

Comparison of oral hygiene habits among university students from Argentina, Spain and Italy

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Bono A, Brunotto M, Almerich J, Molina G. Comparação das práticas de higiene bucal e conseqüências clínicas em estudantes universitários da Argentina, Espanha e Itália. Rev Odontol UNESP. 2006; 35(1): 41-6.

Abstract: The aim of this work is to compare oral hygiene habits among university students from Argentina, Italy and Spain. A random sample was selected of students (n = 150) of both sexes aged 18-29 years studying dentistry, architecture, economics, engineering and philosophy. A transversal study was performed with a structured multiple choice survey. Odontograms were recorded as well as plaque and gingivitis indices. These indices were found to be highest in Argentina and Spain. Active caries prevalence was highest in Argentina and Spain, while obturations were observed in a larger number of Italian students. Correlation analysis showed that decayed teeth and obturations were more common among economic science students from Spain, and cavities were correlated with Italian dental and architectural students. Choice of university degree was not associated with general preventive oral health habits, or with plaque and gingival indices.

Keywords: *Hygiene practices; dental care; oral preventive practices.*

Resumo: Apresenta-se neste trabalho, um estudo das práticas de higiene bucal entre estudantes universitários da Argentina, Itália e Espanha. A comparação das práticas de higiene bucal e repercussões clínicas nos permite avaliar as necessidades atuais e futuras de assistência buco-dental entre os estudantes universitários dos três países. Para a análise estatística foi tomada uma mostra aleatória (n = 150) de estudantes de diferentes faculdades (Odontologia, Filosofia e Ciências Humanas, Arquitetura, Ciências Econômicas e Engenharia), de ambos os sexos entre 18 e 29 anos. Realizou-se um estudo transversal com questões estruturadas com opções, odontograma, registro de placa bacteriana e inflamação gengival. A maioria dos estudantes apresentou placa e inflamação gengival, sendo menor a porcentagem dos estudantes italianos. A presença de cáries ativas foi maior entre os estudantes da Argentina e Espanha, enquanto uma maior quantidade de obturações observou-se em estudantes italianos. Por meio de análises de correspondência, observou-se que a presença de cáries e obturações foram mais comuns entre os estudantes espanhóis de Ciências Econômicas e as cáries ativas relacionaram-se com os estudantes italianos de Odontologia e Arquitetura. Finalmente, depois de se analisar os diferentes indicadores e parâmetros pôde-se concluir que as carreiras universitárias não associam-se com as condutas preventivas de saúde bucal e que as práticas de higiene bucal entre os estudantes não foram totalmente incorporadas devido ao alto nível de cáries observado.

Palavras-chave: *Práticas de higiene bucal; cuidado dental; práticas preventivas de saúde bucal.*

Introduction

Oral diseases are still a public health problem with high prevalence and incidence all around the world. Early detection is important in their prevention and therapy, and a simple oral exam also easily detects signs of malnutrition, immunodeficiency, trauma, and oral cancer. Epidemiological studies have shown signs of gingivitis in the majority of children and initial stages of periodontal diseases in adults. The World Health Organization (WHO) is responsible for oral health programs emphasizing prevention strategies and health promotion¹. Health care and prevention will improve only with greater diffusion and exchange of knowledge at an international level. Dentistry professionals should foster oral health care and preventive habits in patients in order to control plaque development and improve prophylactic care so that surgical procedures do not become necessary. It is known that dentists have a strong impact on the state of oral health even in industrialized countries of Europe such as Germany, Austria, Belgium, France and Greece². However, the question is whether dentistry professionals offer the population all the tools necessary for better oral health care. Dental professionals should offer a thorough education resulting in effective preventive health care practices both in developed countries such as Italy and Spain as well as in underdeveloped countries like Argentina. Frequent migration between Spain, Argentina and Italy since the 19th century has resulted in similar national demographic structures that allow comparisons to be made among these countries. Research has shown that etiological, cultural, and social factors greatly influence the geographical distribution of oral hygiene practices³.

Authors such as Tenenbaum⁴, Sheinin et al.⁵, Kolehmainen, Rytomaa⁶, Lang et al.⁷, Howat et al.⁸, Cavaillon et al.⁹ have studied the oral health of dental students and the positive changes that ensue from their studies. Other investigations, like Kern, Jonas¹⁰, have compared attitudes to dental health care of dental students with those outside the biomedical field.

In the year 2000, at the National University of Córdoba in Córdoba (Argentina), a survey was circulated among a random sample of students in order to evaluate their oral hygiene practices. Results showed a high level of knowledge of oral hygiene practices but the results were not clinically verified. The aim of this work is to compare oral hygiene practices among students from five different degrees at the National University of Córdoba in Argentina, the Università degli Studi di Turin in Italy and the University of Valencia in Spain.

Material and methods

The population was a random sample of students (n = 150) of both sexes of 18-29 years old studying den-

tistry (n = 10), architecture (n = 10), economics (n = 10), engineering (n = 10) and philosophy (n = 10) at the National University of Córdoba - Argentina (n = 50), Valencia University - Spain (n = 50) and Turin University - Italy (n = 50). Ethical norms were followed and signatures of consent were obtained¹¹. The subjects reported no systemic disease, nor were they under medical treatment.

The samples were taken in Spain between 15th and 20th October 2003, in Italy between 3rd and 4th December 2003, and in Argentina between 7th and 14th September 2003.

A transversal study was performed with a structured multiple choice survey. An odontogram was made according to the World Health Organization (WHO) international codification¹¹ and bacteria plaque and gingivitis were recorded. A clinical dental evaluation was made (Alejandra Bono). Survey responses were categorized at different levels. A clinical exam was performed using sterile dental mirrors, sterile blunt explorers, and a light reflector. DMF, the bacteria plaque index (BPI) and the gingivitis index¹¹ were calculated following WHO criteria¹¹. An analysis was made to find relationships between the oral health variables and the degree course of the students from all three countries, considered statistically significant at $p < 0.05$. Dichotomous variables were created: a) active caries with categories DMF = 0 and DMF > 0; and b) obturation with category 0 = without obturation. The index of plaque and inflammation¹² was categorized as follows: IPB or IPC 0 = 0 and IPB or IPC > 0 = 1. A Spearman coefficient (SCC) was used to measure the correlation (coefficient values ≥ 0.60) between hygiene practices and oral health variables. The analysis was performed with Infostat version 1.5 software, 2003 and SPSS version 10.1 for Windows, 1999.

Results

The biodemographic characteristics of the subjects are shown in the Table 1. The majority of subjects were male in Argentina (66%) and Italy (54%) and female in Spain (56%). The survey questions were related to oral hygiene practices (P2-P10), clinical conditions of oral health (IPB, IPC, decayed, missing, and filled teeth) and general health care practices (P11 and P12). The majority of students said they brushed their teeth after each meal but did not use dental floss or mouth wash for prevention (Table 2).

In relation to the oral health indices IPB and IPC, most students showed signs of plaque and gingival inflammation, with the exception of the Italian students who had the lowest percentages of these indices. Active cavities were highest in Argentina and Spain, but fillings were observed in a larger number of Italian students.

The correspondence analysis evaluated the relationship between oral health indices and the choice of a degree. This multivariate analysis was performed on the two first axes,

Table 1. Biodemographic characteristics of the population under study

| Country | Gender (%) | | Age (year) | Status | Studies | Economic Level |
|-----------|------------|----|------------|-------------|-----------------------|------------------|
| | F | M | | | | |
| Argentina | 34 | 66 | 18-29 | 95% single | University unfinished | 100% middle |
| Spain | 56 | 44 | 18-26 | 100% single | University unfinished | 100% middle-high |
| Italy | 46 | 54 | 19-27 | 100% single | University unfinished | 100% middle-high |

Table 2. Percentage of students in this research from universities of Argentina, Spain and Italy

| Country | Argentina | | Spain | | Italy | | |
|----------|-------------|--------------------|---------------------------------------|-----|---------------------------------------|-----|---------------------------------------|
| | N° question | (%) | Answer | (%) | Answer | (%) | Answer |
| P1 | 92 | | Enjoy brushing teeth | 80 | Enjoy brushing teeth | 88 | Enjoy brushing teeth |
| P2 | 40 | | Brush teeth after every meal | 54 | Brush teeth after every meal | 70 | Brush teeth after every meal |
| P3 | 37 | | Gums never bleed when brushing | 52 | Gums never bleed when brushing | 58 | Gums never bleed when brushing |
| P4 | 100 | | Use toothpaste | 100 | Use toothpaste | 100 | Use toothpaste |
| P5 | 98 | | Chose toothpaste personally | 92 | Chose toothpaste personally | 96 | Chose toothpaste personally |
| P6 | 58 | | Use toothpaste to prevent caries | 72 | Use toothpaste to prevent caries | 74 | Use toothpaste to prevent caries |
| P7 | 33 | | Never use dental floss | 58 | Never use dental floss | 56 | Never use dental floss |
| P8 | 50 | | Sometimes use mouth wash | 54 | Sometimes use mouth wash | 1.9 | Sometimes use mouth wash |
| P9 | 68 | | Have had toothbrush for three months | 76 | Have had toothbrush for three months | 92 | Have had toothbrush for three months |
| P10 | 60 | | Were taught by a dentist how to brush | 58 | Were taught by a dentist how to brush | 62 | Were taught by a dentist how to brush |
| P11 | 46 | | Smoke | 52 | Smoke | 20 | Smoke |
| IPB > 0 | 82 | - | | 76 | - | 36 | - |
| IPC > 0 | 78 | - | | 76 | - | 56 | - |
| Carie | 74 | with caries | | 78 | with caries | 68 | with caries |
| Lost | 68 | Have lost no teeth | | 88 | Have lost no teeth | 86 | Have lost no teeth |
| Fillings | 92 | Have obturation | | 72 | Have obturation | 96 | Have obturation |

with 70% accumulated inertia. Decayed teeth and fillings were more common among students of economic sciences in Spain (Figure 1b), whereas engineering students from the three countries showed the lowest values of cavities and fillings (Figure 1a, b and c). The cavities variable correlated with Italian dental and architectural students, and plaque and gingival inflammation were associated with economics students in Argentina (Figure 1a), and dentistry and economics students in Italy (Figure 1c). Correlation of oral hygiene customs (P2, P7 and P8), oral health indices (IPB, IPC, lost and fillings), and general health habits (P11) in

each country were analyzed with the Spearman correlation coefficient (non-parametric). Sex, IPB, and IPC were related with fillings in Argentine students. Italian students showed a positive correlation between smoking, brushing teeth, and fillings. A strong correlation was observed (SCC = 0.84) between plaque and gingival inflammation in Italian students (Tables 3 and 5).

However, career choice was not associated with preventive oral health or general health habits, or with health indices (Tables 3, 4 and 5).

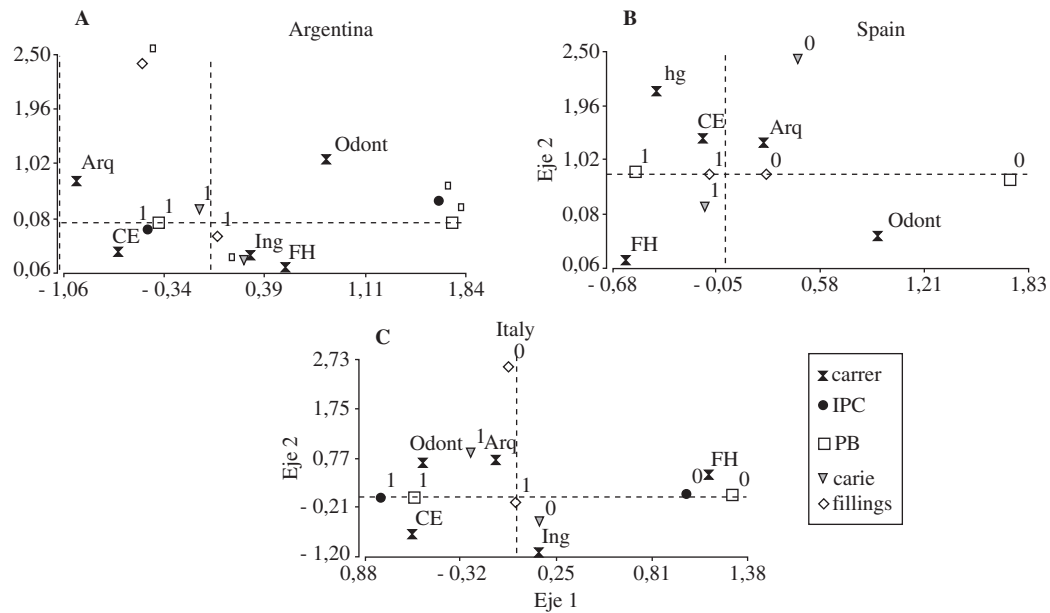


Figure 1. Relation between oral health status and degree choice by university students of Argentina, Spain and Italy. Categories: 0 = absence, 1 = presence. Abbreviations: Arq: Architecture, CE: Economic Sciences, FH: Philosophy and Humanities, Ing: Engineer, Odont: Dentistry. (Inertia two first axes of correspondence analysis in each country= 70%).

Table 3. Spearman analysis of correlation

| | sex | degree | P2 | P7 | P8 | P11 | IPC | IPB | Caries | Fillings |
|------------|----------------|--------|------|------|------|------|----------------|----------------|--------|----------|
| Sex | 1.00 | - | - | - | - | - | - | - | - | - |
| Career | - 0.23 | 1.00 | - | - | - | - | - | - | - | - |
| P2 | 0.08 | 0.03 | 1.00 | - | - | - | - | - | - | - |
| P7 | 0.18 | 0.30 | 0.11 | 1.00 | - | - | - | - | - | - |
| P8 | 0.35 | 0.16 | 0.22 | 0.14 | 1.00 | - | - | - | - | - |
| P11 | 0.36 | 0.24 | 0.13 | 0.25 | 0.32 | 1.00 | - | - | - | - |
| IPC | 0.33 | 0.17 | 0.47 | 0.52 | 0.32 | 0.31 | 1.00 | - | - | - |
| IPB | 0.33 | 0.27 | 0.43 | 0.50 | 0.36 | 0.35 | 0.82 | 1.00 | - | - |
| Carie lost | 0.40 | 0.21 | 0.28 | 0.14 | 0.38 | 0.40 | 0.46 | 0.47 | 1.00 | - |
| Fillings | 0.63(*) | 0.27 | 0.39 | 0.59 | 0.45 | 0.39 | 0.64(*) | 0.65(*) | 0.54 | 1.00 |

(*) $p < 0.05$ to reject $H_0 =$ there is no relationship between these variables.

Table 4. Spearman analysis of correlation

| | sex | career | P2 | P7 | P8 | P11 | IPC | IPB | Caries | Fillings |
|------------|--------|--------|------|------|------|------|------|------|--------|----------|
| Sex | 1.00 | - | - | - | - | - | - | - | - | - |
| Career | - 0.16 | 1.00 | - | - | - | - | - | - | - | - |
| P2 | 0.08 | 0.36 | 1.00 | - | - | - | - | - | - | - |
| P7 | 0.19 | - 0.06 | 0.26 | 1.00 | - | - | - | - | - | - |
| P8 | 0.17 | 0.40 | 0.33 | 0.23 | 1.00 | - | - | - | - | - |
| P11 | 0.40 | 0.05 | 0.12 | 0.20 | 0.17 | 1.00 | - | - | - | - |
| IPC | 0.40 | 0.03 | 0.24 | 0.48 | 0.31 | 0.37 | 1.00 | - | - | - |
| IPB | 0.40 | 0.03 | 0.24 | 0.48 | 0.31 | 0.37 | 1.00 | 1.00 | - | - |
| Carie lost | 0.32 | 0.41 | 0.45 | 0.34 | 0.35 | 0.23 | 0.55 | 0.55 | 1.00 | - |
| Fillings | 0.50 | 0.17 | 0.28 | 0.22 | 0.29 | 0.29 | 0.46 | 0.46 | 0.50 | 1.00 |

Table 5. Spearman analysis of correlation

| | sex | career | P2 | P7 | P8 | P11 | IPC | IPB | Caries | Fillings |
|------------|----------------|--------|----------------|------|------|------|----------------|------|--------|----------|
| Sex | 1.00 | - | - | - | - | - | - | - | - | - |
| Career | - 0.09 | 1.00 | - | - | - | - | - | - | - | - |
| P2 | 0.38 | 0.44 | 1.00 | - | - | - | - | - | - | - |
| P7 | 0.09 | - 0.07 | 0.36 | 1.00 | - | - | - | - | - | - |
| P8 | -0.01 | 0.12 | 0.24 | 0.42 | 1.00 | - | - | - | - | - |
| P11 | 0.35 | 0.28 | 0.62(*) | 0.47 | 0.51 | 1.00 | - | - | - | - |
| IPC | 0.32 | 0.17 | 0.53 | 0.36 | 0.18 | 0.41 | 1.00 | - | - | - |
| IPB | 0.32 | 0.24 | 0.53 | 0.43 | 0.23 | 0.51 | 0.84(*) | 1.00 | - | - |
| Carie lost | 0.14 | 0.39 | 0.32 | 0.18 | 0.27 | 0.44 | 0.40 | 0.31 | 1.00 | - |
| Fillings | 0.62(*) | 0.44 | 0.60(*) | 0.56 | 0.56 | 0.67 | 0.58 | 0.58 | 0.58 | 1.00 |

(*) $p < 0.05$ to reject H_0 = there is no relationship between these variables.

Discussion

Surveys showed a high prevalence of decayed and filled teeth in students in different degree fields in Argentina, Spain, and Italy. The majority of subjects said they practiced good oral hygiene (Table 2) including brushing and using toothpaste, but students from Argentina and Spain had a large number of cavities while Italian students had the highest percentage of fillings.

Our results showed that cavities are high in the sample of students in the three countries, suggesting that oral hygiene practices may have not been incorporated fully as daily habits. These pathologies, of course, have multiple factors. This coincides with research carried out among schoolchildren in Rome, where it was concluded that it is necessary to increase the level of motivation to achieve better oral health¹³.

On the other hand, the greater percentage of obturations in Italy represented a higher degree of conceptualization of preventive habits in relation to oral health, agreeing with observations of Cuenca et al.¹⁴ among dentistry students of Barcelona University. In this study, dental hygiene was good but the DMF index was high because many fillings were present.

Choice of a degree within the health sciences area was not related with oral hygiene practices nor with cavities (Table 2)^{15,16}. The engineering students showed a better state of oral health than dentistry students (Figure 1). On the other hand, economics students showed a worse state of oral health. However, Cortes-Martinicorena, Nevot-Gonzales¹⁷, in a study comparing dentistry and medicine students, observed that dental students started intensive dental treatment at their clinical stage. Azuara Pavon et al.¹⁸ compared dentistry students of FES-Iztacala with patients attending the dentistry service of the same institution, and found that dentistry students pre-

sented a larger number of filled teeth and better dental health than the population attending the same dental service.

Oral health indices of plaque and gingival inflammation showed a precarious state of health in the study population. The populations of the three countries studied showed similar oral hygiene habits; the relationship between these countries through a century of migrations could explain this fact²¹ since it is known that demographics and socio-cultural customs contribute to the development of preventive practices in oral health^{3,19,20}.

Conclusions

Our analysis showed:

- The majority of students said they brushed their teeth after each meal but did not use dental floss or mouth wash for prevention;
- Active cavities were highest in the samples of Argentina and Spain, but fillings were observed in a larger number of Italian students.

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