade. Rio de Janeiro: ILC Brasil; 2015.

31. Milagres CS. Autopercepção de saúde bucal em idosos: uma revisão sistemática [Monografia]. Piracicaba: Universidade Estadual de Campinas, Faculdade de Odontologia de Piracicaba; 2015.

32. Mesas AE, Trelha CS, Azevedo MJ. Saúde bucal de idosos restritos ao domicílio: estudo descritivo de uma demanda interdisciplinar. Physis. 2008;189(1):61-75.

33. Burci LM, Miguel YD, Miguel OG, Souza AW, Dias JFG, Miguel MD. Prevalence of oral impacts on daily performances (OIDP) of elderly people in Curitiba-PR. Braz Dent Sci. 2016;19(4):63-71.

34. Silva DNM, Becker HMG, Couto EAB. Uma revisão integrativa dos aspectos da mastigação em idosos. Rev Kairós Gerontol. 2015;18(3):193-211.

35. Glick M, Williams DM, Kleinman DV, Vujicic M, Watt RG, Weyant RJ. A new definition for oral health developed by the FDI World Dental Federation opens the door to a universal definition of oral health. Int Dent J. 2016;66:322-4.