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Attitudes and practices regarding preventive dentistry among Libyan dentists

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Purpose: To assess the attitudes towards and practices related to preventive dentistry among Libyan dentists. ***Methods:*** A cross-sectional, questionnaire-based survey was conducted among dentists working in Benghazi. All dentists registered with the Dental Association of Benghazi and with two or more years of practice were invited to participate. The questionnaire enquired about dentists' demographic (gender and age) and professional characteristics (practice sector and years of service), attitudes towards preventive dentistry using nine semantic differential scales and the frequency with which they performed eight preventive measures to patients. Non-parametric tests were used to compare attitudes towards and practices related to preventive dentistry by participants' demographic and professional characteristics. ***Results:*** Of the 175 dentists returning questionnaires (response rate 79%), 166 had complete information on all the variables needed for analysis (75%). Dentists felt preventive dentistry was useful and essential to the community as well as of scientific merit for dentists. As for practices, oral hygiene instruction and recommending fluoridated toothpaste were the most commonly reported preventive measures performed by dentists whereas the application of topical fluoride and fissure sealants were the least reported. Attitudes towards and practices related to preventive dentistry varied by professional but not demographic characteristics. ***Conclusion:*** Dentists showed a generally positive attitude towards preventive dentistry. However, certain preventive measures, particularly those that incur costs, were less frequently practised.

Key words: *dentistry, dental service, prevention, attitude, dentists, Libya*

Introduction

The World Health Organization has recommended the orientation of services towards prevention and health promotion as one of the priority action areas to be considered by country members when initiating or strengthening oral health programmes (Petersen *et al.*, 2005). Dental care providers are required to apply evidence based preventive measures which help in prevention and control of dental diseases throughout life (Pitts, 2004). Different preventive methods are available to dental practitioners. These include patients' education and motivation, topically applied fluorides, maintenance of oral hygiene and plaque control, dietary and behaviour modification, and pit and fissure sealants (National Institutes of Health, 2001). In addition, dental professionals are in a position that enables them to take active role in prevention and detection of oral cancer (McCann *et al.*, 2000b) as well as counselling patients on smoking cessation (Watt *et al.*, 2003).

However, clinical practice is shaped by a complex range of factors related to dentists, patients and practice itself (McGlone *et al.*, 2001). Of these factors, dental practitioners' beliefs and attitudes towards treatment options are of particular importance as they can influence dental care choices and treatment philosophies (Grembowski *et al.*, 1991; Kay and Blinkhorn, 1996). For instance, dental practitioners' attitudes were correlated with the application of sealants and preventive dental care and their management of deep dental caries (Romberg *et al.*, 1989; Schwendicke *et al.*, 2013). Moreover, dentists' health beliefs and attitudes may have potential effects on their ability to motivate patients to receive preventive care (Freeman, 1999). Therefore, it is not surprising that much attention has been directed to dentists' attitude towards preventive dentistry as an important factor that influences its practice (Ghasemi *et al.*, 2007).

Despite the fact that most dental diseases are preventable, recent reports show high levels of dental disease and unmet treatment needs among Libyan children, those with special needs and adults (Huew *et al.*, 2011; Arheiam and Omar, 2014; Byahatti and Ingafou, 2011). This could be an indicator of the dominant treatment oriented service system and limited preventive dental care. In Libya, dental care is organised in a two-tier system composed of public and private services. Dentists can work in either sector exclusively or part-time in both (mixed practice). So far, however, little is known about the practice of preventive dentistry in Libya. The aim of this study was to assess practices and attitudes towards preventive dentistry among Libyan general dental practitioners working in Benghazi.

Methods

A cross-sectional, questionnaire-based survey was conducted among dentists working in Benghazi, Libya, during May and June 2012. Benghazi is the second largest city

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in Libya, with a population of around 620,000 and a dentist-to-population ratio of six dentists for every 10,000 inhabitants (Arheiam *et al.*, 2014). The list of dentists registered with the Dental Association of Benghazi, the official body which provides practising licences to dentists, was used as sampling frame for the study. All dentists on the register, currently in practice and with two or more years of practice were invited to participate in the survey. Of those 221, 175 returned questionnaires (response rate 79%) and the analysis is based on the 166 responses with complete information on all the variables needed for analysis (75% of the study population). A minimum sample size of 141 subjects was required to estimate a population mean (score for attitudes towards preventive dentistry) with a standard deviation of 5 units, absolute precision of 0.5 units, 80% statistical power and 95% confidence level.

Formal permission was obtained from the authorities at Ministry of Health and Private Health Care Centres. Implied consent was obtained from returned completed questionnaire. Participants were approached at the public and private dental care centres were they worked and invited to participate by the main researcher. After acceptance, a copy of the self-administered English language questionnaire was handed over and the main researcher returned the next day for collection. Participants provided information on their demographic characteristics (gender and age), practice sector (public, private or mixed) and years of service. They also stated their attitudes towards preventive dentistry using an instrument developed for a previous study among Iranian dentists (Ghasemi *et al.*, 2007). The original instrument consisted of seven-point semantic differential scales describing preventive dentistry using nine adjective pairs. Participants were presented with three merits of preventive dentistry for the community, anchored with the terms useful vs. useless, valuable vs. worthless and essential vs. not essential. These were followed by six merits of preventive dentistry for dentists, anchored with the terms scientific vs. not scientific subject, efficient vs. not efficient practice, easy vs. difficult, attractive vs. not attractive, beneficial vs. costly, and reputable vs. disreputable (online appendix). No definitions for the adjective pairs were provided and participants chose the option that best represented their views about preventive dentistry. Higher scores indicated more favourable attitudes (Ghasemi *et al.*, 2007). The final section of the questionnaire asked dentists about how often they provided preventive dental care to their patients. Eight preventive practices were evaluated, namely advice to quit smoking, recommendation of fluoride toothpaste, dietary counselling, topical application of fluoride, placement of fissure sealants in molars, oral hygiene instruction, oral cancer screening and caries risk assessment. Responses were collected using a 4-point scale with categories coded as always, quite often, seldom or never.

The psychometric properties of the questionnaire were assessed in terms of face validity and reliability (internal consistency). The questionnaire was tested among 20 volunteer dentists from the same study population to assess its face validity and it was found to be clear and understandable. As no changes to the questionnaire were recommended, the questionnaires completed by those volunteers were included in the final study sample. In addition, Cronbach's alpha was 0.72 for attitudes towards preventive dentistry and 0.67 for preventive practices for the full sample.

Data analysis used SPSS v21 software. Medians and interquartile range were used to describe participants' attitudes whereas frequencies and percentages were used to describe participants' practices. Non-parametric tests were used for comparisons because responses were not normally distributed. Mann-Whitney test was used to compare attitude scores by gender while Kruskal-Wallis test was used to compare attitude scores by age groups (23-34, 35-44 and 45-56 years), practice sector (public, private or mixed) and years of service (0-5, 6-10 and >10 years). If the latter test was significant, the Mann-Whitney test was subsequently used for post-hoc comparisons. Due to the small number of responses for some categories, the frequency of preventive practices was dichotomised for analysis by collapsing the top and bottom two categories (always/quite often vs. seldom/never). That cut-off allowed identification of dentists regularly carrying out preventive procedures. The Chi-square test was used to compare the frequency of provision of preventive practices by gender, age groups, practice sector and years of service.

Due to the large number of comparisons made for each attitude and practice, the level of significance was adjusted using the Bonferroni correction. This was done by dividing the standard 5% significance level by the number of comparisons made (0.05/4=0.0125). A p value below 0.0125 was thus used as the threshold to claim that differences between groups were statistically significant.

Results

Data from 166 Libyan dentists were analysed for this study. Their characteristics are described in Table 1. The majority were females (70%), between 23 and 34 years of age (85%), worked in the public health sector (43%) and, most commonly, had up to five years of service (46%).

Table 1. Characteristics of the study sample (n=166)

Variables	n	%
Gender		
Men	50	30
Women	116	70
Age groups		
23-34 years	141	85
35-44 years	15	9
45-56 years	10	6
Practice sector		
Public	71	43
Private	37	22
Mixed	58	35
Years of service		
0-5 years	77	46
6-10 years	69	42
>10 years	20	12

Table 2. Median scores (interquartile range) for attitudes toward preventive dentistry (n=166)

	Variable	*Scientific*	*Efficient*	*Easy*	*Attractive*	*Beneficial*	*Reputable*	*Useful*	*Valuable*	*Essential*
All sample		7.0 (1.0)	6.0 (2.0)	6.0 (2.0)	4.0 (4.0)	5.0 (4.0)	4.0 (4.0)	7.0 (1.0)	6.0 (1.0)	7.0 (1.0)
Gender	Men	6.5 (1.0)	6.0 (2.0)	6.0 (2.0)	3.0 (2.25)	5.0 (3.0)	3.0 (3.0)	7.0 (1.0)	7.0 (1.0)	7.0 (1.0)
	Women	7.0 (1.0)	6.0 (2.0)	6.0 (2.0)	4.0 (4.0)	4.5 (4.0)	4.0 (4.0)	7.0 (1.0)	6.0 (1.75)	7.0 (1.0)
	p value[*]	*0.940*	*0.805*	*0.560*	*0.084*	*0.137*	*0.087*	*0.723*	*0.024*	*0.804*
Age groups	23-34 years	6.0 (1.0)	6.0 (2.0)	6.0 (2.0)	4.0 (4.0)	4.0 (4.0)	4.0 (4.0)	7.0 (1.0)	6.0 (1.0)	7.0 (1.0)
	35-44 years	7.0 (1.0)	6.0 (1.0)	7.0 (2.0)	4.0 (3.0)	5.0 (3.0)	4.0 (2.0)	7.0 (1.0)	6.0 (2.0)	7.0 (1.0)
	45-56 years	6.0 (3.0)	5.5 (4.25)	6.0 (1.25)	2.5 (4.25)	5.0 (2.50)	3.0 (3.0)	6.0 (1.0)	6.0 (1.75)	6.0 (2.75)
	p value[*]	*0.206*	*0.241*	*0.254*	*0.761*	*0.536*	*0.185*	*0.219*	*0.127*	*0.147*
Practice sector	Public	7.0 (1.0)	6.0 (2.0)	6.0 (2.0)	5.0 (4.0)	5.0 (4.0)	4.0 (3.0)	7.0 (1.0)	6.0 (3.0)	7.0 (1.0)
	Private	6.0 (1.0)	6.0 (1.0)	6.0 (0.5)	6.0 (4.0)	6.0 (2.0)	5.0 (3.50)	7.0 (1.0)	7.0 (1.0)	7.0 (1.0)
	Mixed	7.0 (1.0)	6.0 (2.0)	6.0 (2.0)	3.0 (2.0)	3.5 (3.25)	3.0 (2.0)	7.0 (1.0)	6.5 (1.0)	7.0 (1.0)
	p value[*]	*0.832*	*0.256*	*0.933*	***0.001***	***<0.001***	***<0.001***	*0.778*	*0.120*	*0.801*
Years of service	0-5 years	7.0 (1.0)	6.0 (1.50)	6.0 (2.0)	4.0 (4.0)	5.0 (3.50)	4.0 (3.0)	7.0 (1.0)	7.0 (1.0)	7.0 (1.0)
	6-10 years	6.0 (1.0)	6.0 (2.0)	6.0 (2.0)	4.0 (4.0)	4.0 (4.0)	4.0 (4.0)	7.0 (1.0)	6.0 (1.0)	7.0 (1.0)
	>10 years	7.0 (2.50)	6.0 (2.0)	6.0 (1.75)	3.0 (4.0)	5.0 (2.75)	3.5 (3.0)	6.5 (1.0)	6.0 (2.0)	6.0 (1.75)
	p value[*]	*0.857*	*0.315*	*0.633*	*0.945*	*0.275*	*0.223*	*0.460*	***0.009***	*0.105*

* Mann-Whitney and Kruskal-Wallis tests were used to compare two and three groups respectively. The level of significance (p value) was set to 0.0125 after the Bonferroni correction for multiple comparisons. Bold font indicates where significant differences were located.

Table 2 shows participants' attitudes towards preventive dentistry and comparisons of these responses by their demographic and professional characteristics. Participants felt that preventive dentistry was useful and essential to the community as well as of scientific merit for dentists (median scores of 7 for all) while they reported neutral views for two adjective pairs (attractive/not attractive and reputable/disreputable for dentists). There were differences in participants' attitudes towards preventive dentistry by professional characteristics but not by demographic factors. Dentists in mixed practice felt preventive dentistry were more unattractive, costly and disreputable for dentists than those exclusively in the private or public sectors. Furthermore, dentists with fewer years of service felt preventive dentistry was more valuable for the community than those with more than 10 years of service.

As for preventive practices (Table 3), oral hygiene instruction (92%) and recommending fluoridated toothpaste (84%) on one hand and the application of topical fluoride (19%) and fissure sealants (27%) on the other were, respectively, the most and least frequently performed preventive measures by participants. Again, there were significant differences in the practice of preventive dentistry by professional but not by demographic characteristics of participants. Fewer dentists working in private practice reported giving advice on smoking cessation to their patients than those working in public or mixed practices. In addition, fewer dentists with more than 10 years of experience reported giving dietary counselling than those with less than 5 and 6 to 10 years of practice (Table 3).

Discussion

Our findings show that Libyan dentists are generally positive regarding preventive dentistry and particularly towards its merits for the community; however, they were less positive toward dentist-related aspects of preventive dentistry. Whilst the most appreciated qualities of preventive dentistry were being useful and essential to the community, participants considered preventive dentistry as less attractive and reputable for dentists. Although the present findings mirror those of previous studies among Iranian dentists (Ghasemi *et al.*, 2007) and senior dental students (Khami *et al.*, 2012), they contradict results from a previous study among British dentists who think prevention could enhance the reputation of the practice and add to the job satisfaction of the dentist (Holloway and Clarkson, 1994).

Attitudes towards preventive dentistry varied by participants' professional but not by demographic characteristics. First, practitioners working in mixed practice considered preventive dentistry less reputable, attractive and beneficial for dentists than those working in private or public sectors. This attitude could be a reflection of the reimbursement system applied in the private sector of Libya. Practitioners working in both public and private sectors are usually part-timers who receive reimbursement per service. The huge demand for curative services (Tseveenjav *et al.*, 2005), patients' preferences and limited time for dentists in mixed practices can be responsible for paving the way for such attitudes.

Table 3. Frequency of preventive dental practices reported as always and often performed by participants (n=166)

	Variables	*Smoking cessation*	*Fluoride toothpaste*	*Dietary counselling*	*Fluoride application*	*Fissure sealants*	*Oral hygiene instruction*	*Oral cancer screening*	*Caries risk assessment*
All sample		130 (78%)	139 (84%)	95 (57%)	32 (19%)	45 (27%)	152 (92%)	121 (73%)	83 (50%)
Gender	Men	39 (78%)	40 (80%)	25 (50%)	15 (30%)	15 (30%)	45 (90%)	35 (70%)	26 (52%)
	Women	91 (78%)	99 (85%)	70 (60%)	17 (15%)	30 (26%)	107 (92%)	86 (74%)	57 (49%)
	p value[*]	*0.949*	*0.392*	*0.216*	*0.021*	*0.582*	*0.634*	*0.582*	*0.735*
Age groups	23-34 years	109 (77%)	115 (81%)	84 (60%)	28 (20%)	37 (26%)	127 (91%)	104 (74%)	68 (48%)
	35-44 years	11 (73%)	14 (93%)	9 (60%)	3 (20%)	5 (33%)	15 (100%)	10 (67%)	9 (60%)
	45-56 years	10 (100%)	10 (100%)	2 (20%)	1 (10%)	3 (30%)	10 (100%)	7 (70%)	6 (60%)
	p value[*]	*0.215*	*0.178*	*0.049*	*0.745*	*0.823*	*0.258*	*0.823*	*0.555*
Practice sector	Public	61 (86%)	59 (83%)	40 (56%)	15 (21%)	21 (230%)	70 (99%)	55 (77%)	35 (49%)
	Private	22 (59%)	32 (86%)	24 (65%)	5 (14%)	10 (27%)	31 (84%)	21 (57%)	20 (54%)
	Mixed	47 (81%)	48 (83%)	31 (53%)	12 (21%)	14 (24%)	30 (88%)	45 (78%)	28 (48%)
	p value[*]	***0.005***	*0.875*	*0.537*	*0.600*	*0.787*	*0.015*	*0.043*	*0.849*
Years of service	0-5 years	58 (75%)	63 (82%)	46 (60%)	13 (17%)	19 (25%)	67 (87%)	62 (81%)	36 (47%)
	6-10 years	54 (78%)	58 (84%)	44 (64%)	16 (23%)	21 (30%)	65 (94%)	48 (70%)	36 (52%)
	>10 years	18 (90%)	18 (90%)	5 (25%)	3 (15%)	5 (25%)	20 (100%)	11 (55%)	11 (55%)
	p value[*]	*0.365*	*0.674*	***0.007***	*0.550*	*0.718*	*0.104*	*0.053*	*0.721*

[*] Chi-squared test was used to compare study subgroups. Level of significance was set to 0.0125 after the Bonferroni correction for multiple comparisons

Furthermore, the cost of dental treatment and long waiting lists can prevent patients from receiving the care they need (Brennan *et al.*, 2008). For instance, in one study, dental hygienists recognised the lack of cost-effectiveness of dietary advice and its conflict with regular appointment scheduling as barriers (Levy and Raab, 1993). Second, the feeling that preventive dentistry is valuable for the community decreased as years of service accumulated. This finding could be a reflection of changes in dental curriculum, increased awareness of the importance of prevention among recent graduates and changes in the attitudes of older dentists by virtue of longer experience in practice. Nevertheless, attitudes are complex by nature and many factors interact to produce different attitudes (Brown *et al.*, 2002).

Regarding the practice of preventive dentistry, we found that preventive procedures which require little or no material and are not costly to the practice (oral hygiene instructions, recommendations of fluoride toothpaste, advice on smoking cessation and screening for cancer) are the most commonly performed by dental practitioners. Conversely, sealants and topical fluoride application which require special equipment and dental materials were the least frequently performed preventive procedures. These findings could be attributed to the shortage of resources in public health sector or patients' unwillingness to pay for such services in the private health sector. Financial profit is an important determinant to the provision of preventive dental care. Previous research showed that dentists refrain from providing preventive care because of insufficient reimbursement (McCann *et al.*, 2000a; Pine *et al.*, 2004; Tomlinson and Treasure, 2006), patients' unwillingness to pay and preferences not to seek prevention (Brennan *et al.*, 2008; Goodman *et al.*, 2005). However, the provision of dental service is influenced by a range of dentist, practice and patient factors (Brennan and Spencer, 2005; Grembowski *et al.*, 1988).

As with attitudes, dentists' practices of preventive care varied by professional but not demographic characteristics. Dentists in private sector were less likely to provide advice on smoking cessation than those working in the public sector alone or in mixed practice. This could be attributed to the lack of reimbursement and training requirement (McCann *et al.*, 2000a) and limited time for preventive care due to the huge demand for curative care (Tseveenjav *et al.* 2005). In addition, lack of resources and training has been reported as an important obstacle to tobacco counselling in the clinics (Chestnutt and Binnie, 1995). In addition, senior dental practitioners were less likely to conduct dietary counselling with their patients. A recent systematic review has shown that many dentists provide either limited dietary advice or nothing at all (Franki *et al.*, 2014). Although it is unclear why, this finding could be attributed to financial considerations, time constraints or limited extent of nutritional training (Goodman *et al.*, 2005; Levy and Raab, 1993).

This study provides some insights about attitudes towards and practice of preventive dentistry in Benghazi, which has important implications for the development and planning of preventive dental services. Our findings support the notion that dentists view preventive dental services as less economically beneficial and reputable for their practice, although they expressed a relatively positive attitude towards preventive dentistry. The dental community and stakeholders are required to support the implantation of preventive care programmes and to enable the widespread practice of preventive dentistry in different health sectors.

Some limitations of this study need to be discussed. A first limitation relates to the selection of the study group from one Libyan city only. As such, participants' views may not be representative of the entire population of dentists in Libya. A second limitation relates to the use of a self-reported questionnaire for data collection which is prone to certain bias (recall and social desirability bias) and may be less accurate than collection by observation or by dental record abstraction. Further research is required to explore factors deterring dentists from applying preventive care to their patients. The attitudes of patients and other stakeholders towards preventive dentistry and possible barriers for its application should be investigated to develop suitable action plans.

Conclusion

Libyan dentists working in Benghazi have generally a positive attitude towards preventive dental care, especially in terms of it being useful and essential for the community and its scientific merit for dentists. Apart from the application of topical fluoride and fissure sealants, which tend to incur additional costs, preventive care measures were frequently carried out by dentists. Further research is required to investigate the facilitators of and barriers to preventive dental care among dentists in Libya.

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