Assessment of oral health literacy in adolescents: Instruments validated in Brazil

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Fabíola Belkiss Santos de Oliveira
Master in Primary Health Care Institution: Universidade Estadual de Montes Claros (UNIMONTES)

Ana Tereza Silva e Diogo
Master in Prosthodontics Institution: Universidade Estadual de Montes Claros (UNIMONTES)

Árlen Almeida Duarte de Sousa
PhD in Health Sciences Institution: Universidade Estadual de Montes Claros (UNIMONTES)

Júlia Maria Moreira Santos
PhD in Biological Sciences Institution: Universidade Estadual de Montes Claros (UNIMONTES)

Maurício Alves de Andrade
Specialist in Endodontics Institution: Faculdades Unidas do Norte de Minas (FUNORTE)

Juliano Magno de Valadares Bicalho
Specialist in Endodontics Institution: Faculdades Unidas do Norte de Minas (FUNORTE)

Carlos Rogério Pimenta de Carvalho
Specialist in Periodontics
Institution: Faculdades Unidas do Norte de Minas (FUNORTE)

Andréa Maria Eleutério de Barros Lima Martins
PhD in Public Health
Institution: Universidade Estadual de Montes Claros (UNIMONTES)

ABSTRACT
Adolescence is a stage of life where there are major physical and biological transformations concomitant with psychological and social ones, which occur with the development of sexuality and which influence the human being's personality and other aspects of life. Health literacy (HL) can be understood as an individual's ability to access, understand, evaluate and put into practice basic health information. Adolescent oral health literacy (OHL) is an area that is little explored, despite the importance of this formative stage in the individual approach to healthy lifestyles and behaviors. The objective of this study was to carry out an integrative literature review on research instruments validated in Brazil for OHL among adolescents. The search strategy was carried out in August 2023, with a broad search for studies that assessed OHL in adolescents, in the Virtual Health Library (VHL), US National Library of Medicine (PubMed) and Scientific Electronic databases. Library Online (Scielo). The keywords used were "health literacy" and "oral health" and "adolescents". Inclusion criteria: free full texts; only: articles, books and documents, clinical trials, meta-analyses, controlled and randomized trials, analyzes and systematic reviews; without limitations of date or language. Exclusion criteria: studies without the three descriptors present in the text simultaneously, theses and monographs, abstracts, letters to the editor. 47 articles were found in VHL, 118 in PubMed and 13 in Scielo. Nineteen articles were analyzed and presented according to: author, title, year of publication, type of study, objectives, sample size and age group, sample recruitment, data collection tool, limitations and health outcomes. The only research instrument on adolescent OHL validated in Brazil was the BREALD-30 questionnaire, a Brazilian version of the Rapid Estimate of Adult Literacy in Dentistry, which measures literacy through word recognition. An important research gap in this field was revealed.

Keywords: Health literacy, Oral health, Surveys and questionnaires, Teenagers.

1 INTRODUCTION

In adolescence, the life stage of major discoveries and emotional instabilities, we observethe influence of interpersonal relationships on risk or health protection behaviors (Jorge *et al.*, 2018). With

the development of sexuality, major physical and biological transformations concomitant with psychological and social transformations are found. These transformations influence the personality of human beings among other aspects of their lives (Barbosa *et al.*, 2020). At this important stage of human training, health promotion strategies are needed to incorporate healthy behaviors that last throughout life. Most Brazilian health policies are targetedat children or adults. Among adolescents, the majority of actions have been curative, not contemplating health promotion efficiently. Preventive policies and actions aimed at the adolescent are necessary, considering their previous knowledge skills and motivation in the development of social, personal, self-knowledge and life skills, so that their choices are in favorof a healthy life (Sørensen *et al.*, 2012; Rocha *et al.*, 2017). When considering health promotionpolicies, Health Education (LS) is configured as an existing proposal.

The expression LS seems to have been translated into Brazilian Portuguese since 1991, from when instruments were used, created or improved to evaluate the levels of LS, in distinct populations (Pinheiro, 2021; Martins *et al.*, 2022). "Health literacy", "Health literacy", "Health literacy" are the translations of the term "*health literacy*" into Brazilian Portuguese. Thetheoretical model presented in 2012 was translated into Brazilian Portuguese in the same year, but the publication was only available in 2015 (Martins *et al.*, 2015). Initially, the Dictionary of Health Sciences Specialties (DECS) introduced the term "health literacy" as the translation of theterm "*health literacy*." The Brazilian Health Literacy Network (REBRALS) has asked DECS management to change the translation of the term "*health literacy*" from "health literacy" to "health literacy", since the terms "literacy" and "literacy" have different meanings in Brazilian Portuguese (Soares, 2004; Tfouni, 2002). In Portugal, the translation of the term "*health literacy*"into Portuguese is "Health literacy". This Portuguese term has also been considered in Brazil. Therefore, in Brazil, publications are available that consider the three translations presented. Theterm "*health literacy"* appears to have been first used by James Dixon in 1959 in Philadelphia (Pennsylvania, United States), citing it as one of the tools that could be used in health disaster situations as pandemics, for economically disadvantaged populations (Dixon, 1959).

In 2008, the World Health Organization (WHO) considered LS as an intermediate determinant in health fundamental to empowerment and equity in health. Initially, the LS definition considered people's need for prior knowledge, skills, and motivation to access,understand, evaluate, and apply health-related information. In 2021, the term Letrada Organization in Health (OLS) (Abrams *et al.*, 2014) was considered in the definition of LS, sinceit was realized that the organization of the health service can corroborate for people to access, understand, evaluate and apply health-related information. It has to be considered that other models have been developed around the world (WHO, 2008; Sørensen et al., 2012; Abrams *et al.*, 2014; Martins *et al., 2015; Nutbean & Lloyd, 2021; Sørensenet al., 2022).*

Children, adolescents, the elderly, ethnic minorities, people with special needs and the disadvantaged stand out as vulnerable groups at low levels of LS. In this context, awareness of the

importance of LS as a determinant of people's quality of life has stood out. LS levels can be assessed by considering different health conditions. Among these conditions, LSB levels have been assessed since 2015 (Junkes *et al.*, 2015; Lima *et al., 2019;*

The quality of the tools for assessing LSB levels should be considered in the context of research, teaching and health services. Thus, in 2012, a *delphi* study was conducted, with the participation of 47 *experts* on the subject, who sought standardization and definition of terms referring to the evaluation of the quality of measuring instruments. In this study, the following steps were presented to assess the quality of the measuring instrument: reliability, validity, responsiveness and interpretability. Reliability refers to the internal consistency and reproducibility of the measurement, as well as the evaluation of measurement errors. Validity is subdivided into content and face validity; construct validity and discriminant validity. Responsiveness refers to the ability of the measuring instrument to identify changes in what is being measured as a consequence of observable facts or interventions that are intended to alter the *scores* being measured in the measuring instrument. Interpretability, on the other hand, concerns the interpretation of the results of the evaluations that consider the measuring instrument (Mokkink, *et al.*, 2012). LS has been identified, since 2022, as a heterogeneous phenomenon, with diverse origins and evolving (Martins *et al.*, 2022, Martins, *et al.*, 2023). Instruments have been developed that evaluate LS considering the general health of people, as well as instruments directed to certain health conditions or specific populations (Marques e Lemos, 2017). Regarding oral health, some instruments have been developed (Cruvinel, *et al*., 2017; Bado, *et al*., 2018; Firmino, et al., 2020; Lins,et al., 2020). However, it seems that instruments that aim to evaluate oral health literacy (BLS) among adolescents are scarce. It is therefore proposed to identify and evaluate instruments used in Brazil for measuring LSB levelsamong adolescents.

2 METHODS

The literature review called integrativa provides expanded information on a subject, making up a body of knowledge. It uses judicious research methods employed to provide the bestknowledge produced about a given research problem, so that these are critically evaluated by professionals with clinical skills and then incorporated into care practice. It presents different purposes such as defining concepts, reviewing theories or methodological analysis of studies ona given topic (Ercole *et al.*, 2014), allowing also the combination of data from empirical and theoretical literature that can be directed to the identification of spaces in the areas of studies.

2.1 IDENTIFICATION

This integrative literature review, with different methods combined, aimed at broadeningthe possibilities of analysis of scientific knowledge regarding the validation of questionnaires onadolescent

BLS in Brazil. This method synthesized the results obtained in research on the theme, in a comprehensive, systematic and orderly manner. The synthesis of knowledge about the current validated methods for measuring the LSB of adolescents in Brazil can point out possiblescientific gaps to be addressed in future studies. For a broader coverage for the identification of data, a broad question containing the central terms of the search was elaborated, generating the guiding question that guided the review: which instruments for the assessment of adolescent BLSwere validated in Brazil?

2.2 SEARCH STRATEGY

The search strategy was conducted in August 2023, with a broad search for studies that evaluated LSB in adolescents. Research was carried out on articles in the databases Virtual Library on Health (VHL), *US National Library of Medicine* (*PubMed*) and*Scientific Electronic Library Online* (*published*). The keywords used were identified in the Descriptors in Health Sciences (DeCS), of which the terms in Portuguese were used: "literacy in health" *and* "oral health" *and* "adolescents". During the database search, only the "*and*" connective was used to make combinations of the terms.

2.3 ELIGIBILITY CRITERIA

To meet the inclusion criteria, the following studies were eligible: articles, books and documents, without date or language limitations. With regard to the exclusion criteria, studies were not eligible without the three descriptors present in the text simultaneously, theses and monographs, abstracts, letters to the editor, studies involving LS not specific for Dentistry or thatused instruments not validated for use in Brazil, duplicity articles in the researched bases, articlesnot available in full. The process of inclusion and exclusion of this integrative review followedthe *recommendations of the Preferred Reporting Items for Systematic Reviews and Meta-Analyzes* -PRISMA, and for transparency in reporting the results (Hutton *et al.*, 2015), a flowchart was used indicating this procedure, presented in the results of the research, in Figure 1.

2.4 ANALYSIS OF ARTICLES

Only two of the authors evaluated the articles independently, by title, objective, methodology, results, and conclusion, during the search in the databases. In moments of persistent disagreements between these two authors, the last author was consulted, for havingmore experience in scientific research.

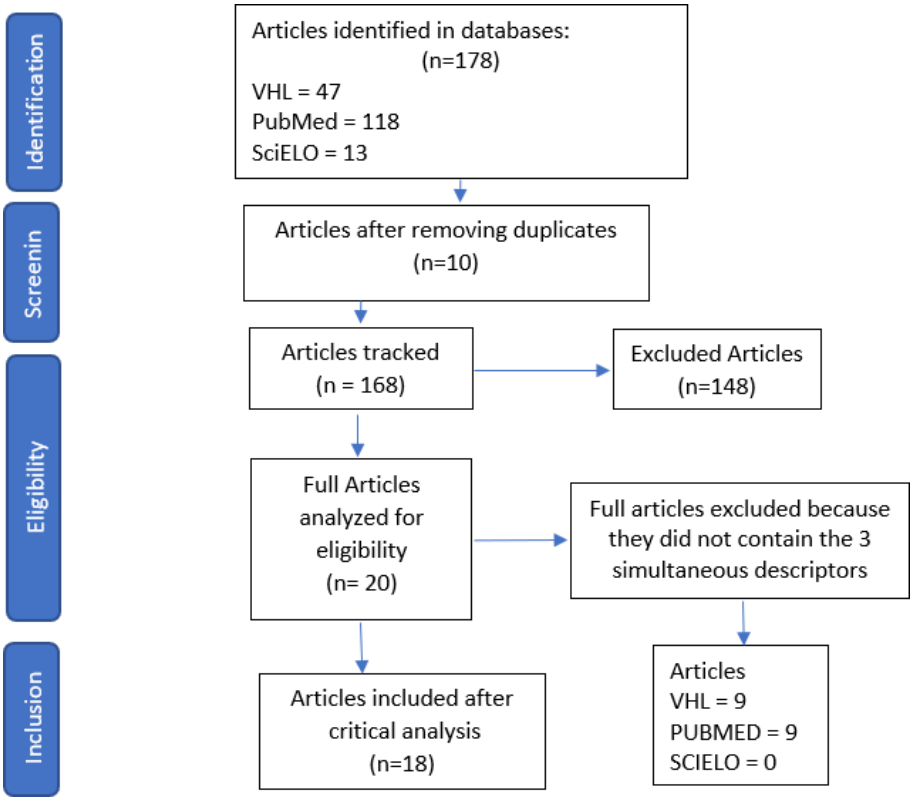
3 RESULTS

According to the combination of the keywords selected in DeCS and the pre-establishedsearch filters, the survey resulted in 47 articles in VHL, 118 in *PubMed* and 13 in *Scielo*. After reading the

title, the objective, the methodology, the results, the conclusion and the application of the eligibility (inclusion) and ineligibility (exclusion) criteria, they were selected: 13 in the VHL; 16 were elected in *Pubmed* and no articles were elected in *Scielo*. All were read in full foreligibility to be certified, leaving, then, 19 articles selected through the search strategies.

The process flow chart for this integrative review is depicted in Figure 1.

Figure 1: Flowchart of the process of exclusion and inclusion of the integrative review, following PRISMA recommendations.



Source: Survey data, 2023.

During the process of reading in full the articles selected for this research, the main resultswere extracted in a synthesized form. The publication period of the 18 articles ranged from 2015 to 2022, with 17 in the English language. All articles are quantitative and epidemiological. The presentation of the results obtained was made in a descriptive manner by means of Table 1, wherethe nine articles found in *PubMed* and the ten articles found in the VHL are distributed in chronological order. Only the data considered most relevant for the present study were evidenced,and presented according to: author, year of publication, location, database, type of study, objectives, sample size, age group and sample recruitment, data collection tool, limitations and health outcomes.

Table 1: Distribution of the 18 articles found in VHL and Pubmed in August 2023 on validated questionnaires fororal health literacy in adolescents, as to author, title, year of publication and database; type of study; objectives; sample size, age group and sample recruitment; data collection tool; limitations and outcomes in health.

Author, year/ Place of study, Database	**Study design**	**Objectives**	**Sample size, age group and recruitment**	**Tool data collection**	**Limitations**	**Health outcomes**
Tsé Carrie K, *et al.*, 2015. Hong Kong, ChinaPubmed	Pilot study, transverse, experimental, randomized	Conduct a pilot study to evaluatethe effectivenessof three majormedia outlets -Twitter, Facebook and YouTube - in supporting adolescent's LSB	Random sample 22 adolescents(aged 14 to 16) from an English school	Social media use and dental experience were collected through a questionnaire. One LSB preand post test(REALD-30)	Cross-sectional study, small sample number, Self-reported experience, participants wererecruited group high socioeconomic status	Audiovisual social mediafrom Facebook and YouTube canbe more Effective fororal healthpromotion (SB) in a Sample ofschool teens
Neelima M, *et al.*,2018. Mysoe, India. Pubmed	Cross-sectional study	Evaluate LSBand SB statusamong adolescents from pre-university colleges	401 (201 adolescents from public and 200, private schools) aged 15 to 20. 50 adolescents paired by gender, drawnby simple random sampling	Structured questionnaire socio-demographic information, previous medical and dental visits, oral hygiene and dietary practices. WHO Oral Health Assessment Form forAdults-2013 and Rapid Estimate Adult Literacy in Medicine REALMD-20 scale	Cross-sectional study, urban areaonly, major cultural differences. The questionnaire usedmeasures there cognition of SB-related words, nottesting the conceptual understanding of what is read	The LSB was significantly associated with the typeof institution,course, dental history and number ofdental visits
Muhammad Ashraf, 2018. Saudi Arabia. Pubmed	Population-based cross-sectional study	Investigate the frequency ofgoing to thedental office andits predictors among adolescent males	376 maleadolescents aged 13 to 14 years.Multi-stage random sampling to recruit participants from publicschools	WHO SB Questionnairefor Children	Cross-sectional study Data collection male only. Data collection of girls by male researchers was difficult due to Arab culture. Self-referenced data	Going to the dental officewas commonin males. Painwas the reasonand a predictorfor dental care,and a smallproportion ofadolescents had dental appointments to routine dental examinations

Khudanov, Bakhtinur *et al.*, 2018. Tashkent, Uzbekistan. VHL	Experimental randomized educational trial longitudinal	Determine if anSB EducationProgram Using a*Qscan* Device could improvethe state of oralhygiene and O LSB of adolescents	One hundred adolescents aged 14 to 16 years, randomization of swappedblocks: (i) control group (traditional learning) and (ii)experimental group (Qscandevice-based learning that allows visualization ofbiofilm through fluorescence)	Socio-demographic questionnaire, knowledge, attitude behavior. SBwas examined (plaque index, cpod, periodonto) atbaseline, 6 months and 18 months after interventions Knowledge, behavior and attitude questionnaire	Sample collectedin the same areawith equal financial condition. The useof *Qscan* allowedeach dentist to select the mostsevere area of the mouth in particular, while educating students	The inclusionof QLF light-induced fluorescence technology ina learningprogram school was helpful in improving the state of oral hygiene and LSB of Uzbekistan's adolescents
Wiener R. Constance *et al.*, 2020. West Virginia, USA, Pubmed	Randomized educational trial Experimental transverse control	Determine whether a peer-assisted learningapproach wouldimpact SB knowledge/attit udes/beliefs and skills for high school children	245 high school students. between 13 and20 years of age, 52.3% of themale sex. Convenience sampling. Cluster designating schools: one for intervention with use of media or a control, with SBhandouts	Pre-test and post-test with evaluation of SB knowledge/atti tudes/beliefs and a self-report of brushing and flossing (SB behaviors)	Cross-sectional study, self-reported brushing	Peer-assisted learning for knowledge oforal hygieneattitudes andbehaviors had similar results when the teacher provided handouts and activity sheets or when providing interactive media and technologies
Dutra, Laio da Costa, *et al.*, 2019Campina Grande,Paraíba, Brazil, VHL	Analytical population-based cross-sectional study used pilot study STROBE s	Investigate whether the Ability to recognize andread SB terms is associated withthe number ofteeth with carious lesions cavitated in adolescents	746 adolescents, 15 to 19 years. probability sampling by two-stage conglomerates (schools and teenagers) stratified by cityadministrative district and typeof school (publicor private)	Parents answered asociodemogra phic questionnaire and adolescents BREALD-30	Cross-sectional study The questionnaire usedmeasures there cognition of SB-related words, nottesting the conceptual understanding ofwhat is read	There is a needfor dentists to improve theiruse of language when communicatin g with patients, for decision making. Adolescents with lowerlevels of BLShad a higher number of teeth with cavitated carious lesions, regardless oftheir socioeconomic level and history of dental visits

Lima, Larissa Chaves Morais de,*et al.*, 2019. Campina Grande,PB, Brazil. VHL	Questionnaire validation with analytical and cross-sectional approach to evaluate psychometric properties (reliability and validity)	To evaluate the psychometric properties of the Portuguese version of theRapid Estimateof Adult Literacy inDentistry (BREALD-30) applied to adolescents	750 adolescents: 375 aged 12 and 375 aged 15 to19, 10 publicschools and 17 private schools randomly drawn. Presentswere evaluatedon the day ofdata collection	Semi- structured questionnaire, objective questions addressing sociodemographic characteristics, questionnaire Brazilian Economic Classification, BREALD-30 and *Functional Literacy*. Clinical data on dental caries Indicator (FLI)	Cross-sectional study The questionnaire usedmeasures therecognition of SB-related words, not testing the conceptual understanding ofwhat is read Self-applicable questionnaire. Local cultural issues	BREALD-30 has shown satisfactory psychometric properties foruse in adolescents Brazilian. Considering Brazil's sizeand culturaldiversity, it will be interesting to observe whether psychometric properties are maintained with adolescents from other regions
Lopes, Roanny Torres, *et al.*, 2020. Campina Grande, Paraíba, Brazil. VHL	Cross- sectional, analytical study with pilotstudy.	Evaluate sociodemographic, family, and behavioral factors associated withLSB in adolescents	746 adolescents aged 15 to 19 years. (16 public and 16 private) from 131 urban schools. Probabilistic sampling by conglomerates complex samples	Socio-demographic questionnaire was sent to parents, scaleof assessmentof adaptabilityand family cohesion, screening test alcohol, smoking andinvolvement with substances, type of dental service used inthe last consultation, BREALD-30	Cross-sectional study The questionnaire usedmeasures there cognition of SB-related words, nottesting the conceptual understanding ofwhat is read	Brazilian adolescents with better socioeconomic status, from families with "entangled" cohesion and "rigid" or "structured" adaptability and whose parents were married showed betterlevels of LSB
#Neves, Érick Tássio Barbosa, *et al.*, 2020. Campina Grande, Paraíba, Brazil. VHL	Cross-sectional study with pilot study	To evaluate the association between the prevalence of cavitated toothdecay and LSBfamily characteristics and sociodemographic factors in early adolescence	740 12-year-old schoolchildren. 520 pupils from 14 public schools and 249 pupils from 18 private schools,selected at random	Diagnosis ofdental caries.Responsible for students provided information on sociodemographic data and students provided information onthe characteristics of the BREALD-30 family. Economic Classification Criteria, FACES-III	Cross-sectional study The questionnaire used measures there cognition of SB-related words, nottesting the conceptual understanding of what is read	A low level of BLS, sociodemographic factors,and a low levelof familialcohesion arepredictors of cavitated caries lesionsin early adolescence

Neves, Érick Tássio Barbosa, *etal.*, 2021. Paraíba, Campina Grande, Brazil VHL	A population-based, observational, analytical cross-sectional study used a pilot study	To evaluate the association of contextual and Individual factors with LSBin early adolescence	740 12-year-old adolescents. randomly selected by probability sampling byconglomerates in two stages of Campina Grande schools.14 public and 18private schools. 520 public and 249 privateschools. 29 left	Eight variables were considered andsocioeconomic information collected with caregivers. Brazilian version of *Family Adaptability and Cohesion Scales*(FACESIII) to measurefamily functionality, and BREALD-30	Cross-sectional study The questionnaire usedmeasures there cognition of SB-related words, nottesting the conceptual understanding of what is read	Individual and contextual factors were associated with BLS inearly adolescence. Female gender, mother's schooling above 8 yearsand balanced family function wereassociated with better*scores*. Adolescents enrolled in schools with higher failurerates had s*lightly* worseLSB scores
Lima, Larissa Chaves Morais, *et al.*, 2021. Campina Grande, Paraíba, Brazil. VHL	Cross-sectional and analytical study STROBE	Evaluate the association between functional literacy andrecognition ofthe word "bruxism" among adolescents	375 12-year-old schoolchildren and 368 from 15 to 19 years. Public and privateschools. Samplesample calculation, withan increase of20% in the total number of	Parents/caregi vers respondedto a socio-demographic judgment. BREALD-30, recognition ofthe word "bruxism" wasused as a dependent variable	Cross-sectional study The questionnaire measures the recognition of SB-related words, not testing the conceptual understanding ofwhat is read.	Recognition ofthe term"bruxism" among 12-year-olds was influenced bythe presence ofhealth insurance and higher level of functional literacy. At theage of 15, hewas influencedby the higherlevel of functional literacy, thelower numberof people athome, the higher level of schooling ofthe person incharge and going to the dentist

Silver, Isolda Mirelle de Lima Ferreira, *et al.*, 2021[a]. Campina Grande, Brazil. Pubmed	Cross- sectional, analytical, school-based study used pilot study	Explore the association between familycohesion and self-perception of the need fordental treatmentamong adolescents	746 pupils aged 15 to 19 enrolledin 16 public and privateschools, randomly selected in thecity's six administrative districts. Sampling conglomerate probabilistic analysis carriedout in two stages. The students were selected by simple samplingdraw at each school	Parents/guardians provided information on sociodemographic data. BREALD-30. Supervised brushing, topical fluoride application and clinical examination. Diagnosis of tooth decayusing Nyvad criteria. FACES III: self-perception need dental treatment, toothache, cohesion and family adaptability	Cross-sectional study, self-report.The questionnaire used measures there cognition of words related to SB, not testing theconceptual understanding ofwhat is read	Tooth decay,pain and toothloss, and family cohesion haveinfluenced self-perception of the need fordental treatment in adolescents. Include environmental assessment family is ofgreat relevance in the expansionof healthy behaviors in adolescents
Silver, Isolda Mirelle de Lima Ferreira, *et al.*, 2021[b]. Campina Grande, Brazil. Pubmed	Population-based cross-sectional analytical study used pilot study	Investigate whether LSB and schoolcontext are associated with caries untreated teeth in the anteriorteeth of adolescents	746 students aged 15 to 19. Probabilistic cluster samplingin two traineeships (schools andadolescents). 32 schools were selected by random drawwith proportional distribution of teenagers in thesix administrative districts of the city	Parents completed a sociodemographic questionnaire and absence/presence of private health plan.Two examiners were trained for the diagnosis ofdental caries using the Nyvad and BREALD-30 criteria	Cross-sectional study The questionnaire used measures the recognition of words related to SB, not testing theconceptual understanding ofwhat is read	The presenceof tooth decay, toothache reported in thelast 6 months,tooth loss, andfamily cohesion of the agglutinated type influenced the self-perceptionof the need fordental treatment in adolescents aged 15 to 19years
Lopes, Roanny Torres, *et al.*, 2021. Campina Grande,Paraíba, Brazil. VHL	Cross- sectional, analytical study with pilot study	Evaluate associations between BLS and family, sociodemographic and dentalservice characteristics in adolescents.	740 adolescents aged 12 years. probabilistic cluster samplingin 14 public schools and 18private ones,simple randomization procedure. cluster.	BREALD-30, FACES III and asked about the type ofdental service(public or private) they used in the last consultation. Socio- economic Questionnaire to Caregivers	Cross-sectional study The questionnaire usedmeasures the recognition of words related to SB, not testing theconceptual understanding ofwhat is read.	Adolescents with female sex, rigid andstructured connected family structure, mother's schooling above 8 years,caregiver's ageabove 38 years and privatedental service type showed the best level of LSB

Moura, Mirella de Fatima Liberato, *etal.*, 2021. Cajazeiras, Paraíba, Brazil. VHL	Cross- sectional, randomized, pilot study	Investigate associations between family environment, adolescents with ADHD, and BHS with experience of early adolescent caries	448 12-year-olds in publicand private schools randomized	SNAP IV, FACES III,CPOD, BREALD-30	Cross-sectional study Lack of a definitive diagnosis for ADHD. The questionnaire usedmeasures recognition of SBA-related words by not testing conceptual understanding of what is read	Adolescents with more symptoms of ADHD, lower BLS, lower household income, and families withmore residentsin the household had greater experience of caries
He, Jinfeng *et al.*, 2022. Longhua District, Shenzhen, China. Pubmed	Analytical, cross-sectional,multi-level analysis	assess the effectsof socio-demographicfactors, dental status, SB knowledge and health-related behaviors indental visits inadolescents 12 years old	953 adolescentsof 12 years, ofwhich 48.3% were public schools and 51.7% were private; 49.1% (n=468) wereboys. Two-stage probabilistic cluster sampling. Thenthe schools were randomly selected withprobability proportional tosize	Self-reported questionnaire with demographic variables, socioeconomic situation, dietary habit,SB behavior, SB-related knowledge, SB-related attitude; The codified oral impactscale on daily performance (OIDP) andSB-related quality of life impact (QVRS)	Cross-sectional study Failed to collect economicfamily historydata. Main study outcome self-reported higher risk of memory bias	The dental visits of 12-year-old adolescents in the district of Longhua were affected by multidimensional factors. Strengthening SB educationand cultivating good oralhygiene habitscan be a viableintervention toimprove effectively the overall level ofSB in adolescents
Ardekani, F Movaseghi, *et al.*,2022 Shiraz, Fars, province ofIran. Pubmed	Randomized educational (experimental) trial transverse controlled	Determine theeffect of theory-based educationon the behaviorof SB and itspsychological determinants, including LSB	162 high school girls aged 14-15. allocation wasmade at thecluster level, 4 schools were randomly divided into control and experimental groups; intervention groups (n = 77)and control groups (n = 85)	A questionnaire to evaluate demographic information, knowledge, behaviors of SB and thePMT constructsLSB Protection Motivation Theory and another questionnaire to evaluate knowledge inSB	Cross-sectional study Study conducted only with girls. Girls who abandoned research. Self-report	After educational intervention, mean SB improved inthe group.There was adecrease in the biofilm index

Baskaradoss, Jagan Kumar *et al.*, 2022. Kuwait, Kuwait. Pubmed	Cross- sectional, population-based study	Evaluate the association between caregiver BLSand SB status ofspecial youth	214 specialyoung pair/caregiver 6 to 12 years and 12 to 21 years.Two-stage cluster samplingtechnique: fourspecial youth schools were randomly selected	Respondents reported on demographic and socioeconomic factors, medical and dental condition of the specialchild. Comprehensive Measure of Knowledge inSB (CMOHK) questionnaire. Gingival indexand plaque index were examined	Cross-sectional study, non-probabilistic sampling for selection of participants, low levels of caregiver conceptual knowledge and cultural issues	Lower levels of caregiver BLS were associated with higher plaque scoresfor your child. Marketing campaigns awareness to improve LSBand caregiverattitude can help improveoral hygiene for special young people

Source: Survey data, 2023.

4 DISCUSSION

Few questionnaires have been developed to evaluate the LSB of adolescents (Tse *et al*, 2015), and these instruments must demonstrate good psychometric properties, for this they need to be evaluated as to their quality (as evaluation of reliability, validity, responsiveness and interpretability). The evaluation of questionnaires used in scientific research on this topic for adolescent audiences is important to ensure that the results obtained are accurate and reliable, ensuring that they can be generalized to the target population. The tools for evaluation, when they demonstrate adequate psychometric properties, are useful and capable of presenting scientifically robust results (Keszei *et al.*, 2010; Mokkink *et al.*, 2010), and can collaborate withhealth professionals in identifying failures in health education and improving SB policies, allowing an intervention closer to the reality of the population in which they operate (Lins *et al*,2020). Only five evaluation instruments described in the world literature measure LS in adolescents (9 to 19 year-old participants) (Perry, 2014). Although most of these evaluation instruments have good internal consistency for this age group, there is a shortage of valid instruments to evaluate the construct in adolescents (Perry, 2014; Vilella, *et al.*, 2016).

In Brazil, until the end of 2015, there was only one instrument for measuring the LSB in adolescents, translated and validated into Brazilian Portuguese, the *Brazilian Rapid Estimate of Adult Literacy in Dentistry* (BREALD-30), (Baldo e Mialhe 2019; Tsé *et al., 2015; Lins 2020) and therefore an emerging theme in* the scientific community (Bado e Mialhe, 2019). A low levelof LSB is one of the predictors of cavitated caries lesions in adolescence, associated with socioeconomic factors and a low level of family cohesion (Neves *et al.*, 2020), correlated with low values of social capital (Knorst, 2022). The adolescent's LSB is an area little explored, in spite of the importance of this formative stage in the individual approach to lifestyles and healthybehaviors. Although some authors (Lins *et al.*, 2020;

Neves *et al.*, 2021) claim that there is a gapin the literature on instruments for evaluating LSB in adolescents, LSB levels have been evaluated among Brazilian adolescents.

According to Lins *et al.* (2020) , only four LSB evaluation instruments have validation for use in Brazil in adults, and, only one of these has demonstrated validity and reliability for application in adolescents in the country, *Brazilian Portuguese version of the Rapid Estimate ofAdult Literacy in Dentistry, BREALD-30.* The present review of integrative literature meets theseauthors, because it also came across this same instrument in most Brazilian investigations on thesubject, analyzed (Dutra *et al*., 2019; Lima *et al*., 2019; Lopes *et al*., 2020; Moura *et al*., 2020; Neves *et al*., 2020; Lopes *et al*., 2021; Neves *et al*., 2021; Prataet al.org (see recital 21). The research that evaluated LSB in Hong Kong adolescents (Tse *et al.*, 2015) used the same validated instrument for Japan, Rapid Estimate of Adult Literacy in Dentistry, REALD-30, with14 to 16 year olds; In India, *Rapid Estimate Adult Literacy in Medicine and Dentistry*, REALMD-20, for 15 to 20 year olds (Neelima *et al.[1], 2018)* was used; And in Kwuait, the Comprehensive Measure of Oral Health Knowledge tK, was applied to people 6 to 1 2 years and 12 to 21 years of age (Baskarados The other studies analyzed (Wiener *et al.*, 2020; Khudanov *et al.*, 2020; Neves *et al*., 2021) did not mention the questionnaire used to measure the LSB of adolescents intheir research.

The questionnaires mentioned above are different in terms of structure, content and psychometric properties. REALMD-20 was developed as a tool that evaluates the patient's abilityto read medical and dental terminology. It is a brief 20-item screening tool that is used to evaluateLSB and help fill the blank space of doctor-patient communication. The high feasibility of the tool saves time for the doctor/dentist, with easy-to-understand instructions for participants (Neelima *et al.*, 2018). It has not yet been used in epidemiological studies beyond the validationprocess, making it impossible to analyze and compare the results, as well as to evaluate the effectiveness of the tools in the national territory (Lins *et al.*, 2020).

The REALD-30 was developed especially for the context of SB. It consists of 30 commondental words with varying degrees of difficulty, which were taken from the dictionary of the *American Dental Association*. Words or terms from brochures and written materials provided todentists and patients were also included. It is based on an interview, requiring participants to readaloud a list of 30 words related to SB, in a time of 2 minutes (Tsé *et al.*, 2015).

According to Junkes *et al.* (2015), the BREALD-30 is a Brazilian version of the *Rapid Estimate of Adult Literacy in Dentistry*, which also consists of 30 dental words, which the respondent must read aloud, covering etiological, anatomical, preventive and curative aspects ofadverse oral conditions. The instrument measures the LSB based on word recognition, organizedin ascending order of difficulty of pronunciation.

Most articles using BREALD-30 presented the analysis of only one skill relative to LSBas a

limitation of research (Firmino *et al.*, 2017). There is a decontextualization of the words presented to the interviewee, which are randomly arranged for the reading, not allowing the examiner to distinguish whether the individual understands and is capable of applying the item in his daily life in a critical manner, or whether he was merely able to pronounce it. By evaluating the construct in its multidimensionality, this type of tool for measuring the degree of LSB fails, although it makes possible a quick and easy administration, as well as a general analysis of the level of literacy of the individual

Most of the epidemiological studies found in this review using BREALD-30 were conducted in Paraíba, Northeast of the country (Dutra *et al*., 2019; Lima *et al*., 2019; Lopes *et al.*, 2020; Moura *et al*., 2020; Neves *et al*., 2020; Lopes *et al*., 2021; Neves *et al*., Prata *et al*. 2021).

The surveys presented an irregular national distribution, which impaired the analysis of the degree of LSB in the different demographic and socioeconomic contexts of Brazil. The lack of data in the other regions of the country, in contrast to the greater concentration of studies in the South (60%), reflects the need for a fairer disposition of the investigations (Lins *et al.*, 2020).

In the category of conceptual knowledge, the CMOHK stands out (Baskarados *et al.*, 2022). It was developed by a group of American researchers (Macek *et al.*, 2010). It consists of 23 questions: 10 questions that evaluate the basic knowledge of the interviewees, six questions that evaluate the knowledge about prevention and treatment of dental caries, five questions that evaluate the knowledge about prevention and treatment of periodontal disease, and two questionsthat evaluate oral cancer. This instrument has no validated version for Brazilian Portuguese.

Articles were also located that present validated instruments for Brazilian Portuguese forthe evaluation of LSB in adults, which could be adapted for the adolescent public. Among theseinstruments are the three questionnaires: Brazilian Short version of the Oral Health Literacy Assessment (OLHA-B-15) (BADO, *et al*., 2018); Short-form of Health Literacy Dental Scale (HeLD-14) (Mialhe *et al., 2020) and Brazilian Oral Health Literacy-Adults Questionnaire (BOHL-AQ) (Almeidaet al., 2022).* The *Oral Health Literacy for Diabetics* (OHL-D) questionnaire (Martins *et al.*, 2020) was validated for adults diagnosed with diabetes mellitus. And the two *Brazilian Portuguese version of the Hong Kong OHL Assessment Task for PediatricDentistry* (HKOHLAT-P) (Firmino, 2019; Firmino *et al.*, 2020) andShortForm of the Brazilian Oral Health Literacy Assessment Task for Pediatric Dentistry(BOHLAT-P-30) (Firmino, 2022)have been validated for parents/guardians of pediatric dental patients.

This integrative literature review presented as a limitation the low amount of evidence found on LSB evaluation instruments in adolescents validated in Brazil, limiting the ability to understand how LSB can affect the health of adolescents within the school environment in the long term. However, he employed judicious research methods providing the best knowledge produced about the investigated problem, and the results could support the critical evaluation ofprofessionals, to then be incorporated

into the practice of care. In addition to the fact that no studies were found that consider all the potential factors associated with LSB among adolescents,the need for the development and evaluation of LSB instruments for this age group in the countrywas verified.

The use of validated questionnaires in the country to measure the LSB of adolescents is important because it allows an accurate and reliable assessment of the knowledge and understanding of adolescents about basic information and services of SB. This can help healthcare professionals identify gaps in the methods of health education currently employed andimprove SB policies, allowing intervention closer to the reality of the population in this age groupin which they operate. In addition, the use of these questionnaires can help identify adolescents with low LSB levels and provide information for the development of specific educational programs to improve the knowledge and understanding of these adolescents about SB.

5 FINAL CONSIDERATIONS

The only research instrument on adolescent BLS validated in Brazil was the BREALD- 30 questionnaire, a Brazilian version of the *Rapid Estimate of Adult Literacy in Dentistry*, whichmeasures literacy through word recognition. There has been an important lack of research in thisfield. It is suggested to apply this questionnaire in adolescents from different regions and contextsof the country, as well as the validation of other instruments, with different approaches, to measure LSB based on the ability of the adolescent to search, understand and use SB information.The validation of questionnaires on this topic in the country could allow professionals to intervene in education and SB closer to the reality of the population in which they operate. By considering the LSB levels recorded among school adolescents, public health managers can develop strategies that aim to assist humanized SB, thus improving the quality of life of the adolescent school community (teachers and students), their family and their surroundings.

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