

ON THE AWARENESS OF MEDICAL UNIVERSITY STUDENTS ABOUT ORAL HYGIENE AND CARIES PREVENTION

Tsyretarova A. D.

Tutor: PhD, associate professor Chepelev S. N.

Belarusian State Medical University, Minsk

Resume. A study of 100 students at the Belarusian State Medical University found that 79% brushed their teeth twice a day, 84% brushed for at least 2 minutes, and 79% cleaned their tongues. Preventive dental visits were performed annually by 44% and semi-annually by 20% of students, while 33% visited the dentist only when symptoms appeared, and 3% avoided visits entirely. Inter-dental hygiene was found to be inadequate: only 44% flossed, and 64% of respondents expressed interest in learning more about caries prevention.

Keywords: oral hygiene, caries prevention, medical university students, survey data.

Relevance. Dental caries is one of the most prevalent chronic infectious diseases worldwide [1]. Its pathogenesis is multifactorial, involving microbial bio-film formation, dietary sugars, and host susceptibility. From the perspective of pathological physiology, caries begins with colonization of the tooth surface by cariogenic bacteria such as *Streptococcus mutans* and *Lactobacillus*. These microorganisms metabolize carbohydrates into organic acids, lowering the local pH and initiating enamel demineralization. If remineralization does not occur, cavitation progresses into dentin and pulp, establishing a chronic inflammatory focus. Locally, the dentin-pulp complex responds with neutrophil and macrophage infiltration, releasing cytokines (IL-1 β , IL-6, TNF- α) that sustain pulpitis and periapical lesions [2].

Persistent oral infection does not remain confined to the oral cavity but disseminates systematically, driving low-grade inflammation that alters vascular, metabolic, and respiratory pathways. Elevated cytokines such as TNF- α and IL-

6 impair endothelial function by reducing nitric oxide synthesis and increasing vascular permeability, thereby accelerating atherogenesis and plaque instability, which links oral disease to cardiovascular events [3]. In metabolism, these mediators interfere with insulin receptor signaling, diminishing glucose uptake and exacerbating insulin resistance. In individuals with diabetes, hyperglycemia further weakens host defenses and salivary production, establishing a bidirectional feedback loop in which poor glycemic control worsens oral infection, and oral infection amplifies systemic inflammation. Within the respiratory tract, dental plaque serves as a reservoir for pathogens that may be aspirated, precipitating pneumonia or aggravating chronic obstructive pulmonary disease [4].

Thus, oral hygiene is not only a measure to prevent caries but also a strategy to reduce systemic inflammatory burden [1]. University students, particularly those in medical faculties, form a key group whose personal habits shape individual well-being and future

professional roles in healthcare.

Aim: was to investigate oral hygiene practices and preventive awareness among second- and third-year medical students, and to interpret these behaviors within the framework of pathological physiology, highlighting their relevance not only for caries prevention but also for systemic health.

Objectives:

1. Describe oral hygiene behaviors among medical students;
2. Assess awareness of preventive measures and familiarity with adjunctive oral hygiene aids;
3. Evaluate patterns of dental attendance and identify gaps in preventive culture;
4. Explore students expressed interest in receiving more information on caries prevention as an indicator of readiness for educational interventions.

Materials and methods. A cross-sectional survey was conducted at Belarusian state medical university. The study population consisted of 100 students enrolled in the second and third years of general medicine and pediatrics. Participation was voluntary and anonymous.

A structured questionnaire of 13 items was designed to assess oral hygiene practices and awareness. Domains included age of respondents, their gender, toothbrushing frequency and technique, toothbrush type, tongue cleaning, dental attendance, brushing duration, dietary habits (consumption of coarse-consistency food), flossing, chewing gum use, toothbrush replacement, familiarity with adjunctive aids (cleansing dental foam, water flosser), and interest in receiving more information on caries prevention.

Responses were summarized using descriptive statistics. The results were interpreted in the context of pathological physiology, linking oral hygiene behaviors to caries and systemic disease pathways.

Results and their discussion. Out of 100 respondents, the vast 69 were female and 31 male (figure 1). Minimum age of students was – 18, maximum – 27, with mean age of 19.5 years in both genders. The majority – 89% were aged 18-20 years, reflecting the early stage of university education, while 8% was 21-23 years, 1% – 24-26 years, and 2% – 27-29 years (figure 2).

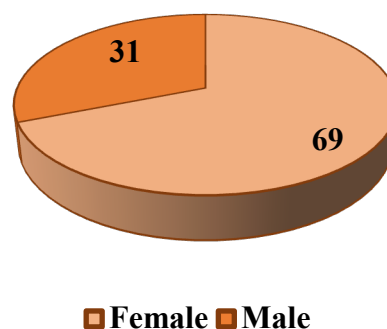


Fig. 1 – Distribution of students based on gender

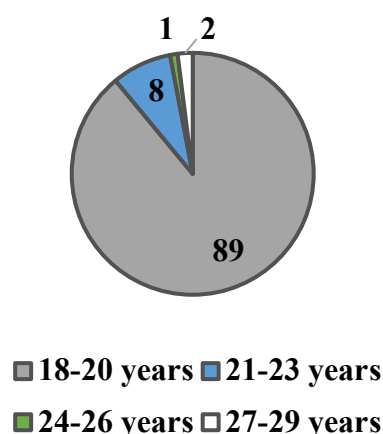


Fig. 2 – Distribution of students according to age group

Most students – 79% brushed their

teeth twice daily, 13% – once daily, 5% – three times daily, 1% – did not usually brush, and another 1% – brushed more than three times a day. This indicates generally favorable habits, consistent with preventive recommendations (figure 3).

Manual toothbrushes were predominant – 89%, with limited use of electric – 8% or sonic – 1% brushes. While manual brushing can be effective, powered brushes have demonstrated superior plaque removal, suggesting a potential area for improvement (figure 4).

Regarding tongue cleaning, majority of respondents (79%) performed it, which is beneficial for reducing microbial load and halitosis. While the preventive visits were reported annually by – 44% and semiannually by – 20%. However, in case of – 33% attendance was registered only when symptomatic, and at last – 3% avoided visits altogether. This reflects a gap in preventive culture which is essential for early detection of caries and periodontal disease.

It was established, that 84% of students answered that they brushed their

teeth for at least 2 minutes, aligning with the consensus guidelines from the World dental federation and the American Dental Association (ADA), which both advice brushing teeth for about two minutes twice daily with a soft-bristled toothbrush.

Only 44% of respondents used dental floss, while – 54% did not, and another 2% were totally unfamiliar with floss. Interdental cleaning is crucial for removing plaque in areas inaccessible to toothbrushes, and its presence is a major risk factor for proximal caries.

On the question of obtaining information, 64% of students expressed interest in additional guidance on caries prevention, while 36% reported no such need (figure 5). This indicates a substantial subgroup of students who are likely to benefit from targeted educational campaigns – for example, structured lectures on oral hygiene, interactive workshops on effective brushing and flossing techniques, distribution of evidence-based brochures, or digital resources such as mobile apps and social media infographics.

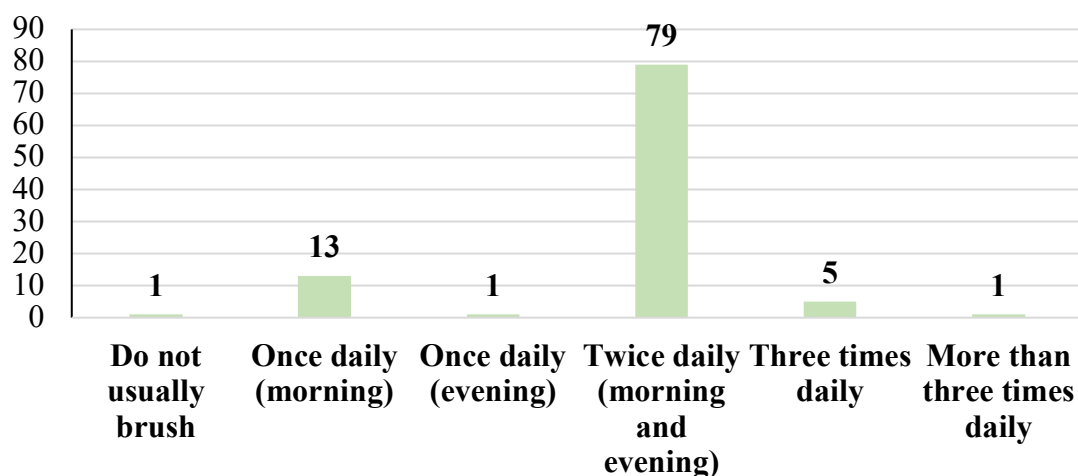


Fig. 3 – Toothbrushing routine by daytime periods

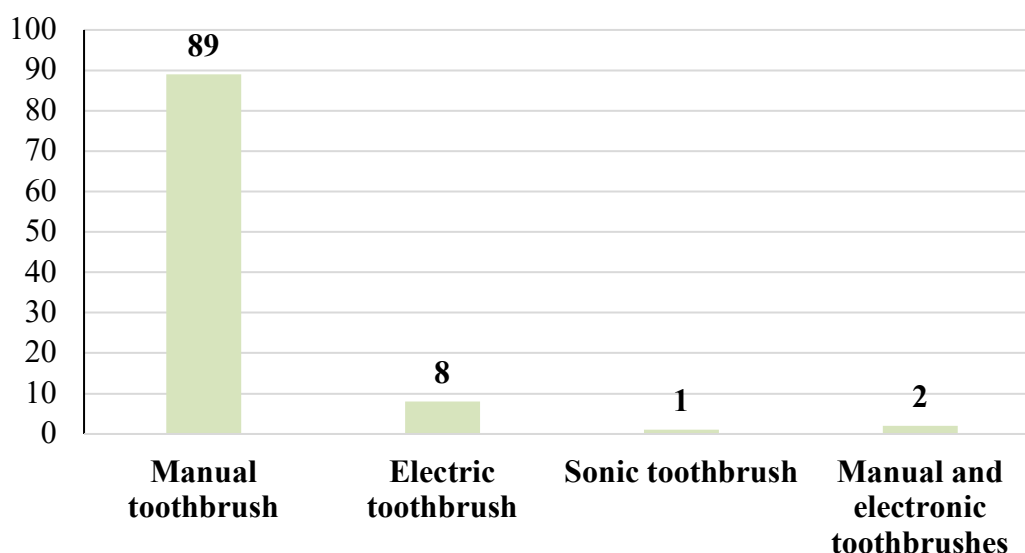


Fig. 4 – Student preferences in toothbrush selection

The results demonstrate that while foundational hygiene behaviors (twice-daily brushing, ≥ 2 minutes duration) are strong, gaps remain in interdental cleaning and preventive attendance. These gaps are significant from a pathophysiological point of view. Without necessary interdental cleaning, biofilm persists in proximal surfaces, producing acids that demineralize enamel and dentin.

Conclusions. This study highlights that medical students demonstrate strong foundational oral hygiene practices, with 79% brushing twice daily, 84% maintaining the recommended duration of at least two minutes, and 79% regularly cleaning their tongue. Despite these favorable behaviors, notable gaps remain in interdental cleaning, as only 44% reported using dental floss, and in preventive dental attendance, where 44%

visited dentist annually, 20% semiannually, while 33% sought care only when symptomatic and 3% avoided visits altogether.

From a pathophysiological perspective, these shortcomings are significant because persistent oral infection sustains systemic inflammation, increasing risk for chronic system diseases. Encouragingly, 64% of students expressed interest in receiving more information on caries prevention, which underscores the opportunity for targeted educational interventions. Integrating oral hygiene education into medical curricula can strengthen preventive behaviors, reduce caries risk, and mitigate the overall inflammatory burden. This aligns with modern concept of oral-general health and supports the role of medical education in fostering holistic preventive care.

Literature

1. Global burden of oral diseases: emerging concepts, management and interplay with systemic health / L. Jin [et al.] // *Oral diseases*. – 2016. – Vol. 22. – №. 7. – P. 6209–619.
2. Inflammatory response mechanisms of the dentine–pulp complex and the periapical tissues / K. M. Galler [et al.] // *International journal of molecular sciences*. – 2021. – Vol. 22. – №. 3. – P. 1480.
3. Relationship between periodontal infections and systemic disease / G. J. Seymour [et al.] //

Clinical Microbiology and infection. – 2007. – Vol. 13. – P. 3-10.

4. Sabharwal, A. Associations between dental caries and systemic diseases: a scoping review / A. Sabharwal, E. Stellrecht, F. A. Scannapieco // BMC oral health. – 2021. – Vol. 21. – №. 1. – P. 472.

ОБ ОСВЕДОМЛЁННОСТИ СТУДЕНТОВ МЕДИЦИНСКОГО УНИВЕРСИТЕТА О ГИГИЕНЕ ПОЛОСТИ РТА И ПРОФИЛАКТИКЕ КАРИЕСА

Цыретарова А. Д.

Научный руководитель: канд. мед. наук, доц. Чепелев С. Н.

Белорусский государственный медицинский университет, г. Минск

Резюме. В ходе исследования, охватившего 100 студентов Белорусского государственного медицинского университета, обнаружено, что 79% студентов чистят зубы дважды в день, 84% – соблюдают рекомендуемую продолжительность чистки не менее 2 минут, а 79% – выполняют очищение языка. Профилактические стоматологические визиты осуществлялись ежегодно у 44% и раз в полгода – у 20% студентов, тогда как 33% обращались к стоматологу только при появлении симптомов, а 3% полностью избегали посещений. Межзубная гигиена оказалась недостаточной: лишь 44% использовали зубную нить, при этом 64% респондентов выразило заинтересованность в получении дополнительной информации о профилактике кариеса.

Ключевые слова: гигиена полости рта, профилактика кариеса, студенты медицинского университета, данные анкетирования.