

# Curricular structure of Mercosur countries' Dentistry undergraduate programs

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## ABSTRACT

This study analyzes the curricular organization of the Dentistry Courses in Mercosur member countries, based on the essential contents' grouping structure, established by the Resolution CNE / CES n. 3 of February 19, 2002. The programs' selection was carried out from existing data of the government agencies of the different countries studied, and in the Universia database. The sample consisted of the curricula of these programs obtained in the websites of their respective institutions, comprising 141 Brazilian programs, 8 Argentinian, 2 Paraguayan, and 2 Uruguayan. The hourly loads of the disciplines of the curricular matrices of these courses were added, according to the Article 6 of the "Diretrizes Curriculares Nacionais" (DCN - Brazilian National Curricular Guidelines), which is subdivided into Biological and Health Sciences, Human and Social Sciences, and Dental Sciences. Descriptive statistics were used to analyze the data. The software used for statistical analysis was SPSS version 22.0. The analysis of the results leads to the conclusion that there is currently a similarity in the countries' curricular structure. Eventual adjustments should be made to achieve a regional professional profile, to establish in the future a strategy of "training for integration" that allows the free passage of Dentistry graduates in Mercosur Member States.

**Descriptors:** Curriculum. Education, Dental. Education, Higher. Evaluation Studies. Mercosur.

## 1 INTRODUCTION

The curricular structure of Dentistry courses, defined in the Brazilian Resolution CNE/CES n. 3/2002, of February 19th, 2002 – ratified by the Resolution n. 3, of June 21, 2021 –, suggests that the contents must be related to the whole health-disease process of citizens,

families, and communities. This process is formally divided in three groups: Biological and Health Sciences, Human Sciences, and Dental Sciences<sup>1,2</sup>.

In a national perspective, although there are huge hardships to rupture with the traditional minimum curriculum, the undergraduate courses

advance, not always evenly, to restructure their pedagogical projects. Nevertheless, it is evident the incipience of the discussion on the curriculum structure, reflecting the professional profile of former students, concerned with regional professional demands of the Southern Common Market (Mercosur) member countries.

Instituted on March 26, 1991, by the Treaty of Asunción, Mercosur is an integration project conceived and implemented by Argentina, Brazil, Paraguay, and Uruguay. It involves economic, political, and social dimensions governed by different agencies and instances, generally decided by a collegiate represented by the Member States. In the economic aspect, the Mercosur assumes nowadays the character of a Customs Union, although their aim is to constitute a Common Market, as established in the Treaty of Asunción<sup>3</sup>.

During the 53<sup>rd</sup> Summit of the Heads of State of the Mercosur and Associated Countries, which occurred on December 18, 2018, a deal was signed to simplify the process of diploma validation in member and associated countries. Although the whole content of the agreement is not yet on public domain, the press reported that the application of the validation will occur gradually between the countries. Moreover, the principle of reciprocity will be adopted, procedurally aiming the strictly documental analysis, without further criteria. The reports also highlight that will only be included in the deal the courses recognized in the System ARCU-SUR4, which includes the Dentistry program.

Considering a future integration with free transit of professionals, this study analyzes the curricular structure of Mercosur countries' Dentistry undergraduate programs.

## 2 METHODOLOGY

This study is a descriptive and documentary research<sup>5</sup>, approved by the

Research Ethical Committee regarding Human Subjects of the Universidade Luterana do Brasil, decision n° 2.344.196.

The research operationalization was conducted in four stages. The data were collected from October 2017 to October 2018: 1) data collection from Higher Education institutions from Brazil through the website e-MEC (<http://emec.mec.gov.br/>), and from other Mercosur countries (Argentina, Paraguay, and Uruguay) through the website Universia (<http://www.universia.net/>); 2) sample calculation with a confidence interval of 95% to define the number of Dentistry undergraduate courses by country; 3) identification of current curriculum matrices of each Dentistry course registered in the websites analyzed according to the sample calculation; 4) quantitative statistical analysis of the total and stratified hourly loads (HL) according to the categories of the Diretrizes Curriculares Nacionais (DCN – National Curriculum Guidelines) established in Brazil.

The sample calculation (with a confidence level of 95%, and maximum estimation error of 5%) defined the necessity of analyzing 189 curricula: 178 in Brazil, 8 in Argentina, 2 in Paraguay, and 2 in Uruguay.

The curricular matrices were analyzed by a trained observer. The total hourly loads were added up, such as the partial HL, defined according to the grouping of the essential contents defined by DCN for the Dentistry programs by the Resolution CNE/CES n. 3, February 19, 2002, article 6°1. Thus, the following groups were considered: Biological and Health Sciences; Human and Social Sciences, and Dental Sciences. The last group was divided as: Clinical Propedeutics; Dental Clinic, and Pediatric Dentistry. When the courses did not correspond to such classification, the respective hourly loads were grouped in a sixth column named as not pertaining to any DCN axis

(NPNE). The sum of the hourly loads structured in the six columns was grouped in a seventh column named total hourly load.

The data were analyzed through descriptive statistics and Friedman and Mann-Whitney's non-parametric tests, which are presented in the tables. For the statistical analysis, the software Statistical Package for the Social Sciences (IBM, Armonk, NY, EUA), version, 22.0 was used.

### 3 RESULTS

There were eventual inconsistencies to obtain or analyze information, such as incomplete data on the websites, curricular matrices containing only the course name – without hourly load –, or only the number of credits, without specifying the HL, or curricular matrices identical in institutions located in more than one city or state, among others. Thus, we opted to exclude from the sample 37 curricula, all from Brazilian Dentistry courses, resulting in a 20% sample loss. Due to this loss, this study's analysis comprised 153 curricula: 141 from Brazil, 8 from Argentina, 2 from Paraguay, and 2 from Uruguay.

The analysis of the results and the subsequent comparisons considered the mean value because it constituted a central tendency measure more robust than the average. Paraguayan Dentistry courses required the higher

HL, and Brazil the lower (table 1).

When HL data were stratified by country, according to the structure established by Brazilian DCN, the lower hourly load found in Brazil occurred in the Dental Sciences axis, in the sub-axis Clinical Propedeutics, with 252.0 hours-class. On the other hand, the higher hourly load occurred in the axis Dental Sciences, in the sub-axis Dental Clinic, with 2130.0 hours-class (table 2).

The results of the Friedman non-parametric test for the hourly loads in the three axes showed no significant difference for the values compared in Brazilian curricular matrices. The higher HL occurred for the axis Dental Sciences with a mean of 2763.0 hours-class, and the lower HL was for the axis Human and Social Sciences, with a mean of 534.8 hours-class ( $p=0.000$ ) (table 3).

The analysis between the structure of HL in the Brazilian Dentistry programs and the hourly load structures grouped from the remaining Mercosur member countries showed a discrepancy between the countries. After grouping data, using as criteria the hourly load - Brazil/hourly load - other Mercosur countries, and performing the analysis of the same criteria by the Mann-Whitney non-parametric test, the mean HL in these countries for the competencies of the axis Biological and Health Sciences is statistically lower than in Brazil (table 4).

Table 1. Total hourly load of Mercosur countries' Dentistry programs

Variable	Country	n	Minimum	Maximum	Median	Mean	Standard Deviation
Total hourly load of the program	Brazil	141	2940.0	6090.0	4125.0	4223.3	540.0
	Argentina	8	3898.0	7200.0	4646.0	4877.9	984.0
	Uruguay	2	4370.0	6265.6	5317.8	5317.8	1340.4
	Paraguay	2	6649.0	6649.6	6649.3	6649.3	0.4
	Total	153	2940.0	7200.0	4175.0	4303.6	659.0

Table 2. Structuring of the hourly loads according to the groups established by the DCN

Country	Areas	Minimum	Maximum	Median	Mean	Standard Deviation
Brazil (n=141)	Biological and Health Sciences	333	1344	680	680.9	150.8
	Human and Social Sciences	80	1355	510	534.8	227.8
	Dental Sciences	2000	5190	2682	2763	517.9
	a) Clinical Propedeutics	60	1365	252	273.7	137.5
	b) Dental Clinic	1400	4980	2130	2185.6	511.7
	c) Pediatric Dentistry	120	520	304	303.7	98.8
	Other (NPNE*)	0	1134	220	244.6	186.1
	<b>Total hourly load</b>	<b>2940</b>	<b>6090</b>	<b>4125</b>	<b>4223.3</b>	<b>540</b>
Argentina (n=8)	<b>Biological and Health Sciences</b>	768	1170	848	917.4	152.2
	<b>Human and Social Sciences</b>	273	765	456	480.6	149.3
	<b>Dental Sciences</b>	2280	5370	2937.5	3192	977.6
	a) <b>Clinical Propedeutics</b>	80	1180	373	391.3	352.2
	b) <b>Dental Clinic</b>	1600	2688	2250	2160.5	485.7
	c) <b>Pediatric Dentistry</b>	120	2520	301.5	640.3	788.1
	<b>Other (NPNE*)</b>	60	834	252.5	287.9	247.1
	<b>Total hourly load</b>	<b>3898</b>	<b>7200</b>	<b>4646</b>	<b>4877.9</b>	<b>984</b>
Uruguay (n=2)	Biological and Health Sciences	720	937.3	828.7	828.6	153.6
	Human and Social Sciences	399.8	1181	790.4	790.4	552.4
	Dental Sciences	2319	4409.6	3364.3	3364.3	1478.2
	a) Clinical Propedeutics	305	576	440.5	440.5	191.6
	b) Dental Clinic	1744	3225.6	2484.8	2484.8	1047.6
	c) Pediatric Dentistry	270	608	439	439	239
	Other (NPNE*)	150	384	267	267	165.5
	<b>Total hourly load</b>	<b>4270</b>	<b>6265.6</b>	<b>5317.8</b>	<b>5317.8</b>	<b>1340.4</b>
Paraguay (n=2)	Biological and Health Sciences	1056	1560	1308	1308	356.4
	Human and Social Sciences	800	1160	980	980	254.6
	Dental Sciences	4409	5500	4954.5	4954.5	771.4
	a) Clinical Propedeutics	400	576	488	488	124.5
	b) Dental Clinic	3225	4580	3902.5	3902.5	958.1
	c) Pediatric Dentistry	520	608	564	564	62.2
	Other (NPNE*)	160	384	272	272	158.4
	<b>Total hourly load</b>	<b>6649</b>	<b>6649.6</b>	<b>6649.3</b>	<b>6649.3</b>	<b>0.4</b>

NPNE\* Hourly loads of courses not identified in none of the axis according to the DCN (such as Informatics, Reading and Text Interpretation, Physical Education, Seminars, Bachelor's thesis, among others).

Table 3. Structuring of the hourly loads, stratified by axes, according to the DCN

Local	Area	Median	Mean	Standard Deviation	p
Brazil (n=141)	Biological and Health Sciences	680	680.9 <sup>A</sup>	150.8	0.000 <sup>***</sup>
	Human and Social Sciences	510	534.8 <sup>B</sup>	227.8	
	Dental Sciences	2682	2763.0 <sup>C</sup>	517.9	
Argentina (n=8)	Biological and Health Sciences	848	917.4 <sup>A</sup>	152.2	0.000 <sup>***</sup>
	Human and Social Sciences	456	480.6 <sup>B</sup>	149.3	
	Dental Sciences	2937.5	3192.0 <sup>C</sup>	977.6	
Uruguay (n=2)	Biological and Health Sciences	828.7	828.6	153.6	NA
	Human and Social Sciences	790.4	790.4	552.4	
	Dental Sciences	3364.3	3364.3	1478.2	
Paraguay (n=2)	Biological and Health Sciences	1308	1308	356.4	0.135
	Human and Social Sciences	980	980	254.6	
	Dental Sciences	4954.5	4954.5	771.4	

NA: Not applicable

Table 4. Hourly load related to the areas, Dentistry programs in Brazil versus other Mercosur member countries

Area	Country	n	Median	Mean	Standard Deviation	p
Biological and Health Sciences	Brazil	141	680	680.9	150.8	0.000 <sup>***</sup>
	Other*	12	892.6	967.7	234.2	
Human and Social Sciences	Brazil	141	510	534.8	227.8	0.578
	Other*	12	479.5	615.5	301.3	
Dental Sciences	Brazil	141	2682	2763	517.9	0.026 <sup>**</sup>
	Other*	12	4768.5	3514.5	1147.9	
Dentistry Sciences - Clinical Propedeutics	Brazil	141	252	273.7	137.5	0.026 <sup>**</sup>
	Other*	12	408	415.6	291.8	
Dentistry Sciences - Dental Clinic	Brazil	141	2130	2185.6	511.7	0.257
	Other*	12	2497.5	2504.9	880.2	
Dentistry Sciences - Pediatric Dentistry	Brazil	141	304	303.7	98.8	0.031 <sup>**</sup>
	Other*	12	417.5	594	637.9	

Other\*: Argentina, Paraguay, and Uruguay, \*\* Significant for  $p \leq 0.05$ , \*\*\* Significant for  $p \leq 0.01$

#### 4 DISCUSSION

In 2002, Mercosur member countries signed the “Acordo sobre residência para nacionais dos Estados Partes do Mercosul” (Agreement on the residence of Mercosur States' Nationals), which, among other subjects, establishes the right of resident migrants to work in the destination

country<sup>4</sup>. This agreement would permit *a priori* that undergraduate degrees obtained in a member country would be valid in other member countries. However, national regulations have hampered this exchange. Until now, undergraduate and graduate degrees must be fully validated by the legislation of member countries<sup>6</sup>. This procedure continues

even with the promulgation of the Decision n. 17/08 in 2009. This decision approved an agreement to create and implement an accreditation system of undergraduate programs to regionally recognize the academic quality of the diplomas conferred in the Mercosur and its Associated States<sup>7</sup>.

The data show a relatively similar curricular structure. Differences occur on the hourly loads required by institutions for curriculum completion (table 1). Paraguay is the country that requires the higher hourly load. In this country, there is an ongoing debate about the education quality of undergraduate programs that do not have the motivation or the minimum requirements to adequately fulfill the training functions of future professionals<sup>8,9</sup>. Following the arguments of Recalde & Abente (2018)<sup>8</sup> and Rivarola (2018)<sup>9</sup>, it can be inferred that there is no directly proportional relation between the total hourly load required for a curriculum completion and the education quality and posterior professional career. It is worth mentioning that lower HL found in Brazil was 2940h. This load violates the Resolution n. 2, from June 18, 2007, which establishes the minimum hourly load and the procedures regarding the completion and duration of undergraduate programs and bachelor's degrees in classes by attendance. Dentistry programs, for instance, must have a minimum hourly load of 4,000 hours<sup>10</sup>.

Mercosur member countries evidence a curricular tendency structured in the surgery-repair paradigm, considering the number of hours available for the competencies related to Dental Sciences - Dental Clinic. The higher hourly load devoted to this axis is evident, which reflects in lower loads devoted to the Human and Social Sciences, and the Biological and Health Sciences (table 2).

Our study results show that the students' profile comprises specific competencies related to the professional career with few competencies

related to Human and Social Sciences. This situation compromises the acquisition of qualified human resources required for the individual-society relation. Thus, professionals are incapable of comprehending social, cultural, behavioral, psychological, ecological, ethical, and legal components, in the individual and collective sphere, of the health-disease process<sup>1</sup>, as suggested by the DCN.

In Argentina, Dentistry students tend to orientate their future career to highly specialized dental repair, especially in the areas of Buccomaxillofacial Traumatology and Surgery, Dental Prosthesis, Dental Implantology, Pediatric Dentistry, Endodontics, and Orthodontics. Such choices are justified by the higher financial return and wider career opportunities<sup>11</sup>.

Brazilian students enrolled at Dentistry intend to work in the private market, with their own office or in a highly specialized area<sup>6</sup>. Such goals tend to reinforce the technical, organicist, and biomedical profile of health care, characterized by individual care, precocious specializing, and therapeutic intervention, among other topics that are evidence the model based on a static concept of the health-disease process.

The precocious specializing concept has stimulated the advance of the Esthetical Dentistry<sup>7</sup>, focused on esthetic procedures frequently without considering their impacts on oral health, favoring unnecessary interventions not always related to health concerns. This professional profile is also evident in Uruguay and Paraguay. This outcome is based on students' perceptions of potential patients and their purchasing power. Generally, Dentistry syllabi in the region structure curricula stimulating high cost therapeutic intervention and the private career<sup>12</sup>.

Nevertheless, the quick establishment of a Dentistry training process for health promotion is indispensable, contemplating prevention, treatment, and maintenance strategies adequate to

Brazilian epidemiological reality, and capable of changing it<sup>13</sup>.

In all countries analyzed, the axis Dental Sciences - Pediatric Dentistry has a lower hourly load than the other axes proposed by DCN. Perhaps, an alteration could be proposed to reduce the hourly load of the axis Dental Sciences, sub-axis Dental Clinic (with the higher hourly load in all Mercosur countries). This fact would stimulate an education for health since childhood, associated with an early access to health care. This alteration could be the solution to change the regional reality, inverting the current system with a higher HL for the sub-axis Dental Clinic, which characterizes the dental surgeon profile focused on treatment practices of the surgery-repair paradigm.

Mercosur member countries commonly have regulating agencies, laws, decrees, and ordinances that establish the criteria for curricular structure in higher education. Argentina has the law n. 24.521/1995; Brazil, the Law n. 9.394/1996; Paraguay, the Law n. 4.995/2013; and Uruguay, the Decree Law n. 15.661/1984 jointly with the Organic Law of the Republic University, enacted in 1958. In this sense, all curricula analyzed are legally supported by their country's regulations.

In Brazil, the minimum and the maximum HL is lower than in the other member countries. It is also more significant in the axis related to the Biological and Health Sciences, Dental Sciences in general, and the specific competencies Clinical Propedeutics and Pediatric Dentistry. The country also has the same low pattern of HL for the axis Human and Social Sciences, and the high pattern of HL to the axis Dental Sciences - Dental Clinic (table 2).

Based on such data, dentists could work in the different countries because their curriculum (regardless of the hourly load) is similar. International agreements might eventually receive political-ideological influences, but they shall never be superimposed on the principles of the

Treaty of Asunción of 1991. The treaty aimed to gradually develop Latin America integration, promoting the scientific and technical development of its Member States, as well as modernizing their economies to increase the offer and quality of service goods, consequently, improving life conditions and stimulating the permanent union between its peoples.

We also emphasize that this study does not analyze the practical application of the curricula, such as the relationship between education, service, and community, established by the DCN 2002, and reinforced and widened by the DCN 2021, such as internships, science outreach, and the commitment to produce knowledge for regional development. Therefore, further studies are required, using other data collection methods and methodologies, to evaluate the possibility of dentists' free transit in the region.

## 5 CONCLUSIONS

The curricular organization of Dentistry programs in Mercosur Member States is similar. Total hourly loads for program completion are different. Paraguay requires the higher amount of hour to complete a surgeon dentist training, while Brazil has the lower requirement of hourly load for a curriculum completion. The Member States require the higher hourly load for the grouping of essential contents (axis) related to Dental Sciences - Dental Clinic. In all Member States, the lower hourly load required was for the axis Human and Social Sciences.

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Campus Canoas.

## ABSTRACT

### Curricular structure of Mercosur countries' Dentistry undergraduate programs

This study analyzes the curricular organization of the Dentistry Courses in Mercosur member countries, based on the essential contents' grouping structure, established by the Resolution CNE/CES n. 3 of February 19, 2002. The programs' selection was carried out from existing data of the government agencies of the different countries studied, and in the Universia database. The sample consisted of the curricula of these programs obtained in the websites of their respective institutions, comprising 141 Brazilian programs, 8 Argentinian, 2 Paraguayan, and 2 Uruguayan. The hourly loads of the disciplines of the curricular matrices of these courses were added, according to the Article 6 of the "Diretrizes Curriculares Nacionais" (DCN - Brazilian National Curricular Guidelines), which is subdivided into Biological and Health Sciences, Human and Social Sciences, and Dental Sciences. Descriptive statistics were used to analyze the data. The software used for statistical analysis was SPSS version 22.0. The analysis of the results leads to the conclusion that there is currently a similarity in the countries' curricular structure. Eventual adjustments should be made to achieve a regional professional profile, to establish in the future a strategy of "training for integration" that allows the free passage of Dentistry graduates in Mercosur Member States. Descriptors: Curriculum. Dental Education, Higher Education. Evaluation Studies. Mercosur.

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