

**Dental specialty centers: new evaluation proposal for endodontics****Centros de especialidades odontológicas: nova proposta avaliativa para endodontia****Centros de especialidades dentales: nueva propuesta de evaluación para la endodoncia****Received: 02/09/2020****Approved: 04/03/2021****Published: 14/10/2021****Leônidas Marinho dos Santos Júnior<sup>1</sup>****Luciane Zanin de Souza<sup>2</sup>****Diana Maria Alexandrino Pinheiro<sup>3</sup>****Flávia Martão Flório<sup>4</sup>**

This is an analytical, quantitative, exploratory and evaluative study, carried out with data based on the Relatório de Habilitações do Sistema de Cadastro Nacional de Estabelecimentos de Saúde (Qualification Report of the National Registry of Health Establishments) for endodontic services, considering data from 2016 and 2017. It aimed to evaluate compliance with the endodontics goal at the São Paulo State's Dental Specialties Centers, Brazil and complementation through the new proposed indicator, Specific Molar Compliance. The general and specific endodontic compliance in permanent molars was calculated, and the findings were associated with the evaluative characteristics: type of center, qualification in the contractual rule, adherence to the 2nd cycle of the access improvement program, number of endodontists and endodontics workload. 195 services were considered, of which 54% were Type II, 36% were Type I, and 10% were Type III. The number of endodontists was the only variable that remained associated with the three outcomes (Global Compliance of Goals, Specific Molar Compliance and adequacy of endodontics to ministerial directives) and center had a higher chance of reaching the target indicators if four or more professionals were working there. The new indicator of molar endodontics compliance made it possible to classify the service and the need for more endodontists as important for compliance with the indicators.

**Descriptors:** Endodontics; Oral health; Outcome and process assessment, Health care.

Trata-se de um estudo analítico, quantitativo, exploratório e avaliativo, realizado com dados baseados no Relatório de Habilitações do Sistema de Cadastro Nacional de Estabelecimentos de Saúde para serviços de endodontia, considerando dados de 2016 e 2017, tendo como objetivo avaliar o cumprimento da meta de endodontia nos Centros de Especialidades Odontológicas do Estado de São Paulo e da complementação por meio do novo indicador proposto, o Cumprimento Específico de Molar. Calculou-se o cumprimento geral de endodontia e o específico de endodontia em molar permanente, e os achados foram associados com as características avaliativas: tipo de centro, habilitação na regra contratual, adesão ao 2º ciclo do programa de melhoria do acesso, número de endodontistas e carga horária de endodontia. Considerou-se 195 serviços, dos quais 54% do Tipo II, do Tipo I com 36%, e do Tipo III com 10%. O número de endodontistas foi a única variável que se manteve associada aos três desfechos (Cumprimento Global de Metas, Cumprimento Específico de Molar e adequação da endodontia às portarias ministeriais) e, possuir quatro ou mais profissionais aumentou a chance dos centros atingirem a meta dos indicadores. O novo indicador do cumprimento de endodontia em molar possibilitou a classificação do serviço e a necessidade de mais endodontistas como importante para o cumprimento dos indicadores.

**Descritores:** Endodontia; Saúde bucal; Avaliação de processos e resultados em cuidados de saúde.

Se trata de un estudio analítico, cuantitativo, exploratorio y evaluativo, realizado con datos basados en el Informe de Habilitaciones del Sistema de Registro Nacional de Establecimientos de Salud para los servicios de endodoncia, considerando datos de 2016 y 2017, con el objetivo de evaluar el cumplimiento de la meta de endodoncia en los Centros de Especialidades Odontológicas del Estado de São Paulo, Brasil y de la complementación a través del nuevo indicador propuesto, el Cumplimiento Específico de Molar. Se calculó el cumplimiento general de la endodoncia y el cumplimiento específico de la endodoncia en molar permanente y se asociaron los resultados con las características evaluativas: tipo de centro, calificación en la norma contractual, adhesión al 2º ciclo del programa de mejora de acceso, número de endodoncistas y carga de trabajo de endodoncia. Se consideraron 195 servicios, de los cuales el 54% eran de Tipo II, el 36% de Tipo I y el 10% de Tipo III. El número de endodoncistas fue la única variable que se mantuvo asociada a los tres resultados (Cumplimiento Global de Metas, Cumplimiento Específico de Molar y adecuación de la endodoncia a las directivas ministeriales) y tener cuatro o más profesionales aumentó la posibilidad de que los centros alcanzaran la meta de los indicadores. El nuevo indicador de cumplimiento de la endodoncia en molar permitió la clasificación del servicio y la necesidad de más endodoncistas para el cumplimiento de los indicadores.

**Descriptores:** Endodoncia; Salud bucal; Evaluación de procesos y resultados en atención de salud.

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## INTRODUCTION

The National Oral Health Policy (*Política Nacional de Saúde Bucal* - PNSB) has as one of its main foundations the implementation of Dental Specialty Centers (DSC) which aims to expand access and qualify secondary care in dentistry through the Oral Health Care Networks (*Redes de Atenção à Saúde Bucal* - RASB) in Brazil<sup>1</sup>. According to its physical-structural resources, the DSC can be classified into three types: Type I (with 3 dental chairs), Type II (with 4 to 6 dental chairs) and Type III (above 7 dental chairs). The number of professionals varies according to the type of service offered<sup>2</sup>, which minimally includes the five mandatory specialties, including endodontics, and the operation of chairs for 40 hours a week<sup>3</sup>.

The DSC must carry out a minimum monthly production in each of the mandatory specialties, in accordance with Ordinance 1464/GM, of June 24, 2011<sup>3</sup> to receive the amounts of monthly financial incentives<sup>4</sup> and specifically for endodontics, the procedures accounted for in the goal include: primary tooth filling; obturation in biradicular permanent tooth; filling in permanent tooth with three or more roots; filling in permanent single-rooted tooth; endodontic retreatment in bi-radicular permanent tooth; endodontic retreatment of permanent teeth with three or more roots; endodontic retreatment of a permanent single-rooted tooth; root perforation sealing.

By the publication of Ordinance 600/GM, of March 23, 2006<sup>2</sup>, for the minimum monthly compliance with endodontic procedures, it should be considered that 20% of procedures refer to filling and/or endodontic retreatment in permanent teeth with three or more roots<sup>2,3</sup>. In Brazil, in its different regions, studies have shown that among the procedures performed by the DSC, endodontics presents the worst results related to meeting the minimum goals<sup>5-8</sup>. Other studies have pointed to non-compliance with goals in different specialties<sup>9,10</sup>. Between 2004 and 2009, Brazilian DSCs from the Northeastern, Southern and Southeastern regions of the country and located in municipalities with low HDI and population size and with large coverage of Family Health Teams showed poor or average performance<sup>11</sup> and both endodontics and surgery were the specialties that presented the lowest productivity<sup>10-12</sup>.

In the states of São Paulo, Rio de Janeiro and Minas Gerais, surveys reveal that the specialties of prosthesis, periodontics and endodontics are those with the greatest repressed demands, and among them, endodontics has the longest waitlist<sup>13-15</sup> and the longest waiting to start treatment in the users' perception<sup>16</sup>; noting that a significant percentage of DSC do not meet the goal of specialized procedures established by the Ministry of Health, and specifically, endodontics<sup>17</sup>.

However, studies that assess the DSC's endodontic services are based on whether or not the monthly number of procedures has been met<sup>5,9-12,17-20</sup>, based only on the proposal of the Global Achievement of Goals of the specialty of Endodontics (*Cumprimento Global de Metas da especialidade de Endodontia* - CGM)<sup>21</sup> and does not add to the need to differentiate the minimum mandatory monthly production of 20% in specific compliance with endodontics of permanent molar teeth<sup>2,3</sup>.

In order to reduce inequities in access to specialized dental services and, thus, provide reductions in morbidity related to oral health, DSCs should be evaluated in favor of continuous improvement of their performance based on productivity, and on consistent methodologies capable of identifying weaknesses and potential that serve as subsidies for management<sup>22</sup>.

There is an advance in the PNSB with regard to the number of specialized outpatient clinics<sup>13</sup>, with a gradual growth in the number of DSC implemented in the country from 931 in 2014 to 1037 in 2016, of these, 368 in the Southeastern region, with 195 of them in São Paulo, and in April 2020, there were 199 accredited DSCs in the state of São Paulo<sup>23</sup>.

Thus, it is necessary to assess whether the services offered to the population are resolute and promote the integrity of actions in the Oral Health Care Network, and thus, be monitored regularly. There is, then, a relevant gap in terms of investigating the relationship between offer

and use of these services, foreseeing the need to review goals and/or changes in the management of these services<sup>5,10,24</sup>.

Thus, this study aims to evaluate the fulfillment of the goal of endodontics in the Dental Specialties Centers in the State of São Paulo and the complementation through the new proposed indicator, Specific Molar Compliance.

## METHODS

This is an analytical, quantitative, exploratory and evaluative study, based on the Qualification Report of the National Registry of Health Establishments System (*Sistema de Cadastro Nacional de Estabelecimentos de Saúde - SCNES*).

The study included all DSCs in the state of São Paulo who have an ordinance for authorization in services with codes 403, 404 and 405 (CEO Type I, Type II, Type II) until December 31, 2016, and those DSC that did not show production in any of the months, in a period of one year. Data were collected in 2018 considering the outpatient productivity of the specialty of endodontics in 2017.

The Global Achievement of Goals of the specialty of Endodontics was evaluated<sup>21</sup>. This indicator is the coefficient resulting from the average of procedures performed in the period of one year of the endodontics specialty subgroup by the number of procedures corresponding to the goal of this subgroup, standardized by Ministerial Ordinance No. 1464 of June 24, 2011<sup>3</sup>, multiplied by one hundred. A goal is considered achieved when the service have met a percentage equal to or greater than 100% of the monthly goal, depending on the type of DSC registered: type I (35), type II (60) and type III (95) endodontic procedures.

Then, the new indicator proposed by the study, called Specific Molar Compliance (*Cumprimento Específico de Molar - CEM*) was evaluated. As regulated, initially, by Ministerial Ordinance No. 600 of March 23, 2006<sup>2</sup> and maintained in Ordinance No. 1464 of June 24, 2011<sup>3</sup> CEOs should carry out 20% filling and retreatment procedures for permanent teeth with three or more roots.

According to the type of DSC, the monthly average of filling procedures and retreatment of permanent molar teeth should be performed within one year: type I (07), type II (12) and type III (19). After the calculation, the service was classified as follows: yes – DSC that reached the goal of endodontic procedure in permanent molar teeth and no – DSC that did not reach the goal of endodontic procedure in permanent molar tooth.

Based on the calculated CGM and CEM indicators, the DSC endodontics specialty service was classified as follows: services that complied with both indicators were classified as adequate to the ordinances, as they fully complied with the requirements of the ministerial ordinances<sup>2,3</sup> as for the minimum monthly productivity of endodontics; and those who did not comply with any or only one of the two indicators were classified as not adequate to the ordinances, that is, they presented inadequate compliance with the ministerial goals.

The association of data obtained from the three outcome variables (CGM, CEM and classification of the endodontic service) with the five independent variables related to the evaluative characteristics of the services and professionals (type of DSC, qualification in contractual rule 7107, adherence to the 2<sup>nd</sup> cycle of the PMAQ-DSC, number of endodontist dental surgeons linked to the service, weekly outpatient workload of endodontics). DSCs qualified with contractual rule 7107 are services that do not generate credit in specialized dentistry actions, that is, they are services able to receive the monthly financial incentive with the fulfillment of the goals of the procedures subgroups<sup>3</sup>.

Data were arranged in absolute and relative frequency tables for outcomes, according to independent variables. Simple logistic regression models were estimated to analyze associations between the five independent variables and each of the three outcome variables. Raw odds ratios and 95% confidence intervals were calculated by regression models.

Variables with  $p < 0.20$  in the simple analyzes were tested in multiple logistic regression models, those with  $p \leq 0.05$  remaining in the final models. Multicollinearity was tested using the generalized variance inflation factor (GVIF), according to Fox and Monette (1992)<sup>25</sup>. All analyzes were performed using the R software (R core team, 2019)<sup>26</sup>.

This study was submitted to the Research Ethics Committee of Faculdade São Leopoldo Mandic, obtaining exemption from analysis, through No.: 2018/032, as it is a research of secondary data in the public domain and without involvement of human and material beings.

## RESULTS

195 authorized DSC in the state of São Paulo until 2016 were found. Table 1 shows the distribution of DSC implemented and enabled according to their evaluative characteristics, with the predominance of DSC Type II (105), representing 54% of the total of DSC, followed by Type I (70) representing 36%, and Type III (20), with the lowest representativeness, ie, 10%. As for the adherence to the 2<sup>nd</sup> cycle of the PMAQ-DSC, the majority, 166 (85.1%), adhered to the program.

In relation to the qualification in contractual rule 7107, it is observed that the majority, 114 (58.5%), of the DSCs of the state of São Paulo chose not to qualify in that rule. As for the number of endodontists linked to the services, it was observed that most of the 195 DSC analyzed, 117 (60.0%), had zero to two endodontists and only 15 (7.7%) of the DSC analyzed had more than four endodontists in service. Of the total DSC studied, the majority 105 (53.8%) have up to 40 hours of weekly workload. In the study there was no exclusion of any of the DSCs, all 195 DSCs in the state of São Paulo, implemented and qualified until December 2016, also presented production in a period of one year, referring to the months of January to December 2017.

**Table 1.** Dental Specialty Centers as a function of independent variables and outcome variables, São Paulo, Brazil, 2017.

Evaluative variables	Categories	DSC total No. (%)
Type of DSC	I	70 (35.9%)
	II	105 (53.8%)
	III	20 (10.3%)
Adhesion to the 2 <sup>nd</sup> cycle of the PMAQ-DSC	Yes	166 (85.1%)
	No	29 (14.9%)
Qualification in contractual rule 7107	Yes	81 (41.5%)
	No	114 (58.5%)
Number of endodontist dentists linked to the service	Up to 2	117 (60.0%)
	2 to 4	63 (32.3%)
	> 4	15 (7.7%)
Weekly outpatient hours of endodontics	Até 40	105 (53.8%)
	40 a 80	66 (33.8%)
	> 80	24 (12.3%)
CGM	Sim	53 (27.2%)
	Não	142 (72.8%)
CEM (20%)	Sim	124 (63.6%)
	Não	71 (36.4%)
Classification of Endodontics Service	Appropriate to Ordinances	52 (26.7%)
	Not appropriate to Ordinances	143 (73.3%)

Regarding CGM, it can be observed in the univariate analysis that the greater the number of endodontists linked to the service and the total weekly workload of the specialty, the greater the frequency of compliance with that goal (Table 2). In multiple analysis, only the number of endodontists remained in the final model and the greater the number of professionals, the chance of complying with the CGM was 15.50 (95%CI: 4.05-59.34) times greater than in the DSC with less endodontists (Table 2).

**Table 2.** Analyzes (gross and adjusted) of associations between independent variables and global achievement of endodontic goals (CGM) in Dental Specialty Centers (DSC) in the state of São Paulo, Brazil, 2017.

Characteristics	Categories	No. (%)	CGM		Gross OR (#IC95%)	p-value	Adjusted OR (#IC95%)	p-value
			No	Yes*				
			No. (%)	No. (%)				
Type of DSC	I	70 (35.9%)	51 (72.9%)	19 (27.1%)	References			
	II	105(53.8%)	78 (74.3%)	27 (27.7%)	0.93 (0.47 – 1.94)	0.8334		
	III	20 (10.3%)	13 (65.0%)	7 (35.0%)	1.45 (0.50 – 4.17)	0.4955		
Adhesion to the 2nd cycle of the PMAQ-DSC	Yes	166 (85.1%)	119(71.7%)	47(28.3%)	1.51 (0.58 – 3.95)	0.3970		
	No	29 (14.9%)	23 (79.3%)	6 (20.7%)	References			
Qualification in contractual rule 7107	Yes	81 (41.5%)	56 (69.1%)	25 (30.9%)	1.37 (0.73 – 2.59)	0.3304		
	No	114 (58.5%)	86 (75.4%)	28 (24.6%)	References			
Endodontist dentists linked to the service	Up to 2	117 (60.0%)	93 (79.5%)	24 (20.5%)	References		References	
	2 to 4	63 (32.3%)	46 (73.0%)	17 (27.0%)	1.43 (0.70 – 2.93)	0.3247	1.43 (0.70 – 2.93)	0.3247
	> 4	15 (7.7%)	3 (20.0%)	12 (80.0%)	15.50(4.05-59.34)	<0.0001	15.50(4.05-59.34)	<0.0001
Weekly outpatient hours of endodontics	Up to 40	105 (53.8%)	84 (80.0%)	21 (20.0%)	References			
	40 to 80	66 (33.8%)	49 (74.2%)	17 (25.8%)	1.39 (0.67 – 2.88)	0.3790		
	> 80	24 (12.3%)	9 (37.5%)	15 (62.5%)	6.6,7(2.5 – 17.32)	<0.0001		

\*Reference category for the outcome variable.

§Odds ratio. #Confidence interval.

As for the CEM, it can be observed in the univariate analysis that the greater the number of endodontists and their weekly workload of endodontics, the greater the frequency of compliance with that goal, as well as the CEO who adhered to the 2<sup>nd</sup> cycle of the PMAQ-DSC presented higher CEM. In the multiple analysis, only the number of endodontists and adherence to the 2<sup>nd</sup> cycle of the PMAQ-DSC remained in the final model and the greater the number of professionals, the chance of complying with the CEM is 15.16 (95%CI: 1.85 - 124, 11) times greater than DSC with zero to two endodontists (Table 3) and DSC who adhered to the 2<sup>nd</sup> cycle of the PMAQ-DSC, the chance of meeting that target is 3.55 (95%CI: 1.46 – 8, 61) times higher than in non-adherent DSCs (Table 3).

In adapting to the regulatory ordinances of the DSC endodontics specialty, it was verified in the univariate analysis that the greater the number of endodontists linked to the service and the weekly workload of the specialty, the better the classification of the DSC endodontics service (Table 4). In the multiple analysis, only the number of endodontists remained in the final model and the greater the number of professionals, the chance of presenting adequate endodontics service to the ministerial directives is 16.35 (95%CI: 4.26-62.73) times greater than DSC with zero to two endodontists (Table 4).

**Table 3.** Analyzes (crude and adjusted) of associations between independent variables and specific molar compliance (CEM) in Dental Specialty Centers (DSC) in the state of São Paulo, Brazil, 2017.

Evaluative Characteristics	Category	No. (%)	CEM		§Gross OR (#IC95%)	p-value	§Adjusted OR(#IC95%)	p-value
			No	Yes*				
			No. (%)	No. (%)				
Type of DSC	I	70 (35.9%)	31 (44.3%)	39 (55.7%)	References			
	II	105(53.8%)	34 (32.4%)	71 (67.6%)	1.66 (0.89 – 3.10)	0.1115		
	III	20 (10.3%)	6 (30.0%)	14 (70.0%)	1.85 (0.64 – 5.39)	0.2562		
Adhesion to the 2nd cycle of the PMAQ-DSC	Yes	166 (85.1%)	53 (31.9%)	113 (68.1%)	3.49 (1.54 – 7.91)	0.0028	3.55 (1.46 – 8.61)	0.0052
	No	29 (14.9%)	18 (62.1%)	11 (37.9%)	References		References	
Qualification in contractual rule 7107	Yes	81 (41.5%)	27 (33.3%)	54 (66.7%)	1.26 (0.69 – 2.28)	0.4520		
	No	114 (58.5%)	44 (38.6%)	70 (61.4%)	References			
Endodontist dentists linked to the service	Up to 2	117 (60.0%)	56 (47.9%)	61 (52.1%)	References		References	
	2 to 4	63 (32.3%)	14 (22.2%)	49 (77.8%)	3.21 (1.60 – 6.44)	0.0152	2.94 (1.45 – 5.98)	0.0029
	> 4	15 (7.7%)	1 (6.7%)	14 (93.3%)	12.85 (1.64 100.93)	0.1987	15.16 (1.85 – 124.11)	0.0113
Weekly outpatient hours of endodontics	Up to 40	105 (53.8%)	49 (46.7%)	56 (53.3%)	References			
	40 to 80	66 (33.8%)	20 (30.3%)	46 (69.7%)	2.01 (1.05 – 3.86)	0.0030		
	> 80	24 (12.3%)	2 (8.3%)	22 (91.7%)	9.62 (2.15 – 43.00)	0.0463		

\*Reference category for the outcome variable.

§Odds ratio. #Confidence interval.

**Table 4.** Analyzes (crude and adjusted) of associations between independent variables and the performance of the specialty of endodontics at the Centers of Dental Specialties (DSC) of the State of São Paulo, Brazil, 2017.

Evaluative Characteristics	Category	No. (%)	Classification of Endodontic Services		§Gross OR(#IC95%)	p-value	§OR of final model (#IC95%)	p-value
			Not appropriate to Ordinances	Appropriate to Ordinances*				
			No. (%)	No. (%)				
Type of DSC	I	70 (35.9%)	52 (74.3%)	18 (25.7%)	References			
	II	105 (53.8%)	78 (74.3%)	27 (25.7%)	1.00 (0.50 – 2.00)	1.0000		
	III	20 (10.3%)	13 (65.0%)	7 (35.0%)	1.56 (0.54 – 4.51)	0.4156		
Adhesion to the 2nd cycle of the PMAQ-DSC	Yes	166 (85.1%)	119(71.7%)	47 (28.3%)	1.90 (0.68 – 5.26)	0.2195		
	No	29 (14.9%)	24 (82.8%)	5 (17.2%)	References			
Qualification in contractual rule 7107	Yes	81 (41.5%)	57 (70.4%)	24 (29.6%)	1.29 (0.68 – 2.45)	0.4308		
	No	114 (58.5%)	86 (75.4%)	28 (24.6%)	References			
Endodontist dentists linked to the service	Up to 2	117 (60.0%)	94 (80.3%)	23 (19.7%)	References		References	
	2 to 4	63 (32.3%)	46 (73.0%)	17 (27.0%)	1.51 (0.74 – 3.10)	0.2612	1.51 (0.74 – 3.10)	0.2612
	> 4	15 (7.7%)	3 (20.0%)	12 (80.0%)	16.35(4.26–62.73)	<0.0001	16.35 (4.26 – 62.73)	<0.0001
Weekly outpatient hours of endodontics	Up to 40	105 (53.8%)	85 (81.0%)	20 (19.0%)	References			
	40 to 80	66 (33.8%)	49 (74.2%)	17 (25.8%)	1.47 (0.71 – 3.08)	0.3011		
	> 80	24 (12.3%)	9 (37.5%)	15 (62.5%)	7.08 (2.71 – 18.49)	<0.0001		

\*Reference category for the outcome variable.

§Odds ratio. #Confidence interval.

## DISCUSSION

It is important to structure an indicator for the specialty of endodontics that can be used in evaluative studies of the country that assess the provision of the service through the user's access to specialties in oral health offered in DSC and that can serve as a reference for future studies that seek the improvement of the public health system.

Among the evaluative characteristics of the services of the 195 DSC in the state of São Paulo, it was observed that the highest frequency was for the DSC Type II 105 (53.8%), a result similar to that observed in the states of Amazonas<sup>18</sup>, Minas Gerais<sup>5</sup> and Pernambuco<sup>9</sup>, probably as a result of the managers' option, based on the service's structural physical characteristics, since, as recommended by Ordinance No. 1464 of 2011, the addition of just one more dental team and one more dental surgeon in relation to the Type I CEO increases the federal implementation financial incentive and the monthly funding incentive in the same proportion and the possibility of a greater population coverage of the specialized service, and with that, the goals for the subgroups of procedures also increase<sup>20</sup>.

It can also be observed that of the 195 DSCs qualified in CNES, only 81 (41.5%) of the DSCs were qualified with contractual rule 7107, which means that they are establishments, without credit generation in specialized dentistry actions and that they are able to receive the monthly funding incentive transferred by the Ministry of Health, depending on the type of DSC. Therefore, they should fulfill all the goals of the subgroups of procedures, necessarily, being entitled to receive the referred financial incentive.

However, among the 81 authorized DSCs, the majority 69.1% (56) did not meet the CGM and 33.3% (27) did not meet the CEM. As a result of not complying with these indicators, it can be inferred that these services had a poor performance when not complying with the requirements of the ministerial ordinances, which would imply the suspension of the transfer of resources related to monthly financial incentives until the regularization of said production, as recommended by Ordinance No. 1464, of June 24, 2011<sup>3</sup>.

The joint assessment of the CGM and the CEM, the proposed indicator, is crucial and necessary for the classification of the endodontic specialty service offered by the DSCs, in a manner consistent with the current regulatory Ordinance, Ordinance 1464/GM, of June 24, 2011<sup>3</sup>, enabling the qualification of access to the specialty and the availability of the health service provided by specialized oral health care.

Although it is clear so much in Ministerial Ordinance No. 600 of 2006 as in Ordinance 1464 of 2011 which amended its annex, which, in order to comply with the minimum monthly production of endodontic procedures, in addition to the minimum number of procedures per type of DSC, it is mandatory to comply with at least 20 % of the following procedures: filling and/or endodontic retreatment in permanent teeth with three or more roots, the CGM<sup>21</sup> indicator widely shown in works<sup>6-12</sup> since its proposal in 2008, which considers only the result of the monthly average of procedures performed in each subgroup dental specialties, without considering the type and minimum percentage of procedure performed, therefore, the joint assessment of the two indicators becomes crucial.

In this context, only 27.2% (53) of the DSC reached the CGM, a result that corroborates other research that showed that among the procedures performed by DSC in regions of Brazil, endodontics has the worst quantitative performance<sup>5-8</sup>.

When evaluating the CEM indicator, it is observed that the majority of DSC 63.6% (124) performed the minimum number of recommended procedures in permanent molars. This result validates the importance and need for differentiation/specification of the CGM of the endodontics specialty with the complementation of the analysis including the new proposed indicator, the CEM, making the evaluation of the specialty more critical, qualified and closer to the reality of performance of the specialty through the pioneering analysis of this indicator. Thus, one can think of the contribution of this new indicator to the particularities of each region

and its existing demand, according to the epidemiological profile of the population in each location in the country.

It is important to highlight that compliance with the provisions of the current ordinance<sup>3</sup> presupposes compliance with both the CGM and the CEM, and, in this sense, only 26.7% (52) of the evaluated DSCs fit into this classification.

The transfer of resources related to the DSC's monthly costing incentives is fully suspended when the minimum monthly production, in any of the specialties offered by the service, in particular, endodontics is not reached within a year, and maintained suspended until such minimum monthly production is regularized<sup>3</sup>. It is inferred that services that are not meeting the aforementioned monthly targets are receiving the monthly funding incentive, which if it is necessary to investigate how, how much and when DSCs are using their federal resources for oral health and whether these investments are being proportional to the achievement of standardized goals.

Among the independent variables tested, service adherence to the PMAQ and the number of professionals linked to the service were associated with compliance with the CEM. Also, services that receive a monthly financial incentive for their productivity through the PMAQ-DSC increased their chance of CEM by about three times. It is possible that adherence to PMAQ-DSC is an important step in the qualification of greater access to specific endodontic treatment of permanent molar teeth (CEM), as it is a strategy that provides financial resources to municipalities that can be transferred to professionals, according to DSC<sup>27</sup> type.

This reality can be considered an essential and differential factor between CEM and CGM, and reinforces the importance of the concept of motivation and performance of professionals for productivity in specific endodontics of molar teeth, as it is a specialty that requires special attention in clinical management and because it was implemented late in the public service, only from 2004 along with the guidelines of the PNSB<sup>1</sup>.

The greater number of endodontists linked to the DSC service proved to be relevant and associated with an increase of more than 15 times in the chances of complying with the CEM and CGM if the service has four or more endodontists and, consequently, better performance in the quality of the service. A similar result found in other studies suggests that the low production of DSCs may be related to the inadequate number of professionals per specialty<sup>28</sup> and the lack of a waiting list system to replace absentees<sup>29</sup>.

Although there has been an increase in the number of implanted DSCs, the secondary care network in oral health has not kept up with the gradual growth in the supply of primary care services through the expansion of coverage of oral health teams in the Unified Health System (SUS). Thus, the low number of professionals in the specialty of endodontics in the current scenario in the large centers of the country is not able to meet the demand, leading to the formation of long waitlists in the DSC associated with failure in the referral mechanism of patients between levels of attention<sup>30</sup>, or the difficulty of access, which can lead to the user giving up, which can compromise the oral health care network.

Endodontics, being a more delicate procedure, requires more care and more time to perform, thus, this can collaborate with non-CGM, it is important to emphasize that the goal established for the specialty of endodontics is based only on the completed endodontic treatment, not counting other procedures between clinical sessions, such as access to dental pulp and medication and the delay dressing with or without biomechanical preparation that are part of the endodontic therapy process until its conclusion<sup>20</sup>. It is necessary to assess the quality of the endodontic service in these health establishments to establish the quality of the service provided in the preservation of permanent molar teeth, management of actions and organization of demand for dental services in the health care network.

Despite the association of the CGM, CEM and classification of the endodontic service with the number of endodontists linked to the service, the results found show that the weekly outpatient workload of endodontics did not influence any of the three outcome variables, this



is opposed to work that have shown that the low productivity of DSCs may be related to non-compliance with the real workload of professionals<sup>29</sup>. A greater number of endodontists in the DSC is suggested as a way to compensate for the professionals' non-compliance with the workload to reach the minimum goals, probably due to the double shift of dentistry professionals in the public and private service<sup>29</sup>.

This percentage difference observed between non-compliance with the two CGM and CEM indicators demonstrated the relevance of this study when specifying the CEM, which aims to bring the local reality closer to the fulfillment of the endodontic goal, in which a lower number of DSC is observed. which did not meet the goal of molars when compared to general compliance (CGM), despite the requirement that 20% of the goal of the procedures in the endodontics subgroup were for filling in permanent teeth with three or more roots and/or endodontic retreatment in permanent teeth with 3 or more roots, through Ordinance No. 1464 (2011)<sup>3</sup>.

Failure to comply with this compliance specification (CEM) makes it difficult to achieve the goal of this endodontics subgroup, distances the actual monitoring of user access and makes it impossible to evaluate the performance of the endodontics service of the DSC, because the CGM is just a general analysis of the specialty.

The alternatives are: hiring more professionals to meet the needs of the service, a better standard of remuneration, and financial incentives for performance based on productivity to motivate/encourage professionals to meet the minimum service provision goals.

The CEM associated with the CGM is necessary for the evaluation of the classification of endodontic services of the DSCs in order to induce managers and professionals to expand and improve the access and quality of specialized services in dentistry and monitor the strategic actions of the DSCs accordingly with the characteristics of the services in each region.

It can be observed, through CEM and CGM, the need to expand specialized attention in dentistry regarding the number of endodontist professionals linked to the DSC service to effectively meet the goals and meet the repressed demand, and thus expand access of users. Thus, there is a need to qualify the strategic and specific actions for monitoring access to the endodontic service.

## CONCLUSION

The use of the CGM as the proposed standard indicated an inadequacy due to the requirements of the ministerial ordinances, identifying the need for complementation through the formulation of the new proposed indicator, the CEM, to obtain the real classification of the endodontic service.

The greater number of professionals linked to the DSC services proved to be important for compliance with the indicators and for an adequate qualification of access to the specialty of endodontics.

It is suggested that other studies be carried out capable of filling some gaps that still exist that may incorporate new effective strategies for organizing the endodontic service, as well as assessing whether there was a suspension of financial resources related to the DSC monthly costing incentives in the event of non-compliance the minimum monthly production, through the CEM, as well as the suspension and/or reduction of the monthly amount of the PMAQ-DSC financial incentive in services that no longer meet the minimum requirements of the program.

As a limitation, there is the use of secondary data, originating from the SUS information systems, capable of resulting in biased estimates, resulting from notification and registration errors. Still, the information available in TABWIN/DATASUS is important for planning and decision-making, especially when associated with other documentary sources, so that the findings of this investigation may contribute to the qualification of the analysis of endodontic services in DSC.

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**Diana Maria Alexandrino Pinheiro, Flávia Martão Flório and Leônidas Marinho dos Santos Júnior** contributed to the design, collection and analysis of data, writing and review. **Luciane Zanin** collaborated in the design, writing and review.

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