Knowledge and Attitude of Iranian Dental School Educators towards Prevention

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Purpose: To investigate knowledge of and attitudes towards prevention of dental caries among Iranian dental educators in relation to their personal and academic background.

Materials and Methods: Of the 15 Iranian state dental schools, 7 were selected by stratified random sampling to serve as clusters. All the present educators (n = 363) were individually asked to voluntarily complete a pre-tested anonymous questionnaire. A total of 291 educators completed the questionnaire (response rate of 80%). The questionnaire requested information on educators' knowledge of caries prevention and attitudes towards preventive dentistry. The educator's age, gender, highest academic degree, department of teaching, and familiarity with the discipline of dental public health (DPH) served as background factors. Chi-square test and a logistic regression model served in statistical analyses.

Results: Educators working in paedodontics, operative dentistry or periodontology departments had more extensive knowledge of caries prevention than did the others ($p < 0.05$). Women, as well as those familiar with DPH, reported more positive attitudes towards prevention than did the others ($p = 0.05$). In the regression model, having a more positive attitude towards prevention was associated with female gender (OR = 2.2, 95% CI: 1.2–4.1), more extensive knowledge of caries prevention (OR = 2.4, 95% CI: 1.1–5.6), and greater familiarity with DPH (OR = 2.0, 95% CI: 1.1–4.1).

Conclusions: Dental educators seem to have different knowledge of and attitudes towards prevention based on their disciplines. This may reflect negatively in preventive practice among both the educators and students. Continuing education activities and placing emphasis and support on prevention-related research are recommended.

Key words: attitude, dental education, knowledge, preventive dentistry

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Concepts of dental caries have changed during the last 30 years in many aspects, including the nature of the disease (Fejerskov, 2004; Pitts, 2004), the diagnostic level (Ismail et al, 2001; Nyvad, 2004) and consequently, the treatment methods (König, 2004). Development of new paradigms, especially concerning the role of fluoride and the complex nature of the disease, has influenced oral health care strategies (Fejerskov, 2004). Clinicians should apply a 'primary caries prevention' approach at the population, group, and individual level (Pitts, 2004). In order to train a prevention-oriented dental workforce, educational institutions should respond to growing evidence of the value of appropriate use of prevention and non-surgical treatment (National Institutes of Health, 2001).

It has been suggested that improvements in applying preventive measures can be achieved by creating supporting policies (Pakshir, 2004) for application parallel with training of a prevention-focused dental workforce (Pitts, 2004). In the latter, dental-school educators carry the main responsibility. Although enhancing the knowledge of students is very important to this process, educators' attitude toward preven-

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Table 1 Distribution of Iranian dental educators (n = 291), by selected background characteristics

	All (n = 291) %	Gender		p *
		Male (n = 175) %	Female (n = 116) %	
Academic degree				0.83
DDS	11	11	10	
MS or PhD	89	89	90	
Department of teaching				0.65
Paedodontics, operative dentistry, periodontology	30	32	29	
Other departments	70	68	71	
Familiarity with DPH field				0.08
Yes	29	33	22	
No	71	67	78	

*Chi-square test was used to evaluate statistical differences based on gender
DPH, dental public health

tion, known to be a component of the 'hidden curriculum', is an influential factor (Brown et al, 2002). Thus, via their knowledge and attitudes towards prevention, dental educators have exceptionally important direct and indirect roles in shaping students' preventive orientation.

Although some studies have explored knowledge and attitudes concerning prevention among medical faculties (Elliot et al, 1994; Frank et al, 2004), preventive orientation of dental educators is a rarely investigated field. In a study of dental educators' own oral health behaviour, it was shown that there is room for improvement in this area (Khami et al, 2006).

The aims of the present study were to investigate knowledge of, and attitudes towards, prevention of dental caries among Iranian dental school educators in relation to their personal and academic background.

MATERIALS AND METHODS

Study subjects and data collection

To obtain a representative sample of dental educators working in a total of 18 dental schools in Iran, a multi-stage approach was used. Three private schools that had some common staff were excluded. Two strata were then defined according to the age of the dental schools. Three older schools and four new ones were selected randomly to serve as clusters. One of the researchers (MK) went to these schools and over 2 days asked all educators present (total n = 363), one by one, to voluntarily fill in a pre-tested anonymous questionnaire. Administrative officials helped to collect the questionnaires immediately. Of the 291 educators participating in the study (response rate of 80%), 60% were men and 40% were women (Table 1). The mean age of the respondents was 41 (SD = 7.9).

Questionnaire and variables

In addition to the personal background such as gender and academic degree (Table 1), the questionnaire requested information on the items below.

Department of teaching
The educators were asked to indicate the department in which they were teaching. For further analyses, those who were working in the departments with direct responsibility for teaching preventive dentistry as specified by the curriculum (i.e. paedodontics, operative dentistry and periodontology) (Sadr, 2001) comprised a separate group.

Familiarity with the field of dental public health
The educators were asked to express how well they were acquainted with the dental public health (DPH) field and how much work experience (teaching, re-

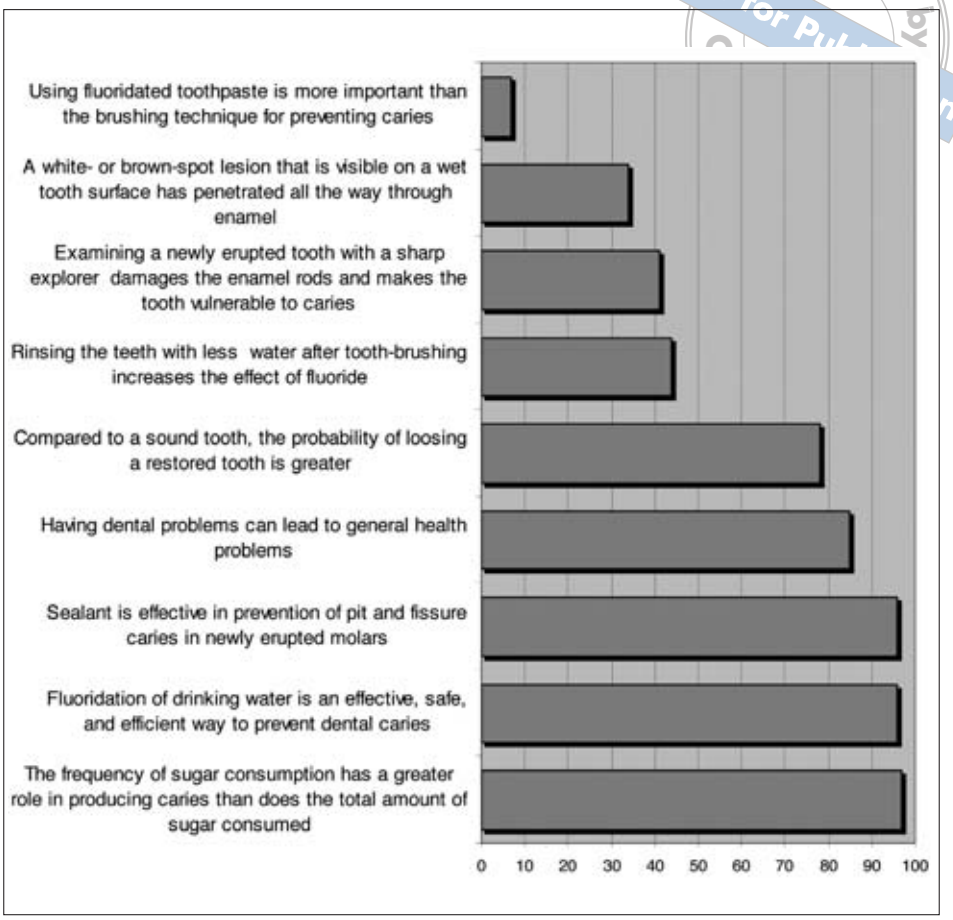

Fig 1 The percentages of Iranian dental educators (n = 291) who agreed with the statements given about caries prevention.

search, planning) they had in the field, via two separate questions. The alternatives were: 'very much', 'quite a bit', 'a little', and 'not at all'. Those who reported knowing quite a bit or very much about the field and having some experience in it were defined as being familiar with the field.

Knowledge of caries prevention

Nine statements regarding different aspects (diagnosis and control) and means (different forms of fluoride, fissure-sealant therapy, diet control) of caries prevention, on a five-point Likert scale from 'completely disagree' to 'completely agree', assessed the respondents' knowledge of prevention. The responses were scored from 1 to 5 according to the respondents' degree of knowledge. The sum of these scores served as the final preventive knowledge score for each respondent. For further analyses, the final scores were subdivided into quartiles of possible scores, with a minimum of 9 and maximum of 45.

Attitude towards preventive dentistry

A seven-point semantic differential scale of five qualities and their opposite qualities was employed for assessing the educators' attitudes toward preventive dentistry. The qualities were: costly for the dentist, beneficial to the dentist; useless for the community, useful for the community; disreputable, reputable; non-essential, essential; and difficult, simple. Scoring of the responses (from 1 to 7, with higher scores for more favourable attitudes) and calculation of final scores were performed in the same way as for preventive knowledge. Quartiles of final scores were defined on the basis of the range of possible scores, from 5 to 35.

Statistical analyses

A Chi-square test served for comparing sub-groups. Odds ratios (OR) were calculated by fitting a logistic regression model to the data.

Table 2 Distribution of knowledge and attitude scores among Iranian dental educators (n = 291) according to their background characteristics

	Highest knowledge scores (quartile 4)	p *	Highest attitude scores (quartile 4) %	p *
Gender		0.85		0.05
Female	12		36	
Male	13		25	
Academic degree		0.74		0.44
DDS	11		37	
MS or PhD	13		30	
Department of teaching		0.04		0.46
Paedodontics, operative dentistry, periodontology	20		27	
Other departments	10		31	
Familiarity with DPH field		0.16		0.05
Yes	18		39	
No	12		27	
Total	14		31	

*Chi-square test was used to evaluate statistical differences between subgroups
DPH, dental public health

RESULTS

As is evident in Fig 1, more than 95% of the educators reported believing in the caries-preventive effects of limiting frequency of sugar intake, adding fluoride to the drinking water, and applying fissure sealants. On the other hand, fewer than 10% of the educators valued using fluoridated toothpaste at a higher level than brushing technique. By choosing a score of 5, 6, or 7 on the semantic differential scale, 28% of the respondents characterised preventive dentistry as 'reputable', 37% as 'beneficial to the dentist', 49% as 'simple', 85% as 'essential', and 96% as 'useful for community'.

The knowledge scores of 14% of the educators were in the highest quartile (Q4), 79% in Q3, and 7% in Q2, with none in Q1. The corresponding figures for attitude scores were 11%, 58%, 31%, and 0% respectively. Based on their acquiring a score in the highest quartile, the educators who were working in paedodontics, operative dentistry, or periodontology departments were deemed to have more extensive knowledge of caries prevention than the other subjects ($p < 0.05$) (Table 2). Women, as well as those who were familiar with the DPH field, reported more positive attitudes toward prevention compared to others ($p = 0.05$) (Table 2). No difference related to age was found regarding the respondents' knowledge and attitude towards prevention.

In the binary logistic regression model (Table 3), having a more positive attitude toward prevention was associated with female gender (OR = 2.2, 95% CI 1.2–4.1), a more extensive knowledge of caries prevention (OR = 2.4, 95% CI 1.1–5.6), and familiarity with the DPH field (OR = 2.0, 95% CI 1.1–4.1).

DISCUSSION

According to the results of the present study, the prevention-orientation of dental-school educators is associated with such elements of their academic background as department of teaching and familiarity with the field of DPH. Also, female educators reported a more positive attitude toward prevention.

Despite the current emphasis on prevention in dental education (Pitts, 2004), and although there have been some studies of the preventive knowledge of dental students, dentists, and dental hygienists, very few studies have focused on the prevention-orientation of dental educators (Lang et al, 1977; Weiss and Diserens, 1980; Khami et al, 2006). To our knowledge, no study exists on the preventive knowledge and attitude of Iranian dental educators. The 18 dental schools in Iran annually recruit 750 undergraduate and 100 postgraduate students through national entrance exams (Pakshir, 2003). Around 800 academic staff members across the var-

Table 3 Association of the various background characteristics with acquisition of an attitude score in the highest quartile among Iranian dental educators (n = 291) in a binary logistic regression model

	ES	SE	p	OR	CI 95%
Female gender	0.786	0.315	0.01	2.2	1.2–4.1
Highest knowledge scores (Q4)	0.872	0.436	0.046	2.4	1.1–5.6
Having MS or PhD degree	-0.059	0.548	0.9	0.9	0.3–2.8
Teaching in certain departments*	-0.404	0.366	0.27	0.7	0.3–1.4
Familiarity with DPH	0.714	0.360	0.047	2.0	1.1–4.1
Constant	-3.339	1.417	0.02		

Hosmer-Lemeshow goodness-of-fit test significance p > 0.05 for the model
DPH, dental public health; ES, estimate of strength; SE, standard error
*Departments of paedodontics, operative dentistry and periodontology

ious departments of all schools are responsible for training dental students (Pakshir, 2003).

To increase the representativeness of the sample in the present study, a multi-stage approach covering all 15 state dental schools served as the sampling method. Moreover, one of the researchers met all of the respondents in the schools selected. Because of the relatively high response rate (80%), and since the three private dental schools in Iran share many academic staff members in common with the state schools, the sample can be considered to be representative of Iranian dental educators. Using a self-administered questionnaire, however, has some weaknesses, such as the possibility of social desirability bias. Thus, in this respect, the results should be interpreted with caution.

As reflected in their reactions to knowledge statements, while being aware of the effectiveness of water fluoridation, fissure-sealant therapy, and sugar intake limitation, the participants underestimated the effectiveness of fluoridated toothpaste. In a previous study, only about two thirds of Iranian dental educators and 76% of senior dental students reported frequent use of fluoridated toothpaste (Khami et al, 2006; 2007). With regard to the current emphasis on the evidence-based effectiveness of fluoridated toothpaste in caries prevention (Marinho et al, 2003; Twetman et al, 2003), and the fact that the recent decline in the incidence of dental caries in many of the developed countries is mostly attributed to its extensive application (Bratthal et al, 1996; Marthaler, 2004), using fluoridated toothpaste should be appreciated as an effective preventive measure in Iranian dental schools.

Regarding the attitudes of the educators, fewer than half of the respondents reported characterising preventive dentistry as easy, beneficial to the dentist, and reputable. This finding is in line with findings among British dentists (Holloway and Clarkson, 1994). Such an attitude may be related to some of the barriers experienced by dentists in application of preventive measures, including perceived unwillingness of patients to pay for prevention (Tomlinson and Treasure, 2006), health system factors such as inadequate appropriations for prevention (Pine et al, 2004), and time constraints arising from great demand for curative care (Tseveenjav et al, 2005).

While no gender differences existed for prevention knowledge among the respondents, women reported more positive attitudes toward preventive dentistry. This difference is consistent with our previous findings, where better oral self-care habits were found among female dental students (Khami et al, 2007) and dental school educators (Khami et al, 2006) compared with their male counterparts. A trend towards non-invasive dental practice has also been found among women compared with men (Tan et al, 2002).

A previous study, in Finland, showed some diversity in clinical decision-making among dental educators, based on their field of speciality (Rytömaa et al, 1979). In the present study, the educators working in paedodontics, operative dentistry, or periodontology departments had more extensive knowledge of prevention, probably due to their direct responsibility for teaching preventive dentistry to students. However, it can be expected that dental educators, regardless of their discipline, possess basic knowledge of prevention.

The educators who were familiar with the DPH field reported more positive attitudes to preventive dentistry. This finding, together with results from a previous study showing that these educators had better oral self-care habits (Khami et al, 2006), shows that

familiarity with the DPH field can be considered an indicator of educators' attitude toward prevention, and it emphasises the importance of assessing attitudes in dental education (Brown et al, 2002).

CONCLUSIONS

Our results show that while the majority of the dental educators were well aware of the effectiveness of some of the professional preventive measures considered here (such as fissure-sealant therapy), their knowledge of some others (such as using fluoridated toothpaste) was deficient. Dental educators seem to have knowledge of and attitudes towards prevention that differ with their discipline. This might manifest itself negatively in the preventive practice of both the educators and students. Continuing education activities specially designed for dental educators, together with increasing emphasis on prevention-related research should be applied to enhance knowledge of and positive attitude towards prevention.

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