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Presentations at the National Congress of Dental Students, Chile, 2010-2013.

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Abstract: The National Congress of Dental Students (Congreso Nacional de Estudiantes de Odontología, CONADEO) is held annually and ranks as the most important instance for diffusing scientific work by dental undergraduates at congress level. The aim of this work is to describe undergraduate students' involvement in CONADEO during 2010-2013. **Methodology:** A bibliometric analysis based on the proceedings of CONADEOS published on the website of the National Scientific Dental Students Association from 2010 to 2013 was conducted. These variables were considered: year, host university, city, title, number of authors, number of organizations, authors' affiliation, area of study, category and level. **Results:** A total of 538 articles from four CONADEOs were analyzed. The largest share was for Universidad de Chile (29.93%) followed by Universidad de la Frontera (17.29%) de Talca (12.27%) and de Valparaíso (11.52%). Regarding area of study, Other (21%), Craniofacial Biology (20.63%), Behavioral, Epidemiology and Health Services (12.64%) and Periodontics (12.64%) were highlighted. In relation to categories, Literature review (48.70%), Research Paper (28.81%) and Case Report (22.49%) were considered. **Conclusion:** These results indicate that participation in undergraduate scientific production focuses on a few universities, and is not based on creating new knowledge but rather collecting what has been already studied. This research appears as the first of its kind and provides valuable information about the reality of undergraduate research to create incentive plans and motivation. **Keywords:** CONADEO, Bibliometry, Congress, Students, University.

Presentaciones en Congreso Nacional de Estudiantes de Odontología, Chile, 2010-2013.

Resumen: El Congreso Nacional de Estudiantes de Odontología (CONADEO) se posiciona como la mayor instancia de divulgación de trabajos científicos por parte de los alumnos de pregrado a nivel de congresos, la que se repite cada año. El objetivo del presente trabajo es caracterizar la participación de estudiantes de pregrado de universidades chilenas en el CONADEO durante el periodo 2010-2013. **Metodología:** Estudio bibliométrico en base a los libros de resúmenes de los CONADEOS del 2010-2013 publicados en la página web de la Asociación Nacional Científica de Estudiantes de Odontología (ANACEO); se consideraron las variables: Año, Sede (Universidad) organizadora, Ciudad, Título, Número de autores, Número de organizaciones, Universidad de origen, Área temática, Categoría y Nivel. **Resultados:** Se analizaron un total de 538 trabajos en 4 instancias de CONADEO. La mayor participación corresponde a la Universidad de Chile (29,93%) seguida por las Universidades de la Frontera (17,29%), de Talca (12,27%) y de Valparaíso (11,52%); según el área temática destaca Otra (21%), Biología Craneofacial (20,63%), Conductual, Epidemiología y Servicios de Salud (12,64%) y Periodoncia (12,64%). Según categoría aparece Revisión bibliográfica (48,70%), Trabajo de Investigación (28,81%) y Caso clínico (22,49%). **Conclusión:** Los presentes resultados indican que la participación en la producción científica de pregrado se centra en pocas Universidades, y no representa creación de nuevo conocimiento principalmente sino recopilación de lo ya estudiado. La presente Investigación aparece como la primera en su tipo y entrega información valiosa acerca de la realidad de la investigación en pregrado para crear planes de incentivo y motivación.

Palabras clave: CONADEO; Bibliometría, Congreso, Estudiantes, Odontología.

Introduction.

Recent investigations have studied the role of research in undergraduate dental education and shown its positive impact on students, increasing both their qualifications and success when continuing postgraduate training¹. Additionally, students believe their participation in research amounts to their personal development and academic achieving^{1,2}.

A fundamental part of this investigative process,

where the scientific method is used, is publishing results, which is not trivial³. For this purpose, conference presentations and publications in scientific journals appear as the most common course. The first ones are an indicator to estimate the scientific production of a country, a scientific society or a university³.

Since these media are closely related, presentations at conferences serve as a leverage for later publication in scientific journals³. In Chile, there is a wide variety

of opportunities for presenting the results of scientific research carried out by students, like research conferences, scientific meetings, student scientific conferences and similar events which are repeated each year, for example, the National Congress of Dental Students (Congreso Nacional de Estudiantes de Odontología, CONADEO), the International Association for Dental Research (IADR) and Faculty Congresses among others.

CONADEO ranks as the most important event for spreading the results of scientific research at undergraduate level in terms of number of presentations divided into three categories: research papers, case reports and literature reviews. The event is open to all the universities in the country and acts as a gateway to the world of research for future dental researchers⁴.

Several bibliometric studies have focused on professionals' participation in scientific meetings and publications in journals at national and international level³. However, there are no published studies describing undergraduate dental students' involvement in diffusing the results of their scientific production. Considering these data is important to modify education policies within each university and create support measures to strengthen the least studied research areas and the least involved universities. These changes are done by organizations intended for such purpose as the National Scientific Association of Dental Students (Asociación Nacional Científica de Estudiantes de Odontología, ANACEO)⁴.

The aim of this work is to describe the involvement of undergraduate students from Chilean universities in CONADEO from the period 2010-2013

Materials and methods.

This corresponds to a bibliometric study. The population to be analyzed is all the presentations at CONADEO from 2010 to 2013. They were collected from the respective proceedings on the ANACEO website⁴, without exclusion criteria.

The included variables were: year, host university, city, title, number of authors, number of organizations, authors' affiliation, area (modified classification by IADR, see below), category (Research Paper, Case Report and Review) and level (1st to 3rd and 4th to 6th year students) .

In order to assess the area of study, a classification which was previously accepted for this purpose according to the areas of study accepted by IADR was used³. The area of "medicine and oral pathology" was added because it suited most presentations in the "Case Report" category.

Data tabulation was done by three researchers and the final review only by one investigator to reduce

possible differences of opinion. Tabulation and data coding were performed on a MS Excel 2013 spreadsheet (MS Corporation, Redmond, USA) and statistical analysis was carried out using with STATA 10/SE (STATA Corp., Texas, USA). Descriptive statistics were generated with mean and standard deviation, interquartile range and frequency distribution and percentage tables. All presentations were analyzed.

Results.

A total of 538 works from four CONADEOs were analyzed: 2010 at Universidad de Chile (Santiago) with 98 articles, 2011 at Universidad de Valparaiso (Valparaiso) with 130 articles, 2012 at Universidad de La Frontera (Temuco) with 173 articles and 2013 at Universidad Mayor (Santiago) with 137 articles.

The percentage distribution of the authors' affiliation by date of CONADEO is shown in Table 1. Table 2 shows the distribution according to areas of study of the papers presented at each CONADEO.

University	Year				Total (%)
	2010 (%)	2011 (%)	2012 (%)	2013 (%)	
U. de Chile	35,71*	25,38	29,48	30,66	29,93
U. de la Frontera	9,18	12,31	23,12*	20,44	17,29
U. de Talca	14,29	11,54	13,29	10,22	12,27
U. de Valparaiso	17,35	22,31*	4,62	5,84	11,52
U. Mayor	3,06	6,92	6,36	15,33*	8,18
U. de Concepción	7,14	4,62	6,36	6,57	6,13
U. Austral de Chile	0	6,92	5,78	2,19	4,09
U. FinisTerra	6,12	2,31	3,47	0	2,79
U. de Los Andes	3,06	0,77	2,31	2,19	2,04
U. del Desarrollo	0	3,08	2,31	1,46	1,86
U. San Sebastián	2,04	2,31	1,16	0	1,3
U. de Antofagasta	0	0,77	0	2,92	0,93
U. Bolivariana	1,02	0,77	1,16	0,73	0,93
Otra	0	0	0,58	1,46	0,56
Total	100	100	100	100	100

*Corresponding CONADEO venue

Table 1. Percent distribution of articles according to the authors' home university per year.

Area	Year				Total (%)
	2010 (%)	2011 (%)	2012 (%)	2013 (%)	
Other	7,14	32,31	22,54	18,25	21,00
Craniofacial Biology	19,39	6,92	17,92	37,96	20,63
Behavioral, Epidemiological and Health Services	25,51	10	10,98	8,03	12,64
Periodontics	9,18	12,31	14,45	13,14	12,64
Cariology	10,2	13,08	15,03	5,84	11,34
Medicine and Oral Pathology	21,43	16,15	6,36	5,84	11,34
Prosthodontics	3,06	3,85	6,36	9,49	5,95
Dental Materials	4,08	5,38	6,36	1,46	4,46
Total	100	100	100	100	100

Table 2. Percent distribution of areas of study according to the number of articles per year.

University	Year			
	2010 (%)	2011 (%)	2012 (%)	2013 (%)
U. Austral de Chile	-	2,56	3,30	3,33
U. de Los Andes	1,33	2,00	1,75	2,67
U. de Antofagasta	-	1,00	-	1,75
U. Bolivariana	2,00	1,00	1,50	3,00
U. de Chile	2,83	2,64	2,88	2,31
U. del Desarrollo	-	3,00	2,50	3,00
U. de Concepción	1,86	2,33	2,27	1,56
U. de la Frontera	2,44	2,50	2,38	2,46
U. FinisTerra	1,33	1,67	2,33	-
U. Mayor	2,33	2,22	2,36	2,14
U. Andrés Bello	3,00	-	-	-
U. San Sebastián	2,50	2,33	1,50	-
U. de Talca	2,64	2,20	2,57	2,64
U. de Valparaíso	3,00	2,66	2,50	2,50
Other	-	-	4,00	2,50
General	2,56	2,48	2,58	2,34

Table 3. Average number of authors by home university and year.

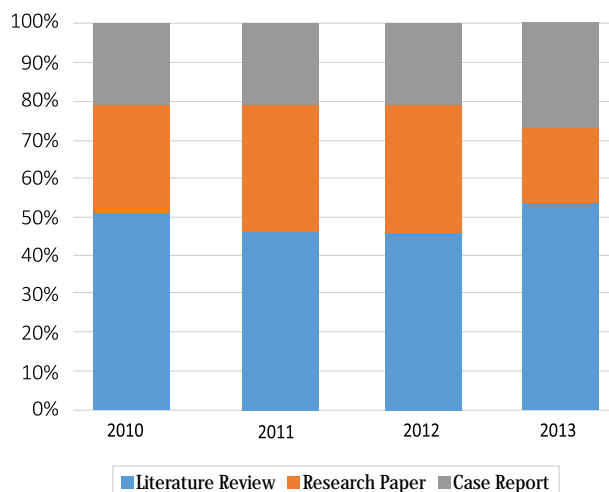


Figure 1. Distribution of presentation categories by year according to the number of articles.

A 53.35% of the articles correspond to students from 4th to 6th year, a 23.05% to those from 1st to 3rd year and the remaining 23.60% did not present a specific level. Figure 1 shows the observed distribution of paper categories according to year. A 98.88% of the papers had only one home institution; the remaining 1.12% had two.

Each paper had a mean of 2.49 ± 0.86 authors, with an interquartile range of two to three authors. Table 3 shows the average number of authors for each home university and year of CONADEO.

Discussion.

In Chile, there has been an increasing interest from

undergraduate students to participate in the production of new knowledge in dentistry. This can be seen in a continuous development of opportunities for presenting research, like the new conferences at several universities belonging to ANACEO such as Universidad de Concepción, Universidad de Chile, Universidad San Sebastian and Universidad de Antofagasta. These events are open to all students in the country and have a high attendance according to the records⁴.

The results of this study show that production is mainly focused in four universities, with over 10% share respectively. It is strongly led by Universidad de Chile and followed by U. de la Frontera, U. de Talca and U. de Valparaíso.

Universidad Mayor appears as the only non-traditional university with high participation considering its two locations (Temuco and Santiago). Also, cooperation between universities at undergraduate level is just over one percent, much lower than that seen in the Chilean participation in global IADR conferences³.

Also, it is noted that participation is focused on students in the 4th-6th year, suggesting a late access to the world of research within universities or motivation problem in the preceding years. It also may be due to the lack of integration of subjects including research methodology with the basic subjects taught in the 1st to 3rd cycle. For this level, about nine out of ten universities have a subject related to research in the last year of this cycle⁵. This indicates the amount of subjects involving research in Dentistry curricula and participation in CONADEO is not proportional since, despite the private universities having a 40% more of research subjects than the traditional ones⁵, it does not translate into greater participation in the congress. Also, it may be students from the first basic cycle are not motivated because they know they have at least three years left to conduct research prior to starting to work or applying for scholarships to continue studying⁶.

On the other hand, the highest rate of participation from students in 4th-6th year may be due to the fact that most of the thesis subjects and research projects are given during the 6th year⁵. Besides, they may feel pressured to improve their resumes by adding research before starting to work or applying for scholarships or to the Destination and Training Stage (Etapa de Destinación y Formación, EDF). It has to be reminded that presenting at conferences or publishing scientific papers have implications for the candidates selection⁶⁻⁷. Regarding this last point, it coincides the universities whose students have greater participation in CONADEO are the

ones whose graduates occupy more EDF positions⁷.

Greater participation in research at first level could increase the chances of students' success in a future continuation of their training. It is known students who start investigating early have a higher productivity in the doctoral stage and academic training and are favored when looking for academic jobs⁸. It is said the best way to promote long-term success is to help students to publish soon and to set this as a performance indicator⁸.

A significant increase in the participation of the university hosting CONADEO the corresponding year can also be seen. In some cases, it more than doubled the participation in the previous year. This may be due to greater diffusion and motivation from the organizing committee. Then, the students from that university have easy access to these events and part of the assistance could be assured. Another influencing factor may be the congress is carried out in the premises of the same university. That makes it easier for the students to participate, since they do not have to cover extra transportation and accommodation expenses. This tendency can be considered when planning an intervention plan for a faculty which has little involvement in publishing scientific research. Also, financial support for transportation and accommodation should be provided in the event that the university is not the venue in order to counteract this disadvantage.

It is observed that the field of greater interest does not fit into the classification. Craniofacial Biology appears as the second preference unlike what happens at the level of professionals where the most studied area is "Periodontics"³. Another factor to be considered is that most papers from undergraduates are in the literature review category unlike the participation of professionals in the IADR, where they are only research papers. This may also influence the already mentioned

difference between undergraduates and professionals.

It also noted that one out of two literature reviews are level 5 evidence, 1 out of 4 research papers have a level of evidence ranging from one to four and one out of five case reports are level 4⁹. This indicates scientific participation from undergraduates does not focus on the production of new knowledge but rather on compilations of what has already been studied. This preponderance of articles with low level of evidence is also observed in the Chilean scientific production in the field of Oral and Maxillofacial Surgery. In this case, most of the articles correspond to case reports and nine out of ten papers present level 4 evidence¹⁰. This situation highlights a big problem since the strict production of new knowledge is greatly reduced by analyzing only the "research paper" category where the above objective could be met. Therefore, it is necessary to modify patterns of acceptance for the "literature review" category to make them stricter as well as to require inclusion of a minimum number of references. Another measure to reduce the gap between the amount of literature reviews and research papers may be deploying a differentiated tuition for registration which rewards and encourages the authors of research.

This study on the dental scientific productivity of Chilean universities at undergraduate level, considering the largest gathering of students at country level⁴, stands out as the first of its kind. It exposes participation in CONADEO is concentrated on a very few universities, the remarkable increase in the participation of students from the host university and the little production of new knowledge at undergraduate level. Further research should be conducted in the area to define participation in other similar events like the scientific congresses of each university, IADR Jr. and specialty congresses accepting undergraduates.

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