ORIGINAL ARTICLE

CONTENTS

# Prevention of oral diseases in the practice of primary care teams

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## ABSTRACT

**Aim:** To analyze the use of oral disease prevention technologies by primary care physicians and nurses

**Materials and Methods:** A cross-sectional medical and sociological study was conducted in primary health care facilities in Ivano-Frankivsk region (western Ukraine) based on the original author's program. The study included 153 randomly selected physicians and 113 nurses who agreed to participate in the study by signing informed consent. The survey included questions about the use of evidence-based recommendations for the prevention of oral diseases by primary care providers in their medical practice and personal life.

**Results:** Primary care teams do not properly conduct screenings on oral cancer (40.8-41.2% of physicians and 61.1-64.6% of nurses), as well as do not advise patients on the frequency and necessity of dentist check-ups for children and adults (34. 0-36.6% and 38.1-42.5%, respectively). They do not consult patients on teeth (50.3-53.1% and 51.3-60.2%) and gums (52.3% and 54.0%) hygiene care and most of them do not have information about these issues in their healthcare facilities or on their social media pages. Half of the physicians and more than half of the nurses themselves either do not visit dentists for checkups at all (9.2% and 11.5%, respectively) or do so irregularly (39.2% and 44.2%). Every fourth doctor (26.8%) and nurse (25.7%) brush their teeth less than twice a day, most do not use flossers (65.4% of doctors and 79.6% of nurses) and interdental brushes (91.5% and 95.6%).

**Conclusions:** Primary care providers do not pay sufficient attention to oral diseases prevention among patients and themselves. Given the severity of the burden of oral diseases, a model for integrating basic dental prevention measures into primary health care should be developed and implemented at the state and regional levels.

**KEY WORDS:** oral health, primary health care, public health, prevention, oral hygiene, oral cancer screening

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## INTRODUCTION

The most prevalent non-communicable diseases in the world are oral diseases, which embedded in overall health and contributes to physical, social and mental wellbeing [1-3].

The most prevalent and consequential oral diseases globally are dental caries (tooth decay), periodontal disease, tooth loss, and cancers of the lips and oral cavity [4]. Most of them are preventable, and yet, oral diseases, remain a substantial population health challenge, pose a significant public health problem and an economic burden globally [5], especially among the most vulnerable in society [6-8] in low-income and middle-income countries [4, 9]. However, dentistry has so far been unable to tackle this problem alone [3, 9].

Given the limited public funds, the most effective measures in this direction are: transformation of oral health systems away from a disease-based curative model to disease prevention [7, 10] and implementation of public health approach to the prevention and control of oral diseases at the population and individual levels [10, 11]. Equally important are measures to facilitate barriers to accessing dental care and maintaining good oral health [12], in particular, by implementing dentistry in the integrated healthcare system [9].

Given the importance of the problem of oral diseases and following a wide public consultation [2], WHO approves Global Strategy and Action Plan on Oral Health 2023-2030 [3]. Underlying the global oral health agenda are six guiding principles: a public health approach to oral health; integration of oral health into primary health care; innovative workforce models to respond to population needs for oral health; people-centred oral health care; tailored oral health interventions across the life course, and optimizing digital technologies for oral health [3].

In this document, the focus on the integration of dentistry with primary care services is extremely important, especially in countries and among people with limited access to dental care [9]. In the opinion

**Table 1.** Using of preventive dental technologies in the practice of primary care providers

| Answer | Physicians, n=153 | | | | Nurses, n=113 | | | | p |
|---|---|---|---|---|---|---|---|---|---|
| | n | % | 95% CI | | n | % | 95% CI | | |
| | | | LL | UL | | | LL | UL | |
| **Examination of the oral mucosa** | | | | | | | | | |
| at every patient visit | 58 | 37.9 | 30.1 | 45.7 | 61 | 54.0 | 44.7 | 63.3 | |
| if there are risk factors | 32 | 20.9 | 14.4 | 27.4 | 15 | 13.3 | 7.0 | 19.6 | 0.01461 |
| if there are complaints | 73 | 47.7 | 39.7 | 55.7 | 39 | 34.5 | 25.7 | 43.4 | |
| never | 5 | 3.3 | 0.4 | 6.1 | 8 | 7.1 | 2.3 | 11.9 | |
| **Palpation of head and neck lymph nodes** | | | | | | | | | |
| at every patient visit | 54 | 35.3 | 27.6 | 42.9 | 60 | 53.1 | 43.8 | 62.4 | |
| if there are risk factors | 37 | 24.2 | 17.3 | 31.0 | 19 | 16.8 | 9.8 | 23.8 | 0.00104 |
| if there are complaints | 72 | 47.1 | 39.1 | 55.0 | 31 | 27.4 | 19.1 | 35.7 | |
| never | 8 | 5.2 | 1.7 | 8.8 | 13 | 11.5 | 5.6 | 17.4 | |
| **Consultation on** | | | | | | | | | |
| dental hygiene devices | | | | | | | | | |
| never | 21 | 13.7 | 8.2 | 19.2 | 27 | 23.9 | 16.0 | 31.8 | |
| very rarely | 56 | 36.6 | 28.9 | 44.3 | 41 | 36.3 | 27.3 | 45.2 | 0.07456 |
| sometimes | 65 | 42.5 | 34.6 | 50.4 | 34 | 30.1 | 21.5 | 38.6 | |
| often | 11 | 7.2 | 3.1 | 11.3 | 11 | 9.7 | 4.2 | 15.3 | |
| rules for tooth brushing | | | | | | | | | |
| never | 30 | 19.6 | 13.3 | 26.0 | 21 | 18.6 | 11.3 | 25.8 | |
| very rarely | 52 | 34.0 | 26.4 | 41.6 | 37 | 32.7 | 24.0 | 41.5 | 0.82438 |
| sometimes | 54 | 35.3 | 27.6 | 42.9 | 38 | 33.6 | 24.8 | 42.4 | |
| often | 17 | 11.1 | 6.1 | 16.1 | 17 | 15.0 | 8.4 | 21.7 | |
| rules for gum care | | | | | | | | | |
| never | 34 | 22.2 | 15.6 | 28.9 | 11 | 44.0 | 24.3 | 63.7 | |
| very rarely | 46 | 30.1 | 22.7 | 37.4 | 9 | 36.0 | 17.0 | 55.0 | 0.86967 |
| sometimes | 64 | 41.8 | 33.9 | 49.7 | 2 | 8.0 | 0.0 | 18.7 | |
| often | 9 | 5.9 | 2.1 | 9.6 | 3 | 12.0 | 0.0 | 24.9 | |
| frequency of dental check-ups | | | | | | | | | |
| never | 13 | 8.5 | 4.0 | 13.0 | 12 | 48.0 | 28.2 | 67.8 | |
| very rarely | 43 | 28.1 | 20.9 | 35.3 | 6 | 24.0 | 7.1 | 40.9 | 0.11516 |
| sometimes | 75 | 49.0 | 41.0 | 57.0 | 2 | 8.0 | 0.0 | 18.7 | |
| often | 22 | 14.4 | 8.8 | 20.0 | 5 | 20.0 | 4.2 | 35.8 | |
| dental prevention for children | | | | | | | | | |
| never | 24 | 15.7 | 9.9 | 21.5 | 11 | 44.0 | 24.3 | 63.7 | |
| very rarely | 28 | 18.3 | 12.1 | 24.5 | 7 | 28.0 | 10.2 | 45.8 | 0.21076 |
| sometimes | 74 | 48.4 | 40.4 | 56.4 | 2 | 8.0 | 0.0 | 18.7 | |
| often | 27 | 17.6 | 11.5 | 23.7 | 5 | 20.0 | 4.2 | 35.8 | |

NB: 95%CI – 95% confidential interval; LL – lower limit; UL – upper limit.

of experts, primary care doctors and nurses can be involved in the prevention of dental diseases by disseminating knowledge about oral hygiene, diet and lifestyle changes among patients, providing screenings aimed at early detection of dental diseases, including cancer and precancerous diseases, referrals for dental care, etc. [7, 13-17]. At the same time, despite the considerable interest in this issue, there is still a lack of research on

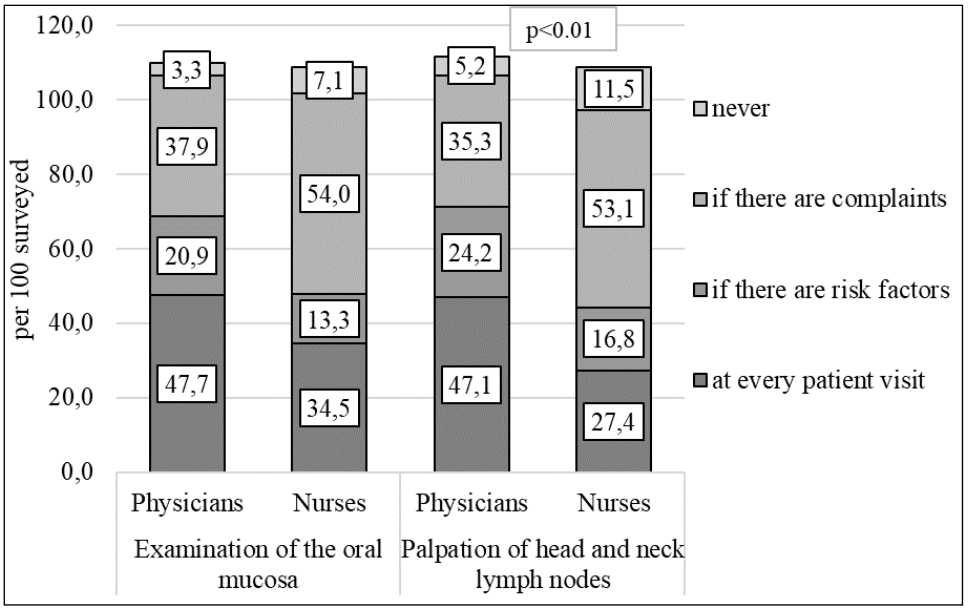


**Fig. 1.** Frequency and conditions of performing oral examinations and palpation of head and neck lymph nodes by primary health care providers.

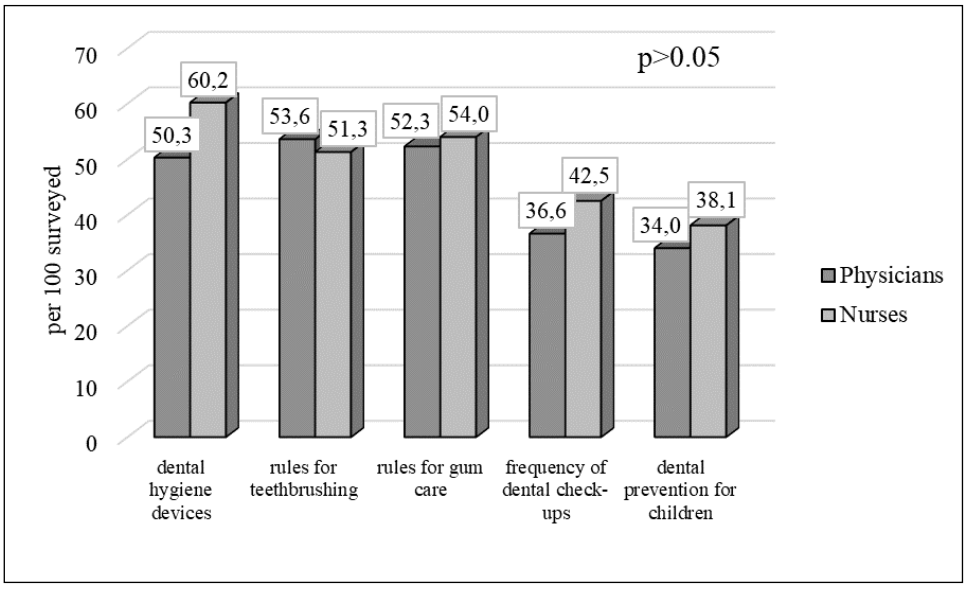


**Fig. 2.** Prevalence rate of negative answers of respondents regarding their consulting on different aspects of dental prevention.

models of involvement of primary care teams in the prevention of oral diseases.

## AIM

The purpose of this study was to analyze the use of oral disease prevention technologies by primary care physicians and nurses.

## MATERIALS AND METHODS

In 2024, a cross-sectional medical and sociological study was conducted in primary health care facilities in Ivano-Frankivsk region (western Ukraine) based on the original author's program. The study included 153 randomly selected physicians and 113 nurses who agreed to participate in the study by signing informed consent.

The survey included questions about the use of evidence-based recommendations for the prevention of oral diseases by primary care providers in their medical practice and personal life. To validate the questionnaire, it was first tested and adjusted on 15 volunteers to determine the time required to answer and the clarity of the answers.

The surveyed primary care physicians and nurses did not differ in age: the average age of physicians was 44.6±1.05 years, and of nurses – 44.8±0.99 years 44.8±0.99 years ($p>0.05$). The majority of respondents were female, and while there were only three male nurses (2.7%), there were a few more physicians – 17 (11.1%, $p<0.001$).

The design and program of the research were reviewed and approved by the Ethics Committee of Ivano-Frankivsk National Medical University (Protocol No. 129/22 of 20.09.2022).

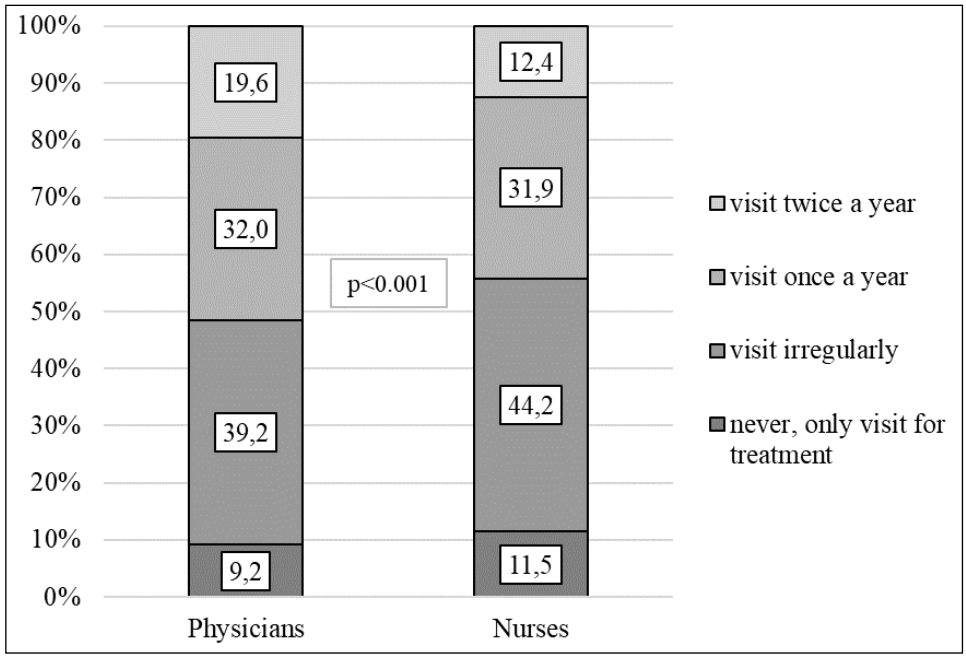


**Fig. 3.** Sources of information for patients about dental prevention in primary health care facilities.

**Table 2.** Using of preventive dental technologies by the primary care providers themselves

| Answer | Physicians, n=153 | | | | Nurses, n=113 | | | | p |
|---|---|---|---|---|---|---|---|---|---|
| | n | % | 95% CI | | n | % | 95% CI | | |
| | | | LL | UL | | | LL | UL | |
| **Frequency of preventive visits to dentists** | | | | | | | | | |
| never. only visit for treatment | 14 | 9.2 | 4.5 | 13.8 | 13 | 11.5 | 5.6 | 17.4 | 0.42336 |
| visit irregularly | 60 | 39.2 | 31.4 | 47.0 | 50 | 44.2 | 35.0 | 53.5 | |
| visit once a year | 49 | 32.0 | 24.6 | 39.5 | 36 | 31.9 | 23.2 | 40.5 | |
| visit twice a year | 30 | 19.6 | 13.3 | 26.0 | 14 | 12.4 | 6.3 | 18.5 | |
| **Frequency of tooth brushing** | | | | | | | | | |
| a few times a week | 1 | 0.7 | 0.0 | 1.9 | 2 | 1.8 | 0.0 | 4.2 | 0.66552 |
| once a day | 40 | 26.1 | 19.1 | 33.2 | 27 | 23.9 | 16.0 | 31.8 | |
| twice a day | 105 | 68.6 | 61.2 | 76.1 | 81 | 71.7 | 63.3 | 80.1 | |
| after every meal | 7 | 4.6 | 1.2 | 7.9 | 3 | 2.7 | 0.0 | 5.6 | |

NB: 95%CI – 95% confidential interval; LL – lower limit; UL – upper limit.

Statistical analysis of the received categorical data was carried out on the database created using Microsoft Excel by calculating the rate of characteristics per 100 respondents with 95% confidential interval. The reliability of the differences in the rates in different research groups (physicians, nurses) was evaluated by chi-square test ($\chi^2$).

## RESULTS

It was found that the less than half of primary care physicians perform oral examination (47.7 responses per 100 respondents) and palpation of head and neck lymph nodes (47.1%) at each patient visit, regardless of the reason for seeking medical care (Table 1, Fig. 1). In another 20.9% and 24.2% of cases, respectively, the surveyed physicians indicated that they performed these procedures when patients had cancer risk factors.

Primary care nurses chose the same answers much less than physicians. Thus, only about a third of them performed oral cavity examination (34.5 per 100 respondents, $p<0.05$) and palpation of lymph nodes (27.4%, $p<0.01$) at each patient visit. The presence of risk factors was the basis for these manipulations by the surveyed nurses in 13.3% and 16.8% of cases, respectively.

Among physicians, only a few respondents admitted that they never examine patients' oral cavities (3.3%)

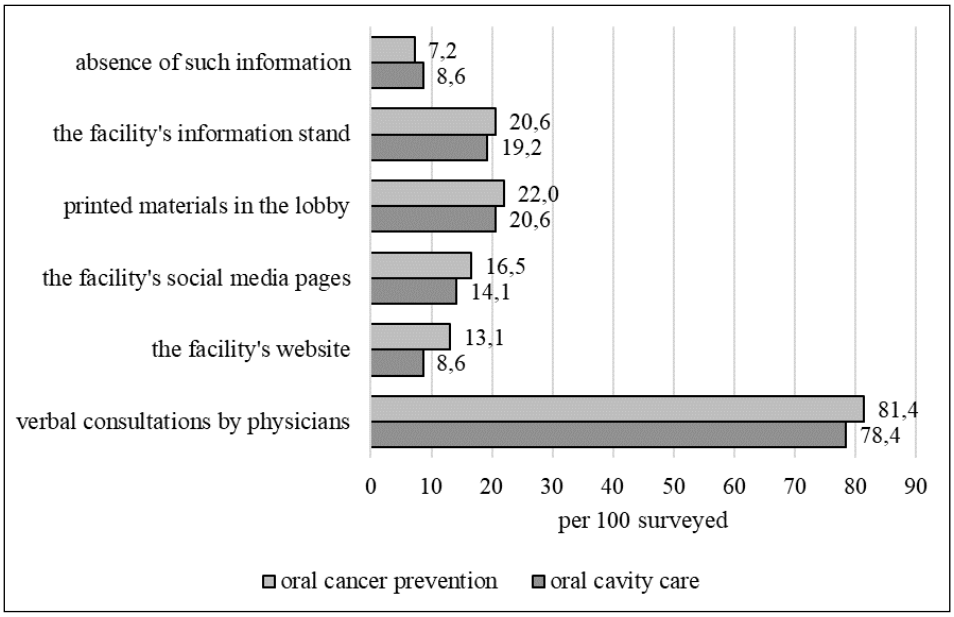


**Fig. 4.** Frequency of preventive visits to dentists by surveyed primary care providers.

and never palpate lymph nodes of the head and neck (5.2%). The number of such respondents among nurses was twice as high – 7.1% and 11.5%, respectively.

At the same time, about 35-40% of physicians (37.9% and 35.3%) and more than half of nurses (54.0% and 53.1%) reported they perform these procedures only if patients have complaints.

It was found (Fig. 2) that more than half of both surveyed physicians and nurses ($p>0.05$) do not or very rarely advise patients on the choice of oral hygiene devices (50.3% of physicians and 60.2% of nurses), rules for brushing teeth (53.1% and 51.3%, respectively), and gum care (52.3% and 54.0%). The rate of respondents advised their patients on the frequency of preventive visits to dentists or give advice on preventing dental diseases in children was somewhat higher. However, the share of those who do not do this was still quite significant: 36.6% and 34.0% among doctors and 42.5% and 38.1% among nurses.

The study of the possibility for patients to receive information about oral hygiene and prevention of oral cancer in the medical facilities where the respondents work showed (Fig. 3) that the majority of such information is obtained through verbal consultation of healthcare providers during patient visits (78.4-81.4%).

Only about 20% of primary care facilities place such data on information stands (19.2-20.6%) or place relevant printed materials in the lobby (20.6-22.0%). Even smaller share of healthcare facilities has such information on their social media pages (14.1-16.5%) or websites (8.6-13.1%). About 10% of facilities (8.6-7.2%) do not offer such information at all.

It was revealed that only 19.2% of primary care physicians and 12.4% of nurses visit dentists for check-ups twice a year, and another 32.0% and 31.9%, respectively, visit dentists once a year (Table 2, Fig. 4). In contrast, half of physicians and more than half of nurses ($p<0.001$) either make preventive visits to the dentist irregularly (39.2% and 44.2%, respectively) or do not make them at all and visit him/her only for treatment (9.2% and 11.5%).

Brushing teeth twice a day or more often was reported by 73.2% of primary care physicians and 74.3% of nurses ($p>0.05$), 61.4% and 51.3% of them ($p>0.05$) listen to dentists' advice when choosing toothpaste, and 36.6% and 32.7%, respectively ($p>0.05$), when choosing a toothbrush. Dental floss was used only by 34.6% of physicians and 20.4% of nurses ($p<0.01$), interdental brushes – 8.5% and 4.4%, respectively, and irrigators – 2.0% and 0.9%.

## DISCUSSION

Despite the evidence-based effectiveness of oral cancer screening at the primary care level [16-17], our study found that 35-40% of doctors perform oral cavity examination and lymph node palpation only when patients complain, and a few 3-5% do not do so at all. At the same time the potential of primary health care nurses to conduct such screenings is poorly used as the same rates among them were 53-54% and 7-11%, respectively. Given that only emergency dental care for adults and dental care for children is covered by the National Health Coverage Program in Ukraine, this makes this type of care unavailable to the majority of the population, including such vulnerable groups as rural and elderly people [18]. This can result in a high proportion of oral cancer new cases being detected at

III-IV stage – 63% (2022), and share of patients lived less than one year since diagnosis at previous year – 34%, in the country [19]. Obviously, the solution to the problem could be wider involvement of primary care teams in screening for oral cancer and precancerous lesions.

The study also found that primary care teams do not sufficiently advise their patients on oral hygiene (50-52% of physicians and 52-60% of nurses) and on the need and frequency of preventive visits to dentists for adults and children (34-37% of physicians and 38-43% of nurses). While the scientific literature provides convincing evidence of the effectiveness of such information and education interventions [3, 7, 9, 15], in particular, by community nurses [13, 14]. In addition, it was found that in primary care facilities, information for patients on oral hygiene and cancer prevention is not sufficiently presented on information stands, in printed leaflets, and in social networks.

The study found that primary health care providers themselves do not sufficiently adhere to preventive recommendations for screenings and oral hygiene. Although there are ongoing discussions among scientists about the frequency of regular visits to dentists for check-ups, given the priority of the national health services towards prevention, the National Institute for Health and Care Excellence (NICE) in the UK insists in its current clinical guidelines on six-monthly dental intervals between oral health reviews [20]. Instead, there was found that only 19.2% of physicians and 12.4% of nurses comply with this. More often, but still insufficiently, respondents follow evidence-based recommendations for toothbrushing twice a day [3, 21] – 73.2% of physicians and 74.3% of nurses, as well as for choosing toothpaste (61.4% and 51.3%, respectively) and toothbrush (36.6% and 32.7%). The use of such evidence-based oral hygiene devices [22] as dental floss is also insufficient among primary care providers – a third of doctors (34.6%) and only a fifth of nurses (20.4%), and quite sporadically – interdental brushes and irrigators.

## CONCLUSIONS

It was found that primary care teams do not pay enough attention to prevention of oral diseases among the population: do not properly conduct screenings on oral cancer (40.8-41.2% of physicians and 61.1-64.6% of nurses) and do not advise patients on the frequency and necessity of dentist check-ups for children and adults (34. 0-36.6% and 38.1-42.5%, respectively). They do not consult patients on teeth (50.3-53.1% and 51.3-60.2%) and gums (52.3% and 54.0%) hygiene care and most of them do not have information about these issues in their healthcare facilities or on their social media pages.

It has been shown that primary care physicians and nurses themselves do not sufficiently adhere to existing evidence-based recommendations for preventive visits to dentists and oral hygiene. Half of the physicians and more than half of the nurses in total either do not visit dentists for checkups at all (9.2% and 11.5%, respectively) or do so irregularly (39.2% and 44.2%). Every fourth doctor (26.8%) and nurse (25.7%) brush their teeth less than twice a day, most do not use flossers (65.4% of doctors and 79.6% of nurses) and interdental brushes (91.5% and 95.6%).

Given the severity of the burden of oral diseases, a model for integrating basic dental prevention measures into primary health care should be developed and implemented at the state and regional levels.

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## CONFLICT OF INTEREST

The Authors declare no conflict of interest

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