Oral health behaviour perception scale applied among a sample of Portuguese adolescents.

Escala de percepción del comportamiento de salud bucal aplicada en una muestra de adolescentes Portugueses.

Odete Amaral.[1]
Patrícia Couto.[2]
Inês Coelho.[3]
Maria José Correia.[2]
Nélio Jorge Veiga.[2]

Affiliations:
[1]CI&DETS – Polytechnic Institute of Viseu, Portugal.
[2]Universidade Católica Portuguesa, Faculty of Dental Medicine, Centre for Interdisciplinary Research in Health (CIIS), Portugal.
[3]Family Health Unit Grão Vasco, Viseu, Portugal.

Corresponding author: Nélio Jorge Veiga. Universidade Católica Portuguesa, Estrada da Circunvalação, 3504 - 505, Viseu, Portugal. **Phone:** (00351) 966454933 Email: nelioveiga@gmail.com

Abstract: Introduction: The application of a scale can be particularly useful for the epidemiological studies comparing different populations and for analysis of the influence of distinct aspects of oral health on the development of certain health conditions. The aim of this study consists in the creation of a scale to classify the level of perception of the oral health behaviors applicable to a sample of Portuguese adolescents. **Material and Methods:** An observational cross-sectional study was designed with a total of 649 adolescents between the ages of 12 and 18 years old from five public schools in the Viseu and Guarda districts, in Portugal. Data was collected by the application of a self-administered questionnaire and, after analysis of data collection, the newly Universidade Católica Portuguesa (UCP) oral health perception scale was created. Statistical analysis was performed using SPSS-IBM software version 24.0 (IBM SPSS, Chicago, Il., USA). In the descriptive statistical analysis, absolute and descriptive frequencies were used for variables with nominal measurement level, mean as a measure of central tendency and standard deviation as a measure of dispersion for interval variables. **Results:** Oral health behaviors perception respecting the assumptions defined by the present scale has been elaborated. The result showed that 67% of the sample presented a poor perception of their oral health behaviors, 23.9% intermediate/sufficient, while 8.2% refer having good perception, respecting the assumptions defined for the elaboration of the present scale. **Conclusion:** For this purpose, through the scale to classify the level of oral health behaviors applicable to the sample of portuguese adolescents, it is possible to compare the data of several samples and understand what are the most frequent oral or eating habits among adolescents.

Keywords: Oral health; Oral hygiene; perception; behavior; adolescent; surveys and questionnaires.

Resumen: Introducción: La aplicación de una escala puede ser particularmente útil para los estudios epidemiológicos que comparan diferentes poblaciones y para el análisis de la influencia de distintos aspectos de la salud bucal en el desarrollo de determinadas condiciones de salud. El objetivo de este estudio consiste en la creación de una escala para clasificar el nivel de percepción de las conductas de salud bucal aplicable a una muestra de adolescentes portugueses.

Material y Métodos: Se diseñó un estudio observacional transversal con un total de 649 adolescentes de entre 12 y 18 años de cinco escuelas públicas de los distritos de Viseu y Guarda, en Portugal. La recolección de datos se realizó mediante la aplicación de un cuestionario autoadministrado y, tras el análisis de la recolección de datos, se creó la nueva escala de percepción de salud bucal de la Universidade Católica Portuguesa (UCP). El análisis estadístico se realizó utilizando el software SPSS-IBM versión 24.0 (IBM SPSS, Chicago, II., EE. UU.). En el análisis estadístico descriptivo se utilizaron frecuencias absolutas y descriptivas para variables con nivel de medida nominal, media como medida de tendencia central y desviación estándar como medida de dispersión para variables de intervalo. **Resultados:** Se

ha elaborado la percepción de conductas de salud bucal respetando los supuestos definidos por la presente escala. El resultado mostró que el 67% de la muestra presentó mala percepción de sus conductas de salud bucal, el 23,9% intermedia / suficiente, mientras que el 8,2% refiere tener buena percepción, respetando los supuestos definidos para la elaboración de la presente escala. **Conclusión:** Para ello, a través de la escala para clasificar el nivel de conductas de salud bucal aplicable a la muestra de adolescentes portugueses, es posible comparar los datos de varias muestras y comprender cuáles son los hábitos orales o alimentarios más frecuentes entre los adolescentes.

Palabra Clave: Salud bucal; higiene bucal; percepción; conducta; adolescente; encuestas y cuestionarios.

INTRODUCTION.

Oral health promotion in the school context should be driven by primary preventive programs in society, which should aim at oral health education and literacy, as well as providing information for the development of healthy oral hygiene habits.[1,2]

Oral health education allows to predict the behaviors and habits of children and adolescents, from which the existence or absence of oral diseases is diagnosed, and their treatment defined. Another measure of the integration of oral health in schools, in the national context, is the reformulation of school curricula together with school health teams. This integration makes it possible to define health education strategies that may stimulate the capacity of the school and family in the adolescent´s oral hygiene and the promotion of healthy eating.[3,4]

In order to have an adequate intervention and a clear definition of the strategies, the assessment of oral health indicators and the development of appropriate scales are essential to evaluate the epidemiological reality from a clinical and behavioral point of view.[1]

In the oral health literature, there are few publications describing the combination of different variables to create a specific oral health scale, in particular, to assess the perception of oral health behaviours among adolescents. The idea of representing the perception of oral health in a single numerical value is of particular interest and gives the possibility to researchers to understand in a more objective and quantitative manner epidemiological variables.[1] Also, the application of a

scale can be particularly useful for the epidemiological studies comparing different populations and for analysis of the influence of distinct degrees of oral health on the development of certain health conditions.[1]

The aim of this study consists in the creation of a scale to classify the level of perception of the oral health behaviors applicable to a sample of Portuguese adolescents.

MATERIALS AND METHODS.

The present study is an observational cross-sectional study and obtained approval by the Health Sciences Institute of the Universidade Católica Portuguesa and the formal authorization of the participating schools.

The informed and explicit consent of the adolescents participating in the study and their legal guardians was also received. A total of 649 adolescents (56.4% of the female gender) between the ages of 12 and 18 years old from five public schools in the Viseu and Guarda districts (Aguiar da Beira, Mundão, Abraveses, Mangualde and Satão) during the year 2017 participated in this study.

These schools have been collaborating with the Faculty of Dental Medicine of the Universidade Católica Portuguesa in other research-orientated projects. All schools participated in the community oral health program "My Best Smile" developed by the Institute of Health Sciences of the Universidade Católica Portuguesa.

Data was collected by the application of a self-administered questionnaire and, after analysis of data collection, the newly UCP oral health perception scale was created.

This research involving human participants was performed in accordance with the Declaration of Helsinki and it was approved by the Ethics Committee of the Universidade Católica Portuguesa, Portugal. The information collected by the questionnaires was provided voluntarily and confidentially was preserved. The anonymity of the information collected was guaranteed by telling adolescents not to sign their names or write down any other form of identification in any part of the questionnaire.

Statistical analysis was performed using SPSS-IBM software version 24.0 (IBM SPSS, Chicago, Il., USA). In the descriptive statistical analysis, absolute and descriptive frequencies were used for variables with nominal measurement level, mean as a measure of central tendency and standard deviation as a measure of dispersion for interval variables.

The sum of the partial indexes of the variables result in the overall oral hygiene value, which has a minimum value of 14 and a maximum of 34.

According to the response tendency, the lower this index, the less appropriate will be the oral health behaviors and the oral hygiene level of the adolescent. Based on the formula Average (M) ± 0.25 Standard Deviation (SD), cutoff groups were grouped which will allow the following classification regarding oral health behaviors in adolescents[5]:

- Insufficient - (≤ M-0.25 SD);
- Intermediate / Sufficient - (> M-0.25 SD <M + 0.25 SD);
- Good - (≥ M + 0.25 SD).

According to the data skewness and kurtosis if the groups are homogeneous, the most correct one will be used (M±0.25 SD), however, if they are not homogeneous groups, we can use the following formula (Median±0.25, interquartile range). From the calculations performed, we found that: M=24.55; SD=3.01. Thus, we obtained the following classification to determine the level of perception of oral health behaviors of a adolescent who answered the questionnaire:

- Insufficient - (≤ 23.8);
- Intermediate / sufficient - (> 23.8 and < 25.3);
- Good - (≥ 25.3).

According to the percentiles obtained:
- Percentile 25 - 23 points;
- Percentile 50 - 24.5 points;
- Percentile 75 - 27.0 points.

By the percentiles, we were able to establish the following final cutoff points for classifying the level of perception of oral health behaviors:

- Insufficient - (≤ 23.0);
- Intermediate / sufficient - (23.0 - 27.0);
- Good - (≥ 27.0).

RESULTS.

The process of creation of the scale was properly structured for the perception of adolescents' oral health behaviors. Thus, the following questions / variables were selected for inclusion in the scale, and data was collected using a self-administered questionnaire. All variables were assigned a numeric index as follows.

How do you describe your oral health?

To obtain the index of the description of their own oral health we used the following items "Very good"; "Good"; "Reasonable"; "Weak"; "Very weak" with a score, revealing that the lower the index, the worse the adolescent's oral health (Table 1).

Do you consider yourself informed about oral hygiene/oral health?

To obtain the oral hygiene / oral health information level index we used the following items "Very"; "Reasonable"; "Little"; "Nothing" with the attribution of a score, revealing that the lower the index, the worse the adolescent's oral health knowledge and information level (Table 2).

Brushing

Based on the variables of the questionnaire "Do you brush your teeth every day?" and "How many times do you brush your teeth per day?", a numerical index of brushing was determined based on the following empirical criteria (Table 3).

Average oral hygiene time

Based on the variables of the questionnaire "Each time you perform your oral hygiene on average, how long does it take?", a numerical index of minutes spent on oral hygiene was determined based on the following empirical criteria (Table 4).

Achievement of oral hygiene

Based on the variables of the questionnaire "How do you perform your oral hygiene?", A numerical index of how oral hygiene was performed based on the following empirical criteria was determined (Table 5).

Use of fluoride toothpaste

Based on the variables of the questionnaire "Do you use a fluoride toothpaste?", a numerical index was determined taking into account the use of the

toothpaste referred to in the questionnaire and based on the following empirical criteria (Table 6).

Correct Brushing Awareness

Based on the variables of the questionnaire "With regard to brushing, do you know how to brush your teeth correctly?", a numerical index was determined for the awareness of correct brushing based on the following empirical criteria (Table 7).

Flossing

Based on the variables of the questionnaire "Do you usually use dental floss?", a numerical index regarding the use of dental floss by the adolescent was determined based on the following empirical criteria (Table 8).

Dental appointment

Based on the variables of the questionnaire "Have you ever had a dental appointment?", a numerical index was determined for the adolescent consultation with the dentist based on the following empirical criteria (Table 9).

Dental appointment in the last 12 months

Based on the variables of the questionnaire "In the last 12 months have you had a dental appointment?", a numerical index was determined for the adolescent consultation with the dentist based on the following empirical criteria (Table 10).

Toothache

Based on the variables of the questionnaire "In the last 12 months, did you have a toothache?", a numerical index was determined for the adolescent consultation with the dentist based on the following empirical criteria (Table 11).

Gum bleeding and/or pain during brushing

Based on the variables from the questionnaire "In the last 12 months did your gums bleed or hurt during tooth brushing?", a numerical index for gingival bleeding during brushing was determined by the adolescent based on the following empirical criteria, they introduce themselves (Table 12).

Gum or gingival inflammation

Based on the variables of the questionnaire "In the last 12 months have you ever had gum or gingival inflammation?", a numerical index was determined for the presence of gingival inflammation by the adolescent based on the following empirical criteria (Table 13).

Consumption of sugary foods

Based on the variables of the questionnaire "Do you eat sugary foods?", a numerical index was determined for the consumption of sugary foods by adolescents based on the following empirical criteria (Table 14).

Consumption of sugary foods between and/or after meals.

Based on the variables of the questionnaire "When do you usually eat sugary foods?", a numerical index was determined for the period of consumption of sugary foods by adolescents based on the following empirical criteria (Table 15).

Table 1. Scores attributed to the perception of the students about their own oral health status.

	Variable	Score
How do you describe your oral health?	Very good	4
	Good	3
	Reasonable	2
	Weak	1
	Very weak	0

Table 2. Scores attributed to the perception of information about oral hygiene and oral health.

	Variable	Score
Do you consider yourself informed about oral hygiene / oral health?	Very	3
	Reasonable	2
	Little	1
	Nothing	0

Table 3. Scores attributed to the perception of daily brushing.

	Variable	Score
Do you brush your teeth every day?	No	0
	Yes	1
How many times do you brush your teeth per day?	≥ 3 times per day	3
	2 times/day	2
	Once a day	1
	< once a day	0

Table 4. Scores attributed to the perception of the average time necessary to guarantee a proper oral hygiene.

	Variable	Score
Average oral hygiene time.	≥ 3 minutes	3
	2 minutes	2
	1 minute	1
	Less than a minute	0

Table 5. Scores attributed to the perception of how oral hygiene should be performed.

	Variable	Score
How do you perform your oral hygiene?	Brush gums, teeth and tongue	3
	Brush teeth and tongue	2
	Brush teeth and gums	1
	Only brush teeth	0

Table 6. Scores attributed to the perception of how oral hygiene should be performed.

	Variable	Score
Do you use fluoride toothpaste?	Yes	1
	No	0
	Do not know	0

Table 7. Scores attributed to the perception of knowledge towards the correct brushing habits.

	Variable	Score
Do you know how to brush your teeth correctly?	Yes	2
	Reasonably	1
	No	0

Table 8. Scores attributed to the perception of the daily use of dental floss.

	Variable	Score
Do you usually use dental floss?	Yes, on a daily basis	2
	Yes, sometimes	1
	No	0
	I do not know what is flossing	0

Table 9. Scores attributed to the perception of having had a dental appointment during the whole life of the student.

	Variable	Score
Have you ever had a dental appointment?	Yes	1
	No	0

Table 10. Scores attributed to the perception of having had a dental appointment in the last 12 months.

	Variable	Score
In the last 12 months have youYes had a dental appointment?	Yes	1
	No	0
	Do not know/do not remember	0

Table 11. Scores attributed to the perception of having had a toothache in the last 12 months.

	Variable	Score
In the last 12 months, did you have a toothache?	Yes	1
	No	0

Table 12. Scores attributed to the perception of symptomatology of the gums in the last 12 months during brushing.

	Variable	Score
In the last 12 months did your gums bleed or hurt during tooth brushing?	No	3
	Yes, sometimes	2
	Yes, very oftenly	1
	Yes, always	0

Table 13. Scores attributed to the perception of gum inflammation in the last 12 months.

	Variable	Score
In the last 12 months have you ever had gum or gingival inflammation?	No	3
	Yes, sometimes	2
	Yes, very oftenly	1
	Yes, always	0

Table 14. Scores attributed to the perception of consumption of sugary foods.

	Variable	Score
Do you eat sugary foods?	No	3
	Rarely	2
	Somtimes	1
	Everyday	0

Table 15. Scores attributed to the daily moments of sugary food consumption.

	Variable	Score
When do you usually eat sugary foods?	After meals	2
	Between meals	1
	Before going to sleep	0

Analyzing the sample included in the present study, and considering the percentiles defined to establish the cutoff points for the classification of the level of perception of oral health behaviours, we verified after applying the scale created that:

67.9% (441) of the sample (present insufficient perception of adequate oral health behaviors;

23.9% (155) intermediate/sufficient;

and only 8.2% (53) present what is considered in the scale as having a good classification in terms of perception of oral health behaviors respecting the assumptions defined for the elaboration of this scale.

DISCUSSION.

In the process of developing the present scale by the self-administered questionnaire, epidemiological data was used in order to operationalize its variables, based on the following empirical criteria:

1. The moderate prevalence of oral diseases, including dental caries, in the adolescent population

Dental caries in the adolescent population remains the most common chronic pathology in adolescents and is more common among children and adolescents aged 5-17 years.[4,5]

Due to poor oral hygiene, which will result in the onset of dental pathologies during childhood, youth and adulthood; at the psychological level; overall health and family quality of life.[4,5]

The study developed by the General Directory of Health, of Portugal, in 2008, on the prevalence of dental caries among children, demonstrates that 51% of Portuguese children with 6 years of age did not have dental caries, registering a decayed, missing and filled permanent teeth index (DMFT index) at 6, 12 and 15. years of 0.07, 1.48 and 3.04 respectively.[5]

On the other hand, the result of the study developed by Reis *et al.*,[6] showed that the prevalence of dental caries among Portuguese 6-year-old children was 49%, rising to 72% at 15 years of age, so it is necessary to invest in the improvement oral health promotion programs for children and adolescents to prevent oral diseases. Theses community oral health interventions need to be correctly adapted to the age stage of the children and adolescents.

2. Moderate brushing frequency at least 2 times/day

According to the study developed by the General Directory of Health, of Portugal, approximately 50% of 6-year-old children and 67-69% of 12 and 15-year-old adolescents use a toothbrush at least twice a day with a fluoride toothpaste.[6] This procedure is essential in oral hygiene as it allows removing dental plaque and food debris. To be most effective, brushing should be supplemented with the use of a fluoride toothpaste and performed at least twice a day.[7,8]

3. Very frequent and poor daily use of dental floss

Despite its relevance, the use of dental floss is not frequent among the young people as many of the

previous studies showed,[9,10] so its implementation and use is essential to prevent the development of dental caries on interproximal surfaces of teeth and periodontal diseases.

4. Moderate appeal of the adolescent attending a dental appointment

Dental appointments should be regular or at least once every six months, which facilitates the diagnosis of oral conditions, information on the most appropriate treatments and preventive measures, such as the topical application of fluorine sealants. and fluoride.[11] After applying the scale created, it was possible to verify that 67.9% of the sample presents a insufficient perception of oral health behaviors; 23.9% intermediate/sufficient and only 8.2% present what is considered on the scale as having a good rating in terms of the perception of oral health behaviors respecting the assumptions defined for the elaboration of this scale.

These results allow us to conclude that at school and family level, some efforts should be made, providing support and supervision at the time of oral hygiene, because only then oral hygiene will be performed frequently and properly. It was also observed that among the adolescents in this sample, despite brushing their teeth daily, they refer not using dental floss, which is essential to complement the brushing.

As recommendations for parents, caregivers and teachers, it is advisable to accompany and supervise younger children and adolescents in the prevention of oral health, particularly at the time of brushing, which should be daily, at dentist appointments of at least twice a year and provision of information for the development of healthy oral hygiene habits.

CONCLUSION.

For this purpose, through the scale to classify the level of perception of oral health behaviors applicable to the sample of Portuguese adolescents, it is possible to compare the data of several adolescents and understand what are the most frequent oral or eating habits among adolescents.

In sum, the use of the scale is relevant, as it can be done at national, regional or local levels, which provides an overview of oral and eating health habits, facilitating the area of action in the strengths and weaknesses that need to be improved, namely, oral hygiene, number of dental appointments and sugary food intake.

REFERENCES.

1. Relvas M, Diz P, Seoane J, Tomás I. Oral Health Scales: design of an oral health scale of infectious potential. Med Oral Patol Oral Cir Bucal. 2013;18(4):e664-70.

2. Aragão A, Sousa P, Ferreira J, Duarte R, Menezes V. Knowledge of Public Daycare Center Teachers of João Pessoa, PB, Brazil, about Child Oral Health. Pesq Bras Odontoped Clin Integr. 2010;10(3):393-8.

3. Garcia R, Sohn W. The paradigm to prevention and its relationship to dental education. J of Dent Educ. 2012; 76(1): 36-45.

4. Gunn A. Dental caries: Strategies to control this preventable disease. Ata Acad. 2013; 42 (2): 117-30.

5. General Directory of Health. National Study of Prevalence of Oral Diseases. Oral Health Promotion Program in Schools. 2008; Lisbon.

6. Reyes C, Dalmacio L. Bacterial diversity in the saliva and plaque of caries-free and caries-active Filipino adults. Philippine J Sci. 2012;141:217-27.

7. Hattne K, Folke S, Twetman S. Attitudes to oral hearth among adolescents with high caries risk. Acta Odont Scand. 2001;65:206-13.

8. Daniel S, Harfst S, Wilder R. Mosby's dental hygiene: concepts, cases and competencies. 2nd. Ed. St Louis: Mosby Elsevier; 2008; 440-55.

9. Pereira A. Odontologia em Saúde Colectiva - Planejando acções e promovendo saúde. 1st. Ed. Porto Alegre: Artmed Editora; 2003.

10. Sambunjak D, Nickerson J, Poklepovic T, Johnson T, Imai P, Tugwell P, Worthington HV. Flossing for the management of periodontal diseases and dental caries in adults. Cochrane Database Syst Rev. 2011;(12):CD008829.

11. Crocombe L, Broadbent J, Thomson W, Brennan D, Poulton R. Impact of dental visiting trajectory patterns on clinical oral health and oral health-related quality of life. J Public Health Dent. 2012; 72: 36-44.