

# Self-perceived health in dental students: a cross-sectional study

## Autopercepção de saúde em estudantes de odontologia: um estudo transversal

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### Abstract

**Objective:** this is a cross-sectional descriptive study, with the objective of verifying the relationship between health self-perception, sociodemographic characteristics, weight status and physical and psychological symptoms in a group of dental students. **Methods:** one hundred and sixty individuals from a Dental School, aged 16-24 years, participated. Questionnaires were applied for socioeconomic characteristics, psychological symptoms, and self-perception of health. Clinical examinations were performed to evaluate oral health (CPOD index, frequency of brushing and dental consultations) and weight status (Body Mass Index, BMI). The data were analyzed by descriptive statistics, Student t, Mann-Whitney, chi-squared tests and logistic regression. **Results:** the prevalence of overweight/obese individuals was 29%, with a similar proportion for the sexes ( $P=0.23$ ). Weight status, satisfaction with body image, comparison with others, feeling depressed or nervous, and eating habits were factors associated with self-perception of health (OR 0.20-5.19,  $P < 0.05$ ). Individuals who were satisfied with their body image or considered their eating habits healthy were more likely to perceive health positively (OR = 4.24 e OR = 4.27). **Conclusion:** socio-demographic characteristics showed no influence on self-perception of health, except weight status that was negatively associated with self-perception of health. Individuals who show satisfaction with their body image and consider themselves to have healthy eating habits perceived their health positively.

**Key words:** Nutritional Status. Oral Health. Health Behavior. Body Image.

### Resumo

**Objetivo:** trata-se de um estudo transversal descritivo, com o objetivo de verificar a relação entre autopercepção de saúde, características sociodemográficas, status de peso e sintomas físicos e psicológicos em um grupo de estudantes de odontologia. **Métodos:** participaram 160 indivíduos, entre 16 e 24 anos, de uma faculdade de Odontologia. Os questionários foram aplicados para características socioeconômicas, sintomas psicológicos e autopercepção de saúde. Foram realizados exames clínicos para avaliação da saúde bucal (índice CPOD, frequência de escovação e de consultas odontológicas) e status de peso (Índice de Massa Muscular). **Resultados:** a prevalência de sobrepeso/obesidade foi de 29%, com proporção semelhante para os sexos ( $P = 0,23$ ). O status do peso, a satisfação com a imagem corporal, a comparação com os outros, a sensação de estar deprimido ou nervoso e os hábitos alimentares foram fatores associados à autopercepção de saúde (OR 0,20-5,19,  $P < 0,05$ ). Indivíduos satisfeitos com sua imagem corporal ou que consideraram seus hábitos alimentares saudáveis apresentaram maior probabilidade de perceber a saúde positivamente (OR = 4,24 e OR = 4,27). **Conclusão:** as características sociodemográficas não mostraram influência na autopercepção de saúde. Indivíduos que demonstraram satisfação com a imagem corporal e que consideraram ter hábitos alimentares saudáveis perceberam sua saúde positivamente.

**Palavras-chave:** Estado Nutricional. Saúde Bucal. Comportamento de Saúde. Imagem Corporal.

### INTRODUCTION

Self-perceived health, which is an individual's own beliefs about the state of his/her health, and associated factors are significant public health concerns<sup>1,2</sup>, influencing the directions of individual's actions<sup>3</sup>. Self-perceived health constitutes an important measurement whereby the population's health can be evaluated, since it provides an overview of the diverse components of health. Moreover, self-perceived health can be influenced by factors relating to sociodemographic status, body image and satisfaction, emotional aspects, and health behavior<sup>1</sup>.

The health of university students should be considered of importance since universities are dealing with future professionals and policy-makers who will influence others' health and quality of life<sup>4,5</sup>. It is important to identify whether the students are applying their acquired knowledge to beneficial everyday behaviors, as well as how they perceive their own health. Determining the health behavior of healthcare students is important to strengthen their credibility as role models promoting health<sup>6,7</sup>. They are future healthcare professionals and will be able to provide better care for others when they

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engage in self-care and promote the highest level of their own well-being<sup>8</sup>.

In this context, the aim of the present study was to determine whether there is a relationship between self-perceived health, sociodemographic characteristics, weight status, and physical and psychological symptoms in a group of dental students.

## METHODS

This is a descriptive cross-sectional study with a quantitative approach, approved by The Research Ethics Committee of the Piraciaba Dental School, University of Campinas, Protocol nº 075/2014.

A convenience sample was selected consisting of adolescents and young adults, aged 16-24 years old. The sample-size calculation was estimated in 161 individuals, taking into account the study of Piko<sup>1</sup>, in which 18.1% of participants presented negative self-perceived health, a maximum tolerable error of 5% and a confidence level of 90%. About 300 individuals at the Dental School were directly contacted by the researcher and asked to participate. Of those, 194 were accepted and examined. However, 14 volunteers dropped out, citing lack of time or interest in completing the questionnaire, 20 volunteers were excluded because they were not undergraduates and graduate students, resulting in a final sample of 160 subjects.

The parents/guardians of volunteers under 18 years old and the volunteers who agreed to participate signed the Informed Consent. Those under 18 years old signed the Informed Assent. The inclusion criteria were healthy individuals, i.e., with good systemic (self-declared) and oral conditions (by clinical examination) and able to participate in the research. The exclusion criteria were oral deformities, dental anomalies, current orthodontic treatment, and fixed or removable oral prosthesis).

The socio-demographic variables were: gender, age, self-declared skin color, family income, and parents' education level. Moreover, weight status was evaluated.

Oral conditions were assessed using the DMFT index (sum of the numbers of permanent, decayed, missing, and filled teeth), according to World Health Organization (WHO) criteria<sup>9</sup>, by an examiner trained and calibrated (C.L.R.G.) during a pilot study (substantial intra- and inter-agreement, Kappa = 0.80). Moreover, the participants replied about the frequency of toothbrushing. The research was conducted at the Piracicaba Dental School, University of Campinas, Piracicaba, SP, Brazil, from March to August 2015.

Weight status was determined based on Body Mass Index (BMI = weight/height<sup>2</sup>)<sup>2</sup>. Weight (Kg) was obtained with an analog scale, and height (m) by means of a stadiometer (Welmy type 110). The BMI interpretation for volunteers aged equal or more than 20 years was based on weight status categories:

Underweight (Below 18.5); Normal or Healthy Weight (18.5 – 24.9); Overweight (25.0 – 29.9); Obese (30.0 and above). For those aged 15-19 years the interpretation was according to the CDC BMI-for-age growth charts, which visually show BMI as a percentile ranking, taking into account age and sex. The weight status categories are: Underweight (Less than the 5th percentile); Normal or Healthy Weight (5th percentile to less than the 85th percentile); Overweight (85th to less than the 95th percentile); Obese (95th percentile or greater)<sup>9</sup>.

Assessment of health perception was carried out based on nine questions from the Health Behavior in School Children (HBSC)<sup>10</sup> developed by WHO to study lifestyle in adolescents, adapted for Portuguese language (personal communication). The questions were self-applied and related to self-perceived health, eating habits, satisfaction with body image, emotional symptoms, and oral health behavior (frequency of toothbrushing).

## Statistics

Descriptive statistics consisted of frequencies, means, and standard deviations. Weight status was grouped into underweight/normal weight and overweight/obese groups. Student t-test for independent samples or the Mann-Whitney test, according to the normality test (Kolmogorov-Smirnov), or the chi-squared test was applied when indicated. To verify the variables related to the self-perception of health, simple- and multiple-logistic regressions were applied. The question "How healthy do you feel you are?" was used as a dependent variable. The respective answer scale contained four alternatives, categorized, for the regressions to be performed, into "very healthy/healthy" (0) and "somewhat unhealthy/very unhealthy" (1). The independent variables were also dichotomized according to the positive and negative aspects of the answers. First, simple logistic regression was carried out with the socio-demographic data, weight status, and the questions from the HBSC. After that, two models were built for multiple analysis, with health perception the dependent variable in both. Socio-demographic data, and weight status were the independent variables for the first model, and the questions from the HBSC were the independent variables for the second model. The variables with a  $P < 0.25$  in the simple logistic regression were included in the multiple models. Those with  $P < 0.05$  were considered as explicative variables in the multiple models. The SPSS (20.0 SPSS Inc., Chicago, IL, USA) was used.

## RESULTS

The volunteers were dental students ( $n=140$ ) and post-graduate students ( $n=20$ ). Table 1 shows the volunteer' socio-demographic characteristics. The prevalence of females (69%) was higher than that of males (31%). The average age was  $20.98 \pm 1.80$  years. Most of the parents had a high education level. Family income ranged from three to 30 minimum salaries per month ( $7.93 \pm 4.62$ ). One minimum salary at the time of the research was about US\$ 274. The majority of individuals

reported themselves as 'white'. The prevalence of overweight/obese individuals was 28%, with similar proportions of the sexes ( $p=0.23$ ). The DMFT average was  $2.59\pm1.49$ . The frequency

of tooth brushing was 3 times per day for the majority of individuals, as expected.

**Table 1.** Descriptive statistics: socio-demographic, weight status and clinical characteristics according to gender and total sample

Variables	Characteristics	Female [n (%)]	Male[n (%)]	Total [n (%)]
Age (years)	16-19 years	29 (18%)	5 (3%)	34 (21%)
	20-24 years	82 (51%)	44 (28%)	126 (79%)
	Mean $\pm$ SD	20.82 $\pm$ 1.88	21.35 $\pm$ 1.56	20.98 $\pm$ 1.80
	Range (years)	16-24	17-24	16-24
Skin color [n (%)]	White	94 (59%)	39 (24%)	133 (83%)
	Brown	7 (4%)	7 (4%)	14 (9%)
	Yellow (East Asian)	4 (3%)	3 (2%)	7 (4%)
	Black	4 (3%)	-	4 (3%)
	No response	2 (1%)	-	2 (1%)
Mother's level of education [n (%)]	No formal education	-	-	-
	Grade school	9 (6%)	8 (5%)	17 (11%)
	High school	29 (18%)	12 (8%)	41 (26%)
	University	73 (46%)	29 (18%)	102 (64%)
Father's level of education [n (%)]	No formal education	1 (1%)	-	1 (1%)
	Grade school	9 (6%)	5 (3%)	14 (9%)
	High school	32 (20%)	11 (7%)	43 (27%)
	University	69 (43%)	33 (21%)	102 (64%)
Family income (minimum salary per month*) [n (%)]	Up to 3	9 (6%)	6 (4%)	11 (9%)
	From 4 to 10	74 (46%)	36 (23%)	110 (69%)
	From 11 to 30	19 (12%)	5 (3%)	24 (15%)
	Did not respond	9 (6%)	2 (1%)	11 (7%)
	Mean		8.10 $\pm$ 4.24	7.66 $\pm$ 5.39
Weight (kg) $\pm$ SD	Range: 43-109	61.04 $\pm$ 10.32	75.99 $\pm$ 13.48	65.62 $\pm$ 13.28
Height (m) $\pm$ SD	Range: 1.52-1.92	1.64 $\pm$ 0.06	1.77 $\pm$ 0.07	1.68 $\pm$ 0.09
BMI $\pm$ SD (weight/height <sup>2</sup> )	Range: 15.80-36.32	22.70 $\pm$ 3.63	24.20 $\pm$ 3.82	23.16 $\pm$ 3.74
Weight status	Underweight/Normal [n (%)]	85 (53%)	29 (18%)	114 (71%)
	Overweight/Obesity [n (%)]	26 (16%)	20 (13%)	46 (29%)
DMFT $\pm$ SD	Range: 0-8	2.65 $\pm$ 1.55	2.47 $\pm$ 1.36	2.59 $\pm$ 1.49
Frequency of toothbrushing	3x per day or more	102 (64%)	35 (22%)	137 (86%)
	2x per day	9 (6%)	12 (8%)	21 (13%)
	1x per day	-	2 (1%)	2 (1%)

SD (standard deviation), BMI (body mass index), DMFT (decayed, missed, filled, teeth)

\*The minimum salary in Brazil in 2015 was R\$ 788.00, corresponding to US\$ 274

Table 2 shows the sample distribution according to the questionnaire responses. Sixty-one percent of the individuals considered themselves very or somewhat healthy. This variable was taken into account for verification of the factors associated with the self-perception of health.

Univariate logistic regression analysis (Table 3) showed that weight status, satisfaction with body image, comparison with others, to feel depressed or nervous, and eating habits were factors associated with self-perceived health (OR 0.20-5.19,  $P < 0.05$ ). Feeling angry, experiencing difficulty sleeping and DMFT entered in the final model due to P values less than 0.25.

**Table 2.** Selected questions based on the instrument "Health Behavior in Schoolchildren"

Questions	Females n (%)	Males n (%)	Total n (%)
How healthy do you feel you are?			
Very healthy	6 (4%)	5 (3%)	11 (7%)
Somewhat healthy	58 (36%)	29 (18%)	87 (54%)
Somewhat unhealthy	45 (28%)	15 (9%)	60 (38%)
Very unhealthy	2 (1%)	-	2 (1%)
What do you think contributes to good health?			
It's solely based on luck	-	-	-
It is based partly on luck and partly on what I do for myself	25 (14%)	18 (11%)	43 (27%)
It is based partly on what I do for myself and partly on luck	15 (9%)	8 (5%)	23 (14%)
It depends solely on what I do for myself and how I act	71 (44%)	23 (14%)	94 (49%)
How satisfied are you with your body?			
Very satisfied	6 (4%)	3 (2%)	9 (6%)
Somewhat satisfied	24 (15%)	17 (11%)	41 (26%)
More or less satisfied	57 (36%)	23 (14%)	80 (50%)
Somewhat unsatisfied	20 (13%)	5 (3%)	25 (16%)
Very unsatisfied	4 (3%)	1 (1%)	5 (3%)
How do you compare your own weight with that of others of your same age?			
Very overweight	1 (1%)	-	1 (1%)
Slightly overweight	22 (14%)	7 (4%)	29 (18%)
About the right weight	55 (34%)	26 (16%)	81 (51%)
Slightly underweight	27 (17%)	16 (10%)	43 (27%)
Very underweight	6 (4%)	-	6 (4%)
How do you compare your eating habits with those of others of your same age?			
Lots healthier	14 (9%)	13 (8%)	27 (17%)
Somewhat healthier	37 (23%)	13 (8%)	50 (31%)
Equal	35 (22%)	15 (9%)	50 (31%)
Somewhat unhealthier	22 (14%)	8 (5%)	30 (19%)
Lots unhealthier	3 (2%)	-	3 (2%)
How frequently do you feel depressed?			
Almost every day	6 (4%)	1 (1%)	7 (4%)
More than once a week	17 (11%)	5 (3%)	22 (14%)
About once a week	10 (6%)	4 (3%)	14 (9%)
About once a month	34 (21%)	11 (7%)	45 (28%)
Almost never or never	44 (28%)	28 (18%)	72 (45%)
How frequently do you feel nervous?			
Almost every day	11 (7%)	-	11 (7%)
More than once a week	28 (18%)	7 (4%)	35 (22%)
About once a week	28 (18%)	11 (7%)	39 (24%)
About once a month	28 (18%)	16 (10%)	44 (28%)
Almost never or never	16 (10%)	15 (9%)	31 (19%)

Questions	Females n (%)	Males n (%)	Total n (%)
How frequently do you feel angry?			
Almost every day	9 (6%)	1 (1%)	10 (6%)
More than once a week	24 (15%)	6 (4%)	30 (19%)
About once a week	29 (18%)	17 (11%)	46 (29%)
About once a month	31 (19%)	11 (7%)	42 (26%)
Almost never or never	18 (11%)	14 (9%)	32 (20%)
How frequently do you experience difficulty sleeping?			
Almost every day	7 (4%)	1 (1%)	8 (5%)
More than once a week	9 (6%)	9 (6%)	18 (11%)
About once a week	16 (10%)	2 (1%)	18 (11%)
About once a month	16 (10%)	5 (3%)	21 (13%)
Almost never or never	63 (39%)	32 (20%)	95 (59%)

**Table 3.** Simple logistic regression according to health perception as a dependent variable

Dependent variable: health perception. Independent variables: socio-demographic variables, DMFT, nutritional status, and questions (HBSC)				
	Coefficient	p-value*	OR	IC 95%
Gender	0.51	0.16	1.66	0.81-3.40
Age	-0.44	0.26	0.65	0.30-1.39
Skin color	0.10	0.81	1.11	0.48-2.57
Mother's level of education	0.05	0.87	1.06	0.54-2.05
Father's level of education	-0.62	0.06	0.53	0.28-1.04
Family income	0.27	0.43	1.31	0.67-2.54
Weight status	0.78	0.03	2.18	1.09-4.38
DMFT	0.50	0.12	1.65	0.87-3.10
Contribution to good health	0.17	0.60	1.19	0.62-2.27
Satisfaction with the body	1.44	0.0005	4.23	1.88-9.55
Comparing the own weight with that of others of the same age	-1.62	0.0002	0.20	0.08-0.47
Comparing eating habits with those of others of the same age	1.64	0.0001	5.19	2.26-11.93
Feel depressed	-0.96	0.008	0.38	0.19-0.78
Feel nervous	-0.76	0.02	0.46	0.24-0.90
Feel angry	-0.72	0.03	0.49	0.25-0.94
Difficulty sleeping	-0.77	0.03	0.46	0.23-0.94

The final model of the multiple logistic regression are in Table 4. The variables that remain with P values lesser than 0.05 showed that individuals satisfied with their body image or considering their eating habits as healthy had a higher probability of

having positive perceived health (OR = 4.24 and OR = 4.27, respectively). The other variables cited above, which entered in the final model, were not associated with self-perceived health (Table 4).

**Table 4.** Multiple logistic regression models according to health perception as dependent variable (only variables with P values less than 0.25 in simple logistic regression were included)

Dependent variable: health perception. Independent variables: socio-demographic variables, DMFT and HBSC questions Model chi-square – 48.60; P < 0.0001				
	Coefficient	p-value*	OR	IC 95%
Gender	0.24	0.57	1.28	0.54-3.07
Father's level of education	-0.65	0.11	0.52	0.23-1.15
Weight status	0.72	0.13	2.06	0.81-5.28
DMFT	0.40	0.26	1.50	0.74-3.05
<b>Satisfaction with the body</b>	<b>1.44</b>	<b>0.007</b>	<b>4.24</b>	<b>1.48-12.16</b>
Comparing the own weight with that of others of the same age	-0.43	0.37	0.65	0.25-1.70
<b>Comparing eating habits with those of others of the same age</b>	<b>1.45</b>	<b>0.003</b>	<b>4.27</b>	<b>1.61-11.34</b>
Feel depressed	0.86	0.06	2.35	0.97-5.72
Feel angry	-0.86	0.27	0.42	0.10-1.71
Feel nervous	0.92	0.21	2.50	0.59-10.67
Difficulty sleeping	0.11	0.80	1.11	0.48-2.57

In bold: variables that remained significant in the multiple model

## DISCUSSION

This study evaluated the factors implicated in self-perceived health in adolescents and young adults studying at a dental school. The females represented 69% of the sample, an expected value, since the Piracicaba Dental School has a greater number of female students<sup>11</sup>, following the trend in relation to the feminization occurrence in the dental courses<sup>12</sup>, as well as in other health areas in Brazil<sup>13</sup>. Most of the participants presented a good socioeconomic level, since 84% declared family income from four to 30 minimum salaries, meaning middle and upper classes<sup>13</sup>. In addition, most parents had a higher level of education, supporting the socioeconomic level of the sample studied.

The majority of volunteers were of normal weight (64%), corroborating previous studies<sup>14,15</sup>. The frequency of overweight/obesity was 29% that can be considered high and above the value observed in by Justo et al<sup>14</sup>, probably due to age, since those authors evaluated only 18-year-old individuals; it is known that increasing age increases the prevalence of obesity<sup>16,17</sup>. The findings about of overweight/obesity must/be considered disturbing, particularly because the individuals are studying healthcare. Considering that risk factors for dental caries and obesity are common, such as the excess and frequency of carbohydrate consumption, education aiming obesity control should be combined in the dental curriculum with the acquisition of knowledge about the maintenance of good oral health, since obesity is a risk factor for several physical and psychological disorders<sup>18,19,20</sup>.

Good oral conditions were observed, as expected in a sample of dental students. The average DMFT was 2.59±1.49 and tooth brushing at least three times daily was highly reported. In addition, most of the sample was composed of students with

a good socioeconomic background, supported by the high level of parents' education that could contribute to good oral health. More than half of the participants had positive self-perceived health and were aware that good health depends on their own choices and behavior, agreeing with Moreira et al<sup>3</sup>. This finding may be attributed to the fact that this population has higher expectations regarding what it means to be in good health, and because this segment would present with a lower incidence of diseases, as previously observed<sup>21</sup>. In addition, age and father's level of education were not related to self-perceived health, which could be attributed to the sample characteristics, i.e., being dental school students and having a level of education similar to that of the parent.

More than half of the study population expressed dissatisfaction with their bodies. Nevertheless, to be of weight equal to or less than others did not influence the self-perceived health, as previously found by Sand, Furberg, Lian et al.<sup>22</sup>. This degree of concern can be confirmed by the fact that the number of adolescents dissatisfied with body image was greater than that of those outside of the normal range.

Most of the volunteers (79%) reported healthy eating habits. A positive self-perception about eating habits can be a reflection of a well-educated population aware of the benefits of healthy eating for achieving good health. Such benefits were confirmed by the four times greater probability of having a positive self-perception of health reported by those who considered their eating habits healthy. A recent review of the literature showed that lower food expenditure contributes to less-healthy food choices in groups from low socioeconomic levels<sup>23</sup>. Previously, Giskes et al.<sup>24</sup> showed higher total fat intakes among socioeconomically disadvantaged groups.



The prevalence of volunteers feeling depressed, nervous, or angry was high, but not associated with self-perceived health, independently of the frequency. These results were unexpected, since self-perceived health can be viewed as a psychosocial health indicator<sup>1,25</sup>. The nature of the questions may have contributed to the lack of association. Considering the high prevalence of psychological symptoms found, efforts toward detecting students' emotional disabilities and helping their well-being would be beneficial, since schools are a key setting for improving adolescent health<sup>26</sup>. Furthermore, while 40% of the volunteers had difficulty sleeping once a week or more, it did not influence their self-perceived health. Those findings contrasted with Štefan et al.<sup>27</sup>, who verified significant associations between sleep duration and sleep quality with poor self-rated health; moreover, they found that participants with higher psychological distress rated also the perceived health as poor. Maybe, such contradictory findings could be due to different methodological approaches and geographical settings<sup>27</sup>, summed to the different categorization of the variables.

Some study limitations should be pointed out: the cross-sectional characteristics of the study do not allow us to establish the direction of the causal relationships. The non-response rate was high, despite our best efforts to invite the students.

Additionally, since the questionnaire was self-applied, over- or underreporting of the answers may have occurred, adding a cross-sectional characteristic of the study. Moreover, many volunteers did not know the family income, so a subjective evaluation of socioeconomic status could be used, asking how they rated their family's socioeconomic status<sup>1</sup>. Finally, the students were from a dental school, indicating the need for a more representative sample from other universities in other regions of Brazil.

## CONCLUSION

In conclusion, in the sample studied, socio-demographic characteristics showed no influence on self-perception of health, except weight status that was negatively associated with self-perception of health. Individuals who demonstrate satisfaction with their body image and consider themselves to have healthy eating habits perceived their health positively.

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