

## Brazilian Dentistry is Among the Best in the World. Is it True?

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It is common to hear the assertion that Brazil's dentistry is one the best in the world or that Brazil has the best dentists. These statements are based, in part, on the total number of scientific dentistry manuscripts produced in Brazil and on extrapolating the ranking of Brazilian faculty/courses compared to others in the world, which also uses the number of article publications produced by each institution as a parameter. As a result, schools and/or courses in dentistry from Brazilian public universities appear ranked in high positions, such as the *Universidade de São Paulo* in the Global ranking of Shanghai, which appears in tenth place [1]. Therefore, Dentistry in Brazil is among the best in the world, as this is a direct metric: more publications must be at the forefront of knowledge, and this transfers to classrooms and clinics where future dentists in training are learning dentistry. The result, in the end, should be better oral health for Brazilians.

If we examine the oral health of Brazilians, based on data from the Brazilian Ministry of Health, people aged 5 or 12 years have between 2 to 3 teeth affected by caries, and this number rises to between 4 to 5 among those between 15 and 19 years old, rises to 16 to 17 among those who are between 35 and 44 years old, and rises to between 27 to 28 among those who are between 65 and 74 years old. At 65 years of age, Brazilians, on average, have lost between 20 and 21 teeth, and 69% have lost at least one tooth [2]. Based on these indicators, the assertion that Brazil has one of the best dentistry in the world cannot be disputed when comparing the country with the outcomes of caries and tooth loss in Canada or the United States.

Brazil has approximately 360,865 dentists, which means 168 dentists for every 100,000 Brazilians. Furthermore, the country has 36,144 oral health technicians [3]. In addition, dentists are trained in a total of 575 dentistry schools/courses [4].

How do these numbers compare to other countries in the world? Brazil is among the 25 largest economies in the world, in ninth. The tenth place is Canada. The 12-year-old Canadian has, on average, one tooth affected by caries, but the 60-year-old Canadian has lost between 21 and 22 teeth, and 22% of those people have lost at least one tooth. Compared to the United States, which is considered the world's top economy, 12-year-olds have between 1 and 2 decayed teeth, and 24 % of 60-year-olds have lost at

least one tooth, with an average of 13 missing teeth. Again, these numbers do not show such big differences [5].

However, Canada has ten colleges of dentistry and 520 training centers for dental hygienists. The country has an estimated total of 19,433 dentists or 51 dentists for every 100,000 people. The United States has 68 schools of dentistry and 278 training centers for dental hygienists. Approximately 173,574 dentists, or 59 dentists, for every 100,000 people.

The oral health indicators of Brazilians, Canadians, and Americans, based on caries experience at age 12 and missing teeth at age 60, are not very different, but the efficiency to obtain these results through investment in dental professionals is different. Brazil has more than 8 times the number of dentistry colleges/courses than the United States and more than 57 times the number in Canada. On the other hand, the training policy for dentistry professionals in Brazil does not include the training of dental hygienists, which is apparently the opposite of what the two North American countries practice. These data indicate that training and, consequently, dental practice are centered almost exclusively on the dentist, keeping an expanded oral health team on the sidelines or the care process.

Back to the extrapolation that the quality of dentistry has to do with the quality of dental education, estimated by the number of scientific articles on dentistry published, Brazil has the second largest production of scientific papers on dentistry in the world (9% of the total), only behind the United States. This is a direct result of valuing the number of articles published as a metric for evaluating the quality of *Stricto Sensu* postgraduate programs in dentistry in Brazil, which add up to a total of 109. The quality of these publications, however, which is measured by the Scimago Institutions Ranking, ranks Brazil in fourteenth place, a contribution of 1.77% to the knowledge of humanity. If we consider the H index, the country moves to the twenty-third position [6]. Furthermore, when these quality indicators are used to rank Brazil's higher education institutions, the country only has six schools among the top 500 in the world.

Considering that national sovereignty is related to the country's capacity to produce science in response to its demands, what should be expected from the country that appears in second place in the rank of production of scientific articles in the field of dentistry? If the answer is based on quantitative parameters, a high-quality standard of oral health in its population is expected. However, if we assess the quality, represented by the planning of investigations, adherence to national issues, and methodological quality, we can better understand the oral health situation of Brazilians and the country's eighth position in the ranking that considers the H index (metric recognized as a parameter for quality of scientific productions).

We understand that historical, social, and cultural aspects are related to the population's standard of oral health, and that is precisely why it is relevant to highlight Brazilian dental research that considers these factors and the population's demands. This would certainly result in the rationalization of resources and better health and intellectual production indicators.

In summary, Brazil has dental caries and tooth loss indicators comparable to countries considered to be equivalent or economically more potent in the world, but this is the result of an investment many times greater in terms of training dentists. In addition, Brazil has the second largest production of scientific dental articles in the world, almost 10%, but this is equivalent to less than 2% of the knowledge generated in the world.

Is Brazil's dentistry among the best in the world? The answer is yes if what we think is important is quantity, not quality.

## Authors' Contributions

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