Original Research
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Brazilian Oral health teams in primary care and oral cancer: Results of a national evaluation

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Abstract: Oral cancer is one of the most prevalent cancers in Brazil. An understanding of how public policies are implemented to address this problem can contribute to the construction of solutions. The "Programa de Melhoria do Acesso e da Qualidade" (PMAQ-AB and PMAQ-CEO) at the level of primary and secondary care are evaluations that also collect data on prevention and monitoring strategies for oral cancer. This study aimed to analyze the results of the incorporation of oral health teams to evaluate the strategies adopted by Brazil regarding the impact on the diagnosis of oral cancer. Of the 17,202 family health teams evaluated, 72.10% had oral health teams (OHT). Considering the strategies for prevention, screening, campaign, and follow-up of suspected cases, 72.27% of the campaign teams and 59.09% of the teams who accompanied suspected cases had OHT. In secondary care, more than 65% of the teams in the Southeast and South regions registered cases of oral cancer, and the referral network was more represented. The inclusion of OHT had a positive impact on campaign actions, follow-up, referral to specialists, and registration of suspected cases throughout Brazil.

Keywords: Diagnosis, Oral; Health Services Research; Community Dentistry; Public Health Dentistry.

Introduction

One of the major challenges for policymakers is to plan and evaluate public health policies that seek to reduce inequities and health promotion for all.[1,2] Since 2004, the Brazilian government has implemented the National Oral Health Policy, named "Brasil Sorridente," which states in its guidelines the need to plan and carry out actions in oral health, prioritizing regions and populations with greater social vulnerability,[3] including actions to prevent and diagnose oral cancer early.[4] There was success in the pro-equity measures that sought to correct injustice and inequities in oral health in Brazil with a higher concentration of oral health team in more socially vulnerable regions.

The National Policy of Primary Care recommends that the Family Health Strategy should be composed of a minimal team of professionals (Family Health Team), among them, a doctor, nurse, nursing assistant or nursing technician, community health agents, and oral health

professionals. In 2011, primary health care in the Brazilian public health system was subjected to a complex evaluation, named "*Programa de Melhoria do Acesso e da Qualidade da Atenção Básica* - PMAQ-AB" (Program for Improving Access and Quality of Primary Care), which resulted in the evaluation of 38,812 basic health units throughout Brazil.[5]

The International Agency for Research on Cancer estimated 529,000 new cases and 292,000 deaths resulting from cancers of the lip, oral cavity, and pharynx worldwide,[6] with Brazil being one of the countries with a high prevalence. In this context, there are challenges in implementing actions ranging from health promotion to cancer treatments for oral cancer in a country of continental dimensions such as Brazil, where more than 80% of the population is dependent on the public health system. There has been a substantial growth of oral health teams, with the inclusion of dentists and dental nurses, working together with family health teams in primary health care (PHC).[3] The objective of this study was to analyze the results of the incorporation of oral health teams to evaluate the strategies adopted by Brazil regarding the impact on the diagnosis of oral cancer.

Methods

This study was approved by the research ethics committee. The process of PMAQ-AB and CEO evaluation included steps ranging from an appointment visit to the "in loco" evaluation carried out by professionals outside the Ministry of Health. The information collected was organized into three modules in PMAQ-AB: a) Observation in the primary health unit; b) Interview with professionals of the primary care team and the manager; c) Interview with the users of the health unit and seven priority areas, including oral health.

The PMAQ-CEO data collection was organized as follows: Dimension I–municipal, state management for CEO development; Dimension II–the structure and operating condition of the CEO; Dimension III–valorization of the worker; Dimension IV–access and quality of attention and organization of the work process; Dimension V - access, use, participation, and user satisfaction.

These data were transmitted in a secure internet network classifying each service according to the indicators presented, and are available on the official website (https://aps.saude.gov.br/ape/pmaq). The data used refer to the second cycle of PMAQ-AB (2013) and the first cycle of PMAQ-CEO (2014). For the external (in loco) evaluation of PMAQ, the supporting documents were used to validate the answer; when this was not possible, the answer was not considered for scoring.[7]

Oral health has been evaluated in several domains, and the topics below summarize the themes of the questions used (Table 1).

Absolute and relative frequencies were used to describe the presence of oral health teams in health units throughout the country, according to region. The chi-square test was used to compare the presence and absence of oral health staff based on reports from campaigns, registration, and follow-up of cases, as well as supporting documents. Poisson regression was used to calculate the prevalence ratios of the analyzed variables. In addition, a regression line was constructed by comparing the proportion of the units of the federation with the presence of the oral health team and its human development index (HDI), which can be used to study the association of multiple variables of interest with count data outcome.

The statistical software STATA 10.0, was used for the analyses. All tests were performed at a significance level of 5%.

Results

We interviewed 17,202 family health teams, and of these, 72.10% had oral health teams; these teams

Table 1. Questions regarding oral health in PMAQ_AB and PMAQ_CEO.

PMAQ Evaluation	Themes
PMAQ-AB	1. Number of the family health team in PHC – with and without oral health staff
	2. Campaign to detect oral lesions and referral cases
	3. Follow up on suspected/confirmed cases
PMAQ-CEO	1. Biopsy: deadline for scheduling and results
	2. Follow up on suspected/confirmed cases
	3. Referral for treatment

were more in the Northeast (85.54%) and Central-West (83.41%) regions, followed by the Southeast and South regions, which had the lowest proportion of non-oral health teams (39.04% and 31.86%, respectively).

Figure shows the regression line that correlates the HDI of each state of the Federation (2010) with the proportion of the presence of OHT in the family health teams, demonstrating that there is an inverse relationship between the HDI and the presence of oral health teams, implying that the states with the highest HDI had a lower proportion of OHT (p = 0.023).

Proportionally, the Northeast and Central-West regions are responsible for most initiatives for prevention campaigns and referrals of suspected cases of oral cancer. The North region equally carries out this type of activity (46.12%).

We also highlighted the number of health units that did not present information on whether prevention and referral campaigns were carried out on suspected cases of oral cancer or not, with a total of 4,646 basic health units (27.01%). Of the health units studied, only 43.13% registered and followed-up suspected cases of oral cancer, with the South region accounting for the highest proportion of follow-ups (47.41%) and the North, the lowest (31.48%). Considering a total of 9,112 basic health units conducting campaigns and referrals of suspected cases, the proportion of teams that registered and followed-up suspected cases corresponded to 81.43%. In addition, more than half of the teams (57.60%) who carried out registration and monitoring of suspected cases of oral cancer had a supporting document.

Table 2 shows that there was a total of 17,202 health teams, and 12,403 of these teams had at least one general dentist and a dental assistant (OHT) (72.10%). The presence of the OHT was related to a higher proportion of campaigns for prevention and referral of suspected cases of oral cancer (72.72%), whereas these activities were reported by only 1.90% of health units that did not have OHT (p = 0.00). In addition, 59.09% of the OHT did registration and monitoring of the suspected cases, and a proportion of them had a document proving this activity (33.93%). Again, in teams where there was no oral health care staff, a minimal portion of the services was recorded and monitored for suspected cases (1.90%) and documented (1.34%) (p = 0.00) (Table 2).

Table 3 shows that primary health care teams with the presence of an oral health staff performed 36% more campaigns and referrals of suspected cases of oral cancer, 35% more records and follow-ups of these cases, and an excess of 20% tended to have more supporting documentation of this monitoring concerning the units that did not have dental health staff.

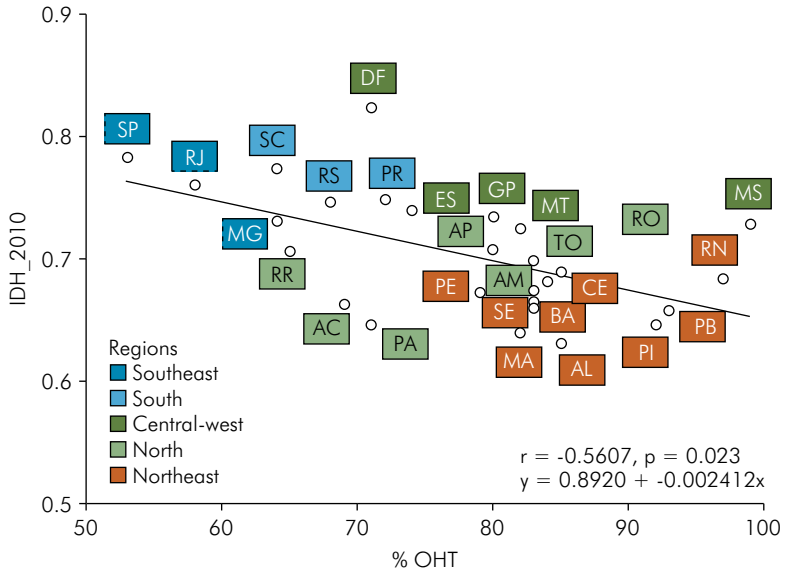

Figure. Regression line of HDI (Human Development Index) with the proportion of oral health teams.

Table 2. Number of health units that reported carrying out a campaign and referral for prevention, which reported registration and monitoring of suspected and confirmed cases, as well as having documented records of the registry and follow-up of suspected and confirmed cases of oral cancer according to the presence of oral health in the teams.

Variable	With Oral health		Without Oral Health		No Information		Total	
	n	%	n	%	n	%	n	%
With campaign and referral	9,02	72.72	89	1.90	3	2.80	9,112	52.97
Without campaign and referral	3,37	27.17	72	1.60	2	1.87	3,444	20.02
No information	13	0.11	4,531	96.50	102	95.33	4,646	27.01
With registration and follow-up	7,329	59.09	89	1.90	2	1.87	7,42	43.13
Wthout registration and follow-up	5,061	40.80	72	1.60	3	2.80	5,136	29.86
No information	13	0.11	4,531	96.50	102	95.33	4,646	27.01
With supporting documents	4,209	33.93	63	1.34	2	1.87	4,274	24.85
Without supporting documents	3,12	25.15	26	0.56	0	0	3,146	18.29
No information	5,074	40.91	4,603	98.10	105	98.13	9,782	56.86
Total*	12,403	100	4,692	100	107	100	17,202	100

*p = 0.000 in all comparison groups.

Table 3. Prevalence ratio (RP) of Health teams that reported carrying out campaigns and referral, registration and follow-up, and documentation of suspected and confirmed cases of oral cancer, according to the presence of oral health team.

Variable	RP	IC	p-value
Campaign and referral	1.367	1.36-1.37	0.000
Registration and follow-up	1.358	1.35-1.36	0.000
Presence of supporting documents	1.200	1.19-1.20	0.000

The first cycle of PMAQ-CEO evaluated 930 CEOS, in relation to the performance of biopsy, 66.01% from the Northern, 75.77% Northeast, 95.15% Central-West, 87.24% of the Southeast, and 100% of the South region performed soft tissue biopsy.

Regarding the time for scheduling the biopsy, data showed that in more than 80% of the regions, patients were scheduled within seven days, and only 0.71% took more than 60 days to collect a biopsy from the patient. Regarding the time to receive the biopsy report, it took up to 30 days in most regions, although in the Northern region, almost 1/3 of the units could not determine the deadline to know the result of the biopsy (26.31%).

In secondary care, after the diagnosis of oral cancer, when asked if the CEO has reference to these cases, the following results were obtained (Table 4).

The Central-West, Southeast, and South regions reported that the treatment of patients was diagnosed in more than 85% of the services. The region that presented the lowest reference network for patient care was the Northeast, with 30.42% of the services without a tertiary network for patient referral.

The registration of those diagnosed with oral cancer by the service showed the following results: the North and Northeast regions reported that less than half of the services have a registry of users, of 27.11% and 54.36%, respectively. The Southeast region had 67.35% of the services, followed by the South (65.38%) and Central-West (54.83%) regions.

Table 4. Referral and record of users who have the diagnosis of oral cancer.

Region	Does the CEO have reference for referral of confirmed cases of oral cancer?		Does the CEO have a record of users who have the diagnosis of oral cancer?		Presence of supporting document	
	Yes (%)	No (%)	Yes (%)	No (%)	Yes(%)	No (%)
North (n = 59)	42 (71,18)	17 (28,81)	16 (27,11)	43 (72,88)	11 (68,75)	5 (31,25)
Northeast (n = 355)	247 (69,57)	108 (30,42)	162 (45,63)	193 (54,36)	126 (77,77)	36 (22,22)
Central West (n = 62)	54 (87,09)	8 (12,90)	34 (54,83)	28 (45,16)	30 (88,23)	4 (11,76)
Southeast (n = 337)	303 (89,91)	34 (10,08)	227 (67,35)	110 (32,64)	210 (92,51)	17 (7,48)
South (n = 104)	90 (86,53)	14 (13,46)	68 (65,38)	36 (34,61)	57 (83,82)	11 (16,17)

Discussion

Two-thirds of the primary health care teams have oral health teams in Brazil. However, there is a greater expansion of oral health in the regions with the worst HDI, that is, the Northeast and Central-West regions of Brazil, which highlights the importance of public policies seeking equity when planned and implemented.[8] The correlation between states with a HDI[9] and the presence of oral health teams in the health units was significant in those states with a lower HDI (Figure), based on the results from PMAQ-AB. The expansion of primary care coverage in dentistry is associated with a reduction in mortality rates from oral and oropharyngeal cancer,[10] although the expansion of PHC seems to have followed equity measures, the network of cancer care and treatment is still largely concentrated in the Southern and Southeastern regions. Despite the expansion of the care network, the lower-income population still encounters difficulties in accessing health services, resulting in impacts on the oral health of individuals.[11,12]

Ferlay et al.[13] found that more than 70% of oral cancer cases occur in developing countries, therefore, measures taken by "Brasil Sorridente" to prioritize regions with lower HDI may have a positive effect on mortality and morbidity from oral cancer in Brazil, and there is evidence of an inverse association between survival and mortality from head and neck tumors and the socioeconomic status of patients.[14,15,16]

Approximately one in four of the managers of the family health teams interviewed did not know whether their units were campaigning or active in the search for suspected cases of oral cancer, indicating that a considerable part of the health units did not include oral cancer in their agendas, and measures must be taken to sensitize managers and professionals of the important role that the PHC can exercise in prevention, including oral cancer.[17,18] Investments in qualification and coverage of family health teams can contribute to the improvement of indicators through timely promotion and prevention actions. The lack of multidisciplinary work and inadequate sensitivity to the needs of patients and the community have been correlated with the omission of treatment by health teams.[19]

A study demonstrated that from the first cycle of PMAQ-AB around 72.66% of OHTs claim to carry out campaigns to detect suspected malignant lesions and refer cases, this was similar to our findings in the second cycle of evaluation, meaning that the OHT is providing continuous actions for an early diagnosis.[20] Although the effectiveness of oral cancer screening is controversial,[21,22] the "Brazil Sorridente" program has a series of actions that must be developed by OHT in the management of oral cancer such as conducting preventive tests for early detection, monitoring suspected and confirmed cases, creation of a referral service, ensuring treatment and rehabilitation, establishing partnerships with universities and organizations for the prevention, diagnosis, treatment, and rehabilitation of patients with oral cancer.[23] However, professionals need to be continually educated so that they can conduct these tasks with confidence and ensure patient safety, preventing unnecessary referrals.[24]

The PMAQ-AB data revealed that almost two-thirds of the primary care teams who carried out campaigns and tracked and recorded suspected cases of oral cancer had dentists working on their teams. On the other hand, < 2% of the teams were without dentists. The presence of the dentist in primary care is decisive for the success of preventive measures in the case of oral cancer ($p < 0.05$). This correlation is also shown in Table 3, showing that the presence of OHT was related to 36.7% more prevention and referral campaigns and 35.8% more registrations and monitoring of suspected cases. Walsh et al.,[25] emphasized the importance of primary care in affirming that general dental practitioners and dental care professionals should remain vigilant for signs of potentially malignant disorders and oral cancer while performing routine oral examinations in practice.

The presence of the OHT integrated into the PHC is an important factor in the organization of the services because these teams keep records and follow-up suspected cases with a significant statistical difference in relation to the teams without oral health teams (Table 2). This is a very important measure that can guarantee the care of the users since registration and monitoring are important actions of the PHC[26,27] and highlight the importance of oral

health teams in PHC. Lucena et. al observed that reformulation of the "Política Nacional de Atenção Básica" (PNAB – National Primary Care Policy) in 2017 for non-mandatory oral health in the Family Health Strategy resulted in worry as this could lead to limited ceiling expenditure on health and education and a decrease in the number of OHT implanted in Brazilian municipalities; this, in turn, may represent a reduction in users' access to oral health services, with effects on health conditions and quality of life.[28]

It is worth mentioning that more than half of the teams (57.60%) who registered and monitored suspected cases of oral cancer had a supporting document, and most of these services were in the Southeast and South regions, demonstrating that the recent expansion of oral health in regions with low HDI needs to be accompanied by team qualification actions.[29] This study has some limitations, such as the number of teams participating in the PMAQ-AB and PMAQ-CEO cycles was controlled and participation involved voluntary adherence, which may have led to the selection teams being more committed to the work process. The linkage of team certification of the financial transfer may have created a bias in the responses; encouraging well-performing teams may not cause their actions to alter and discourage poorly performing teams from engaging in pay-per-performance-based incentive programs.[30]

Dentists at CEOs and in the PHC have a record of their diagnosed patients showing that they know their role and seek to organize the work processes and case management for follow-up of the patients in the care network, and the construction of agendas agreed upon between the levels of care is fundamental for the management and resolution of the service.[31,32] The Northern and northeastern regions still present low percentages of follow-up of the cases, with findings similar to those found by Casotti et al.,[33] the time elapsed between the suspicion and diagnosis should be as soon as possible; thus, it is essential to organize the network and attend to the cases.

Regarding the integration of the secondary care network, patients were scheduled in a short time and sent for treatment in the tertiary network in the great part of the country, except for some regions where the HDI was lower, showing the vulnerability of the health of this population. It is therefore necessary to reevaluate the indicators for the implantation of new CEOS in the municipalities, to reduce these differences.[34] Although the diagnosis does not appear to be delayed, information about the patient's treatment time at the tertiary level is not known, Galante et al.[35] identified that dentists have a clear understanding of their role in the healthcare network; however, with efficient communication between primary and secondary care, when the patient is referred for treatment, continuity of care is lost because of fragmentation in the care network.

There have been an increase in the number of oral health teams after the implementation of the national policy; however, the tertiary care network did not expand in the same way. Of the 299 centers for cancer treatment in SUS, 156 offered radiotherapy, and only 11 were in the Central-West region, eight in the North, and 27 in Northeast. Radiotherapy is critical because approximately 50% of cancer patients undergo this type of therapy at some stage of treatment.[36] INCA estimated in 2020[37] a higher frequency of oral cancer in the Southeast region, and Northeast, which should be taken into account when planning and expanding the care network in the coming years.

The data from PMAQ-AB and PMAQ-CEO demonstrate the importance of incorporating OHT into primary care teams when planning preventive actions and early detection of oral cancer and potentially cancerous lesions and show how the oral health care network is structured and organized to guarantee the integral care of patients with oral cancer in the country. The existence of an oral health care network has shown positive results in the early diagnosis of cancerous lesions, and in a retrospective study conducted between 2009 and 2017 identified an increase in oral health coverage in primary and secondary care which contributed to the reduction in the frequency of stage IV oral cancer cases.[38]

In Brazil, we can affirm that the inclusion of the dentist in the PHC and secondary care was decisive in incorporating a routine examination of the oral mucosa and visual inspection in the services. The presence of the dentist was essential to ensure the registration of suspected cases of oral cancer and to monitor patients after referral to specialized services.

Conclusion

Based on the findings, it can be observed that the inclusion of oral health teams at the primary care level has had a positive impact on campaign actions, follow-up, referral to specialists, and registration of suspected cases of oral cancer in Brazil; furthermore patients are diagnosed in a short period when referred for secondary care. Secondary care presents mostly a referral for tertiary care, where the treatment will be performed; however, further studies are still required to understand how network care is offered.

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