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ORIGINAL ARTICLE

Association between Oral Health Literacy and Socioeconomic Variables in Users of Centers for Dental Specialties

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ABSTRACT

Objective: To test possible associations between Oral Health Literacy (OHL) level and socioeconomic covariates among users of Centers for Dental Specialties (CEOs). **Material and Methods:** The Health Literacy in Dentistry (HeLD-14) instrument was applied to 130 adult users of CEOs located in 13 municipalities in the state of São Paulo – Brazil, as well as socioeconomic issues. The researcher applied instruments in a specific room after randomly selecting individuals in the waiting room and invitation acceptance. Each item was ranked on a 5-point scale, ranging from 0 to 4, in which high scores indicate minimal difficulties in performing functions (high OHL) and low scores indicate very limited abilities to perform functions (low OHL). Statistical analysis using the Levene test was used to verify the possibility of using the one-way ANOVA test, and in case results show positive values ($p>0.05$), the Kruskal Wallis test was used. **Results:** The average age of participants was 45 years, with more than half being female (68.7%) with 9-11 years of schooling (48.4%). When considering the total value of HeLD-14 questions, OHL was associated with covariates schooling, marital status and family income. **Conclusion:** OHL levels were associated with socioeconomic variables, contributing to evidence in this field of specialized care.

Keywords: Health Literacy; Health Education; Specialties, Dental; Secondary Care Centers.

Introduction

Health literacy has aroused the interest of researchers, especially in the last twenty years [1], increasing searches in databases, which found more than one thousand articles on the subject until the year of 2017, most of them with associations between health literacy and social and demographic covariates and health outcomes; however, it is the first time that a literacy study is carried out in a Center for Dental Specialties (CEO) [2]. Furthermore, knowledge transfer and health literacy were considered as priorities in the seventh global health promotion conference [3].

It is important to point out that Health Literacy (HL) is widespread as a measure of the ability of users to obtain, process and understand basic health information. In addition, this construct measures their decision-making skills in relation to care and disease prevention [4]. Therefore, good HL levels of users promote the search for health services in a preventive and early manner, especially with regard to diseases sensitive to Primary Care (AB), decreasing the demand for specialized services, as in CEOs, which provides greater burden to the health system and more iatrogenic therapy to users. Therefore, it is necessary to investigate possible associations with the HL levels of this population [4].

More specifically, Oral Health Literacy (OHL) is associated with dental care and outcomes [5]. Furthermore, numerous instruments have been used; however, few have been validated for Brazilian Portuguese, such as the Brazilian Rapid Estimate of Adult Literacy (BREALD-30), Oral Health Literacy Assessment-Spanish (OHLA-S) and, more recently, the Health Literacy in Dentistry (HeLD-14). Although the HeLD-14 instrument has already been validated in Brazil, only three studies are used, one in Brazil and two in Australia, so it is important to carry out studies in more population groups [6-10].

The "Brasil Sorridente" National Oral Health Policy PNSB was responsible for implementing an oral health care network aimed at comprehensive care, and, in 2004, through Decree No. 1.570/GM, this network considerably expanded the provision of secondary care from the creation of CEOs. CEOs are subdivided into three types (I, II, II) and differentiated by the number of operating dental equipment: three, from four to six and above six, respectively to the order of types, the minimum specialties are oral diagnosis, specialized periodontics, minor oral surgery, endodontics and care for patients with special needs [11].

In 2011, the Program for Improving Access and Quality of Basic Care (PMAQ) was created with the aim of contributing to the qualification of inequities in health services provided by primary health services and is currently working to correct problems, as in cases of physical precariousness, lack of adequate receptivity of patients, poor working conditions, lack of improvement in the work process, instability/overload of health teams, incipient management, low integrality and insufficient funding [12,13]. Additionally, PMAQ-CEO was established in 2013 and revised in 2015, the date of its first application, to contribute to secondary care [14].

Due to the quantitative lack of scientific articles associating OHL and health-related variables in Brazil [5], and because it is a service (CEO) that is widely spread throughout the country, combined with a recent evaluation process (PMAQ-CEO), the conduction of studies that explore this area is essential to qualify the health promotion policy and to achieve one of the five goals established by the Seventh Global Health Conference: Health Literacy and Health Behavior [3].

In this context, the aim of this work was to test possible associations between OHL level and socioeconomic covariates of CEO users.

Material and Methods

Ethical Clearance

This study was approved by the Research Ethics Committee of the Faculty of Dentistry of the Federal University of Pernambuco under protocol number 2.478.524. In addition, all volunteers signed the Free and Informed Consent Form (FICF).

Study Design and Sample Population

This is an analytical cross-sectional study. The convenience sample consisted of 130 adults (68.75%) aged 18-82 years, who were in the waiting room of Centers for Dental Specialties (CEO) of some municipalities in the state of São Paulo: Avaré, Barra Bonita, Bauru, Botucatu, Igaraçu do Tietê, Jaú, Lindóia, Macatuba, Pederneiras, Piracicaba, Rio Claro and Santa Bárbara d'Oeste. Subjects were invited to participate in the Program for Improving Access and Quality of Basic Care (PMAQ-CEO) and, together with the present study, signed the Free and Informed Consent Form. To be considered eligible for the research, individuals should meet the following criteria: having performed at least one consultation prior to the interview; self-reported ability to read and speak Brazilian Portuguese; no diagnosis of dementia, visual or hearing impairment, and not having used alcohol or drugs at the time of the interview. Illiterates and those under 18 years of age were excluded from the research. Sample type selection was due to logistical reasons arising from large territorial displacement (12 municipalities), with regional and pre-established selection, due to the need for brief execution to complete the PMAQ-CEO assessment, which was performed together from the application of the OHL instrument.

Data Collection

Data collection was carried out by means of interviews at the Centers for Dental Specialties in a reserved room through random selection in the waiting room. Data were collected in October, November and December 2018. Regarding the HeLD-14 instrument, the researcher attended a workshop with the advisor of the Faculty of Dentistry of Piracicaba (FOP-UNICAMP) in order to discuss the operationalization of work stages, the attributions of each participant and ensure an acceptable degree of uniformity in procedures, and finally, calibration. The order of application during the interview was initiated by the PMAQ-CEO instrument and then by HeLD-14, as the latter took an approximate time of 10-15 minutes.

Health Literacy in Dentistry (HeLD-14)

The HeLD-14 instrument was used because it took a shorter time to be applied, as it has fewer questions. Despite this, it is important to emphasize that this is a "short" version of HeLD-29, already validated by Mialhe et al. [8], which is based on seven characteristics: understanding, communication, access, receptivity, support, use and economic barriers (Chart 1). Furthermore, the establishment of validated and rapid instruments can be efficient for research reproducibility and clinical consultations to achieve improvements in oral health literacy.

Chart 1. The Health Literacy in Dentistry instrument and its 14 items with response options.

Items
Receptivity
1. Can you perceive what your oral health needs are?
2. Can you find time to do things that are good for your oral health (e.g., brushing your teeth or dentures)?
Understanding
3. Can you understand the information written, for example, in leaflets that the dentist gives you?
4. Can you understand the oral health information from leaflets left at dental clinics or waiting rooms?

Support
5. Are you able to take a family member or friend with you to the dental appointment, if necessary?
6. Can you ask someone to accompany you to a dental appointment, if necessary?
Economic Barriers
7. Can you afford to pay for a dentist appointment?
8. Can you afford the necessary medications to treat your oral health?
Access
9. Do you know how to obtain an appointment with a dentist?
10. Do you know everything you need to do to see a dentist?
Communication
11. Can you seek a second opinion from another dentist about your oral health, if necessary?
12. Can you use the information given by a dentist to make decisions about your oral health?
Use
13. Can you carry out the instructions that a dentist gives you?
14. Can you use the advice you received from a dentist to make decisions about your oral health?
Answers and Scores
No Difficulty [4]
Little Difficulty [3]
Medium Difficulty [2]
Great Difficulty [1]
No [0]

Each item was ranked on a 5-point scale, ranging from 0 to 4, so that high scores indicate minimal difficulties in performing functions (high OHL), and low scores indicate very limited ability to perform functions (low OHL). Thus, considering the total of items, scores can range from 0 to 56 points [10].

Socioeconomic Characteristics and Dental Specialties

In order to analyze the socio-economic characteristics of the sample, some questions were selected from the PMAQ-CEO data collection instrument, being subsequently categorized into the following covariates: "Education", with the following question: "What is your educational level?", which was sub-classified into years of schooling — 0 to 8 years, 9 to 11 years, 12 or more; “Gender”, with the following question: “What is your gender?”, with male or female as answer options; “Family Income”, with the following question: “What is the monthly family income in your house?”, which was sub-classified into number of minimum wages — up to 1, from 1 to 2, 3 to 5, 5 to 8, above 8; "Dental specialty", with the following question: "What type of treatment did you come for in this place?", which refers to the dental specialty - Endodontics, Minor Oral Surgery, Specialized Periodontics, Oral Diagnosis, Prosthetics, Specialized Dentistry, Pediatrics-Companion, Patient with special needs-Companion or Acupuncture and Urgency; “Marital status”, with the following question: “What is your marital status?”, which was sub-classified as single, married/stable union, divorced/separated/widowed; “Skin color (Self-declared)”, with the following question: “Which color do you declare yourself?”, which was sub-classified as White, Black, Brown or Yellow; “Area”, with the following question: “Do you live in an urban or rural area?”, with urban or rural area as answer options; “Unit” in which the interview was conducted, sub-categorized as Avaré, Barra Bonita, Bauru, Botucatu, Igaraçu do Tietê, Jaú, Lindóia, Macatuba, Pederneiras, Piracicaba, Rio Claro and Santa Bárbara d’Oeste; "Participation in the ‘Bolsa Família’ cash transfer program" - which deals with a Brazilian social program aimed at low-income families - with the following question: "Do you participate in the ‘Bolsa Família’ cash transfer program or have you already participated?", with sub-classification of yes/ already participated or no/never participated; “House covered by Community Health Agent (ACS)”, with the following question: “Do you receive a home visit from a Community Health Agent in your house?”, with yes or no as answer options - being that the Community

Agent is a professional who promotes the dialogue between health units and the community, which can contribute to a better relationship between them and change health care outcomes; and, finally, "Age"[14,15].

Statistical Analysis

Collected data were entered into a table in the Microsoft Excel® software (Microsoft, Redmond, WA, USA) and then in the MedCalc® statistical software (Medcalc® Software, Mariakerke, Belgium). In the latter, data were submitted to statistical analysis using the Levene test to verify the possibility of using one-way ANOVA, and in case results show positive values ($p>0.05$), the Kruskal Wallis test was used. All statistical significance levels in this study were 5% [16-20]

Results

The study included 130 individuals; however, two were excluded by the exclusion criteria, totaling 128 individuals. The average age of participants was 45 years, more than half being female (68.7%) with 9-11 years of schooling (48.4%) (Table 1).

Table 1. Characteristics of the analyzed sample.

Variables	N (%)
Gender	
Female	88 (68.7)
Male	40 (31.3)
Specialty	
Endodontics	34 (26.5)
Surgery	26 (20.3)
Prosthetics	26 (20.3)
Specialized Periodontics	15 (11.7)
Patients With Special Needs - Companion	8 (6.2)
Specialized Dentistry	7 (5.4)
Pediatrics - Companion	5 (3.9)
Oral Diagnosis	4 (3.1)
Urgency	2 (1.5)
Acupuncture	1 (<1)
Marital Status	
Single	33 (25.7)
Married/Belonging	71 (55.4)
Separated/Divorced/Widowed	24 (18.7)
Skin Color (Self-Declared)	
White	79 (61.7)
Brown	35 (27.3)
Black	14 (10.9)
Yellow	0 (<1)
Area	
Urban	124 (96.9)
Rural	4 (3.1)
House Covered by Community Health Agent	
Yes	54 (42.2)
No	74 (57.8)
Schooling	
0-8 Years	46 (35.9)
8-11 Years	62 (48.5)
9 Years or More	20 (15.6)
Family Income (in Minimum Wages)	
Up to 1	18 (14.0)
1 to 2	43 (33.6)

2 to 3	35 (27.3)
3 to 5	25 (19.5)
5 to 8	7 (5.4)
9 or More	0 (<1)
Participation in The '*Bolsa Família*' Cash Transfer Program	
Yes/Has Already Participated	31 (24.2)
No/Never Participated	97 (75.8)
Held – 14 Literacy	
Less Than or Equal to the Median (≤41)	65 (50.8)
Above the Median (>41)	63 (49.2)

In Table 2, the score of each question of the HeLD-14 instrument and covariates were individualized. The "Sum" representing the total score, which ranges from 0 to 56 points, was calculated and its association with covariates was also tested. Results showed statistical significance between "Sum" and items: "Education", "Marital status" and "Family Income". When individualized, the questions of the HeLD-14 instrument in association with covariates "House covered by ACS" presented association with Q-6; "Education" with Q-1, Q-2, Q-3, Q-4, Q-7, Q-8, Q-9, Q-10, Q-11, Q-12, and Q-14; "Dental specialty" with Q-8, Q-9, Q-10, Q-12, Q-13 and Q-14; "Marital Status" with Q-4, Q-9, Q-11 and Q-12; "Age Group" with Q-7; "Participation in the 'Bolsa Família' cash transfer program" with Q-5; "Family Income" with Q-3, Q-4, Q-6, Q-7, and Q-8; "Gender" with Q-5 and Q-6, and "Unit" with Q-11.

Table 2. Association between Oral Health Literacy and socioeconomic covariates.

Items	Q-01	Q-02	Q-03	Q-04	Q-05	Q-06	Q-07	Q-08	Q-09	Q-10	Q-11	Q-12	Q-13	Q-14	Sum
Area	0.066°	0.558°	0.351	0.582	0.367	0.290°	0.503	0.708	0.087°	0.073°	0.629	0.135°	0.471	0.213°	0.553
ACS Covered	0.978	0.527	0.092°	0.112°	0.109	< 0.001	0.475	0.696	0.707	0.642	0.789	0.899	0.238	0.179	0.227
Skin color	0.546	0.557	0.740	0.599	0.991	0.770	0.360	0.342	0.968	0.919	0.281	0.540	0.925	0.756	0.800
Schooling	0.016°	0.019°	0.001°	0.033°	0.543	0.448°	0.0004°	0.012	0.034°	0.030°	0.004	0.000°	0.167°	0.001°	0.000°
Specialty	0.688°	0.522°	0.142°	0.155°	0.871	0.751°	0.066°	0.478	0.035°	0.030°	0.071°	0.045°	0.046°	0.001°	0.070°
Marital Status	0.262	0.310°	0.054°	0.007°	0.210°	0.442	0.160	0.073	0.014°	0.052°	0.027	0.002°	0.054°	0.122°	0.004°
Age Group	0.761	0.116°	0.694°	0.713°	0.378	0.086°	0.001	0.189	0.511°	0.672°	0.210	0.261°	0.435°	0.161°	0.095°
Bolsa Família(1)	0.644	0.999	0.527	0.481	0.015°	0.057°	0.312°	0.051°	0.190	0.849°	0.325	0.960	0.432°	0.286°	0.053°
Family Income	0.106°	0.146°	0.001°	0.006°	0.182°	0.017°	0.000°	0.022	0.277°	0.244°	0.050	0.153°	0.201°	0.328°	0.002°
Gender	0.796	0.220	0.509	0.322°	0.020°	0.006°	0.565	0.250	0.819	0.056	0.207	0.589	0.162°	0.731°	0.651°
Unit	0.744	0.712°	0.579	0.351°	0.698°	0.661°	0.501	0.250	0.444°	0.822°	0.038	0.098°	0.258°	0.363°	0.763°

(1)Participation in the '*Bolsa Família*' cash transfer program; °The Kruskal Wallis test was applied after the Levene test was positive ($p<0.05$).

Discussion

The present study aimed to test the possible associations between Oral Health Literacy (OHL) levels of users of Centers for Dental Specialties (CEO) and health-related outcomes, as well as to analyze difficulties of access to CEOs due to socioeconomic factors. Therefore, it contributed to explore possible associations between OHL and the characteristics of users who seek specialized oral health services. However, there was a limitation regarding the number of participants due to logistical reasons arising from large territorial displacements (12 municipalities), with regional and pre-established selection due to the need for a brief execution to complete the PMAQ-CEO assessment, which occurred together with the application of the OHL instrument. In this sense, studies with calculated samples should be carried out so that they can be representative of populations.

The results presented by the OHL instrument are new for the secondary and specialized care of the Unified Health System (SUS). In studies carried out by Batista et al. [5] and Mialhe et al. [8] on the OHL

instrument, similar associations were found in the primary care (AB) of SUS, such as socioeconomic and dental outcomes, corroborating the findings of this study.

Regarding the total score, only "Education", "Marital status", and "Family Income" were statistically significant. The relationship between high OHL and individuals with higher educational level and those who live with a partner or even who live with other people is associated with better knowledge about health issues, better health practices or ease of access, similar to other findings in previous studies and in systematic reviews [21,22]. Furthermore, the statistical significance of family income allows hypothesizing that individuals with higher income have greater access to information of better quality, as well as to oral health products since family income inequalities can have direct interference in the acquisition of dental supplies — such as toothpaste, brush and floss [23]. "Area", either urban or rural, and "Self-declared skin color" were the only items that did not present statistical associations in any of the questions, nor in their "Sum".

Covariate "House covered by ACS" had statistical association only in question 6: "Can you ask someone to accompany you to an appointment with the dentist, if necessary?". This statement can be justified by the help of Community Health Agents (ACS), who track and monitor users of the health system on their way to health units, and also, through knowledge and trust, provide health education and guidance for the proper use and access to oral health services [24].

Covariate "Education", defined by the number of school years, was the main item with statistical significance in practically all questions. The results suggest that the longer the schooling, the better the indicators of development and understanding of health information, resulting in better OHL [8,25]. Similarly, using the HeLD-14 instrument in its total score, that is, as the "Sum" of this study, Mialhe et al. [8] found the same association with schooling, but in AB; therefore, the findings of this study corroborate the association in specialized care. However, when individualized, questions associated to schooling did not present statistical significance to questions 5, 6 and 13, which is due to the fact that questions 5 and 6 refer to the support domain, that is, they are more dependent on the individual's social life, according to previous research, in which partners can collaborate and facilitate access [22,26,27]. Question 13, referring to the use domain, may have obtained this result because, despite all the knowledge acquired, individuals may not be willing to comply with attitudes that they recognize are necessary or even consider themselves self-resolving, such as underutilization of health services for major or recurrent symptoms [28].

Covariate "Specialty" had statistical significance in questions 9, 10, 12, 13 and 14, which represent access, communication and use domains. That is, they are related to the ability of users to use health services, for example - "Do you know how to obtain an appointment with a dentist?" - which may represent the delay/lack of knowledge on the use of the preventive AB service, becoming a case demanding specialized dentistry, a service of greater complexity, diverging from a more conservative and radical endodontic/dental treatment - such as extraction - being associated with the reason for the last visit to the dentist due to pain or routine [8].

Regarding covariate "Marital status", the results showed statistical significance in questions 4, 9, 11, 12, and in the "Sum" of questions. In general, marital status was able to make the set of questions statistically significant, and it can be assumed that living with a partner can be considered essential to solve/help to solve problems raised in questions asked. Question 4, associated to the understanding domain, raises the hypothesis that, even if individuals do not understand the presented leaflets, they may have a person close to them to help them better clear their doubts — as reported in studies associating the presence of a partner and greater attention to care [26,27]. In questions 9, 11 and 12, which involve access and communication, it can be

assumed that the person can help the partner to search for one or more professionals, in addition to better understanding the information given by them [22,29,30].

Covariate "Age group" was only significant for question 7 of the economic barriers domain — "Can you afford to pay for an appointment with a dentist?". It can be assumed that the individual, regardless of income, can afford or "will find a way" to obtain an appointment with a dentist, or that the user may be aware, due to experience and dependence, of the possibility of finding access to dental treatment within the SUS [31], or even due to the condition of older individuals for helping dependents, or using numerous medications that compromise income, making payment for a dental appointment unfeasible. Thus, the insufficiency response of users, when asked in this research, is justified by question 7 of the HeLD-14 instrument [31-33].

Covariate "Participation in the 'Bolsa Família' cash transfer program" had an influence only on question 5 in the support domain, which is related to the displacement of family members or friends by the user for consultations. This can be explained by the fact that the 'Bolsa Família' cash transfer program is a social program that is premised on the existence of a low-income family including pregnant women and children or adolescents aged 0-17 years [34]. In this sense, it is assumed that a family is composed of 2 or more people and that one of them (the head of the family) will always be willing to take their children for care.

Covariate "Family income" shows significant results in the "Sum" and, individually, in questions 3, 4, 6, 7 and 8. Regarding questions 3, 4 and 8, association can be observed between understanding, support and economic barriers domains of individuals with higher family income in relation to access to study and knowledge to obtain the necessary answers for their clarification, in addition to being able to acquire dental supplies and instruments [23]. Additionally, questions 6 and 7 suggest the possibility of resources for displacement or even the presence of a family member to accompany individuals to appointments.

Covariate "Gender" was only significant in questions 5 and 6, as males, although less prevalent in the study, obtained different values compared to females, both for asking for company for consultations and being able to be taken to appointments. This fact can be justified, for example, by the fact that men are still, to a large extent, the only workers outside the home and financial providers of Brazilian households, with women being responsible for domestic and child-rearing functions. In this way, they have greater time flexibility and, consequently, are more likely of being able to use oral health services - given the fact that most services work during working/commercial hours, but on the other hand, they are less likely of obtaining company and financial resources for the displacement [34].

Covariate "Unit", which refers to which Center for Dental Specialties the individual was interviewed, only question 11 - "Can you obtain a second opinion about your oral health?" — had statistical influence. This statement is supposedly justified because the local service allows the same patient to search for more professionals to obtain a second opinion, or having two units, as in the municipality of Piracicaba, Brazil.

Conclusion

Oral health literacy was associated with the use of certain dental areas in specialized services, care and relationship with socioeconomic factors. Therefore, the results of this study can support oral health professionals and managers in decision-making, with the joint analysis of OHL studies carried out in AB, so that programs aimed at improving OHL levels in the population are encouraged to establish a better relationship between AB-sensitive issues and specialized services such as CEOs.

Authors' Contributions

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All authors declare that they contributed to critical review of intellectual content and approval of the final version to be published.

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Conflict of Interest

The authors declare no conflicts of interest.

Data Availability

The data used to support the findings of this study can be made available upon request to the corresponding author.

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