Functional literacy and the assessment process as a diagnostic instrument for temporomandibular disorders: observational study

Alfabetismo funcional e o processo de avaliação como instrumento diagnóstico das disfunções temporomandibulares: estudo observacional

Adriana Hernandes Pinheiro[1], Luciane Lacerda Franco Rocha Rodrigues[1], Thiago Bezerra Leite[2], António Sérgio Guimarães[3]

ABSTRACT

BACKGROUND AND OBJECTIVES: Health literacy is a topic that has been gaining traction in recent years, both on the policy and research agendas of many countries, however there is no evidence about temporomandibular disorders (TMD) and this topic. The objective was to evaluate the association between the level of functional literacy and the understanding of the Diagnostic Criteria for Temporomandibular Disorders (DC/TMD) through self-report and to associate the time of TMD complaint with the levels of functional literacy.

METHODS: This is an observational, cross-sectional study, comprising 56 patients from the Temporomandibular Disorders (TMD) clinic at São Leopoldo Mandic College. The DC/TMD questionnaire – axis I, a sociodemographic questionnaire, and tests of the *Indicador de Alfabetismo Funcional* (Functional Literacy Indicator - INAF) were applied.

RESULTS: The outcomes showed that 85.7% of the sample were females and 14.3% males, mainly white (60.7%), with a schooling degree, predominantly from the 3rd grade of high school and professionally active. It was found that 22.5% of the sample were functionally illiterate and 77.5% were functionally literate, 30.6% of whom had elementary level schooling. There was a significant association between the schooling level and combined INAF (p=0.005), as well as between combined INAF and duration of complaint in intervals for jaw pain (p=0.037) when Chi-square tests were used. There is evidence to establish that the mean duration of headache complaints (in months) between literacy groups are different (p=0.001) when using the Student´s t-test. With these results, it is possible to suggest that lower levels of functional literacy are related to a poorly detailed perception of TMD complaints regarding the duration of the complaint and, mainly, to the association of headache with a complaint of TMD.

CONCLUSION: Lower levels of functional literacy are related to a poorly detailed perception of TMD complaints regarding the duration of the complaint and, mainly, to the association of headache with a complaint of temporomandibular disorders.

Keywords: Diagnostic, Literacy, Temporomandibular dysfunction.

Adriana Hernandes Pinheiro – https://orcid.org/0009-0002-8552-3590;
Luciane Lacerda Franco Rocha Rodrigues – https://orcid.org/0000-0001-5913-0713;
Thiago Bezerra Leite – https://orcid.org/0000-0002-1915-1410;
António Sérgio Guimarães – https://orcid.org/0000-0003-1756-8957.

1. São Leopoldo Mandic College of Dentistry, Orofacial Pain Laboratory, Campinas, SP, Brazil.
2. Dr. Leão Sampaio University Center, Department of Occlusion and Orofacial Pain, Juazeiro do Norte, CE, Brazil.
3. Laboratory of Neuroimmune Interface of Pain Research, São Leopoldo Mandic College of Dentistry, Campinas, SP, Brazil.

HIGHLIGHTS
• Lower levels of functional literacy are related to a poorly detailed perception of TMD complaints regarding the duration of the complaint
• Lower levels of functional literacy are related to less association of headache with a complaint of temporomandibular disorders.
• The lower the ability to detail the symptoms, the more chances of misdiagnosis may occur.

RESUMO

JUSTIFICATIVA E OBJETIVOS: O letramento em saúde é um tema que vem ganhando força nos últimos anos, tanto nas agendas políticas como de investigação de muitos países, no entanto não existem evidências sobre as disfunções temporomandibulares e este tema. O objetivo foi avaliar a associação entre o nível de alfabetismo funcional e a compreensão dos Critérios Diagnósticos para Disfunção Temporomandibular (DC/DTM) por meio do autorrelato e associar o tempo de queixa de DTM com os níveis de letramento funcional.

MÉTODOS: Trata-se de um estudo observacional, transversal, realizado com 56 pacientes do ambulatório de Disfunções Temporomandibulares (DTM) da Faculdade São Leopoldo Mandic. Para isso foram aplicados o questionário DC/DTM – eixo I, questionário sociodemográfico e testes do Indicador de Alfabetismo Funcional (INAF).

RESULTADOS: Mostraram que 85,7% da amostra era do sexo feminino e 14,3% do sexo masculino, predominantemente brancos (60,7%), com escolaridade superior, predominantemente do 3º ano do ensino médio e profissionalmente ativos (57,1%).

Verificou-se que 22,5% da amostra eram analfabetos funcionais e 77,5% eram alfabetizados funcionalmente, sendo que 30,6% possuíam nível fundamental. Houve associação significativa entre escolaridade e INAF combinado (p=0,005), bem como entre INAF combinado e tempo de queixa nos intervalos de dor mandibular (p=0,037) quando foram utilizados testes Qui-quadrado. Há evidências que estabelecem que a duração média das queixas de cefaleia (em meses) entre os grupos de alfabetismo é diferente (p=0,001) quando utilizado o teste *t* de Student. Com base nesses resultados, é possível sugerir que níveis mais baixos de alfabetismo funcional estariam relacionados a uma percepção pouco detalhada das queixas de DTM quanto à duração da queixa e à associação de cefaleia com queixa de DTM.

CONCLUSÃO: Níveis mais baixos de alfabetismo funcional foram relacionados à percepção pouco detalhada das queixas de DTM quanto à duração e, principalmente, à associação de cefaleia com queixa de disfunção temporomandibular.

Descritores: Alfabetismo, Diagnóstico, Disfunção temporomandibular.

INTRODUCTION

Communication is an indispensable tool in the context of health care, and the written form is widely used in these activities. As is well known, the act of reading and writing does not only involve the decoding capacity that is obtained through the literacy process, it is also an important action for social integration and it is necessary to contextualize them to everyday practices and the information obtained through these activities[1]. Thus, the term functional literacy is used for the individual's ability to use reading, writing, and numeracy to face social demands in everyday, domestic or work contexts[2].

There is a growing concern about Health Literacy, which implies the ability to obtain, process, and understand written, spoken, or digital information in basic health services, necessary to make pertinent decisions about one's own health, medical care, and their impact on different clinical outcomes[3-5]. Therefore, the patient needs to effectively present functional competence to use and interpret texts, documents, and numbers. Health literacy is a topic that has been gaining traction in recent years, both on the policy and research agendas of many countries[6].

Health professionals cannot assume that all patients can read, but direct inquiry about their reading level may not be effective, as illiteracy often causes shame and embarrassment[7]. Although not specific to health, the surveys of the *Indicador de Alfabetismo Funcional* (Functional Literacy Indicator – INAF)[8], the only instrument that assesses general literacy in Brazil, reveal worrying numbers. Among Brazilians aged 15 to 64 years, 3 out of 10 people have literacy below elementary, that is, they are considered functionally illiterate. Besides, 8% of these individuals can be considered completely illiterate in terms of reading/writing skills, not even being able to decode words and phrases. Most (34%) of the respondents reach, at most, the elementary level of literacy[9].

In this sense, the studies related to temporomandibular disorders (TMD) are growing[10,11]. TMD consists of a set of alterations related to the temporomandibular joint, masticatory muscles, associated structures, or even a combination of them[12], being the most common cause of chronic orofacial pain of non-odontogenic origin seen by dentists[13]. Thus, it is considered a public health problem affecting 5% to 12% of the world population[14]. In this context, there is little literature that associates the levels of functional literacy with the self-report of questionnaires used in diagnostic and research criteria on TMDs. Thus, the objective was to evaluate the relationship between sociodemographic data and duration of TMD complaints with the level of literacy.

METHODS

This is an observational, quantitative and cross-sectional study. The project was approved under opinion number 4,983,524 in the research ethics committee. To participate in the research, participants read and signed the Free and Informed Consent Term (FICT).

The sample consisted of 56 patients of both genders, aged between 15 and 64 years, from the São Leopoldo College TMD/Orofacial Pain Clinic, calculated from the sample universe (Population) that corresponds to patients from the dysfunction clinic. The individuals answered the Diagnostic Criteria for Temporomandibular Disorders (DC/TMD) and INAF.

Data collection

The study consisted of the application of the new DC/TMD – axis I, sociodemographic questionnaire (gender, age, ethnicity, professional activity, and schooling level) and INAF tests, all used in partnership with the non-governmental organization (NGO) educational action.

The questionnaire and the tests were applied in the waiting room of the dental clinic while the subjects were waiting for care, on pre-established days. The new diagnostic criteria for TMD (DC/TMD – axis I) uses, as patient reporting parameters, pain modifying factors, i.e., improvement or worsening of pain with mandibular movements or parafunction in the mandibular muscle (masseter), in the head (temporal) region, inside the ear and preauricular region in the last 30 days and, for joint alterations, disc displacement with reduction (DDWR) and degenerative joint diseases, the report of any joint noise (clicking or crackling) during the 30 days prior to the examination caused by mandibular movements, as well as a history of locking the mouth open or closed in the same period[14]. Thus, it was possible to classify TMD as muscular, articular or both. Although the clinical examination is part of the axis I diagnosis protocol, it was not included in the study, which focused on the assessment of reading comprehension and contextualization with the main complaint of the participants.

To survey the levels of functional literacy and proficiency, the INAF was used, conceived in 2001 in a group effort between the Paulo Montenegro Institute (1) and the *Ação Educacional* NGO (2) to classify the degree of functional literacy in Brazil. This instrument employs an evaluation process with tests and questionnaires, in a total of 32 items, which involve the reading and interpretation of everyday texts (tickets, news, instructions, narrative texts, graphs, tables, maps, advertisements, etc.), in addition to a contextual questionnaire

that addresses sociodemographic characteristics and reading, writing and calculation practices that the subjects perform in their daily lives.

The 32-item questionnaire was initially applied to 40 patients, when it was noticed that many individuals were refusing to answer the test or abandoning it, claiming it was too long. At this point, it was decided to reduce the questionnaire to 23 items, making it more attractive to patients. This reduction was supported by the statistical test used to establish the levels of functional literacy and proficiency, which is the Item Response Theory (IRT), whose strong point is the possibility of formulating different tests that, when compared to each other, generate the same information. Currently, INAF classifies functional literacy into five levels: illiterate, rudimentary, elementary, intermediate and proficient[8].

To establish the proficiency determined according to the INAF criterion, the IRT statistical test was used as a statistical technique that proposes theoretical models that represent the behavior of the answers attributed to each of the questions as a function of the individual's ability. In other words, each test question has its degree of difficulty defined a priori and the score (proficiency) of each respondent varies according to the degree of difficulty of the questions they were able to answer correctly[15]. In addition, the range on the proficiency scale is between zero and 200 points[8] as shown in table 1.

Statistical analysis

Data tabulation and analysis were performed using the free software R 4.0.3 (R Core Team, 2020, https://www.R-project.org/) and the graphs were built in Excel. Descriptive analysis was used for the sociodemographic profile and for the categorical variables. The Chi-square test with p-value less than or equal to 5% and the t test were used to compare means.

RESULTS

Of the 56 patients evaluated, 85.7% were females and 14.3% were males; 60.7% were white, followed by brown/black (35.7%); aged between 35-49 years (39.3%), followed by individuals over 50 years (30.4%); with schooling predominantly with the complete 3rd grade of high school (41.1%), followed by individuals with complete higher education (25%) and professionally active (57.1%) (Table 2).

The sample used to characterize the levels of functional literacy and proficiency was composed of 49 individuals, as 7 were excluded for not having answered or having abandoned the test spontaneously, and it was not possible to conclude whether all the questions would have been wrong if they had followed it to the end. They could only be classified as absolute illiterates if they declared themselves to be so. Thus, 22.5% were classified as functionally illiterate and 77.5% as functionally literate. The elementary level is the lowest among the levels that make up the functionally literate group and represents 30.6% of the sample (Table 2).

As for the TMD classification, those of the muscular, articular and both types appear, respectively, in 43.8%; 4.2% and 43.8% of the women, and in 8.3% it was not possible to determine; for men, this percentage was 50%; 12.5%; 25% and 12.5%, respectively (Table 3).

Table 1. Sections of literacy groups and intervals on the proficiency scale.

Literacy groups	Scale
Illiterates	$0 < x \leq 50$
Rudimentary	$50 < x \leq 95$
Elementary	$95 < x \leq 119$
Intermediate	$119 < x \leq 137$
proficient	> 137

Paulo Montenegro and Ação Educativa (2016).

Table 2. Profile of the participants.

Groups	Non-responders (%)	Female (%)	Male (%)	Non-responders (%)	Total (%)
Illiterates ($0 < x \leq 50$)	0 (0%)	1 2.4%)	1 (14.3%)	2 (4.1%)	2 (3.5%)
Rudimentary ($50 < x \leq 95$)	0 (0%)	8 (19.0%)	1 (14.3%)	9 (18.4%)	9 (16.0%)
Elementary ($95 < x \leq 119$)	0 (0%)	13 (31.0%)	2 (28.6%)	15 (30.6%)	15 (27.0%)
Intermediate ($119 < x \leq 137$)	0 (0%)	8 (19.0%)	2 (28.6%)	10 (20.4%)	10 (18.0%)
Proficient (>137)	0 (0%)	12 (28.6%)	1 (14.3%)	13 (26.5%)	13 (23.0%)
Undetermined	7 (100%)	6 (85.7%)	1 (14.3%)	0 (0%)	7 (12.5%)
Total	7 (100%)	48 (87.5%)	8 (14.3%)	49 (100%)	56 (100%)
Functionally illiterate (illiterate + rudimentary)		9 (21.4%)	2 (28.6%)	11 (22.5%)	11 (22.5%)
Functionally literate (elementary + intermediate + proficient)		33 (78.6%)	5 (71.5%)	38 (77.5%)	38 (77.5%)

Table 3. Distribution of gender among types of temporomandibular disorders

Gender	Muscular	Articular	Both	Undetermined	Total
Female	21 (43.8%)	2 (4.2%)	21 (43.8%)	4 (8.3%)	48 (100.0%)
Male	4 (50.0%)	1 (12.5%)	2 (25.0%)	1 (12.5%)	8 (100.0%)

The pain complaint was divided into mandibular pain and headache, and the most frequent complaint time interval was between 1-5 years for both mandibular pain and headache and, in the case of headaches, the declaration of no pain was also high in percentage. The mean time for jaw pain was 78.8 months and, for headaches, it was 54.6 months with a mean proficiency value of 114 and a mean age of 43.2 years (Table 4). Complaint times show greater variability in declared values.

Demographic data were related to combined literacy levels as shown in table 5. The Chi-square test that measures the association between Combined INAF and each of the demographic variables showed that only schooling is related to INAF (p value is less than 5 % or 0.05). Individuals who have declared elementary schooling have the lowest levels of literacy (Table 5).

Data on understanding the diagnostic criteria (DC/TMD – axis I) were related to the levels of combined literacy (Table 6). The Chi-square test showed that there is no association between the combined INAF and the joint noise variables and types of TMD (p–value greater than 5% or 0.05).

Regarding joint noises, 1 individual was not considered in the test due to a lack of declaration about noise.

The time intervals of jaw pain and headache complaints were related to the combined INAF levels (Table 7). The Chi-square test showed that only the complaint times in intervals (mandibular pain) is associated with INAF (p–value less than 5% or 0.05). The "Don't know/don't remember" statements show the greatest proportional difference between the literacy groups tested. The complaint times in intervals (headache) is not associated with the level of functional literacy (p–value is greater than 5% or 0.05). Additionally, the t-test that relates the mean duration of complaints (in months) with combined INAF demonstrates that there is evidence to state that the duration of headache complaints between literacy groups are different (p-value is less than 5 % or 0.05) as shown in table 8, and the average times of headache

Table 4. Mean time of complaint and proficiency value.

Variables	Total cases	Valid cases	Missing cases	Mean	Standard deviation
Age (years)	56	54	2	43.2	14.4
Complaint time (jaw pain)	56	49	7	78.8	107.3
Complaint time (headache)	56	49	7	54.6	103.6
Combined proficiency value	56	49	7	114.4	28.9

Table 5. Relationship of demographic data and combined INAF.

		Combined INAF		Total	p-value Chi-square test
		Illiterate + rudimentary	Elementary + intermediate + proficient		
Gender	Female	9	33	42	
	Male	2	5	7	0.675
	Total	11	38	49	
Age (Years)	≤ 24	1	5	6	
	25 to 34	1	7	8	
	35 to 49	4	17	21	0.547
	≥ 50	5	9	14	
	Total	11	38	49	
Level of schooling	Fundamental	4	1	5	
	High school	3	18	21	
	College	4	19	23	*0.005
	Total	11	38	49	
Work situation	Active	6	24	30	
	Inactive	2	8	10	
	Others	3	6	9	0.687
	Total	11	38	49	
Ethnicity	White	6	25	31	
	Black/brown	5	13	18	0.496
	Total	11	38	49	

Table 6. Relationship of understanding of DC/TMD (axis I) and combined INAF.

		Combined INAF		Total	p- value Chi-square test
		Illiterate + rudimentary	Elementary + intermediate + proficient		
	No	6	21	27	
Articular noises	Yes	5	16	21	0.897
	Total	11	37	48	
	Muscular	6	18	24	
	Articular	0	1	1	
Types of TMD	Both	4	16	20	0.927
	Undetermined	1	3	4	
	Total	11	38	49	

Table 7. Relation of time intervals of jaw pain and headache complaints and combined INAF.

		Combined INAF		Total	p- value Chi-square test
		Illiterate + rudimentary	Elementary + intermediate + proficient		
	None	0 (0%)	4 (10.53%)	4	
Complaint times in intervals (jaw pain)	≤ 5 years	4 (36.36%)	21 (55.26%)	25	
	≥ 5 years	3 (27.27%)	11 (28.95%)	14	*0.037
	Don't know/don't remember	4 (36.36%)	2 (5.26%)	6	
	Total	11 (100.0%)	38 (100.0%)	49	
	None	6 (54.54%)	11 (28.94%)	17	
Complaint times in intervals (headache)	≤ 5 years	3 (27.27%)	13 (34.21%)	16	
	≥ 5 years	0 (0%)	9 (23.68%)	9	0.213
	Don't know/don't remember	2 (18.18%)	5 (13.15%)	7	
	Total	11 (100.0%)	38 (100.0%)	49	

Table 8. Relation of the average duration of complaints (in months) of jaw pain and headache and combined INAF.

		n	Mean	SD	p-value (t test)
Complaint times in intervals (jaw pain)	Illiterate + rudimentary	7	65.57	22.96	0.785
	Elementary + intermediate + proficient	36	73.04	13.75	
Complaint times in intervals (headache)	Illiterate + rudimentary	9	8.00	4.80	*0.001
	Elementary + intermediate + proficient	33	57.00	13.17	

complaint at the lowest level of literacy are much shorter than those reported at the high level.

DISCUSSION

The studied sample included 22.5% functionally illiterate and 77.5% functionally literate, of which 30.6% are at the elementary level, which is the lowest in this group (Table 3). This information is close to the data from the study[9], which shows that in the last INAF survey of 2018, 29% of Brazilians aged between 15 and 64 have literacy below elementary, that is, they were not able to perform simple tasks such as reading words and sentences.

It is worth mentioning that the DC/TMD was conceived considering populations with socioeconomic, cultural, and demographic conditions different from the Brazilian, not to mention the fact that it is written in another language and undergoes translations that can change the meaning of the terms used. It is important to point out that the Brazilian population classified as literate, by its self-declaration, in the official censuses, is not always qualified with writing, reading, and interpretation of texts and numbers skills to understand the socioeconomic context in which it is inserted[16] and, according to the Brazilian Institute of Geography and Statistics (IBGE, 2019), Brazil has 11.3 million illiterates, representing 6.8% of the population aged 15 and over. TMD complaints occurred more among females, aged over 35 years, reinforcing the studies[11,17-20], and predominantly affecting the white ethnicity followed by brown/black. A total of 41.1% of the sample completed the 3rd year of high school, 25% have completed higher education and 57.1% are professionally active, which corroborates the study[19,21]. The Chi-square test showed that the level of education is the only demographic variable that

is related to the level of literacy. In fact, it is expected that the higher the level of education, the higher the level of functional literacy, as described in the work[9].

However, the complaint of joint noise appeared in 46.4% of the sample, differently from the study[17], which reported only 5% of joint sounds in a sample of 894 individuals, however, corroborating the study[18], showed that joint sounds were the most common TMD complaints. This data demonstrates that there is no difference in literacy levels in relation to noise perception since self-report is subjective. As only the clinical examination would be able to confront these data, an attempt was made to compare the self-report of joint noises (since the noises would determine a joint TMD) with the clinical examination performed by the professional, but there was no success in the search for the clinical record of patients. Many patients were not found in the college's registration system. In the search of 40 files, five patients were found and all reported joint noises. Of the five patients who reported noises, determining joint TMD, only one coincided with the clinical examination and this individual had an elementary level of literacy. Of the 4 patients who had a self-report discrepancy with the clinical examination, three had an elementary level of literacy and one was proficient.

Mandibular pain and pain in the head region appeared more frequently in the time interval between 1 and 5 years (Tables 7 and 8). Analyzes demonstrated an association between combined INAF and interval complaint times for jaw pain. This is explained by the high percentage of functional illiterates, who reported jaw pain, and did not remember/do not know the time interval for the complaint (36.36%). This data indicates that people who declare they don't know/don't remember are associated with lower levels of literacy.

The time of complaint in headache intervals was not associated with the level of functional literacy but, interestingly, 54.54% of the functional illiterates did not report a headache. This is possibly because the headache is recognized as "normal", that is, it is a pain experienced, many times, throughout life and overcome with drugs and easily associated with stress. These individuals would not search for dental services because of a headache but would do so because of jaw pain due to the association of the jaw with the dentist. Perhaps the headache induces these people to initially seek other professionals such as the neurologist.

On the other hand, the t-test that related the mean duration of complaints (in months) with combined INAF showed that there is evidence to state that the times of headache complaint between the literacy groups are different (p-value is smaller than 5% or 0.05). This means that for the functionally illiterate, the average time of headache complaint was 8 months. This low time is explained by the majority of illiterate patients reporting not experiencing headaches or that it is so common that it has little relevance and is disregarded in self-reports, on the other hand, for literate patients, the average time of complaint was 57 months. With this result, it is possible to affirm that because it is considered a "normal" pain, it is better understood and detailed by the most proficient individuals.

It should be noted that this work presented some difficulties in its development generated by the long INAF test and sociode-mographic questionnaire, which discouraged people from participating in the research, later associated with the COVID-19 pandemic that put people in social isolation, causing interruption of data collection.

Considering the results obtained, further studies are suggested on the influence of functional literacy in the diagnosis of TMD, and it is important to emphasize that self-reports must be complemented with clinical examinations, since the answers are subjective and depend on a broader understanding of the context that involves the "disease" that led the individual to seek treatment. Furthermore, low levels of literacy are related to low detail in the answers, that is, the individual has little perception of himself. It would be interesting to know, initially, the level of education of patients to develop a better approach so that their diagnosis is accurate, indicating the best treatment, and that the treatment is properly understood and performed by the patient for a favorable outcome.

CONCLUSION

Among the demographic variables related to functional literacy, the level of schooling was the only one that was associated with the level of literacy. In addition, there was no difference in literacy levels in relation to the perception of TMD signs and symptoms for both joint noises and jaw pain and headache. This means that the self-report presents the same levels of difficulty for any level of proficiency as it is of a subjective nature.

Finally, it was concluded that lower levels of functional literacy were related to a poorly detailed perception of TMD complaints regarding the duration of the complaint and, mainly, to the association of headache with a complaint of TMDs. For individuals with low literacy levels, jaw pain justifies seeking treatment, as it is less recognized than headaches. This means that the lower the ability to detail the symptoms, the more chances of misdiagnosis may occur.

AUTHORS' CONTRIBUTIONS

Adriana Hernandes Pinheiro
Data Collection, Research, Methodology, Writing - Preparation of the Original, Writing - Review and Editing
Luciane Lacerda Franco Rocha Rodrigues
Supervision, Validation, Visualization
Thiago Bezerra Leite
Writing - Review and Editing , Visualization
António Sérgio Guimarães
Project Management, Methodology, Supervision, Validation, Visualization

REFERENCES

1. Yanez N, De Oliveira R, De Melo UFCG. Alfabetizar Letrando: Reflexões Sobre o Analfabetismo Funcional No Brasil. 2009. 18p.
2. Ribeiro M, Vóvio VCL, Moura MP. "Letramento no Brasil: alguns resultados do indicador nacional de alfabetismo funcional". Educação e sociedade, Campinas, 2002;23(81):49-70.

3. Parker R. Health literacy: a challenge for American patients and their health care providers. Health Promotion International, 2000;15(4):277-83.

4. Adams RJ, Stocks NP, Wilson DH, Hill CL, Gravier S, Kickbusch I, Beilby JJ. Health literacy--a new concept for general practice? Aust Fam Physician. 2009;38(3):144-7.

5. Weiss BD, Mays MZ, Martz W, Castro KM, DeWalt DA, Pignone MP, Mockbee J, Hale FA. Quick assessment of literacy in primary care: the newest vital sign. Ann Fam Med. 2005;3(6):514-22.

6. Protheroe J, Wallace LS, Rowlands G, DeVoe JE. Health literacy: setting an international collaborative research agenda. BMC Fam Pract. 2009;10(1):51.

7. Andrus MR, Roth MT. Health literacy: a review. Pharmacotherapy. 2002;22(3):282-302.

8. Instituto Paulo Montenegro e Ação Educativa. Indicador de Alfabetismo Funcional - INAF. Estudo Especial Sobre Alfabetismo e Mundo Do Trabalho. Instituto Paulo Montenegro/Ação Social do IBOPE. 2016;26.

9. Lima APM, Catelli R. Inaf Brasil 2018; 2018. 1–22. http://acaoeducativa.org.br/wp-content/uploads/2018/08/Inaf2018_Relatório-Resultados-Preliminares_v08Ago2018.pdf.

10. Martins RJ, Garcia AR, Garbin CA, Sundefeld ML. The relation between socio-economic class and demographic factors in the occurrence of temporomandibular joint dysfunction. Cien Saude Colet. 2008;13(Suppl 2):2089-96.

11. Bove SR, Guimarães AS, Smith RL. Characterization of patients in a temporomandibular dysfunction and orofacial pain outpatient clinic. Rev Lat Am Enfermagem. 2005;13(5):686-91.

12. Tjakkes GH, Reinders JJ, Tenvergert EM, Stegenga B. TMD pain: the effect on health related quality of life and the influence of pain duration. Health Qual Life Outcomes. 2010;8:46.

13. McNeill C. Management of temporomandibular disorders: concepts and controversies. J Prosthet Dent. 1997;77(5):510-22.

14. Schiffman E, Ohrbach R, Truelove E, Look J, Anderson G, Goulet JP, List T, Svensson P, Gonzalez Y, Lobbezoo F, Michelotti A, Brooks SL, Ceusters W, Drangsholt M, Ettlin D, Gaul C, Goldberg LJ, Haythornthwaite JA, Hollender L, Jensen R, John MT, De Laat A, de Leeuw R, Maixner W, van der Meulen M, Murray GM, Nixdorf DR, Palla S, Petersson A, Pionchon P, Smith B, Visscher CM, Zakrzewska J, Dworkin SF. Diagnostic Criteria for Temporomandibular Disorders (DC/TMD) for Clinical and Research Applications: recommendations of the International RDC/TMD Consortium Network* and Orofacial Pain Special Interest Group†. J Oral Facial Pain Headache. 2014;28(1):6-27.

15. Instituto Paulo Montenegro. Indicador de Alfabetismo Funcional. INAF/Brasil. 2007. 1-18p.

16. Elliot LG. Indicador Nacional de Alfabetismo Funcional: como avaliar as deficiências educacionais de jovens adultos no Brasil. Rev Meta: Avaliação. 2012;3(7):61-80.

17. Luz JG, Maragno IC, Martin MC. Characteristics of chief complaints of patients with temporomandibular disorders in a Brazilian population. J Oral Rehabil. 1997;24(3):240-3.

18. Gonçalves DA, Dal Fabbro AL, Campos JA, Bigal ME, Speciali JG. Symptoms of temporomandibular disorders in the population: an epidemiological study. J Orofac Pain. 2010;24(3):270-8.

19. Dantas AMX, Santos EJL, Vilela RM, Lucena LBS. Perfil epidemiológico de pacientes atendidos em um serviço de controle da dor orofacial. Rev Odontol UNESP. 2015;44(6):313-9.

20. Ferreira CLP, Silva MAMR, Felício CM. Sinais e sintomas de desordem temporomandibular em mulheres e homens. CoDAS. 2016;28(1):17-21.

21. Carthery-Goulart MT, Anghinah R, Areza-Fegyveres R, Bahia VS, Brucki SM, Damin A, Formigoni AP, Frota N, Guariglia C, Jacinto AF, Kato EM, Lima EP, Mansur L, Moreira D, Nóbrega A, Porto CS, Senaha ML, Silva MN, Smid J, Souza-Talarico JN, Radanovic M, Nitrini R. Performance of a Brazilian population on the test of functional health literacy in adults. Rev Saude Publica. 2009;43(4):631-8.