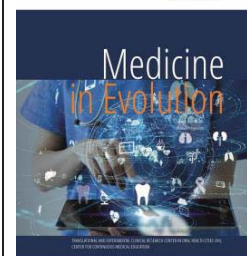


# Patients' attitude toward the use of secondary products for oral hygiene



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## Abstract

The proper oral hygiene routine includes, besides toothbrushing, secondary oral hygiene products like interdental cleaning products and mouthrinses. The aim of the present study was the assessment of patients' attitude toward secondary oral hygiene products. Material and method: the cross-sectional study was conducted in 2022 on a sample of 223 Romanian adults and the assessment was performed using an on-line self-assessment questionnaire. The results showed the frequency of users at least 1 time/day as follows: 33.63% dental floss, 15.69% interdental brushes, 19.73% oral irrigator, 44.39% mouthrinses. Regarding the motivation for the use of interdental cleaning products, prevention of oral conditions was mentioned as follows: 27.80% for dental floss, 9.87% for interdental brushes users and 16.59% for oral irrigator. For justifying the use of mouthrinses for preventive reasons, 17.04% mentioned prevention of caries and 56.05% of gingival inflammation. Among the reasons for not using these products in daily routine, neglect and the lack of comprehension of their role as well as the lack of perceived need were most frequently met statements. Conclusion: In the present study, adults declared a low rate of use of secondary oral hygiene products and the barriers mentioned were mostly related to insufficient knowledge and interest regarding the impact they have on prevention of dental caries and periodontal inflammation.

**Keywords:** oral hygiene, dental prevention, oral health, interdental cleaning, mouthwashes

## INTRODUCTION

Both dental caries and periodontal disease are caused by the dental plaque accumulation and persistence [1]. Dental plaque is a biofilm with a very complex organized and specialized structure composed by bacteria embedded in an intercellular matrix [2,3].

Even though there are many risk factors that influence the development of dental caries [4] and periodontal disease [5], in order to prevent their debut and relapse, it is mandatory to control the dental plaque [4,5]. The main procedure to remove the dental plaque is the toothbrushing [6,7] with a proper toothbrush, tooth paste adapted to each patient's needs as well as a correct brushing technique. However, toothbrushing only is not enough to remove the plaque [8] because of the inability of a toothbrush to reach interdental spaces where a high quantity of plaque remains after toothbrushing, thus, maintaining the risk for the development of caries and inflammation in these vulnerable proximal areas.

Dental floss is a well-known and the most commonly used secondary product for cleaning interdental spaces [2,9]. Its features are variable and developed to respond to different patients' needs and preferences. Unfortunately, there are some clinical situations that impede the dental floss use, such as the presence of dental bridges or fixed orthodontic appliances. Interdental brushes are another type of secondary products used for interdental spaces [2,9]. These are appropriate and efficient especially for periodontal patients whose large interdental spaces caused by the recession of interdental papilla [10], or orthodontic patients who need to clean under the orthodontic archwire [9]. These interdental brushes are of different diameters to suit the dimension of interdental spaces. Other technical characteristics are made to ease their use by different patients [2]. Another product recommended for mechanical control of dental plaque in interdental spaces is the oral irrigator [2,10], which is a device that cleans using water with controllable pressure. It is suitable for the vast majority of patients.

In addition to mechanical control of dental plaque through toothbrushing and the above-mentioned interdental cleaning secondary products, in certain cases, in order to favor the condition for primary and secondary prevention of dental caries and periodontal inflammation, there is recommended the use of mouthrinses in order to either chemically control the dental plaque [11] or increase the fluoride intake [12,13]. To maximize their effect of the active ingredients and to minimize their secondary effect it is mandatory for patients to respect the product indications.

In practice, the use of secondary oral hygiene products is scarce among patients [9]. There are many reasons for the lack of use, because of either the patients' lack of knowledge or lack of motivation [14]. However, among patients that are aware of these secondary products, the difficulties they have when using them are an important reason for keeping them from using them regularly [2,9,14]. Moreover, when it comes to the mouthwashes, the patients tend to choose them for comfort reasons more than for functional, medical or dental reasons [9].

### *Aim and objectives*

The aim of the present study was to assess the patients' attitude towards the use of secondary oral hygiene products in terms of opinions, motivation and difficulties in use.

## MATERIAL AND METHODS

A survey was conducted between February-June 2022, under the coordination of the Oral Health and Community Dentistry Department from the Faculty of Dental Medicine,

“Carol Davila” Medicine and Pharmacy University (Bucharest, Romania). The study group was formed by 223 Romanian adults that were neither dental students nor dentists. Participants were assessed using an on-line questionnaire with 22 items, both open and closed-ended questions regarding the use of dental floss, interdental brushes, oral irrigator and mouthrinses. The questionnaires were anonymous, no sensitive personal data were collected and the subjects were informed regarding the aim of the study and their rights as participants in a study in accordance with the Declaration of Helsinki.

## RESULTS

Participants had a mean age of  $29.64 \pm 2.82$  years and 86.10% (192 subjects) were females. It was observed that within the studied group, regarding the frequency of use of secondary oral hygiene products, mouthrinses are used by more participants (87.00%) compared to the interdental cleaning products and that oral irrigator is the least frequently used product (43.50%). Moreover, dental floss is the preferred product for cleaning the interdental spaces but its use for at least 1 time/day is declared by only 33.63% of participants (Table I).

Table I. Frequency of use of secondary oral hygiene products

Frequency	Type of secondary oral hygiene products % (N)			
	Dental floss	Interdental brushes	Oral irrigator	Mouthrinses
> 1 time/day	13.00% (29)	7.17% (16)	7.17% (16)	14.35% (32)
1 time/day	20.63% (46)	8.52% (19)	12.56% (28)	30.04% (67)
< 1 time/day	44.39% (99)	29.60% (66)	23.76% (53)	42.60% (95)
Never	21.97% (49)	20.63% (46)	56.50% (126)	13.00% (29)

When it comes to motivation for using these products, participants to the study declared the use of interdental cleaning products mainly to remove the food debris that are disturbing (47.53% for dental floss, 20.18% for interdental brushes, 20.63% for oral irrigator) but in low percentage they perceive it as a contribution to prevention of dental caries and gingival inflammation (Table II).

On the other hand, mouthrinses are perceived as beneficial in prevention mostly related to periodontal inflammation (56.05%) in comparison to dental caries (17.04%) (Table III). Another finding regarding the use of mouthwash is that 53.36% of the subjects declare the use of it to benefit from fresh breath in similar frequency as for inflammation prevention (Table III).

Table II. Patients' reasons for using interdental cleaning products

Reason	Type of interdental cleaning products % (N)		
	Dental floss	Interdental brushes	Oral irrigator
Prevention of dental caries/periodontal inflammation	27.80% (62)	9.87% (22)	16.59% (37)
Removal of disturbing food debris between teeth	47.53% (106)	20.18% (45)	20.63% (46)

	Type of interdental cleaning products % (N)		
	Dental floss	Interdental brushes	Oral irrigator
Reason			
<i>Recommendation from the dentist</i>	22.87% (51)	16.14% (36)	17.94% (40)
<i>Easier use compared to other interdental cleaning products</i>	13.00% (29)	6.73% (15)	11.21% (25)
<i>Intolerance/impossibility in use of other interdental cleaning products</i>	3.59% (8)	7.62% (17)	5.38% (12)

Table III. Patients' reasons for using mouthwashes

	Mouthrinses% (N)
Reason	
<i>Prevention/control of dental caries</i>	17.04% (38)
<i>Prevention/control of periodontal inflammation</i>	56.05% (125)
<i>Control of hypersensitivity</i>	10.76% (24)
<i>Fresh breath</i>	53.36% (119)

On the other hand, in regards to the underuse of the secondary oral hygiene products, the most frequently met answers about the reasons for not using them every day, were negligence (25,11% dental floss, 14.35% interdental brushes, 17.49% oral irrigator, 28.25% mouthrinses) (Table IV).

In case of mouthrinses (41.70%) and interdental brushes (55.15%), most of the participants stated they are not aware of the role these products play in maintaining oral health.

Table IV. Patients' reasons for not using every day the secondary oral hygiene products

	Type of secondary oral hygiene products % (N)			
	Dental floss	Interdental brushes	Oral irrigator	Mouthwash
Reason				
<i>Don't understand its importance</i>	1.35% (3)	55.16% (123)	8.97% (20)	41.70% (93)
<i>Don't need it</i>	7.17% (16)	8.97% (20)	12.11% (27)	34.53% (77)
<i>Don't know how to use it</i>	3.14% (7)	16.14% (36)	7.62% (17)	0% (0)
<i>Hard to use it</i>	9.87% (22)	15.69% (35)	5.38% (12)	0% (0)
<i>Causes gingival bleeding</i>	14.35% (32)	3.59% (8)	6.28% (14)	-
<i>High costs</i>	0% (0)	7.17% (16)	2.24% (5)	2.24% (5)
<i>Lack of time needed for use</i>	8.52% (19)	13.00% (29)	6.28% (14)	6.73% (15)
<i>Neglect</i>	25.11% (56)	14.35% (32)	17.49% (39)	28.25% (63)

## DISCUSSIONS

In the present study, adults declared a low rate of use of secondary oral hygiene products and the barriers mentioned were mostly related to insufficient knowledge and interest regarding the impact they have on prevention of dental caries and periodontal inflammation. Current recommendations for the prevention of dental caries include the use of dental floss for both adults and children [4,6], even from the first interdental contact formed between temporary teeth [6]. Moreover, in cases of high carious risk, fluoride containing mouthrinses are recommended as supplements [12,13]. On the other hand, the use of both mechanical control of dental plaque using products that adapt to different interdental space devices, and chemical control through antiseptic mouthwashes [10,11].

A study [15] on a sample with adults with a similar age as our group (26 year-old vs. a mean age of 28 years among participants in present study), observed that 51% consider dental floss use important, while our subjects even though in a very low percentage declare they didn't consider the dental floss use important. Only one third report a daily use and one quarter used it less than daily because they neglected. Moreover, a previous research [14] regarding behavioral change for daily use of dental floss showed that the motivation to use it increases after patients are properly informed about the risks that incomplete plaque removal has on oral health as well as the benefits the use of interdental cleaning methods have on prevention of oral conditions. In our study, we found that a very low proportion of subjects are aware of the role that dental floss has on prevention of dental caries and gingival inflammation.

When it comes to the interdental brushes as alternatives to dental floss, in our study it observed that it was the interdental cleaning products with the highest percentage of participants who answered they didn't understand its role as well they had difficulties in using it or didn't know how to use it at all. Previous meta-analyses [2,10] stated that, compared to dental floss, interdental brushes have a higher impact in reducing inflammation, when used properly, and it is recommended as the first-choice interdental cleaning product for patients with periodontitis [10]. Thus, within the studies group there is a necessity to increase the awareness regarding the importance of interdental brushes used on prevention and control of the inflammation. Related to difficulties in using them, opposite to our participants' perception, previous research showed that interdental brushes are preferred by the patients due to the ease in use compared to dental floss [2].

Oral irrigators were found in our survey to be the interdental cleaning product with the least percentage of users and with the highest percentage of subjects that stated they did not need this product. A Cochrane systematic review [2] published in 2019 showed that there is some evidence showing a superiority in oral irrigator compared to dental floss when it comes to reducing the gingival index but not the dental plaque index. However, this product's ability to remove the biofilm from not only supragingival but also subgingival surfaces [2,10], as well as hard-to-reach areas, are benefits for certain patients.

Mouthwash was the secondary oral hygiene product used by the highest proportion of participants in the study, compared to the other products assessed. Moreover, no participants reported difficulties in using this product. However, the users might underrate its impact on oral health since half of them answered that the main reason for rinsing with this solution is for a fresh breath. Although there is a strong evidence in the literature that twice daily use of fluoride containing mouthrinse proved to reduce the risk of dental caries in vulnerable patients [12,13,15], in our study a low proportion of subjects showed awareness about the role the fluoride mouthwashes play in the prevention of dental caries. On the other hand, antiseptic containing mouthrinses are strongly recommended for patients with gingival

inflammation going under active and maintenance periodontal treatment [11], only half of the participants mentioned prevention of gingival inflammation as a reason for using mouthrinse.

The present study have the limitation of reporting results based on patients' self-assessment and statements. Clinical assessment to correlate the survey data with oral health status and plaque index are considered for a future phase of this research. In addition, this cross-sectional survey represents a starting point for a detailed research regarding the practical difficulties patients have in using secondary oral hygiene products.

Nevertheless, this study offers an overview on patients' perspective and level of knowledge that contributes to the basis of oral health promotion programs aiming to increase the awareness and knowledge level in regards to proper oral home care routine in preventing oral conditions.

## CONCLUSIONS

The current survey showed a suboptimal use of secondary oral hygiene products, with mouthwashes preferred over interdental cleaning products. Participants showed a low level of awareness regarding the importance of using these products for the prevention of dental caries and gingival inflammation. Participants' motivation regarding the use of interdental cleaning products was most frequently related to the removal of disturbing food debris, underestimating the role it plays in oral conditions. Dental floss was the product of choice for interdental cleaning. Among the limits in using these secondary oral hygiene products, negligence and low level of understanding their role were most frequently mentioned.

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