

## **Brazilian Dentistry Profiles and Workforce**

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### **Abstract**

*The aim of this study was to assess the dentistry profile, based on social and demographic data, post-graduation formation, and to verify the insertion of dental graduates in the labour force. The participants were professionals graduated from a Brazilian Public Dental School, between 2000 and 2010. An instrument was sent by mail and/or e-mail to them. It was used Kruskal Wallis Test. Among 1047 questionnaires, 189 returned and 65.6% were answered by female. In relation to post-graduation course, 57.7% of professionals performed it, however 56.9% not attended only in their area; 66.6% of professionals are concentrated in cities larger than 100 thousand habitants. There was association between income and gender, and others. The predominant work modality was self-employed. Among the total, 36.5% want to work part-time in dentistry. The female gender was predominant and there was wage discrepancy between genders. The professionals have been concentrated in largest cities.*

**Keywords:** Dentistry; Labour force; Dental staff.

### **1. Introduction**

Performing research on the profiles of graduates of university courses can be used to ensure adequate formation and market demand. This research can also represent an efficient form of reorientation of the educational model, and be used to evaluate educational institutions to ensure quality.

The first dentistry course in Brazil was offered on October 25, 1884, through decree number 9311, together with the first course in medicine at the Universities of Rio de Janeiro and Bahia States. Since then, the number of courses in dentistry has increased. In 2010, 193 institutions offered courses in dentistry (Brasil, 2012a). In 1966, dentistry was declared a profession in Brazil through law number 5081(Brasil, 2012b).

Since regulations of this profession began, dentistry has undergone many changes, including an increasing of number of professionals in the labour market that today has reached 242,226 dentists (Brasil, 2012c). These changes can be explained by considering the changes in the epidemiological profiles of dental caries and tooth loss (Piovesan et al., 2010; Silveira Neto & Nadanovsky, 2007; Watt, Sheiham, 1998).

Alternatively, they can be explained by considering the direction of national policies in oral health, which have focused strongly on health promotion and prevention, access to services, and increased dental appointments (Brasil, 2006a; Brasil, 2006b). These policies highlight regional and cultural differences in Brazil.

Historically, dentistry graduates focused on the stomatognathic system and biological aspects (Silveira, 2004). They particularly focused on curative actions related to collaborative attitudes towards health. The epidemiological profile of oral diseases has changed, as cited earlier, encouraged mainly by Brazilian health policies. These policies were based strongly on recovering an integral dimension of care and are strategically conducted *a priori* through primary attention and in multi-professional cooperation (Brasil, 2006b; Brasil 2004). As a result of these changes, a different dental profile is imminent.

Dentists form and are influenced by many factors, including students, their parents, families, patients, clients, academy, professors, the Brazilian Health System, class organization, private companies, and the labour market (Silveira, 2004). To understand the professional labour force, it is essential to ascertain the position of dentistry by characterizing its labour market (Pinto, 2008) and directing a correct human resource policy (Michel-Crosato et al, 2003).

With respect to these aspects, the aim of this study was to assess the dentistry profile, based on social and demographic data and post-graduation formation, and to verify the insertion of dental graduates in the labour force.

## **2. Methods**

The participants in this study were professionals who graduated from a Brazilian Public Dental School, between 2000 and 2010. To collect the data, we used an instrument constructed from another questionnaire that was pre-tested by Moimaz (2003) and contained 36 questions. The following variables were analyzed in this study: age, gender, marital status, post-graduation formation, professional insertion, cited income, and others. The questionnaires were sent by mail or e-mail to all 1,047 dentists who had graduated from the University between 2000 and 2010. Residential and electronic addresses were obtained from the Academic Technical Division. We mailed an envelope enclosing a questionnaire, a stamped response envelope, and an explanatory letter containing the research description, information about the aim of study, and instructions on how to fill in the forms. Participants were e-mailed similar content. The participants were also informed about the ethical aspects of the study, and explained that their data would be kept anonymous.

The collected data were analyzed using Epi-Info version 3.5.2 software (CDC, 2007). BioEstat version 5.3 software (Ayres M, Ayres Jr., 2007) was used to perform additional statistical analyses, including the Kruskal-Wallis test with Dunn's correction, to verify the associations among variables with 5% confidence intervals. This study followed the rules of the Official Decree 196/96 by the Brazilian Health Council and was approved by the Ethical Committee on Research with Humans (Protocol number: 2007-02463).

## **3. Results and Discussion**

Of the 1,047 questionnaires sent, 189 were returned answered. Some questionnaires (56) were returned unanswered because they were sent to the wrong mailing addresses or unknown e-mail addresses, and the final sample was composed of 991 sent questionnaires. The response rate was 19.1%. This response rate was higher than the 7% rate reported by Mialhe, Furuse, Gonçalo (2008) and lower than the 50.9% rate reported by Nunes et al. (2010); however, these authors only contacted participants by e-mail, and they did not mail questionnaires to participants. The response rate was too lower than 86.9% reported by Hunter, Harrhy, Morgan (2010) with paediatric dentists postal survey at United Kingdom.

Table 1 shows the social and demographic characteristics of the study participants.

Table 1 – Social and demographic variables of graduates dentists from a Brazilian Public Dental School – Brazil, 2011.

<b>VARIABLES</b>		
	<b>n</b>	<b>%</b>
<b>GENDER</b>		
Male	53	28.0
Female	124	65.6
No answer	12	6.4
Total	189	100.0
<b>MARITAL STATUS</b>		
Single	129	68.3
Married	59	31.2
No answer	1	0.5
Total	189	100.0
<b>AGE</b>		
20-24 years	17	9.0
25-29 years	87	46.0
30-34 years	75	39.7
35 years or over	3	1.6
No answer	7	3.7
Total	189	100.0
<b>POPULATION SIZE OF CITY</b>		
Until 10.000 habitants	8	4.2
To 10.000 a 100.000	45	23.8
To 100.000 a 500.000	66	34.9
Over than 500.000 habitants	60	31.7
No answer	10	5.4
Total	189	100.0

As shown in Table 1, the dentistry profession has been considered a female profession, corroborating the results of many previous studies (da Silva et al, 2012; Hunter, Harray, Morgan, 2010; Moimaz, 2003; Moimaz et al, 2003; Nunes et al, 2010). According to sociological studies about gender, women form the majority in many health professions (Hirata, 2002), including dentistry, which is confirmed by the data in this study. In previous studies, dentists were frequently installed in large urban centres (Moimaz, 2003; Nunes et al, 2010), and this finding was reinforced by the data collected in this study. Our findings indicated that more than 65.0% of the dentists worked in cities with a population over 100,000 habitants (Table 1). These data demonstrate the poor distribution of professionals throughout the national territory and can be considered a taxpayer factor for the increasing of iniquities in oral health.

The average age of the respondents was 29.3 years, and ranged from 22 to 41 years (Table 1). These results agree with the profile of Brazilian dentists in a previous study (Moimaz et al, 2003). The graduates were asked about their motivations for choosing their profession. In response to this question, the participants gave the following answers: 56.1% declared dentistry was their vocation, 22.8% declared family influences, 5.3% selected financial causes, 3.2% chose their profession for status, and 18.5% selected other causes, corroborating previous research by Mialhe, Furuse, Gonçalo (2008).

When asked about post-graduation formation in a speciality, 109 (57.7%) participants said that they had speciality, and 2 (1.0%) participants gave no answer.

Among those who graduated between 2001 and 2005, only 18 (16.5%) completed their speciality courses, while among those who graduated between 2006 and 2010, 82 (75.2%) professionals concluded their speciality courses. Among the total who completed their specialty courses, 9 (8.3%) did not provide the year they concluded their courses. The most popular specialty areas were orthodontics (34.9%), followed by periodontics (12.8%), and dental implants (10.1%). The public health and family health areas represented 4.6%, while the sum of all other areas totalled 36.7%. The finding that orthodontics was the most popular specialty area confirmed results of previous studies (Nunes et al, 2010; Nunes, Leles, Gonçalves, 2010).

Although the National Curricular Guidelines of Dentistry Graduation describes the profile of graduates as “generalist, humanist, critical and reflexive graduates to perform in all levels of health attention based on technique and scientific rigor” (Brasil, 2002), a different situation is observed in post-university life. The professionals have aimed to specialize as observed in the findings, reinforcing Flexner’s model (Almeida Filho, 2010; Duffy, 2011). In relation to *stricto sensu* post-graduation, 19% (36) of the participants completed their master’s courses, and 9.5% (18) completed a doctorate degree.

Even if the dentists specialized in a particular area, 56.9% of the graduates reported attending in a different area. Meanwhile, only 22.0% stated that they worked only in their area of specialty, and 21.1% did not answer this question. This response was linked to financial questions and the labour market. The incomes reported by dentists have been decreasing proportionally through the years, so dentists are unable to limit their practice to their chosen areas of specialty. The dentists reported incomes that ranged from US\$116.95 to US\$14,619.88. Some professionals explained that they were “paying to work” (Figure 1).

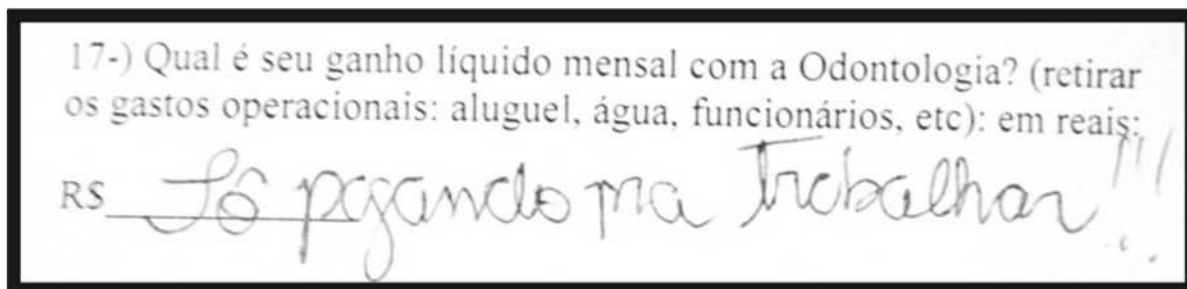


Figure 1 – Relate of a graduate from a Brazilian Public Dental School about monthly income – Brazil, 2011.

The following table shows the association between reported income and some of the studied variables.

Table 2 – Income cited by graduates dentists from a Brazilian Public Dental School associated to different variables – Brazil, 2011.

VARIABLES	n	AVERAGE (US\$)	$\sigma_g$	p
<b>INCOME X GENDER</b>				
MALE	50	2913.0	2.06	<0.05*
FEMALE	107	1784.0	2.18	
<b>INCOME X YEAR OF GRADUATION</b>				
2000	15	2857.7	1.74	<0.05*
2001 <sup>#</sup>	15	2928.5	1.86	
2002 <sup>#</sup>	16	2860.0	1.99	
2003	16	2406.4	1.64	
2004	18	2361.9	2.06	
2005	29	2310.9	2.25	
2006	21	1459.2	2.21	
2007	17	1356.5	2.11	
2008 <sup>#</sup>	5	771.9	1.64	
2009	8	1184.2	1.76	
2010	3	779.7	2.24	
<b>INCOME X MODALITY OF LABOUR</b>				
SELF-EMPLOYED DENTISTS	103	2463.8	2.02	>0.05
DENTIST THAT WORK BY PERCENTAGE	58	1996.1	2.41	
DENTIST CONTRACTED IN PRIVATE SECTOR	17	1792.2	1.75	
UNIVERSITY PROFESSOR	8	1681.3	2.25	
RESEARCHER	13	1535.1	3.33	
DENTISTS FROM PUBLIC SERVICES	30	2178.7	1.65	
DENTISTS THAT WORK IN TWO OR MORE MODALITIES	56	2246.7	2.28	
<b>INCOME X SOCIAL CLASS OF ATTENDED PATIENTS</b>				
UPPER CLASS	4	4386.0	3.23	<0.05**
MIDDLE CLASS	70	2347.5	1.88	
LOWER CLASS	34	1649.6	2.06	
UPPER/MIDDLE CLASS	5	2257.3	2.49	
MIDDLE/LOWER CLASS	21	1559.4	1.55	
UPPER/MIDDLE/LOWER CLASS	8	3508.8	2.55	
<b>INCOME X SPECIALIZING</b>				
YES	99	2411.5	2.08	<0.05*
NO	67	1763.5	2.23	
<b>INCOME X NUMBER OF HOURS WORKED WEEKLY</b>				
UNTIL 20 HOURS <sup>#</sup>	38	1468.5	2.41	<0.05*
FROM 21 TO 40 HOURS	64	2104.8	2.01	
MORE THAN 40 HOURS <sup>#</sup>	61	2462.3	1.89	
<b>INCOME X ACQUIRE REAL ESTATE</b>				
YES	105	2802.0	1.82	<0.05*
NO	59	1038.7	1.93	
<b>INCOME X SATISFACTION WITH INCOME</b>				
SATISFACTED A LOT <sup>#</sup>	34	3295.3	1.91	<0.05*
SATISFACTED A LITTLE <sup>#</sup>	89	2168.2	2.06	
DISSATISFIED <sup>#</sup>	44	1192.5	2.01	

\*p<0.05; \*\*Significance without Dunn's correction; <sup>#</sup>Significance with Dunn's correction

According to the data shown in Table 2, the difference between male and female incomes was statistically significant, and men had higher wages. This result can be confirmed by Canadian findings where women dentists' income were almost half than men's income (Adams, 2005). When the year of graduation was considered, there were significant differences between the incomes of graduates in 2000, 2008 and 2009.

Those who graduated in 2008 and 2009 had the lowest incomes. In relation to the modality of insertion in the labour market, 57.7% of the participants reported being self-employed, 32.3% worked by percentage, 15.9% dentists worked as a public service and 30.7% declared work in more than one modality. There were no significant differences in wage among the categories (Table 2); however, when the data were evaluated by specialization, lower incomes were noted for professionals who invested in formal professional qualifications. The dentists' incomes were evaluated in relation to the social classes of the attended patients. Although there were significant differences between the values, following data correction, there were no significant differences among the categories due to the low number of respondents (Table 2).

Among the participants that reported working as self-employed, by percentage or by contract, 47.0% stated that they had some insurance, while 53% did not. Among the total that worked with insurance, 94.4% declared being dissatisfied with the value paid by the insurance. Therefore, it is not possible to consider the dentistry market as promise (Brasil, 2002) or co-operator to professional satisfaction because the Market law, there are a growing number of dentists linked to these companies by day. Authors that explain the devaluation of the worker front in the labour world resort to Marx's theory and use dialectical theories to explain them (Ribeiro, 2006; Codo, 2010; Seligmann-Silva, 2011). Considering these authors and this line of thought, it is possible to conclude that the better the dental consultations and the final product of the dentist's labour, the less is the value of the professional who makes it. This conclusion is because the profits that relate to the product are directed to insurance companies and not directed to the worker.

The average number of hours worked weekly was 35.2 hours, a finding similar that of Michel-Crosato (2008). There were statistically significant differences in income between those who worked up to 20 hours and those who worked more than 40 hours. The latter had the highest incomes. Therefore, to get higher incomes, professionals are required to have long workdays that can deprive other important areas of their lives (Table 2). A survey in the United Kingdom found almost half women dentists (48%) reported that they were working full time (Murray, 2002). Job satisfaction was assessed through satisfaction with income, number of hours worked weekly, professional relations and daily performance (Figure 2). The results showed high satisfaction just with daily performance. Job satisfaction was judged like good by Gilmour et al (2005) at a research with England's dentists and stress was appointed like dissatisfaction factor at that time.

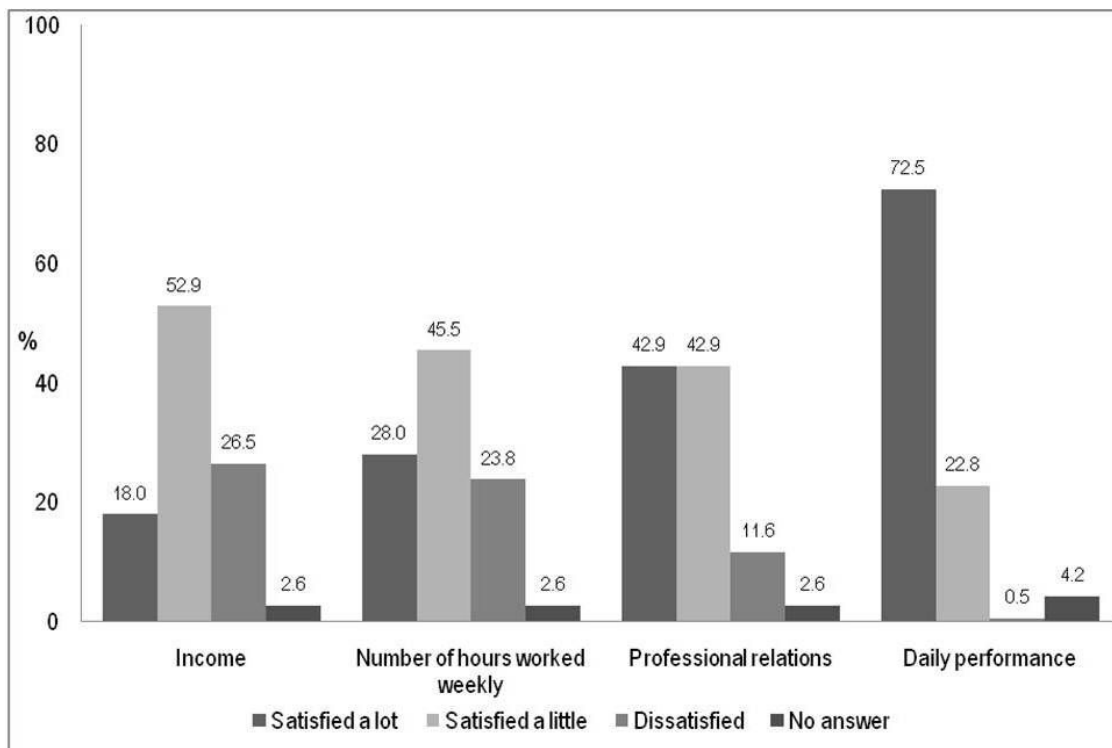


Figure 2 – Graduates' distribution according to satisfaction about income, hours worked weekly, professional relations, daily performance – Brazil, 2011.

When professionals were asked if they had acquired real estate or major purchases with their income, 36.5% reported that they had not bought anything. Among those that made purchases, the most (51.3%) bought cars, followed by houses (12.7%). Table 2 shows that there were significant differences between the reported incomes and acquiring of real estate or major purchases.

Income satisfaction was strongly related to declared income, and those who earned the lowest wages reported being dissatisfied (Table 2). When considering the number of hours worked, there was neither an association with gender nor with time since graduation ( $p < 0.05$ ). The finding related to the time since graduation disagreed with Moimaz's findings; however, in this study there was also no association between gender and the number of hours worked, which corroborated Moimaz's findings (Moimaz, 2003). Although, Murray's findings showed the female dentists at United Kingdom National Health System were working 2 or fewer days/ week, because their childcare responsibilities (Murray, 2002).

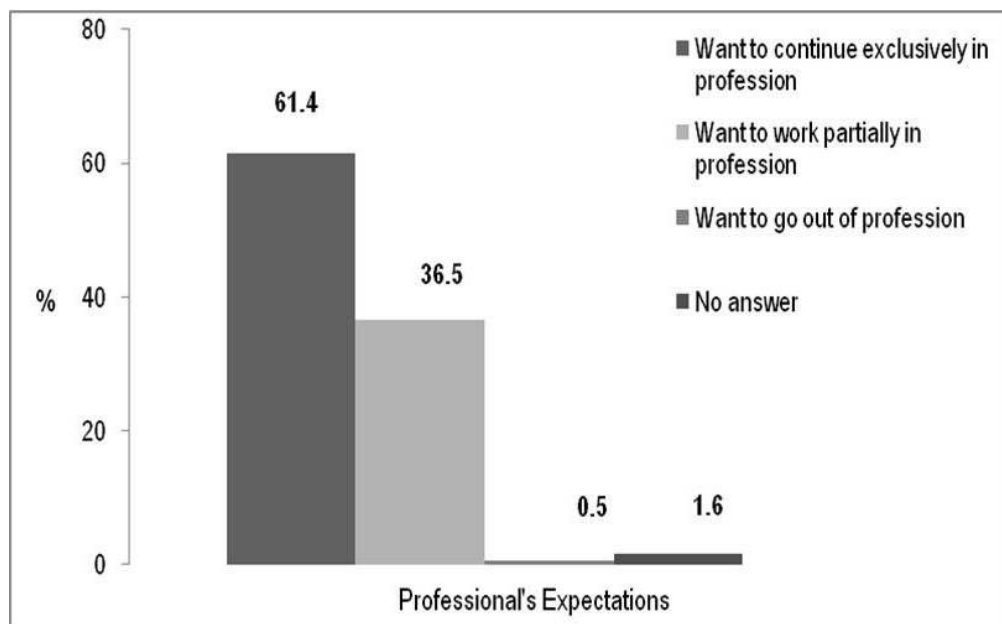


Figure 3 – Professional Perspectives of graduates from a Brazilian Public Dental School – Brazil, 2011.

Figure 3 demonstrates that a high number of graduates want to work part-time in their profession (36.5%), and that these people aim to get second jobs. A Jordan's research showed more than half dentist would not choose dentistry again as their profession (Oweis et al., 2012). The professionals were also asked about whether they would encourage their children to pursue dentistry as a profession. Of the respondents, 38.6% would not encourage dentistry courses for their sons, while 58.9% said they would encourage dentistry, and 1.8% did not answer the question. This result has been showed by Murray (2002) in a survey with female dentists. At that research, the women were divided about this question. Previous research by Moimaz et al. (2003) indicated that slightly more than 40.0% of professionals would not encourage their sons to pursue dentistry because of saturation of the labour market and the low professional income. Thus, these results suggest that challenges in the labour market are negatively affecting dentistry as a profession. Women in this profession are persistently devalued compared to males. This subject must be researched more in the future to change the professional reality.

#### 4. Conclusion

We conclude that women and not married were predominant on the number of dentists who graduated from a Brazilian Public Dental School. A large number of professionals have been trying to specialize; however, even if they become experts, they continue performing in other non-specialty areas of dentistry. At labour market, self-employed was principal modality of insertion. A considerable number of professionals declared that they were dissatisfied with their incomes. The number of professionals is concentrated in mid- to large-sized cities. To advance our knowledge of Brazilian dentist's profile and identify barriers to dentistry, future research should be done. Such research can contribute new training policies and direct new routes to the profession.

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