# DENTAL EQUIPMENT AND SUPPLIES AND THEIR ASSOCIATION WITH PRIMARY HEALTH CARE UNITS

Equipamentos e insumos odontológicos e sua relação com as unidades da atenção primária à saúde

Equipos e insumos odontológicos y su relación con las unidades de atención primaria de salud

**Original Article** 

#### **ABSTRACT**

**Objective:** To analyze the association between dental equipment/supplies and primary health care units. **Methods:** Quantitative cross-sectional study carried out in health care centers (n=243) and Primary Health Care Units (PHU) (n=1101), in the 16 Regional Health Divisions of the state of Paraíba, Brazil, in 2012 and the first semester of 2013. Secondary data about dental equipment and supplies was collected in the health units. Data emerged from questions on oral health of the National Program for Access and Quality Improvement in Primary Care (PMAQ). The t-Student and chi-square tests (p=0.05) were applied. **Results:** A reduced number of dental equipment and supplies was found, such as autoclaves in proper conditions for use in only 27.2% (n=66) of the health care centers and 29.0% (n=319) of the PHU; and sealants in sufficient quantity only in 31.7% (n=77) of the health care centers and 30.7% (n=338) of the PHU. There are differences between the kinds of health facilities and the availability of materials and equipment, such as reflectors (p<0.05), and association with the regional health divisions was evidenced. **Conclusion:** In the primary care level, health units of the state of Paraíba feature reduced amount of dental equipment and supplies, with a significant difference between the type of health facility and the regional health divisions.

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**Descriptors:** Primary Health Care; Dental Care; Structure of Services.

# **RESUMO**

Objetivo: Analisar a relação entre equipamentos/insumos odontológicos e as unidades de atenção primária à saúde. Métodos: Estudo transversal do tipo quantitativo realizado em postos de saúde (n=243) e unidades básicas de saúde (USB) (n=1101), nas 16 regionais de saúde do Estado da Paraíba, no ano de 2012 e primeiro semestre de 2013. Coletaram-se dados secundários sobre equipamentos e insumos odontológicos nas unidades de saúde. Esses dados emergiram das questões de saúde bucal do Programa Nacional de Melhoria do Acesso e Qualidade da Atenção Básica (PMAQ). Aplicaram-se os testes t de Student e Oui-quadrado (p=0,05). Resultados: Encontrou-se um número reduzido de equipamentos e insumos odontológicos, como autoclaves em condições de uso em apenas 27,2% (n=66) dos postos de saúde e em 29,0% (n=319) das UBS, e selantes em quantidade suficiente apenas em 31,7% (n=77) dos postos de saúde e em 30,7% (n=338) das UBS. Há diferença entre os tipos de unidades e a disponibilidade de equipamentos e materiais, como refletores (p<0,05), constatando-se associações com as regionais de saúde. Conclusão: Na atenção básica, as unidades de saúde do Estado da Paraíba apresentam alguns equipamentos e insumos em número reduzido, com diferença significativa entre o tipo de unidade e as regionais de saúde do estado.

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Descritores: Atenção Primária à Saúde; Assistência Odontológica; Estrutura dos Serviços.

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# **RESUMEN**

Objetivo: Analizar la relación de los equipos/insumos odontológicos y las unidades de atención primaria de salud. Métodos: Estudio transversal del tipo cuantitativo realizado en centros de salud (n=243) y unidades básicas de salud (UBS) (n=1101) de las 16 regionales de salud del Estado de Paraíba en el año de 2012 y en el primer semestre de 2013. Se recogieron datos secundarios de los equipos e insumos odontológicos de las unidades de salud. Estos datos emergieron de las cuestiones de salud bucal del Programa Nacional para la Mejoría del Acceso y Calidad de Atención Básica (PMAC). Se aplicaron las pruebas t de Student y la prueba Chi-cuadrado (p=0,05). **Resultados:** Se encontró un número reducido de equipos e insumos odontológicos como autoclaves en buenas condiciones solamente en el 27,2% (n=66) de los centros de salud y en el 29,0% (n=319) de las UBS y sellantes en cantidad suficiente solamente en el 31,7% (n=77) de los centros de salud y en el 30,7% (n=338) de las UBS. Hay diferencia entre los tipos de unidades y la disponibilidad de los equipos y materiales como los reflectores (p<0,05) con asociaciones entre las regionales de salud. Conclusión: En la atención básica las unidades de salud del Estado de Paraíba presentan algunos equipos e insumos en cantidad reducida y diferencia significativa entre el tipo de unidad y las regionales de salud del estado.

**Descriptores:** Atención Primaria de Salud; Atención Odontológica; Estructura de los Servicios.

#### INTRODUCTION

More than 20 years since its birth, from the 1988 Brazilian Constitution, the Unified Health System (*Sistema Unico de Saúde - SUS*) features as one of its basic principles the integration of actions and services. This principle aims at ensuring comprehensive health care to the user within the public system<sup>(1,2)</sup>. In this context, Primary Health Care (PHC) acts as a set of actions and extensive interventions developed for prevention, promotion, cure and rehabilitation of the families' general health<sup>(3)</sup>.

With PHC as one of SUS entrance doors, the Family Health Program (FHP) arose in 1994, intended to reorganize the health care model which was then current, and only in 2000 there was the inclusion of Oral Health Teams (OHT), thus increasing the access to an essential dimension in order to move towards the comprehensive care<sup>(4)</sup>.

Complementing the organization and SUS coverage, the Ministry of Health (MOH) has subsidized several initiatives aiming at the reorganization of the tactics delineated by the National Policy of Primary Care, in order to increase the quality of primary health care services<sup>(5,6)</sup>.

One of the measures implemented was the "Health closer to you - Access and Quality / National Programme

for Access and Quality Improvement in Primary Care - PMAQ" which intends to expand the access and improve the quality of health care by providing a national, regional and local quality standard<sup>(5,7)</sup>. The PMAQ is organized into four phases comprising a cycle, namely: participation and contracting, development of actions, external assessment and contract renewal<sup>(5)</sup>.

The first phase of PMAQ determines joining the program by means of contracting commitments and indicators between the primary care teams and municipal managers, and between these and the Ministry of Health. The second phase consists in the development stage of the actions to be undertaken by the primary care teams. The third phase corresponds to the external assessment, where a set of actions are performed in order to ascertain the access and quality conditions of all the municipalities and primary care teams participating in the program. Finally, the last step is the contract renewal stage, in which, based on each team's performance assessment, a new contracting process is performed, with indicators and commitments that should be achieved, thus completing the cycle proposed by the program<sup>(5)</sup>.

The third phase is carried out with the services assessment, by using three instruments: module I (direct observation in the primary health care unit - PHU); module II (interview with the professional of the primary care team and analysis of documents in the primary health care unit); and module III (interview with the user) <sup>(5)</sup>.

Through the assessment of the services quality, the PMAQ-AB seeks, among other things, to verify the Family Health Strategy (FHS) effectiveness in incorporating the SUS principles. As regards the comprehensiveness, understood as a set of actions and services intended to ensure the health care continuity along the different levels of care<sup>(8)</sup>, it can be observed that the effectiveness of the continuing dental service provision is hindered when there is unavailability of supplies/materials and equipment for the provision of attention to the user.

Thus, it highlights the importance of evaluating the structure for dental care, in order to identify and characterize weaknesses in primary care, with a view to ensure problemsolving capacity, efficiency and improved quality and access to oral health practices<sup>(5)</sup>.

Based on these assumptions, this study aimed at analyzing the relationship between dental equipment and supplies and primary health care units (PHU).

# **METHODS**

This is a cross-sectional, quantitative, inductive study, carried out in primary health care units in the state of Paraíba, in year 2012 and first semester of 2013.

According to the Brazilian Institute of Geography and Statistics (*Instituto Brasileiro de Geografia e Estatística - IBGE*) and the Council of Municipal Health Secretariats of Paraíba (CONSEMS/PB), Paraíba has 223 municipalities,

which were distributed in 16 regional health divisions (Figure 1), grouped according to the demographic, socioeconomic and health characteristics, including epidemiological data on health services accessibility and supply in each region<sup>(9,10)</sup>.

Figure 1 - Regional health divisions of the State of Paraíba.



Source: Council of Municipal Health Secretariats of Paraíba - COSEMS/PB.

Secondary data was collected from the database produced by the Ministry of Health, originating from the first cycle of the PMAQ external assessment of primary care (year 2012 and first semester of 2013).

The number of health facilities contracted in the State of Paraíba was 1,344, with 1,101 classified as "primary health care units" and 243 as "health centers". The variables analyzed in this study are described in Table I.

Health centers are characterized by the traditional or passive model, in which there is no active bond with users. They do not adopt the current logic of the Family Health Units (FHU) and the subsequent insertion of the Family Health Strategy (FHS), where the ability to meet the population's health needs is enhanced. These facilities do not have a multidisciplinary team such as the Oral Health

Team (OHT), nor provide comprehensive care of children, adults, women and the elderly<sup>(11-13)</sup>.

The primary health care units are characterized by the presence of a multidisciplinary team that includes at least a general practitioner or a family health specialist, a general nurse or family health specialist, an auxiliary nurse or nursing technician, and community health workers (CHW). As part of the multidisciplinary team, the oral health professionals (or Oral Health Team - OHT) can be added to the basic composition: the general dentist or family health specialist, and the oral health assistant and/or technician. These units seek to meet the user's health needs in a continuous way<sup>(11-13)</sup>.

The instrument for external assessment in PMAQ Module I was the basis for obtaining data in this study. It addresses oral health issues, with information concerning

Chart I - Variables analyzed from the information obtained in the health care units. Paraíba, 2012-2013.

Variable analyzed	Detailing	Category of analysis				
	Amalgam mixer					
Dental equipment	Dental chair					
	Air compressor with safety valve	1- In proper conditions for use.				
	Dental curing light	in proper conditions for use.				
	Dental stool					
	Reflector					
	Dental cuspidor	2- No conditions for use.				
	Autoclave	2- No conditions for use.				
	Dental delivery units (high and low speed handpieces)					
Dental materials/supplies	Amalgam Various cements Suture threads	1 - Sufficient amount.				
	Sealants	2 In sufficient amount				
		2 - Insufficient amount.				
	Anesthetics					
Type of health facility	1 - Health Center 2 - Primary Health Care Unit	<ol> <li>Unit designated to provide assistance to this population, scheduled or not, by technicians with intermittent presence or absence of medical professional<sup>(12)</sup>.</li> <li>Unit designated to assist a population with comprehensive, primary care, regardless of programmation, within the basic specialties<sup>(12)</sup>.</li> </ol>				

materials, supplies and equipment intended for the dental care provided in the health care units of Paraíba that had joined the program,.

These instruments were applied to assess all teams contracted by PMAQ. However, Module I, which focuses on the analysis of the units structure was also applied to all the units registered as primary care services, in order to conduct a census comprising the primary units regardless of their adherence to PMAQ<sup>(5)</sup>.

Descriptive analysis was conducted by means of absolute frequencies and percentages, and the Chi-square test, Kolmogorov-Smirnov and Student's t-test were used for inferential analysis, adopting a confidence interval of 95% ( $\alpha$ =0.05) and using the SPSS software, version 21.0.

The Kolmogorov-Smirnov test was used to identify the data distribution, therefore, as a normality test. Through it, the data in this study was found to be parametrically distributed, thus allowing the subsequent use of Student's t test.

By means of Student's t-test, a comparative analysis was performed between the type of health facility (health center and primary health care units), the presence of dental equipment and the conditions of dental supplies/materials.

The existence of association between the type of unit and the regional health divisions of Paraíba was also analyzed by the Pearson's chi-square test. In order to identify which of them presented differences regarding the type of health facility, the chi-square test was used again, comparing the regional health divisions one by one.

#### **RESULTS**

Insufficient availability of some dental supplies/materials and equipment can compromise the resolution of the oral health demands of primary care users, thus affecting the credibility of this level of attention. Given that, the services evaluation process, including the availability of supplies/materials and equipment, plays a strategic role in identifying weaknesses in dental care<sup>(14)</sup>.

From the collection of data on oral health issues, it was possible to learn the number of health units in Paraíba and their distribution, according to the type, as for the dental equipment and supplies/materials. After processing the data, there was significant difference (p-value < 0.05) between the types of health facilities and the availability of equipment and supplies/materials in those units (Table I).

Additionally, a small number of units was found with all the equipment and materials listed in proper conditions for use and in sufficient quantities, when compared to the total number of health units present in the state (n=1.344).

The small number of health units with autoclaves in proper conditions for use (only 27.2% of health centers and 29.0% of the PHU) was evidenced. It was found that more than half of the health centers and primary health units had the other pieces of equipment.

As for supplies/materials, a small number of health units presented sealants in sufficient quantity (only 31.7% of health centers and 30.7% of the PHU). The same could be observed for various cements (41.9% of health centers; 49.6% of PHU) and amalgam (48.6% of health centers, 58.9% of PHU). Similarly to pieces of equipment, the other supplies/materials were available in more than half of health centers and primary health care units.

The results showed an association between the type of health facility and the presence of pieces of equipment such as amalgam mixer (p=0.025) and dental chair (p=0.013). The same was observed regarding supplies/materials such as amalgam (p=0.00) and various types of cements (p=0.00) (Table I).

Table I - Distribution of dental equipment and supplies/materials according to the types of health units. Paraíba, 2012-2013.

	Type of health unit								
	Health center (n=243)				PHU (n=1.101)				
Variables									
	Yes		No		Yes		No		p-value
	n	%	n	%	n	%	n	%	
Equipment									
Amalgam mixer	144	59.3	99	40.7	743	67.5	358	32.5	0.025*
Dental chair	159	65.8	84	34.2	785	71.3	316	28.7	0.013*
Air compressor with safety valve	154	63.7	89	36.3	768	69.8	333	30.2	0.126
Dental curing light	135	55.9	108	44.1	713	64.8	388	35.2	0.149
Dental stool	155	64.1	88	35.9	765	69.5	336	30.5	0.074
Reflector	156	64.6	87	35.4	782	71.1	319	28.9	0.040*
Dental cuspidor	159	65.4	84	34.6	779	70.8	322	29.2	0.267
Autoclave	66	27.2	177	72.8	319	29.0	782	71.0	0.820
Dental delivery units (high and low speed Handpieces)	158	65.0	85	35.0	777	70.6	324	29.4	0.257
Supplies									
Amalgam	118	48.6	125	51.4	648	58.9	453	41.1	0.000**
Various cements	101	41.9	142	58.1	546	49.6	555	50.4	0.000**
Suture threads	122	50.2	121	49.8	672	61.0	429	39.0	0.000**
Dental sealants	77	31.7	166	68.3	338	30.7	763	69.3	0.130
Anesthetics	128	52.6	115	47.4	696	63.3	405	36.7	0.301

<sup>\*</sup>Significance level p<0.05. \*\*Significance level p<0.001. PHU: Primary health care units

When comparing the percent values obtained for items related to the physical structure (dental equipment) between health centers and primary health care units, there was greater inadequacy within the health centers. With regard to dental supplies, on the other hand, the smaller availability was evidenced within the primary health care units (Table I).

Another aspect to be highlighted is the significant statistical difference evidenced between the type of health unit and the regional health divisions (p=0,029). In order to identify which of them presented differences regarding the type of health facility, they were analyzed one by one andd those presenting significant differences are displayed on Table II.

Table II - Regional health divisions showing significant difference according to the type of health unit when analyzed one by one. Paraíba, 2012-2013.

Regional health division	REG 5	REG 9	REG 10	REG 11	REG 12	REG 13	REG 14	REG 15
REG 2		0.000**		0.006*	0.009*	0.000**		
REG 4	0.000**	0.043*		0.012*		0.021*	0.011*	0.016*
REG 5		0.050*		0.015*		0.025*	0.007*	0.010*
REG 6			0.027*					
REG 9				0.005*		0.000**		
REG 11					0.018*	0.003*	0.042*	
REG 12						0.003*		
REG 14								0.000**

<sup>\*</sup>Significance level p<0.05. \*\*Significance level p<0.001.

REG: Regional health division

# **DISCUSSION**

As seen in this study, a low percentage of health facilities had autoclaves in proper conditions for use. Therefore, it is assumed that such units faced difficulties regarding the sterilization of instruments used in dental assistance. It is important to consider that the frequent absence of autoclave within the health facilities might be related to the fact that the sterilization process could be, in part, centrally performed in other certain services. In municipalities of the state of São Paulo, it was found that the autoclave was the most popular means of sterilization in primary care units, standing out as the most efficient and agile method of the sterilization process<sup>(15)</sup>.

The reduction in the items required for medical/dental care in health facilities may be closely associated with the supply and maintenance of pieces of equipment and supplies, for example. Even though biddings are deemed necessary, the problem often arises from the legislation regarding those biddings, which requires ability on the part of the managers for good operation of the health system. The search for a skilled use of resources in order to expand the results in the health units, whether it be done through a higher benefit-cost ratio or by the lowest unit cost of the service offered, must abide by the limits of the law, which is commonly related to difficult and irresolute

bureaucracies<sup>(16)</sup>. Such problem becomes more evident in the context of health, since decentralization has left to the municipalities the role of primary care manager and, as such, the responsibility for the management of supplies and equipment purchasing, with small municipalities tending to present lower technical and administrative capacity to ensure afficient management.

It was observed in this study that a reduced number of health units presented some materials/supplies, such as dental sealants, a variety of cements and amalgam. The lack of materials and supplies compromises the practice, prevents adequate health care, hinders the problem-solving capability of the offered service and, finally, gives rise to distrust in the population<sup>(17)</sup>.

It is emphasized that such lack is mentioned by the primary care users as one of the reasons that stimulate them to miss the scheduled dental appointments<sup>(18)</sup>.

It is known that the quality of service, despite being sometimes erroneously presented with a one-dimensional or reductive character, is a concept that emerges from a comprehensive, multidimensional reality. The performance of a good dental practice is recognizably not restricted to the structure of this service, even though this aspect is essential. Thus, the availability of equipment, materials and supplies for the accomplishment of a good dental practice becomes crucial for the service efficiency<sup>(19)</sup>.

This fact is also emphasized by the National Primary Care Policy. It highlights the need for the existence and regular maintenance of stock of supplies for proper functioning of the primary health care units<sup>(20)</sup>.

One can argue that a compromised or improper physical structure can obstruct the achievement of one of the important and basic principles of the current health system: comprehensiveness. Once the comprehensiveness presupposes the continuing provision of the set of actions and services, in order to ensure health promotion, protection, healing and rehabilitation of individuals and populations, it is understandable that the physical structure interfere directly with the continuity of health care<sup>(17,21,22)</sup>.

The analysis of regional health divisions of the state of Paraíba revealed heterogeneity in their distribution, considering the type of health unit present in each of them.

These findings point out the need for a different look at each region, and other studies already meant to evaluate the distribution and characteristics of different health facilities offered by the public sector reveal, from a certain territorial base, the heterogeneous nature of these services<sup>(23-25)</sup>.

In Paraíba, health centers were found more inadequate as concerns the dental equipment, compared to the primary health care units. On the other hand, there was greater availability of dental supplies in the primary health units. In this regard, it is assumed that, as a result of the insertion of the Family Health Strategy and consequent restructuring of units, the primary health care units have suffered major adjustments in relation to the physical structure over the past few years. The deficiency of materials and supplies, however, is still deemed a difficulty to be overcome.

It stands out, therefore, the importance of the process of evaluation of services, since it allows the perception of such issues, so that the managers' awareness and increased problem-solving capacity be promoted. Nevertheless, the planning and implementation of these actions is a complex and delicate process, which includes a variety of factors, such as the indispensability of generating changes in service and the standardization of quality, owing to the social, economic and demographic inequalities of the country<sup>(26)</sup>.

The results of this study corroborate the importance of information coming from the National Program for Access and Quality Improvement in Primary Care (PMAQ-AB). From that information one can get an overview of the reality of health facilities and primary care, among other aspects, regarding the structure available for dental care, thus contributing to the development of strategies that make it possible to overcome any weaknesses, from the restructuring of the existing or development of new public policies.

Among the limitations of this study, it should be highlighted the use of secondary data, which can lead to errors resulting from the poor quality of filling out the information. It is noteworthy, however, that no significant sample loss occurred, and the design of this study allows a quick and practical exposure of reality.

Another aspect to be emphasized is the difficulty in drawing an effective comparison with other studies with similar approach and methodology in the literature, since the database used is still little explored. On the other hand, it demonstrates the relevance of the findings presented here, which may be the object of reflection and allow similar studies, considering other states and regions of Brazil.

# **CONCLUSION**

It was noticed, from this study, that there is relationship between the primary health care units and the availability of dental supplies/materials and equipment, signaling that primary care still faces difficulties regarding the structure for dental care. There is also a reduced quantity of dental equipment (health centers) and supplies/materials (in primary health care units), thus compromising, or even rendering unfeasible the oral health actions. It is known that some factors are indispensable, deemed basic and primordial, for the provision of comprehensive oral health care to take effect.

It was also seen that there was an association between the regional health division and the type of health unit in Paraíba, with heterogeneous distribution of these regional divisions.

Following that, this study evidenced the need for reorganization of the health facilities structure in Paraíba, as regards the maintenance and availability of equipment and supplies, in order to improve the problem-solving capacity of primary care.

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