Factors influencing self-reported use of mouthwashes among dental patients in Amman, Jordan

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Abstract

Aims: To assess the extent of mouthwash self-reported use and to evaluate the sociodemographic factors affecting this behavior.
Methods: A survey was conducted with 317 patients aged 16-76 years attending the Department of Dentistry, University of Jordan Hospital. Sociodemographic data, self-reported general and oral health status, oral hygiene methods, and data on mouthwash use were collected. Results: The prevalence of self-reported use of mouthwash was 44.8%. Female patients used mouthwashes more frequently, and there was nearly 2% increase in the chance of using mouthwash with each one-year increase in the patient's age. Only self-reported gingival inflammation was associated with self-reported mouthwash use (P=0.044).
Conclusion: The findings showed that mouthwash use could be influenced by age and gender and could be associated with the patient's perception of his/her gingival condition. There is a need for larger scale studies to elucidate the different factors influencing mouthwash use and the role it could play in the programs of oral hygiene promotion.

Keywords: Oral hygiene, mouthwash, self-reported, socioeconomic factor.

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Introduction

Oral health is an important component of an individual's general health. The presence of oral health problems might result in physical discomfort, pain, infection, tooth loss, and it can affect productivity and the quality of life.[1] In addition, there has been a confirmed and measurable association between periodontal disease and serious systemic diseases[2-4], such as coronary heart disease[5,6] and preterm birth.[7,8] Therefore, establishing a good level of oral health is essential for the improvement of the quality of life.

Effective and regular oral hygiene practices are essential for the achievement of good oral health[9], and are effective in reducing dental caries and gingivitis.[10,11] Tooth brushing is the most common and most effective method of maintaining good oral hygiene levels through the mechanical plaque control.[12] Other mechanical measures exist to support tooth brushing such as dental floss, toothpicks, interdental brushes, and water-jet devices.[13] Moreover, chemical products and preparations are available in the market to aid in plaque

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control, such as mouthwashes. Mouthwashes are used as an adjunct to mechanical plaque control via antiplaque effects and, in certain cases, anti-inflammatory effects.[14] Mouthwashes are also used in the control of halitosis and dentine hypersensitivity.[15]

There has been an increased awareness among the population regarding the importance of oral health in the overall wellness. Hence, individuals are paying more attention to different oral hygiene measures and products available, including the daily use of over the counter mouthwashes.[16,17] Different factors might influence the use of different oral hygiene measures.[18] Socioeconomic factors have been related to oral hygiene practices, such as tooth brushing.[14,19] However, there is little evidence regarding the self-reported use of mouthwashes and the effect of socioeconomic factors. Therefore, the purpose of the present study was to assess patient's self-reported use of mouthwashes, and to identify socioeconomic factors related to this behavior. Findings of the present study would help in designing effective oral health education programs.

Material and methods

The School of Dentistry Research and Ethics Committee at The University of Jordan reviewed and approved the study which was conducted in full accordance with the World Medical Declaration of Helsinki. A pretested and validated survey was conducted on patients attending the Department of Dentistry at the University of Jordan Hospital, Amman, Jordan. The study samples were randomly selected from patients attending dental clinics for examination and treatment from November 2014 to March 2015. All patients aged 16 years or older were considered eligible to participate. The purpose of the study was explained to participants, and all subjects consented prior to participation. The survey was conducted using modern standard Arabic language, with English translation available in hand.

The survey was conducted by two trained research assistants. Participants were asked to answer a structured questionnaire including information on the participant's demographics, smoking habits (type of smoking, frequency and duration), general health status, oral hygiene method, and attitudes toward dental treatment. Participants were also asked about mouthwash use, including frequency, reason, and the types of mouthwashes used. Finally, participants were asked to report on the presence of any signs or symptoms related to periodontal disease.

Statistical analysis was performed using SPSS for Windows version 17.0 (SPSS, Chicago, Ill., USA). Descriptive statistics were conducted and bivariate analyses using chi-square tests and independent samples *t*-test were used to determine the associations between the different predictor variables and the use of mouthwash. Forward stepwise multivariate logistic regression analysis was then used to control for potential confounding variables and to calculate the odds ratios (ORs) and confidence limits for potential independent predictors of mouthwash use. Statistical significance was set at $P < 0.05$.

Results

A total of 317 subjects aged 16 to 76 years (mean=37.07, SD=13.55) participated in the survey, with a response rate of 79.25% (a total of 400 subjects were asked to be interviewed). Table 1 summarizes the demographics of the study population as well as the effect of different factors on mouthwash use.

Table 1: Demographic and oral hygiene methods of participating patients (n=317) and relation to mouthwash use.

Variable		Total No. (%)	Mouthwash use No (%)	*P value*
Gender	Male	128 (40.4)	44 (34.4)	***0.002****
	Female	189 (59.6)	98 (51.9)	
Age (years)	Mean = 37		Mean ± SD	***0.004****
	Range = 16-76	Not using	35.1 ± 13.1	
	SD = 13.6	Using	39.5 ± 13.7	
Marital Status	Single	115 (36.3)	50 (43.5)	*0.72**
	Married	202 (63.7)	92 (45.5)	
Education	Primary school	40 (12.6)	18 (45)	*0.75**
	High school	91 (28.7)	43 (47.3)	
	Bachelor	148 (46.7)	67 (45.3)	
	Master/PhD	38 (12)	14 (36.8)	
Occupation	Unemployed	30 (9.5)	15 (50)	*0.41**
	Working	146 (46.1)	57 (39)	
	Retired	28 (8.8)	15 (53.6)	
	Housewife	70 (22.1)	35 (50)	
	Student	43 (13.6)	20 (46.5)	
Monthly Income (JD)	<300	67 (21.1)	32 (47.8)	*0.64**
	300-500	128 (40.4)	52 (40.6)	
	500-700	54 (17)	23 (42.6)	
	700-900	28 (8.8)	15 (53.6)	
	>900	40 (12.6)	20 (50)	
Chronic disease	No	275 (86.8)	117 (42.5)	***0.046****
	Yes	42 (13.2)	25 (59.5)	
Medical Insurance	None	79 (24.9)	35 (44.3)	*0.65**
	50-70% coverage	51 (16.1)	21 (41.2)	
	80-90% coverage	157 (49.5)	75 (47.8)	
	100% coverage	30 (9.5)	11 (36.7)	
Brushing	Daily	210 (66.2)	102 (48.6)	***0.029****
	Infrequently	73 (23)	30 (41.1)	
	Don't use	34 (10.7)	10 (29.4)	
Flossing	No	250 (78.9)	112 (44.8)	*1.00**
	Yes	67 (21.1)	30 (44.8)	
Dental visits	Irregular	238 (75.1)	102 (42.9)	*0.23**
	Regular	79 (24.9)	40 (50.6)	
Smoking	No	223 (70.3)	103 (46.2)	*0.63**
	Ex-smoker	17 (5.4)	6 (35.3)	
	Smoker	77 (24.3)	33 (42.9)	

*P value of Chi square test. **P value of Student's t-test. SD: standard deviation.

Of the study population, 142 (44.8%) reported that they used mouthwashes with 47 (33%) using them on a daily basis. Among them, 120 (85.2%) participants knew the type of mouthwash they were using and 28 (19.7%) participants reported that they used more than

one type of mouthwash at the same time. The frequencies of mouthwashes used according to the active ingredient are presented in table 2.

Table 2: Frequencies of mouthwash types used according to the active ingredient.

Mouthwash type	Frequency
Salt & Water	54/120
Essential oils	34/120
Chlorohexidine gluconate	26/120
Quaternary Ammonium Compounds	20/120
Others	21/120

Female gender (*P*=0.002), older age (*P*=0.004), presence of chronic disease (*P*=0.046), and frequency of brushing (*P*=0.029) were significantly associated with mouthwash use. Regression analysis indicated that only increasing age (*P*=0.005) and female gender (*P*=0.003) were significantly associated with mouthwash use. Women used mouthwashes more frequently and there was nearly 2% increase in the chance of using mouthwash with each one-year increase in patient's age.

Only 175 (patients reported having periodontal problems. They reported various periodontal problems that were associated with mouthwash use (Table 3), but only self-reported gingival inflammation was significantly associated with mouthwash use (*P*=0.044). Analyzing the association between the type of mouthwash used and different self-reported symptoms showed no significant association for any type of mouthwashes, with water and salt being the most commonly used mouthwash for all the symptoms.

Table 3: Nature of self-reported periodontal problem and relation to mouthwash use.

Periodontal problem		Percentage using mouthwash	P value*
Gingival inflammation	No	40.9	**0.044**
	Yes	56.1	
Tooth hypersensitivity	No	47.9	0.96
	Yes	48.4	
Bleeding upon brushing	No	51.9	0.34
	Yes	44.7	
Spontaneous bleeding	No	48.1	0.89
	Yes	46.2	
Halitosis	No	50.7	0.17
	Yes	35.5	
Gingival recession	No	47.5	0.80
	Yes	50.0	
Tooth mobility	No	46.4	0.056
	Yes	85.7	
More than one periodontal problem	No	45.6	0.45
	Yes	51.4	

*P value of Chi square test.

Discussion

Mouthwashes are considered an important adjunct to mechanical oral hygiene measures for the control of plaque accumulation. In recent years, there is an increase in the use of self-medication[20,21], and it seems logical to assume that self-prescription of mouthwashes could fit into this category, especially that many types of mouthwashes are generally available as part of the over-the-counter drugs .[15] There is evidence that the long term use of mouthwashes, such as essential oils-based or cetylpyridinium chloride-containing, as adjuncts to brushing has shown an additional benefit with regards to plaque and gingivitis reduction[22-25] with no reports on negative side effects except for staining that was reported with long term use of chlorhexidine-containing mouthwashes.[25,26] There is, however, lack of information in the literature regarding the prevalence and the factors associated with self-reported use of mouthwashes. The present study examined the prevalence and the factors associated with self-reported use of mouthwashes among a convenience sample of dental patients attending The University of Jordan Hospital which is a major teaching hospital in Jordan attended by patients from various socioeconomic backgrounds.

Nearly half of the patients in this study used mouthwashes. Except for female gender and age, this study did not find any significant association between sociodemographic and oral hygiene related factors and mouthwash use. The association with increasing age found in this study contrasts with another report that showed a decline of mouthwash use with age.[27] There is no clear explanation for the effect of age on mouthwash use. There is, however, an increase in the consumption of prescription and non-prescription medications in older adults.[28] This could be explained by the possibility that older patients may try to take better care of themselves to prevent diseases, or the belief that some health problems are not serious enough to seek professional care. Female patients used mouthwashes more than males, in accordance with other reports.[27,29] This could be explained by the fact that females have better oral health behaviors than males.[30,31]

Patients use mouthwashes for different reasons ranging from prevention of malodor to complete replacement of mechanical plaque control.[27] Long-term use of mouthwashes is not associated with any increased risk of opportunistic infections, microbial resistance, soft tissue lesions, salivary flow, or taste.[32] The daily use of mouthwashes could be advocated as an adjunct to the daily mechanical control of plaque, especially in those individuals unable to perform adequate plaque control or those suffering from gingivitis.[33-35] In fact, there is enough evidence to support the incorporation of mouthwashes as part of routine oral hygiene regimens in patients with periodontal disease.[25,36,37] However, the long-term use of mouthwashes might have an effect on the composition of the oral microbiome, which might have an impact on general health.[38,39] Moreover, regular mouthwash use might favor the overgrowth of pathogenic or resistant bacteria, and might affect antibiotic efficacy.[39]

The current study showed that mouthwash use was only statistically associated with self-reported symptoms of gingival inflammation. Gingival inflammation is a non-specific term, so patients might have used it as an explanation of different symptoms they were suffering from in relation to periodontal diseases. However, in the questionnaire, participants were provided with an exhaustive list of the different symptoms they could have encountered. This

result emphasizes the necessity for education campaigns regarding the role of mouthwashes in oral hygiene protocols. One explanation could be that many patients, especially in the developing countries, might be substituting professional dental care by over-the-counter products, especially if those are commercialized with misleading miraculous effects. In fact, the role of dental professionals regarding the indications and the distribution of oral hygiene products has been delegated to the industry, in part due to the absence of studies evaluating the long-term profile of the use of oral hygiene products.[40] This assumption is supported by the high percentage (75%) of participants of this study who have irregular dental visits. This issue is of paramount importance, especially on a national level, because regular visits to the dentist are critical for the maintenance of good oral health. Regular dental visits help to reduce tooth mortality and the incidence of caries and periodontal diseases.[11]

An additional factor that might be related to the increase in the frequency of mouthwash use is the relatively high cost of dental care in the developing countries related to the average wages that might push many individuals to search for cheaper solutions for oral and dental problems. This is important since good healthcare could be influenced by available sources and finances.[41,42] This assumption is also supported by the result that the most commonly used type of mouthwashes in this study was water and salt.

Findings of the present study are limited by the relatively small number of participants and that it only included patients attending dental clinics at a teaching hospital. These patients, however, are not necessarily representative of the general population of Jordan. Therefore, further larger-scale studies addressing this issue are encouraged. An inherent limitation of the present study is a self-report interview; participants therefore might be reluctant to explicitly disclose their views and rather provide biased and socially acceptable answers.[43] Furthermore, the present study was conducted in a teaching hospital; a setting that might influence participants' responses and might not necessarily reflect responses and attitudes of dental patients attending private dental clinics.

Conclusions

Overall, this study explored factors influencing mouthwash use. Within the limitations of the study, it showed that mouthwash use could be influenced by age and gender, with older and female individuals using mouthwashes more frequently. There is a need for larger-scale studies on mouthwash use to better understand factors influencing the use of mouthwashes and the role it could play in the programs of oral hygiene promotion. Total dependence on mouthwashes to deal with oral health problems could result in an important general oral health problem with a greater economic and social burden, if appropriate regulations and awareness campaigns are not established.

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العوامل المؤثرة على الاستخدام الذاتي لغسول الفم لدى مرضى طب الأسنان في عمان، الأردن

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الملخص

الأهداف: تقييم مدى الاستخدام الذاتي لغسول الفم ودراسة العوامل الاجتماعية والديموغرافية التي تؤثر على هذا السلوك.

العينة والمنهجية: أجري مسح على 317 مريضاً تتراوح أعمارهم بين 16–76 عاماً من بين مراجعي عيادات دائرة طب الأسنان في مستشفى الجامعة الأردنية. تم جمع البيانات الاجتماعية والديموغرافية، وحالة الصحة العامة والفمية المبلغ عنها ذاتيا، وأساليب العناية بالصحة الفموية، والبيانات الخاصة باستخدام غسول الفم.

النتائج: كان انتشار الاستخدام الذاتي لغسول الفم بين عينة الدراسة 44.8%، مع استخدام أكبر لدى المرضى الإناث. وكان هناك زيادة بنسبة 2% تقريبا في فرص استخدام غسول الفم مع زيادة عمر المريض كل عام. وارتبط فقط الالتهاب اللثوي المبلغ عنه ذاتيا مع الاستخدام الذاتي لغسول الفم (p=0.044).

الخلاصة: أظهرت النتائج أن الاستخدام الذاتي لغسول الفم يمكن أن يتأثر بالعمر والجنس، ويمكن أن يرتبط بإدراك المريض لحالة اللثة. هناك حاجة لدراسات أكبر وأوسع نطاقا لتوضيح العوامل المختلفة التي من الممكن أن تؤثر على استخدام غسول الفم والدور الذي يمكن لغسول الفم أن يقوم به ضمن برامج التوعية حول العناية بالصحة الفموية.

الكلمات الدالة: العناية بالصحة الفموية، غسول الفم، استخدام ذاتي، عوامل اقتصادية واجتماعية.