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Socio-demographic characteristics and career choices amongst Chilean dental students.

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Abstract: This cross-sectional study aimed to explore the socio-demographic and career choice characteristics of dental students in two publicly funded universities in Chile. A total of 601 dental students participated in the study with a 53% response rate. The written survey covered age, gender, type of school attended, place of residence, parental occupation, level of education, tuition fees payment methods, along with motivations and preferences towards dentistry as a career. The respondents had an average age of 22 years old. Sixty one percent of respondents were female, and the majority had completed secondary education in private and subsidized schools with only 21.5% having finished in public schools. Most of the students covered their tuition fees with parental money (37.1%), followed by any type of loan (27.9%). The majority of students (63.8%) had placed dentistry as their first career choice with self-motivation being the most important reason for their decision. This study provides a description of the socio-demographic and economic profile of Chilean dental students and provides insights about career decision issues. It also purposes areas for further research and management by academics for future program development.

Keywords: students, dental, Chile, socioeconomic factors, career choice.

Características socio-demográficas y elección de la carrera en estudiantes de odontología en Chile.

Resumen: El presente estudio descriptivo de corte transversal explora el perfil socio-demográfico y los factores asociados a la elección de la carrera de los estudiantes de odontología pertenecientes a dos universidades estatales chilenas. Un total de 601 estudiantes participaron de esta investigación con una tasa de respuesta del 53%. La encuesta escrita incluyó, edad, género, educación secundaria, lugar de residencia, nivel educacional y ocupación de los padres, método de pago junto con las motivaciones y proyecciones de los estudiantes hacia la carrera. Los participantes reportaron una edad promedio de 22 años. Sesenta y un por ciento de los participantes fueron mujeres, y la mayoría terminó la enseñanza media en escuelas privadas o subvencionadas, con sólo un 21,5% que se graduó en escuelas públicas. Un gran número de estudiantes paga la universidad con dinero de sus padres (37,1%), seguido con créditos de diversa índole (27,9%). La mayoría de los estudiantes seleccionó odontología como primera preferencia (63,8%), y esa elección fue principalmente mediada por motivación personal. Este estudio entrega una descripción del perfil socio-demográfico y económico de los estudiantes de odontología en Chile y otorga una visión de la problemática que existe con los factores relacionados con la elección de la carrera. Además este estudio recomienda futuras áreas a investigar y el manejo por parte de los académicos para el desarrollo de programas futuros.

Palabras clave: estudiantes de odontología, Chile, perfil sociodemográfico.

Introduction.

Dentistry has become a career of interest for Chilean students. There is an increasing number of Chilean universities creating new dental schools in response of this high demand. This fact makes the exploration of students' socio-demographic characteristics a relevant aim for dental education research.

The number of students in the dental course has increased exponentially, reaching 12,000 enrolled students across the 34 Chilean dental schools by 2011¹. This may have an effect on the students' academic performance, which might be also influenced by factors related to the students' socio-demographic and economic profiles², referencing that "the economic and cultural inequalities promote differences in the students' educational outcomes³".

It should be a Chilean government policy that

Public universities must address equity issues and educate students regardless of cultural and economic background⁴. Therefore, determining the socio-demographic profile of dental students will offer an insight into the veracity of this policy. In addition, reporting of career preferences and expectations of dental students are important as they are factors which may indicate professional trends amongst future dental practitioners. This exploration will be useful in monitoring these factors in the future Chilean dental workforce. This will be a valuable information for the recruitment and retention of the future dental professionals in different post-graduate specialization programs⁵.

This study aims to describe the socio-demographic profile and career choices in a Chilean dental student sample.

Materials and methods.

This cross-sectional descriptive study summarizes the socio-demographic characteristics and career choices amongst dental students from the University of Valparaíso and from the University of Talca.

The Human Research Ethics Committee from the University of Melbourne (HREC No 0932899), and the Bio-ethics Committees from the University of Valparaíso and Talca approved this project.

Dental schools context: The University of Talca - Dental School (founded in 1994) and the University of Valparaíso - Faculty of Dentistry (founded in 1953) were invited to participate. Both dental schools include competency-based learning in their academic programs. At the time of data collection a total of 541 and 587 students were enrolled, respectively. These universities are public universities, dependant on the Education Ministry of the Chilean Government. The main entry requirement is a high score in the University Selection Test (PSU) by students graduating from secondary schools. These universities provide a five-year program in dentistry, including basic health sciences courses in the first years. Additionally, both universities require students to complete a research thesis and community work in their final year of study. The 6th year of this program is called "Internship".

Participants and procedures: the participant universities were conveniently selected. Local coordinators organized recruitment of participants and data collection. All dental students 18 years old and older were invited to participate (n=1129). Data collection and recruitment were performed from September to December 2010. During a regularly scheduled class meeting, all students from first to final year were briefed on the aims of the study and invited to participate. Participants were asked to complete the questionnaire anonymously in their own time and to return it as soon as possible after distribution. Completion of the questionnaire required about 30 minutes. Two-week and four-week follow-up reminder e-mails were sent to participants.

Instruments: the present study is part of a large project investigating psycho-social characteristics on Australian, New Zealand and Chilean dental students⁶. The written survey was based on a previous format used in studies from Australia, New Zealand and Chile⁶⁻⁷. The survey was translated by the principal researcher (KG) and it was piloted among Chilean scholarship-holder students from the University of Melbourne. The survey included the following sections:

- a) Socio-demographic information: included seven questions in relation to age, sex, year of study, university, residency during studies and parental residency.
- b) Socio-economic information: included five

questions regarding university fees payment methods, parents' educational level and parents' occupations according to the International Standard Classification of Occupations (ISCO)⁸.

c) Career choice section: included thirty three questions related to students' career preferences and motivations for choosing dentistry as a career.

Data analysis: The data analysis included descriptive information of the socio-demographic characteristics and career choices (e.g., frequencies and distributions). ANOVA was used to identify association between continuous variables and Chi-square for categorical variables. Missing data were minimal and they were randomly distributed in the data set. All p values <0.05 were considered significant. Data were analyzed using SPSS V 20.0 (IBM, NY, USA)

Results.

Response rate: In total, six hundred and one questionnaires were returned. Three hundred and ten were from the University of Valparaíso (51.6%) and two hundred and ninety one from the University of Talca (48.4%). The response rates were 52.8% and 53.8%, respectively.

Socio-demographic characteristics: The average age of participants was 21.95 years old (s.d. 2.37). Dental students from all years of the dental course responded to this survey. The highest percentage of respondents (21.6%; n=129) were in the fourth year, whereas the lowest percentage were from the internship year (9.7%). The majority of the sample was female (61.3%). A large number of participants lived in their parental residency during their studies (43.8%) or rent houses and apartments (35.1%). The University of Talca showed the highest frequency of dental students not living with their parents compared to students from The University of Valparaíso (28.9% vs 57.7%; p<0.05). The parental residency of students was mainly located in communal capital cities (59.9%).

Table 2 summarizes the distribution of frequencies and bivariate analysis for dental students' socio-demographic characteristics.

Socio-economic characteristics: dental students were most frequently financially supported by their parents to cover their educational expenditures (37.1%), followed by university loans combined with other methods (27.9%), for example finance from parents, bank loans and their personal savings. Only the 21.2% of students pays their university fees using university loans exclusively.

Private/governmentally subsidized schooling was the most common type of prior education among dental students (78.5%). Differences by university were significant. A significant number of dental students

Socio-demographic characteristics		Universities		Total n(%) (n=601)
		Valparaiso n(%) (n=310)	Talca n(%) (n=291)	
Average age (SD)		22.03 (2.18) ^	21.87 (2.55)^	21.95 (2.37)
Sex	Females	186 (60.6)	181 (62.6)	367 (61.3)
	Males	124 (40.0)	108 (37.4)	232 (38.7)
Year of study	First	40 (12.9)	58 (20.2)	98 (16.4)
	Second	62 (20.0)	47 (16.4)	109 (18.3)
	Third	63 (20.3)	51 (17.8)	114 (19.1)
	Forth	80 (25.8)	49 (17.1)	129 (21.6)
	Fifth	29 (9.4)	60 (20.9)	89 (14.9)
	Sixth	36 (11.6)	22 (7.7)	58 (9.7)
Residency during studies	Parental residency	179 (57.7)*	84 (28.9)*	263 (43.8)
	Family or Friends	13 (4.2)	12 (4.1)	25 (4.2)
	Boarding house	24 (7.7)	42 (14.4)	66 (11.0)
	Rented House or apartment	71 (22.9)*	140 (48.1)*	211 (35.1)
	Others	23 (7.4)	13 (4.4)	36 (6.0)
Parental residency	Communal capital city	149 (52.3)	185 (67.8)	334 (59.9)
	Non-communal capital city	136 (47.7)	88 (32.2)	224 (40.1)

Table 1. Distribution of frequencies of dental students' socio-demographic characteristics and bivariate analysis by universities
* p<0.05 Chi-square ^ p>0.05 ANOVA

from Talca (29.7%) came from a public education background, whereas only 13.8% of students from Valparaiso came from public high schools (p<0.05).

The educational level of the students' parents is predominantly professional, being 36.8% for fathers and 35.2% for mothers. In regard to parents' occupa-

tions, a large number of dental students have parents who both work in professional occupations, (32.9% for fathers and 30.3% for mothers). A high frequency of mothers (42.5%) held an elementary occupation (e.g., cleaners, housewives, or were retired). Table 2 shows the distribution of frequencies of the dental

Socio-economic characteristics		University		Total n(%)
		Valparaiso n(%)	Talca n(%)	
Fees payment	University loan	77 (25.0)	50 (17.2)	127 (21.2)
	Money from parents	123 (39.9)	99 (34.0)	222 (37.1)
	Scholarships	26 (8.4)	30 (10.3)	56 (9.3)
	University loan with others	69 (22.4)	98 (33.7)	167 (27.9)
	Others	13 (4.2)	14 (4.8)	27 (4.5)
Previous Education	Public	42 (13.8)*	86 (29.7)*	128 (21.5)
	Private or subsidized	262 (86.2)*	204 (70.3)*	466 (78.5)
Educational level Father/Mother	Primary	10 (3.2)/14 (4.5)	21 (7.40)/22 (7.5)	31 (5.2)/36 (6.0)
	Secondary	50 (16.2)/71 (22.9)	94 (33.2)/106 (36.6)	144 (24.3)/177 (29.5)
Occupation Father/Mother	Technical	70 (22.7)/82 (26.5)	58 (20.5)/54 (18.6)	128 (21.6)/136 (22.7)
	Professional	129 (41.7)/112 (36.1)	89 (31.4)/99 (34.1)	218 (36.8)/211 (35.2)
	Post-graduate	41 (13.3)/25 (8.1)	16 (5.7)/7 (2.4)	57 (9.6)/32 (5.3)
	Others	9 (2.9)/6 (1.9)	5 (1.8)/2 (0.7)	14 (2.4)/8 (1.3)
	Military	23 (7.9)/2 (0.7)	6(2.3)/0(0)	29 (5.2)/2 (0.3)
Occupation Father/Mother	CEO, directors	20 (6.8)/1 (0.3)	5 (1.9)/0(0)	25 (4.5)/1 (0.2)
	Professionals	105 (36.0)/98 (32.7)	78 (29.4)/80 (27.8)	183 (32.9)/178 (30.3)
	Technicians	27 (9.2)/11(3.7)	26 (9.8)/19 (6.6)	53 (9.5)/30 (5.1)
	Public administration	19 (6.5)/9 (3.0)	22 (8.3)/16 (5.6)	41 (7.4)/25 (4.3)
	Sales	39 (13.4)/53 (17.7)	51 (19.2)/38 (13.2)	90 (16.2)/91 (15.5)
	Farmers	6 (2.1)/0(0)	20 (7.5)/0(0)	26 (4.7)/0(0)
	Operators	9 (3.1)/2 (0.7)	15 (5.7)/5 (1.7)	24 (4.3)/7 (1.2)
	Machinery, drivers	12 (4.1)/3 (1.0)	11 (4.2)/1 (0.3)	23 (4.1)/4 (0.7)
	Elementary, house wives, retired and dead	32 (11.0)/121 (40.3)	31 (11.7)/129 (44.8)	63 (11.3)/250 (42.5)

Table 2. Distribution of frequencies of students' socio-economic characteristics and bivariate analysis by universities.
* p<0.05 Chi-square

Career choices		University		Total n(%)	
		Valparaiso n(%)	Talca n(%)		
When did you commence dentistry?	Immediately after highschool	178 (57.6)	185 (63.8)	363 (60.6)	
	No Immediately after highschool	131 (42.4)	105 (36.2)	236 (39.4)	
What was your first career preference?	Dentistry	202 (65.4)	181 (62.2)	383 (63.8)	
	Medicine	95 (30.7)	95 (32.6)	190 (31.7)	
	Others	12 (3.9)	15 (5.2)	27 (4.5)	
	Undecided	8 (2.6)	12 (4.1)	20 (3.3)	
What do you want to be in the future?	General dentist	8 (2.6)	12 (4.1)	20 (3.3)	
	Specialist	221 (71.3)	177 (60.8)	398 (66.2)	
	Others (academic, researcher)	11 (3.5)	17 (5.8)	28 (4.7)	
	Undecided	70 (22.6)	85 (29.2)	155 (25.8)	
What specialty would you like?	Orthodontics	35 (13.2)	43 (19.0)	78 (15.9)	
	Surgery	37 (13.9)	40 (17.7)	77 (15.7)	
	Prostodontics	22 (8.3)	23 (10.2)	45 (9.1)	
	Periodontics	12 (4.5)	9 (4.0)	21 (4.3)	
	Pediatric dentistry	23 (8.6)	26 (11.5)	49 (10.0)	
	Oral medicine	4 (1.5)	0 (0)	4 (0.8)	
	Special needs	20 (7.5)	16 (7.1)	36 (7.3)	
	Radiology	3 (1.1)	2 (0.9)	5 (1.0)	
	Others	7 (2.6)	3 (1.3)	10 (2.0)	
	Undecided	103 (38.7)	64 (28.3)	167 (33.9)	
	In what sector would you like to work?	Private sector	24 (7.8)	24 (8.2)	48 (8.0)
		Public sector	41 (13.3)	38 (13.1)	79 (13.2)
		Private and public	159 (51.6)	128 (44.0)	287 (47.9)
University combined with private-public		52 (16.9)	49 (16.8)	101 (16.9)	
Others		8 (2.6)	22 (7.6)	30 (5.0)	
Undecided		24 (7.8)	30 (10.3)	54 (9.0)	
What would be your preferred work setting	Big city	94 (32.2)	77 (27.7)	171 (30.0)	
	Small city/rural	150 (51.4)	158 (56.8)	308 (54.0)	
	Undecided	48 (16.5)	43 (15.5)	91 (16.0)	

Table 3. Distribution of frequencies of factors associated with career choices by universities.

students' socio-economic characteristics by university.

Career choice and preferences: the majority of students commenced dentistry immediately after completing highschool (60.6%). From those students who

commenced dentistry at least a year after finishing secondary school, a large proportion did a pre-university course or studied other careers. Participating students nominated dentistry as their first career choice

		Little influence			Strong influence	
		1	2	3	4	5
What did influence you to choose dentistry as a career?	Self-motivation	3.4	4.3	14.3	21.0	57.0
	Father	28.2	18.0	28.4	16.2	9.2
	Mother	23.0	14.8	31.1	20.2	10.9
	Relative or friend	46.6	14.4	18.8	12.2	8.0
	Family dentist	66.1	10.5	8.5	6.4	8.5
	Vocational counselor or schoolteacher	68.2	12.0	11.6	5.3	2.9
What reasons did influence your career choice?	Work for people	1.2	3.3	17.1	34.2	44.2
	Expected life style	1.8	2.8	20.8	36.9	37.7
	Flexible working hours	2.2	4.8	12.5	32.0	48.5
	Work independence	3.5	5.5	16.0	29.0	46.0
	Money advantages	2.5	5.5	26.5	34.5	31.0
	Having a health professional career	3.0	4.2	15.5	24.5	52.8
	Interesting career	2.3	4.5	17.2	34.4	41.6
	Chance to complete the career	16.3	13.6	32.9	22.2	15.0
Better than others	Job security	4.0	6.7	25.9	34.6	28.8
	Chances to find a job	5.4	7.2	32.8	30.3	24.3
	Others	11.7	12.7	26.5	20.1	29.0

Table 4. Percentage for motivations/influences and reasons for choosing dentistry as a career.

(62.2%), followed by medicine (32.6%). Most of the students noted that they would like to specialize in dentistry (66.2%) with orthodontics being the most frequently selected specialization course (15.9%). Almost half of the students would prefer to work in both public and private sectors. An important number of students (16.9%) selected working as an academic or researcher as their main future career preference and 54.0% of participants would like to work in a rural setting or in a small city. Table 3 illustrates the distribution of frequencies of students' career choices and preferences.

Self-motivation was the strongest influence in dental students' decision to choose dentistry as a career (57.0%). Vocational counselors and schoolteachers had the littlest influence amongst dental students (2.9%). Students most frequently reported "having a health profession" (52.8%), "flexible working hours" (48.5%), "work independence" (46.0%) and "working for people" (44.2%) as the strongest reasons for choosing dentistry as a career. Table 4 summarizes the influences and reasons for choosing dentistry amongst Chilean dental students.

Discussion.

The response rate of 53.0% in this study was lower than previous reports from dental students in Chile.⁹ This lower rate may be due to the timing of the data collection, which was performed close to the students' university examinations. Another factor that was likely to have influenced the response rate was that participation was voluntary. The low participation of 6th year students is related to the extramural internships as part as their academic program.

To determine if the sample was indeed representative of the population, comparisons between the characteristics of the wider population of participating dental students and the actual sample were explored to see how they differed. The distributions by gender, year of study, and age were not statistically different. Thus, despite the limitations, it can be inferred that the sample was representative.

Overall, the socio-demographic profile showed that there are more females enrolled in the dental courses than males. This trend has previously been reported in Australia and New Zealand¹⁰⁻¹¹, Canada¹², UK¹³, Greece¹⁴, Malaysia¹⁵, US¹⁶ and Chile²⁻⁹. These findings support the conclusion that females students dominate in dental education. Therefore, it may be appropriate to consider future steps to better support women in their career path: for instance, allowing for continued education and re-entry into the profession after a leave of absence (e.g., maternity leave).

Students' dependence on their parents was mea-

sured with respect to their accommodation during their studies. The majority of students did not live with their parents. These dental students may prefer local universities for emotional or economic reasons. However, students from Talca were significantly more independent (i.e., living away from the parental home) than students in the University of Valparaíso. This may be a function of geography considering that, currently, the University of Talca has the only dental school located in a large central area between Santiago and Concepción.

Family income was not directly investigated when ascertaining the socio-economic status of dental students. However, data on parental occupations and educational level, dental students' secondary education, and fee-payment methods were used as proxies. Findings showed that dental students generally came from well-educated families, with a majority having at least one parent with a professional occupation. These findings are consistent with other studies⁵⁻¹⁷. The socio-economic analysis undertaken in the present research demonstrates that students supplement money from their parents with bank loans to cover their educational expenses. This indicates that, although the students generally came from well-educated families, the family income was not enough to cover the entire cost of dental education. As a result, students finished their courses with huge bank debts, when the average salary amongst Chilean dentists is approximately USD\$1,500, monthly¹⁻¹⁸.

The smallest percentage of students had a public schooling background (21.5%). The majority reported private/governmentally subsidized high school as the most common form of previous education. These findings are similar than reports from the University of Concepción². The Chilean educational system has been criticized as segregated and lacking in equity, where the quality of education significantly differ according to the students' socio-economic status¹⁹.

Data analysis showed that students from more disadvantaged backgrounds still form only a minority in Chilean dental education. This conclusion is supported by another report, indicating that inequalities are present in dental education as well, independently if the dental schools are from public universities²⁰.

In general, dental students commenced their university studies immediately after finishing secondary school. However, the results of the current study indicated that a high proportion of students (39.4%) commenced dental school at least a year after finishing secondary education. Most of them had studied a pre-university course or other careers. In addition, for some students, dentistry continues to be a second-

choice alternative to medicine (31.7%). This difference may stem from the fact that, in Chile, medicine continues to be one of the most well-paid professions and offers more employment opportunities immediately following graduation²¹. This finding may be related to two possibilities: first, the students may have initially been unsuccessful in gaining admission into dentistry courses.

Despite the selection scores for admission have decreased¹, they are still very competitive amongst traditional universities²². Second, those dental students may have been uncertain about their career choices. To help those students beginning their career path, recruitment processes and career-counseling could be improved during high school to better guide students in their career decisions, as findings from the present study showed that vocational counselor and school teachers had almost no influence in students career choices (2.9%). Better vocational programs in high school may be helpful to decrease the students' career withdraw rate, which is reported to be 50%¹. Another option could be to renew the academic curriculum transforming dentistry in a shorter postgraduate course, where the basic requirement is to have a previous degree in biomedical sciences. Developed countries have incorporated this dental curriculum, for instance, the recent Melbourne Model in Australia²³.

Chilean students would prefer to become dental specialists after graduation and the most selected preference was orthodontics. Similar to other health professionals, dental students might consider income as the main motivation behind specializing²⁴. The majority of the students would like to work in a small or rural city. This finding is not supported by the actual employment situation as reports show a huge gap in oral health access and care between the urban and rural populations. Rural population reports less regular check-ups and a great percentage of the population has never visited a dental practitioner¹⁸. This point highlights the importance of including interventions in the academic curriculum to promote the migration of professionals and future dental specialists to remote and rural communities.

A 16.9% of students would like to be an academic or researcher. This finding is relevant for promoting research-related activities or subjects in the academic curriculum across all dental schools. One study, published in 2012, reported that the scientific and research productivity is mainly provided by traditional universities, for example, the University of Chile and the University of Concepción²⁵.

In the present study, dental students' decisions about their career seemed to be self-motivated. It would appear that most students did not experience social or familiar pressure when choosing their careers.

These results are also similar to previous reports from Australia and New Zealand⁵⁻⁷.

Amongst the reasons for choosing dentistry as a career, students' preferences were: having a health science profession, flexible working hours, independence in the workplace and the altruistic philosophy of helping people. The financial advantages of the profession represented a secondary interest amongst dental students, as they may be more informed about some negative expectations for the profession and the great chances for potential unemployment.¹ Professional orientation must be delivered during the first years of the dental course. This may guide students in their future career preferences and may provide them a better understanding in regard to the benefits and challenges of the profession.

Conclusions

The present study describes the socio-demographic profile and career choices amongst dental students from two public Chilean dental schools. These characteristics are important to consider when developing or changing the academic dental curriculum. For example, the inequalities for accessing dental education, self-motivation for choosing the career, the students' high interests in improving people's oral health, preference for specialization programs, an increasing interest for working in rural settings, motivation for research, etc. These factors must be considered by academics for under-graduate and post-graduate curriculum development, as the academic curriculum should be based on the students' real professional interests. Future investigations could explore the association of socio-demographic characteristics and career choices with academic-related factors, such as admission scores and academic performance. In addition, to compare socio-demographic profiles within graduated dental professionals and to explore career preferences changes during the students' career path are important objectives for further research. The study of psycho-social factors is also a relevant area to investigate in the dental workforce and in dental education.

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