

Characteristics of oral health literacy in Senegal: A cross-sectional study among women in the Department of Pikine

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Abstract

Senegal having a significant prevalence of socially differentiated oral diseases, oral health literacy (OHL), an individual and social resource, should be considered alongside a remedial response. This work aimed to analyze women's OHL characteristics. A cross-sectional study on 315 women in Pikine County was carried out, using the Oral Health Literacy-Adult Questionnaire (OHL-AQ) for the OHL data collection and a questionnaire for the women's socioeconomic characteristics data. These women had an OHL average score of 6.5 ± 3.1 and a median of 6. Among them, 56.5% had a seemingly low OHL level, a little over 68.9% had a score above the median as regards the "listening, communication and understanding" aspect, 58.4% to "decision making", 55.2% to "understanding numbers" and 33% to "reading and understanding". According to a multivariate analysis, secondary and higher educated women ($p < 0.001$) with an active social network ($p < 0.023$), in a wealthy household ($p < 0.0001$) and of nuclear household type ($p < 0.036$) had a higher OHL level. Women in Pikine have low OHL and are from working-class households. Therefore, oral health policies must take into account the women's social network contribution to the OHL improvement.

Introduction

In recent years, health literacy (HL) scoop has seen a revival of major mutations in the population's health. Due to complex healthcare systems coupled with the pandemic of chronic conditions, particularly in industrialized countries, patients have to be

specifically competent and be more in control of their health.¹ HL involves the ability to access, understand, assess and appropriately use health information to promote and maintain good health.² It implies a certain knowledge, personal skills and self-confidence to improve personal and community health by changing their habits and living conditions.³ According to Nutbeam, there are three levels of HL, which are "functional", "interactive" and "critical". "Functional" HL refers to basic skills of reading and writing for everyday situations. "Interactive" HL involves cognitive skills alongside psychosocial skills to actively participate in everyday life.⁴ "Critical" HL involves advanced cognitive skills with psychosocial skills to assess information, make an informed decision, appropriately use health services and be more in control of everyday life events.⁴ "Interactive" HL implies the ability to interact with one's surroundings, skills to create dynamic social networks.⁵

In dentistry, OHL is the individual and social ability to maintain and improve oral health.⁶ It, however, reveals some oral health disparities, oral health prevention⁷ and care⁸ access issues. Unlike individuals with high OHL, those with limited OHL are at higher risk of developing dental caries,⁹ periodontal disease,¹⁰ and are less compliant with dental check-ups.¹¹ According to the literature, certain socioeconomic characteristics including education, income and social cohesion determine the OHL level.^{12,13}

In Senegal, a 2015 STEP survey had revealed that the prevalence of dental caries and gingivitis among women is 79.7% and 21.8%, respectively.¹⁴ The care supply is low and unequal with one dentist per 27,540 inhabitants where 76.6% of whom are in the country's capital, Dakar.¹⁵ In practice, they offered curative care most, with high costs essentially borne by households, while the country's economic situation hinders no hope, in the medium term, for an accessible and universal oral health care supply. Therefore, it is necessary to develop, in conjunction with curative care, an approach promoting health by generating or maintaining good health, involving particularly the community and individual and collective skills. OHL is among promising approaches,⁷ which will be beneficial if based on family, specifically, on women due to their main role in managing the family health and disease, particularly for the children. Some studies have reported a significant association between maternal characteristics and children's oral health.^{16,17} In a meta-analysis in 2018, Firmino *et al.* had specifically suggested that good parental

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Informed consent: The manuscript does not contain any individual person's data in any form.

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OHL correlated with a lower risk of dental caries and poorer oral health-related quality of life.¹⁸ The 2014 study by Vichayanrat *et al.* concluded that good maternal OHL leads

to good oral health in children.¹⁹ OHL affects directly the mother's knowledge and beliefs, leading children to eat healthier and regularly brush their teeth.^{20,21}

Promoting better oral health in families in Pikine, especially among children, requires knowledge of the women's oral health characteristics. This work aimed to analyze the OHL's characteristics of women in Senegal.

Materials and methods

Ethical considerations

The study was approved by the Health Research National Ethics Committee (HRNEC) of the Senegalese Ministry of Health and Social Action with the reference 00050MSAS/DPRS/. The participants had materialized their acceptance by signing a free and informed consent document. A data confidentiality agreement was concluded between the participants and the principal investigator.

Type, setting and study population

A cross-sectional study was conducted in Pikine, a department in Dakar with 16 communes. The study population consisted of women (mothers) over 18 years old. Inclusion criteria were to be a resident of a selected commune for at least one year, have at least one dependent child, and agree to participate in the study by signing a free and informed consent. Women with a disability or any other disease that could hold back the data collection were not included in the study.

Sampling and sample size

The data were collected from an original study of a population of children aged three to nine years and their mothers assessing the prevalence and associated factors of dental caries in children. The sample size was $N=35 \times 9=315$ child-woman pairs,¹⁷ the needed number of subjects for field surveys according to the so-called "exploratory" method defined by the WHO. It suggests selecting between 20 and 50 subjects per site depending on the magnitude of the parameter to be analyzed.²² Given that nine sites out of the department' 16 were selected, there were thirty-five subjects per site based on the 68% prevalence of dental caries among children in Pikine. Thus, 315 women made up the study population.

The study variables

Oral health literacy

The OHL was measured with the Oral

Health Literacy-Adult Questionnaire (OHL-AQ),²³ which has seventeen items divided into four dimensions: "reading and comprehension"; "understanding numbers"; "listening, understanding and communicating"; and "making appropriate decisions" in oral health. A correct answer scores 1 and a wrong answer 0, thus, the total score (unweighted sum) ranges from 0 (lowest) to 17 (highest). From the median score, the OHL and its four dimensions were divided into dichotomous categorical variables for the statistical analyses. Thus, the minimum score to the median score inclusive represents the "lower OHL" class and scores above the median score represent the "higher OHL" class. The published questionnaire was translated from English into Wolof and French.

The women demographic and social characteristics

Age in years was divided into two categories based on the median age: under 35 years old/35 years or more. The education level was defined according to two modalities: not enrolled or primary/secondary or higher education; work status distinguishes women with a paid job and those without one; the occupation distinguishes working class, women executive or middle-level profession. The number (density) and the frequency (activity) of contacts with one's environment estimate the social network. The variable "number", called social support is divided into two categories according to the median score: strong support/weak support; while the frequency is made up of three categories that are rare (less than 1 time/month), frequent (at least 1 time/month) and very frequent (at least 1 time/week).²⁴

Household characteristics

They are the estimated wealth and the structure. The estimated household wealth was based on a list of households compared to a list of basic assets based on the indicators used in the Senegalese poverty monitoring reports.²⁵ The households were classified into poor, average, and rich. The structure is defined by the relationship between the members (living under the same roof) around the couple or a parent and his/her children. A nuclear household consists of a couple with their children, an extended household includes a couple living with related or unrelated members, and a redefined household includes a couple with their own and other children and possibly other members.²⁵

Data collection

Socio-demographic and OHL data were

collected using a face-to-face questionnaire in French or Wolof by two trained interviewers. The inter-interviewer's agreement estimated by the Kappa test was 87.2%, calculated from the pre-test survey data on a sample of 20 women from another commune in the Dakar suburbs.

Analysis plan

Data were processed with Excel and analyzed using the STATA.13 software. The Chi-2 test of association was used for the bivariate analysis between the OHL and the independent variables. A logistic regression model was developed with the variables whose p-value was significant in bivariate analysis. The sociological lowest rank variable was chosen as the reference category. A significance level of $p<0.05$ was used.

Results

The average age of the women was 34 ± 7 years. A little over two-thirds of them (68.3%) were not educated or had primary school level, 52.1% had a paying job with 53.1% among them being working-class workers and 21.9% executives. They had a dynamic social network (41.6% very frequent contacts and 36.8% frequent contacts), lived in a predominantly poor (54.6%) and extended (64.4%) household (Table 1). Their average OHL score was 6.5 ± 3.1 and the median was 6, 56.5% of them had an OHL level above the median. Depending on the dimensions, 33% of the women had scores above the median for "reading and comprehension," 58.4% for "decision making", and 68.9% for "listening, communication, and comprehension" (Table 2). With the bivariate analysis, the OHL was significantly associated with their education level ($p<0.001$), paying job ($p<0.0010$, occupation $p<0.001$), and contact frequency ($p<0.009$), and with household wealth ($p<0.001$) and structure ($p<0.001$) (Table 2) as well. The multivariate analysis had shown a higher level of OHL among women with secondary or higher education [OR=6.43 and CI 95% = (3.38-12.23)], those with very frequent contact with their social network [OR=1.49 and CI95% = (1.14-2.98)] and those living in a wealthy household [OR=4.70 and CI95% = (1.95-11.38)] and of nuclear type [OR=1.91 and CI95% = (1.04-3.49)] (Table 3).

Discussion

The study has some limitations. Among them the non-approval of the OHL measurement in the local language is one.

However, all investigators were fluent in the local language and cultural context. The collection of certain data by questionnaire can be considered as a limitation. In fact, when faced with questions that involve the image of the person, some tend to systematically give a favorable answer. Which may be at the origin of a social desirability bias.

This study is the first one in Senegal to focus on childbearing age women's OHL characteristics. The main finding has shown that women's OHL is characterized by its low, average and varied score according to individual factors (education level and social network) and household characteristics (wealth and typology). It was reported good communication and appropriate decision-making skills in the women. Their OHL average level score was very low compared to the threshold score of 12 by the designers of the study measurement scale.²³ The literature has reported better OHL average scores than those found in the study.

Using the same measurement tool (OHL-AQ), Vyas *et al.*²⁶ and Mohammadi *et al.*²⁷ had found scores twice as high (13.9 and 12.07 respectively) as those in this study. Other studies in the USA²⁸ and Hong Kong,²⁹ however, using different measurement tools, found better average scores than those of this study. These observed differences in OHL levels can be attributed to the diversity of measurement tools, study populations or socio-cultural contexts. The heterogeneity of measurement tools from the literature can lead to a diversity of results and makes comparisons difficult. The studies conducted in the USA and Hong Kong have used the REALD-30, a tool limited to the evaluation of functional OHL, as reading, calculation and comprehension skills.⁴ This form of assessment is part of a piecemeal conception of OHL. In contrast, in this study, a tool that is designed to be more consistent with the current understanding of OHL was used.

The study has highlighted improved "listening and communication" and "appropriate decision making" skills in women. While fewer of them had "properly" answered the reading and comprehension section, they were many to correctly answer the listening, comprehension and communication and appropriate decision-making sections. It was revealed that a low percentage of women had a high school education or higher, and it is known that education is strongly correlated with the level of OHL. Furthermore, the result could imply the role of "orality", which is prevalent in the Senegalese context. Unlike orality, OHL is strictly associated with academic skills. In oral cultures, speech dominates in communication and generates systems of representations and behaviors linked to the cultural context.³⁰ Such orality creates an interesting perspective in the OHL conceptualization in the Senegalese context.

The interaction between the cultural and

Table 1. Characteristics of women and households and bivariate analysis (N=315).

Variables	Descriptive analysis		Bivariate analysis with the OHL	
	N	%	OR non-adjusted	p
Characteristics of the women				
Age bracket				<0.522
≤35 years	188	59.7	1	
>35 years	127	40.3	1.16(0.74-1.82)	
Age average in years (±ET)	34(±7)			
Education				<0.001
None-Elementary	215	68.3	1	
Secondary or higher	100	31.7	11.08(6.23-19.72)	
Paying job				<0.001
Not working	151	47.9	1	
Working	164	52.1	2.69(1.69-4.27)	
Occupation				<0.001
Working-class	87	53.1	1	
Middle-class	41	25	2.45(1.14-5.21)	
Executive	36	21.9	9.66(3.2-27.29)	
Social support				<0.924
Weak	178	56.5	1	
Strong	137	43.5	1.02(0.65-1.60)	
Average of supports (±ET)	6(±3)			
Contacts frequency				<0.008
Rare	68	21.6	1	
Frequent	116	36.8	1.75(0.93-3.32)	
Very frequent	131	41.6	2.60(1.39-4.84)	
Oral Health Literacy	315			
Low	178	56.5		
High	137	43.5	-	-
Average score (±ET)	6.5(±3.1)			
Characteristics of the households				
Household wealth				<0.001
Poor	172	54.6	1	
Average	95	30.2	4.31(2.52-7.36)	
Rich	48	15.2	11.40(5.24-24.80)	
Household structure				<0.001
Extended	92	29.2	1	
Nuclear	203	64.4	2.47(1.49-4.09)	
Other	20	6.4	2.73(1.07-6.98)	

socioeconomic context and the health and education systems produces the level of OHL,³¹ which explains the women's low level of OHL in this study. Indeed, individual characteristics of women and material conditions of households were revealed to be factors associated with OHL through a logistic regression model. The relationship between individual characteristics and women's OHL suggests that the level of OHL increases with education and the dynamism of social networks. The OHL is closely related to school knowledge, which contributes to varying degrees of the demands of society,³² including those related to oral health. This result is supported by the high proportion (68.3%) of the study population who were not educated or had primary education. Such findings highlight the low educational rate of Senegalese women¹⁴ and are consistent with previous studies that had found a strong influence of

educational level on OHL.^{13,27} Lopes *et al.* have reported, in a study in Brazil that women with more than eight years of education had, on average, seven times higher OHL scores than women with eight or fewer years of education.¹² Furthermore, women's social network significantly influences their OHL level. Information and knowledge, especially health information, reach social networks and are shared voluntarily or involuntarily among members.³³ It contributes to shaping attitudes through the influences it induces.³⁴ Thus, frequent interaction with family, relatives, neighbors, colleagues and friends is a privileged means of sharing information and developing health knowledge, particularly in terms of care.^{35,36} In Senegal, many women socially interact through associations or groups for solidarity, mutual aid, or the informal economy. Thus, these findings highly suggest promoting women's networks in Senegal

for health promotion purposes. The country's community health policy is based on a network of community health actors (community relays and Bajanu Gox) made up mainly of women who are mainly focused on maternal and child health. They organize social mobilizations, home visits and awareness-raising sessions, to support the referral health structure, significantly reducing maternal and infant mortality in Senegal.³⁷ Community actors, though enhanced women's social networks can improve the oral health of their children while improving their OHL

The results of the study suggested that the socio-economic context is another OHL low-level rate factor because material conditions and household size influence the women's OHL level. Such findings corroborate the literature's report of a significant relationship between the family socioeconomic status and its members' OHL.¹² Yet

Table 2. Distribution of oral health literacy level and its dimensions (N=315).

Variables	N (%)	Average score ± ET (min-max)
Oral Health Literacy (OHL)		
Low	178(56.5)	6.5±3.1 (1-16)
High	137(43.5)	
Reading and comprehension		
Low	211(66)	2.1±1.1 (0-6)
High	105(33)	
Understanding the numbers		
Low	141(44.8)	1.7±1 (0-4)
High	174(55.2)	
Listening, communication and comprehension		
Low	98(31.1)	0.8±0.6 (0-2)
High	217(68.9)	
Appropriate decision making		
Low	131(41.6)	1.9±1.2 (0-5)
High	184(58.4)	

Table 3. Results of the multivariate analysis (N=315).

Variables	OR Adjusted (IC 95%)	P
Age		
≤35 years	1	<0.458
>35 years	0.78(0.43-1.36)	
Education level		
None-Elementary	1	<0.001
Secondary-Higher Education	6.43(3.38-12.23)	
Contacts frequency		
Rare	1	<0.087
Frequent	1.34(0.73-2.12)	
Very frequent	1.49(1.14-2.98)	
Household wealth		
Poor	1	<0.001
Average	2.98(1.63-5.45)	
Rich	4.70(1.95-11.38)	
Household structure		
Extended	1	<0.036
Nuclear	1.91(1.04-3.49)	
Other	2.45(0.75-8.05)	

most inhabitants of Pikine and their extended families are highly impacted by insecurity unlike the nuclear households,²⁵ the inverse relationship between household size and OHL is also within that context. Unlike this finding, Lopes *et al.*, in a study about Brazilian adolescents, have reported a higher OHL average score of the latter in families of more than five members, which is due to information sharing and the mutual influence on health.¹² A dynamic social network in the dissemination of information supports this argument.

Conclusions

The study had revealed a low level of OHL among women, which is correlated with the level of education, social networks, and the material conditions and size of the women's households. Women's characteristics and their family social environment help shape their OHL levels. Enhancing women's HL is a means of empowering them and encouraging their community participation in oral health promotion. Within that context, a proportionate universalism approach to interventions can address women's OHL characteristics. It will consist, in addition to suggesting actions for all, to target certain women according to their OHL level. These interventions can be based on their socialization network. This study also reveals the need for additional research to contextualize the OHL and its determinants, and to develop a measurement tool that takes into account the context of orality in Senegal.

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