Perceptions and Challenges of Primary Health Care Dental-Surgeons in the Early Diagnosis of Oral Cancer

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Percepção e Desafios dos Cirurgiões-Dentistas da Atenção Primária à Saúde no Diagnóstico Precoce do Câncer de Boca

Percepciones y Desafíos de los Odontólogos que actúan en la Atención Primaria de Salud en el Diagnóstico Temprano del Cáncer Bucal

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ABSTRACT

Introduction: Oral cancer is the main burden in oral health, and its early detection is directly associated with better clinical outcomes. **Objective:** This study aimed to identify factors related to primary health care dental-surgeons that contribute to the low resoluteness in the early diagnosis of the disease. **Method:** Cross-sectional observational study conducted with dental-surgeons working in municipalities of a state in southeastern Brazil. Data were collected through an online questionnaire and analyzed using descriptive statistics and the chi-square test. **Results:** A total of 248 responses were obtained. Most professionals reported insecurity in diagnosing disorders with malignant potential (64.52%), low self-perception of skills to perform biopsies, and lack of knowledge about referral and diagnostic pathways. Only 16.13% reported they performed biopsies, while 62.90% had never carried out the procedure. No significant association was observed between performing biopsies and years of clinical practice (p=0.659). However, limited knowledge about oral cancer precursor lesions was directly associated with years of professional practice (p=0.002), impacting the ability for screening/diagnosis (p<0.001) and biopsy practice (p<0.001). Additionally, structural deficiencies and the absence of continuous educational actions were identified. **Conclusion:** This study demonstrates that the low resoluteness of primary health care in the early diagnosis of oral cancer can be associated with lack of practical training and insufficient institutional support.

Key words: Mouth Neoplasms; Early Diagnosis; Primary Health Care; Dentists; Biopsy.

RESUMO

Introdução: O câncer de boca é o principal agravo em saúde bucal, e a detecção precoce dessa doença está diretamente associada a melhores desfechos clínicos. **Objetivo:** Identificar fatores relacionados aos cirurgiões-dentistas da Atenção Primária à Saúde (APS) que contribuem para a baixa resolutividade no diagnóstico precoce da doença. **Método:** Estudo observacional transversal com cirurgiões-dentistas atuantes nos municípios de um Estado do Sudeste do Brasil. Os dados foram coletados por questionário on-line e analisados por meio de estatística descritiva e o teste qui-quadrado. **Resultados:** Obtiveram-se 248 respostas ao questionário. A maioria dos profissionais relatou insegurança no diagnóstico de desordens com potencial de malignização (64,52%), baixa autopercepção de habilidade para realização de biópsias e desconhecimento dos fluxos de atendimento. Apenas 16,13% afirmaram realizar biópsia, enquanto 62,90% nunca haviam realizado o procedimento. Não foi observada associação significativa entre a realização de biópsia pelos cirurgiões-dentistas da APS e o tempo de prática clínica (p=0,659). Destaca, ainda, que o pouco conhecimento das lesões precursoras do câncer de boca está associado ao tempo de atuação do profissional (p=0,002), com impacto na aptidão para o rastreamento/diagnóstico (p<0,001) e prática de biópsia (p<0,001). Por fim, foram levantadas deficiências estruturais e ausência de ações educativas contínuas. **Conclusão:** Este estudo evidencia que a baixa resolutividade da APS no diagnóstico precoce do câncer de boca pode estar associada à carência de capacitação prática e de suporte institucional.

Palavras-chave: Neoplasias Bucais; Diagnóstico Precoce; Atenção Primária à Saúde; Odontólogos; Biópsia.

RESUMEN

Introducción: El cáncer de boca es el principal mal en la salud bucal y su detección temprana se asocia directamente con mejores desenlaces clínicos. **Objetivo:** Identificar factores relacionados con los odontólogos que trabajan con la Atención Primaria de Salud (APS) que contribuyen a la baja eficacia en el diagnóstico temprano de la enfermedad. **Método:** Estudio observacional transversal realizado con odontólogos que trabajan en municipios de un estado del sudeste del Brasil. Se recolectaron los datos mediante un cuestionario en línea y se analizaron con estadística descriptiva y la prueba de ji al cuadrado. **Resultados:** Se obtuvieron 248 respuestas al cuestionario. La mayoría de los profesionales refirió inseguridad en el diagnóstico de alteraciones con potencial maligno (64,52%), baja autopercepción de habilidad para realizar biopsias y desconocimiento de los flujos de atención. Solo el 16,13% declaró realizar biopsias, mientras que el 62,90% nunca había efectuado el procedimiento. No se observó una asociación significativa entre la realización de biopsias por parte de los odontólogos de la APS y el tiempo de práctica clínica (p=0,659). Asimismo, se resalta que el escaso conocimiento sobre las lesiones precursoras del cáncer bucal está directamente asociado con el tiempo de ejercicio profesional (p=0,002), con impacto en la aptitud para la detección/diagnóstico (p<0,001) y en la práctica de biopsias (p<0,001). Finalmente, se identificaron deficiencias estructurales y ausencia de acciones educativas continuas. **Conclusión:** Este estudio evidencia que la baja eficacia de la APS en el diagnóstico temprano del cáncer bucal puede estar directamente relacionada con la falta de capacitación práctica y el insuficiente apoyo institucional.

Palabras clave: Neoplasias de la Boca; Diagnóstico Precoz; Atención Primaria de Salud; Odontólogos; Biopsia.

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INTRODUCTION

Primary Health Care (PHC) plays a strategic role in early detection of oral cancer due to its wide territorial capillarity and easy access by the population. The sociodemographic profile of PHC users is mostly formed by low-educated individuals, 64% only have completed elementary school or are illiterate, and individuals living in least economic conditions accounting for more than 80% of the total[1]. Most of the patients diagnosed with oral cancer are low educated, 84.67% did not complete elementary school or are illiterate[2]. Poorly educated individuals from low working classes and low family income have more risk of developing the disease (OR = 1.84, 1.85 and 2.41, respectively)[3]. In addition, dismal clinical outcomes have been observed in low educated individuals and exclusive users of the public health system who present risk of mortality between 31% and 62% depending on the location of the lesion when compared to those assisted by private clinics[4].

This socioeconomic scenario is associated with barriers of access to specialized care and lack of information about prevention and initial signs of oral cancer, which contributes to late diagnosis. The initial identification of suspicious lesions is assigned to PHC professionals and fast referral for treatment, which improves the prognosis and survival[5]. However, a study conducted by professionals from Latin America and Caribbean, specialized in oral diagnosis, reveals that PHC professionals are not properly trained to detect oral cancer[5,6]. Although the national guidelines acknowledge PHC as the main gateway for screening and early diagnosis, only 2.38% of the biopsies for diagnosis of lip and oral cavity cancer are performed at this level of attention[7].

In this scenario, the recognition of oral potentially malignant disorders (OPMD) is important for early detection of oral cancer since these lesions have increased risk of malignancy in the course of life, identified in a multicenter study in Latin America where 18% of the squamous cell carcinoma (SCC) of the oral cavity, the most common histological type of oral cancer, are preceded by these lesions[8]. Leukoplasia, erythroplakia and actinic cheilitis are among the main OPMD. Proliferative verrucous leukoplasia is the highest risk lesion, followed by erythroplakia with rates of malignant transformation ranging around 50% and 30% respectively[9], and leukoplasia with a rate of 6.64%[10]. Further to the rates of malignant transformation of OPMD, it is important to remind that, in average, each Brazilian general dental-surgeon identifies approximately 19.32 cases of OPMD yearly along a 35-year professional career. Therefore, it is estimated that each dentist is able to diagnose close to 676 cases of OPMD during the professional trajectory and the likelihood of finding patients with oral cancer during this period is of 2.66 cases per dental-surgeon[11].

These data reinforce the importance of training for dental professionals to recognize, monitor and treat correctly these precursor lesions of oral cancer. Dental-surgeons expertise in managing OPMD is essential for early diagnosis and adoption of timely and correct therapeutic conducts. In light of this, it is important to bring up the issue of what are the main difficulties found by dental-surgeons of PHC to perform effectively the role they are assigned to in early identification of OPMD and oral cancer[12,13].

Understand the barriers these professionals face is one of the pillars of the management of the main buccal harm in public health, since PHC is at the frontline of healthcare and responsible to provide care to a population more vulnerable to be affected by oral cancer. The objective of this study is to identify barriers faced by professionals and health services that interfere in the early diagnosis of oral cancer in PHC.

METHOD

Cross-sectional, observational study conducted with PHC's dental-surgeons of the 78 municipalities of the state of Espírito Santo located in Brazil's southeast regions following the guidelines of the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE).

To determine the study population, the staff registered at PHC were considered, according to open access available in the digital platform *eGestorAB*, referred to April2024, regardless of the workload or modality (family health team or basic attention). In that site, it is possible to find information about the number of oral health staff registered with workload of 20, 30 or 40 hours weekly, but not the exact number of dental-surgeons per team. Therefore, it was adopted the criteria of one dental-surgeon per team, which resulted in a total estimated population of 668 professionals. The inclusion criteria were: dental-surgeons registered in the state's oral health team, working in PHC and actual professional link with the city at the moment of the research.

The software Open Source Epidemiologic Statistics for Public Health (OpenEpi)[14], version 3.01 was utilized to calculate the sample with expected proportion of 50%%, level of confidence of 95% and sample error of 5%, resulting in a minimum sample of 245 participants. The population of dental-surgeons per health regions is: 31.13% in the Central/North region, 43.41% in the Metropolitan region and 25.44% in the South region. The

sample was allocated proportionally among the regions in order to ensure the representativeness and reduce selection bias. Every dental-surgeon linked with the PHC oral health team in the state of Espírito Santo was included, as long as their connection was active in the moment of the research.

The data collection instrument utilized was a questionnaire adapted from Cunha et al. and Franklin[15,16], structured online in the platform Google Forms (Supplementary material 1). The questionnaire addressed aspects related to the diagnosis of OPMD and early diagnosis of oral cancer as well as the working process of professionals in case of suspected cases.

Data were collected in two stages between June and December 2024. Initially, the technical references in oral health of the state and municipalities shared the link of the questionnaire with their teams through WhatsApp (version 2.25.14.79). Secondly, to optimize the response rate, the link was resent to the professionals who had not responded to the questionnaire.

The study variables were organized as dependent and independent. The dependent variable was the health region of the municipality and knowledge about OPMD. The variable "performance of biopsy" was analyzed as dependent in some associations and independent in others according to the relation of interest established in the statistical analysis.

The data were organized and tabulated in Microsoft® Excel® for Microsoft 365 (version 2501 Build 16.0.18429.20132, 64 bits). The statistical analysis was performed with the software Jamovi®[17] (version 2.3.285.0), and application of chi-square test to verify associations among variables with level of significance of 5% ($p \leq 0.05$) and confidence interval of 95%.

The associations analyzed were: (1) knowledge about OPMD with years of clinical practice, ability to perform screening/diagnosis, self-perception about knowing to perform biopsy and performing biopsy; (2) performing biopsy and time of clinical practice. These associations were defined based on theoretical hypotheses related to the influence of professional experience, technical knowledge and clinical self-confidence about the diagnostic capacity according to Noro et al.[18]. In that sense, it was considered that the variables time of clinical practice, perceived ability for screening/diagnosis and self-perception about the performance of biopsy can be related to great knowledge of OPMD and adoption of more definitive clinical conducts as the performance of biopsies. Therefore, it was attempted to investigate whether more experience and professional confidence would be associated with better working conditions for identification and early management of these lesions.

The Ethics Committee of the "*Centro de Ciências da Saúde da Universidade Federal do Espírito Santo (CCS/Ufes)*" approved the study, report number 6,810,263/2024 (CAAE (submission for ethical review: 78089824.1.0000.5060), in compliance with Directive number 466/2012[19] of the National Health Council. All the participants signed the electronic informed consent form (ICF) to ensure the respect to their dignity, autonomy, privacy and rights and were briefed about the study.

RESULTS

249 dental-surgeons signed the ICF, one of them declined to participate, and eventually 248 were enrolled in the study which is the final study sample. The sample was representative of the population of professionals with 31.45% (n=78) of the responses originated from the Midwest/North region, 42.34% (n=105) from the Metropolitan region and 25% (n=62) from the South region. In addition, 1.21% (n=3) declined to inform the region where they worked.

Most of them (38.71%, n=96) had less than five years of clinical practice, followed by 25.81% (n=64) with more than 20 years of experience. Among the participants, 19.35% (n=48) reported experience between five and ten years, 6.05% (n=15) between 11 and 15 years and 9.68% (n=24) between 16 and 20 years. Only 0.40% (n=1) declined to inform their years of clinical practice.

The majority (60.89%, n=151) attended specialization courses, 28.63% (n=71) had Bachelor degree, 9.27% (n=23) had master degree and 0.81% (n=2) had PhD. In addition, 0.40% (n=1) declined to inform.

95.97% (n=238) acknowledged the possibility of doing an early diagnosis of oral cancer. Only 0.40% (n=1) responded that the diagnosis would only be feasible at advanced stages of the disease, while 2.82% (n=7) claimed they did not know and 0.81% (n=2) declined to inform.

The most common function informed by 45.16% (n=112) of PHC's dental-surgeons was a combination of educative and preventive integrated actions, screening, diagnosis and referral (Figure 1).

The factors associated with the perceptions, attitudes and challenges faced by the professionals are described in Table 1. For suspicion of oral cancer or OPMD, 16.13% (n=40) of the professionals did the biopsy within the available structural and technical possibilities. When asked about the ability to do biopsies, 68.95% (n=171) claimed they didn't and 62.90% (n=156) reported they had never did the procedure (Figure 2).

Table 2 presents the professionals' perception of the organization of the health services, including educative

actions, matrix support, shipping the material to biopsy, access to the anatomopathology laboratory, participation in the team of early diagnosis, healthcare flow and factors associated with delay of secondary attention.

Statistically significant association was found among knowledge of OPMD and the variables analyzed. The data show that, regardless of the time of clinical practice, professionals claim they know little about OPMD and are insecure about the diagnosis (p=0.002). Also, they affirm they are able to do the diagnosis but expertise would be important (p<0.001), they affirm they do not feel able to do the biopsy (p<0.001) and never did the procedure (p<0.001). The details are shown in table 3.

There was no statistically significant association between dental-surgeons doing the biopsy and time of clinical practice (p=0.659). Among the professionals with less than five years of experience (n=96), 34.3% (n=33) affirmed they did the procedure, a similar proportion observed among those with more than 20 years of practice (n=64) (32.8%, n=21). The highest relative proportion of performing biopsies was registered among participants with 11 to 15 years of practice (n=15) (60.0%) (n=9), although this group represents a lesser portion of the total sample. The chi-square test was utilized with confidence interval of 95% and level of significance of p<0.05.

DISCUSSION

The main findings of this study indicate that, although most of PHC's dental-surgeons recognize the possibility of early diagnosis of oral cancer, but there are still obstacles at professional and organizational level. 64.52% of the professionals claimed they are insecure to diagnose OPMD and 68.95% affirmed they are not skilled to do biopsies, reflecting deficit of practical skills. 62.90% of the participants have never did biopsies, the barriers are lack

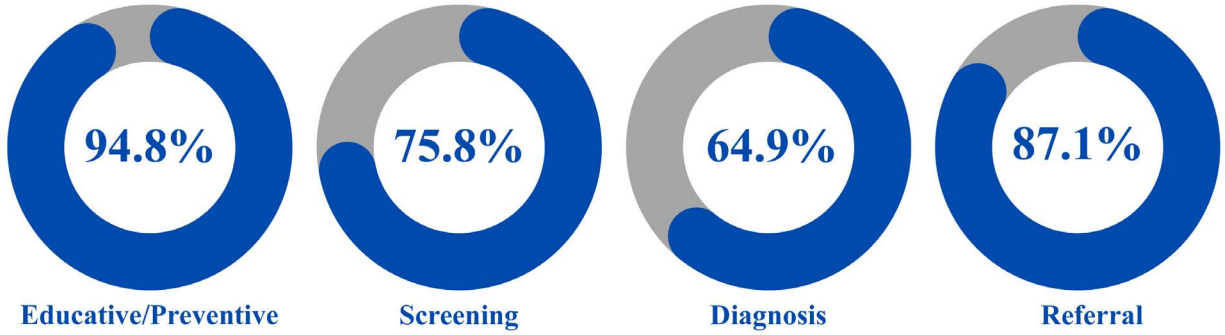

Figure 1. Function of PHC dental-surgeon in relation to oral cancer

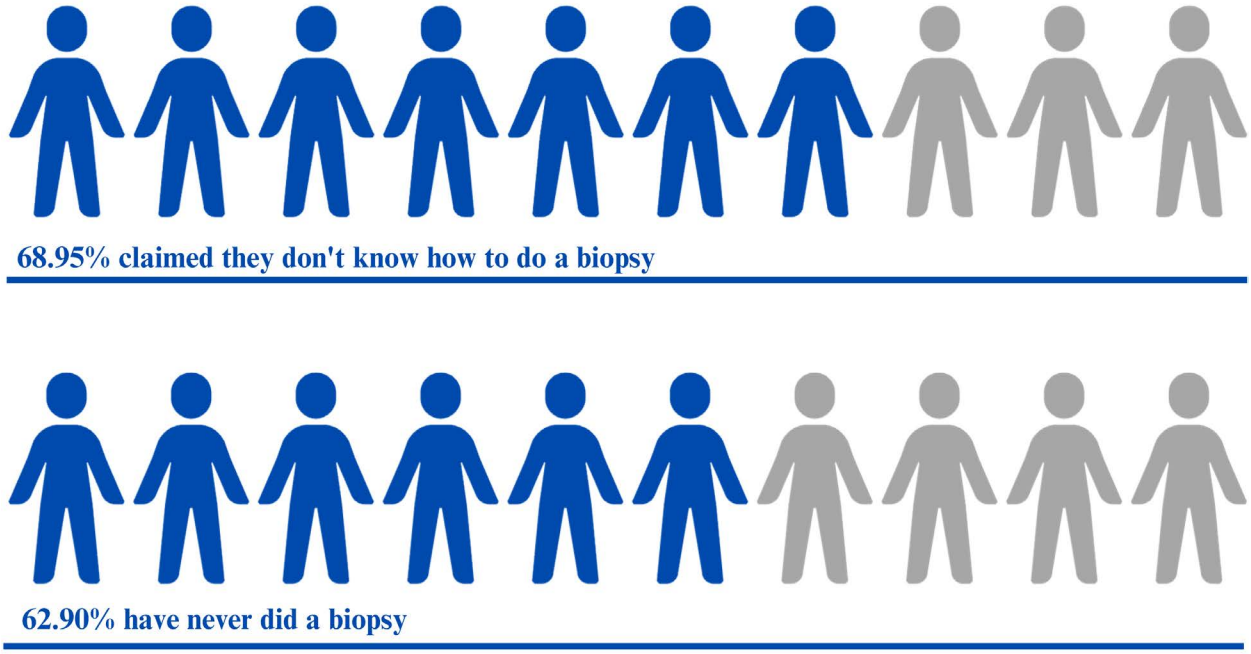

Figure 2. Skills and frequency of biopsy

Table 1. Perception and conduct of dental-surgeons on oral cancer and OPMD (n=248)

Variable	n	%
Knowledge about OPMD		
I know little and I'm insecure to do the diagnosis	160	64.52
I know every OPMD and I feel confident to do the diagnosis	61	24.60
I don't know how to distinguish from other potentially malignant disorders	16	6.45
I decline to respond	11	4.44
Procedure in case of suspicion of oral cancer or potentially malignant lesion*		
I do biopsy (within structural and technical possibilities)	40	16.13
I refer to the specialist of the Dental Specialties Center	163	65.73
I refer to the universities	39	15.73
I don't know how to proceed	2	0.81
I refer the patient to the emergency	9	3.63
I refer through the regulation system (MV Soul)	123	49.60
I decline to respond	4	1.61
Procedure followed if oral cancer is confirmed		
I tell the patient the case was referred to the specialized service	64	25.81
I continue to follow up the patient concomitantly with the specialized service	179	72.18
I decline to respond	5	2.02
Ability to do screening and diagnosis of oral cancer		
Yes, I'm aware of the signs and symptoms of the disease	17	6.85
Yes, but expertise is important	177	71.37
No, what I know is not enough to screen or do the diagnosis	52	20.97
I decline to respond	2	0.81
Ability to do the biopsy		
Yes	72	29.03
No	171	68.95
I decline to respond	5	2.02
Frequency of biopsy		
Never	156	62.90
Less than 5	59	23.79
Between 6 and 10	18	7.26
Between 11 and 20	2	0.81
Above 20	12	4.84
I decline to respond	1	0.40
Reasons for never doing a biopsy*		
No patient has ever presented a lesion that required a biopsy	49	26.78
I don't have the skills to do these techniques	43	23.50
I'm not experienced enough to do these techniques	106	57.92
Lack of surgical instruments and recipient with formol at PHC to do the procedure	67	36.61
I decline to respond	18	9.84
Prepared to report a confirmed case of oral cancer		
Yes, I am prepared	135	54.44
I'm not prepared	84	33.87
I decline to respond	4	1.61
Another professional is responsible or I assign the task to someone else	25	10.08

Captions: OPMD = oral potentially malignant disorders; *= more than one alternative.

Table 2. Knowledge professionals have about their health service (n=248)

Variables	n	%
Educative actions about early diagnosis of oral cancer		
Yes	101	40.73
No	75	30.24
I don't know	62	25.00
I decline to respond	10	4.03
Matrix support for oral diagnosis and detection of oral cancer		
Yes	82	33.06
No	94	37.90
I don't know	66	26.61
I decline to respond	6	2.42
Responsible for shipping the biopsy material to the lab		
The professional who collected	53	21.37
The patient	32	12.90
The lab collects at the unit	14	5.65
I don't know	122	49.19
I decline to respond	9	3.63
Others	18	7.26
The professional knows that the city has a histological/anatomopathological lab or a contract with another laboratory		
Neither a proprietary lab nor a contract with another laboratory	23	9.27
Proprietary laboratory	2	0.81
Contract with another laboratory	80	32.26
Proprietary laboratory or contract with another laboratory	1	0.40
I don't know	135	54.44
I decline to respond	7	2.82
Contribution of other professionals of the team of early diagnosis of oral cancer*		
Yes, doing diagnosis	43	17.34
Yes, in case of suspicious oral cancer, attempt to pursue inter-disciplinary action together with the dental surgeon	214	86.29
Yes, performing health education	175	70.56
No, oral cancer is a theme to be discussed only by the dental-surgeon	3	1.21
I don't know	0	0
I decline to respond	4	1.61
Flow of patients suspected of oral cancer		
The patient is captured initially at primary health care and then referred to other levels of attention	229	92.34
The patient is captured at the secondary level of health attention	3	1.21
The patient is captured at the tertiary level of health attention	1	0.40
I don't know	14	5.65
I decline to respond	6	2.42
Factors associated with diagnosis delay or care to patients with oral cancer in secondary service*		
Error of the professional (flawed clinical exam or unfamiliarity with this type of lesion)	160	64.52
Error of the patient (flawed self-perception)	127	51.21
Lack of information (patient and professional)	182	73.39
Error of the health network (there are no reference health services)	114	45.97
I don't know	10	4.03
I decline to respond	5	2.02

Caption: * = more than one alternative

Table 3. Association between knowledge of OPMD with time of clinical practice, ability to do screening/diagnosis, self-perception about own ability to do the biopsy and biopsy itself (n=248)

	Knowledge about OPMD					
	I know every OPMD and I'm sure I can do the diagnosis n (%)	I know little and I'm insecure to do the diagnosis n (%)	I don't know how to distinguish from other potentially malignant disorders n (%)	I decline to respond n (%)	Total n (%)	*p*
Time of clinical practice						
Less than 5 years	19(19.7%)	68(70.8%)	3(3.1%)	6(6.2%)	96 (100%)	
Between 5 and 10 years	17(35.4%)	26(54.1%)	3(6.2%)	2(4.1%)	48 (100%)	
Between 11 and 15 years	5(33.3%)	10(66.6%)	0(0%)	0(0%)	15(100%)	0.002
Between 16 and 20 years	6(25.0%)	15(62.5%)	2(8.3%)	1(4.1%)	24(100%)	
Less than 20 years	17(26.5%)	41(64.0%)	8(12.5%)	1(1.5%)	64(100%)	
I decline to respond	0(0%)	0(0%)	0(0%)	1(100%)	1(100%)	
Ability to do screening/diagnosis of oral cancer						
Yes, I'm aware of the signs and symptoms of the disease	13(76.4%)	3(17.6%)	0(0%)	1(5.8%)	17(100%)	
Yes, but expertise would be important	46(25.9%)	113(63.8%)	10(5.65%)	8(4.5%)	177(100%)	<0.001
No, my skills are not enough for this	2(3.8%)	42(80.7%)	6(11.5%)	2(3.8%)	52(100%)	
I decline to respond	0(0%)	2(100.0%)	0(0%)	0(0%)	2(100%)	
Ability to do the biopsy						
Yes	27(37.5%)	38(52.7%)	4(5.5%)	3(4.1%)	72(100%)	<0.001
No	34(19.8%)	119(69.5%)	12(7.0%)	6(3.5%)	171(100%)	
I decline to respond	0 (%)	3(60.0%)	0(0%)	2(40.0%)	5(100%)	
How many biopsies did you perform?						
Never	27(17.3%)	111 (71.15%)	11(7.0%)	7(4.4%)	156(100%)	
Less than 5	19(32.2%)	34(57.63%)	4(6.7%)	2(3.3%)	59(100%)	<0.001
Between 6 and 10	5(27.7%)	12(66.67%)	1(5.5%)	0(0%)	18(100%)	
Between 11 and 20	1(50.0%)	1(50.0%)	0(0%)	0(0%)	2(100%)	
More than 20	9(75.0%)	2(16.6%)	0(0%)	1(8.33%)	12(100%)	
I decline to respond	0(0%)	0(0%)	0(0%)	1(100.0%)	1(100%)	
Total	61(24.5%)	160(64.5%)	16(6.4%)	11(4.4%)	248(100%)	

Captions: OPMD = oral potentially malignant disorders; *= chi-square test, confidence interval 95%, p<0.05.

of proper instruments and unfamiliarity of how to ship materials for analysis. The combination of these factors revealed poor effectiveness in managing precursor lesions of oral cancer in PHC, compromising their strategic role as gateway to the health system.

In face of a suspicion of oral cancer or OPMD, the predominant conduct taken by dental-surgeons is the referral to a specialist. Only 16.13% of the professionals reported they did biopsy, showing the low resoluteness of PHC. Similar results have been observed in other regions and contexts, for instance, in the Brazilian Northeast where only 12% of the dental-surgeons did the procedure[20], and in the South region, 31.6% did the biopsy and 68.4% decided for referral. A similar scenario was described in Brisbane, Australia where 76.2% of the generalist dental-surgeons preferred the referral and only 23.8% did the procedure[22]. These findings reinforce the hypothesis that poor professional training is a common challenge in different realities, reducing the effectiveness of healthcare across many health systems. The low number

of biopsies found in the present study corroborates the findings of Strey et al. who concluded that only 23.44% of PHC dental-surgeons did biopsies during their clinical practice[13], demonstrating that this procedure is not incorporated yet consistently in the clinical routine of PHC. In addition, as shown by Braun et al., it was not observed statistically significant association between the self-efficacy to do biopsies and prior experience with diagnosis of oral cancer or frequency of exam of oral mucosa, indicating that insecurity to do the procedure still persists even among experienced professionals or with regular clinical practice[23].

The lack of practical knowledge (57.92%) is one of the motives for not doing biopsy and even out of necessity, many professionals feel they are not skilled to do it with confidence. Similar results were found in the literature where 76.1% of the professionals affirmed they are not skilled and experienced enough to do the procedure. On the other hand, professionals who considered the technical and practical formation satisfactory have performed a large number of biopsies along their career than those who deemed both aspects of the formation as insufficient[13]. Another aspect that emerged from the study is the lack of basic materials and appropriate infrastructure (36.61%), revealing a fragility in the working environment. Even if the professional knows or wishes to do the procedure, the lack of basic conditions makes performance unfeasible, compromising the resoluteness of the service.

Furthermore, some professionals affirmed they have never provided care to patients with suspicious lesions (26.78%), a similar scenario found in Spain where 23.5% affirmed they failed to observe lesions to do the procedure[24], although it is expected that general clinical dental-surgeons in Brazil are responsible for the diagnosis of approximately 676 cases of OPMD in the course of a 35-year career[11].

These data indicate gaps of practical formation either in undergraduation or lack of continued clinical trainings in the service. Corroborating this limitation, a study identified that 72.40% of PHC dentists believe that clinical training of oral pathology in the curriculum of undergraduation was not satisfactory[13]. A qualitative study, on its turn, observed that traditional training focused to theoretical contents in stomatology are offered frequently, but have limited practical application in health units. This finding suggests that theoretical formation alone is not sufficient to fully qualify the professionals, being necessary more effective complementary strategies and applicable in the daily life of PHCs[12]. Therefore, promoting specific training with theoretical-practical approach and ensure proper structural conditions to allow professionals to perform this procedure with confidence and institutional support can change the reality of PHCs.

The present study reinforces that poor familiarity of OPMD is associated with insecurity of clinical practice, particularly in relation to performing biopsies (Table 3). On the other hand, statistically significant association was not found between the time of clinical practice and performance of biopsies by PHC's dental-surgeons (p=0.659). Although the study has defined the total time of clinical practice as a variable, similar result was identified by Noro et al.[16] who evaluated the time of practice specifically in public institutions and also have not found statistic association with performance of biopsy. The convergence of findings in regard to different dimensions of professional experience can signalize that the time of practice alone, either general clinic or public service is not in itself a determinant to adopt this diagnostic conduct.

The persistence of lack of confidence, even among more experienced professionals, reinforces the importance of continuous education as foundational element to qualify the clinical practice focused to early diagnosis of oral cancer. Studies demonstrate that training programs and continuous education for health professionals contribute significantly to improve knowledge, clinical competence and diagnostic precision for early identification of oral cancer and OPMD. In addition, educational interventions have been effective to strengthen professional confidence and improvement of the skills for screening, recognition and management of these lesions[25].

The diagnostic process of oral cancer can be fully conducted at PHC, especially when articulated with matrix support. The strategy of healthcare and technical-pedagogic support to the reference teams, complementary to traditional mechanisms of attention, such as protocols and regulation systems is based in the joint construction of guidelines and definition of responsibilities among teams and experts[26]. However, it was observed that 64.52% of the professionals do not know or have no access to matrix support directed to oral diagnosis, which can compromise timely detection of the disease while limiting the access to specialized consulting, discussion of cases and support for clinical decisions. This unawareness can also signalize failures of institutional communication, fragility of local management or absence of well-defined flows among primary attention and specialized services. A study conducted in Europe identified that primary attention professionals consider the improvement of communication and inter-professional partnerships, particularly between primary and secondary attention, one of the main factors to improve the timeliness of cancer diagnosis[27]. Without proper matrix support, including access to specialists, diagnostic tests, continued education and effective communication systems, PHC teams face

difficulties to identify and properly refer patients suspected of cancer, compromising the diagnosis in initial stages when options of curative treatment are more likely[28,29].

The majority of the study participants (55.24%) reported that the municipality does not have educational actions focused to early diagnosis of oral cancer or is unaware of any such initiatives. This reveals an important gap: educational actions that could contribute to the conscientization of the population and early detection of the disease are lacking, little divulged or unrelated to clinical practice. The literature supports said findings while showing that many professionals claim they perform educational and preventive actions through presentations in health units and groups such as smokers, hypertense and older adults, however, these activities once more are sporadic and discontinued quite often[18].

The absence of continuous educational actions in PHC compromises early detection of oral cancer since health education if integrated to clinical practice favors the recognition of signs and symptoms by the population and strengthens self-care. In parallel, continuous education enables technical improvement and updating of conducts in face of diseases like oral cancer. Both educational dimensions targeted to the community and professionals contribute to expand the autonomy of the individuals, promoting best qualified clinical decisions and protagonism of the users involving their own health.

Further to the difficulties of the diagnostic process of oral cancer, it was found that 43.95% of the participants reported they were ill-prepared to communicate the diagnosis in confirmed cases of oral cancer, assigning this task to other professionals or delegating the task. This finding emphasizes the importance of including the communication of dismal news in actions of continued education. An intervention based on the protocol SPIKES has shown to be effective to improve dental-surgeons ability to communicate the diagnosis to the patient[30].

For early detection of oral cancer and OPMD it is recommended that PHC performs additional clinical tactile-visual and intraoral exam of all the adult patients in the first routine visits and also in urgent consultations[31]. The scenario revealed in the study did not include data about the systematic performance of this exam either in elective consultations or urgency assistance. This is an important variable to understand why oral cancer is not being detected earlier. The voluntary participation through online questionnaire can be a selection bias given the potential adherence of professionals more compromised and interested in the theme. In addition, because the study was referenced to only one Brazilian state, the findings reflect predominantly a specific reality. Future multicenter studies may improve the understanding of the theme in other scenarios and contribute to a more comprehensive perspective of the national reality.

Investments in PHC and expansion of the coverage of family health teams have been associated with the reduction of oral cancer mortality rates[5]. In light of the present findings, it is important to concentrate efforts in technical training of PHC professionals to diagnose oral lesions as an essential strategy for early detection of the disease. The perception dental-surgeons have of the barriers that hamper the diagnosis appears to be a self-criticism about their clinical practice and exposes structural obstacles such as fragility of the reference and counter-reference flows and limitations imposed by the sociocultural condition of the users.

CONCLUSION

This study demonstrated that barriers of formation, training and working conditions of dental-surgeons of PHC can impact the action for early diagnosis of oral cancer. Most of the professionals reported insecurity to diagnose OPMD, lack of technical skill to do biopsies and unfamiliarity of referral flows and specialized support. Clinical experience alone was not a determinant to do biopsy, indicating that poor resoluteness of PHC arises from lack of practical skill and insufficient infrastructure. These findings reinforce the necessity of investing in continuous education focused to theory and practice, qualified matrix support and improvement of the structure of the services to strengthen dental-surgeons for early detection of oral cancer.

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CONTRIBUTIONS

All the authors contributed substantially to the study conception and design, acquisition, analysis and interpretation of the data, writing and critical review. They approved the final version for publication.

DECLARATION OF CONFLICT OF INTEREST

There is no conflict of interest to declare.

DATA AVAILABILITY STATEMENT

The dataset generated and analyzed are available at the repository of Ufes at the URL: https://repositorio.ufes.br/collections/b5354daf-a7ff-468b-89f2-6de802e1a60f.

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