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Dental knowledge and attitudes among Arab schoolteachers in northern Israel

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Summary

A representative random sample of 597 Arab schoolteachers in northern Israel, was surveyed regarding sources and levels of knowledge and attitudes about dental caries prevention. Data were measured according to a self-administered questionnaire from a 91.4 per cent response rate. When ranking the effectiveness of different caries preventive measures teachers on average listed optimal water fluoridation as a lower priority compared to toothbrushing, dental visits, fluoride mouthrinses and eating fewer sweet products. Placing of fissure sealants was ranked as the second least effective caries preventive measure, with 39.6 per cent not knowing the effectiveness. Only 68.5 per cent of the schoolteachers were aware of the anti-bacterial role of fluoride, and only a small minority knew of fluoride's potential in healing incipient caries. Teachers seemed less motivated to being involved in dental health school programmes which involved dedicating school time and their active involvement, such as fissure sealant programmes at school, supervision of brushing and flossing, and school mouthrinsing programmes. They revealed positive attitudes towards: informing parents about the importance of oral hygiene and teaching children about preventive dentistry. Teachers' main reported source of knowledge was the dental office. It is the responsibility of the dental profession to ensure that updated knowledge is correctly conveyed to schoolteachers, who are an important and potentially influential sector of dental health consumers and health education agents.

Schoolteachers have an internationally recognised potential central role in school-based dental education[1–11]. Considerable importance has therefore been attributed to their dental knowledge[4–9]. Teachers have the unique potential of preparing a future generation of correctly informed health care consumers and decision-makers.

Surveys conducted in Minnesota, USA, among future schoolteachers[8] and in Michigan, USA, among elementary schoolteachers[9], established that oral health knowledge of these important populations was often inadequate and inaccurate. The subjects were ill-informed and held inconsistent opinions about basic oral health related concepts. Studies in Romania, China and Saudi Arabia have reported positive attitudes among schoolteachers towards school based dental health education and a willingness to be involved in oral health promotion[6,10,11]. A higher level of dental knowledge was revealed among Kuwaiti schoolteachers than among parents, and teachers reported a positive attitude towards the prevention of dental diseases[4]. Among Tanzanian schoolteachers low levels of oral health knowledge were found, accompanied by a poor attitude towards becoming involved in dental health education[2]. These international data describe the significant, but not always easy, potential of incorporating schoolteachers in oral health promotion programmes.

The last Israeli national caries survey reported a DMFT level of 2.99 at age 12 years[12]. Recent research has indicated a further trend of decreasing caries, which has been attributed to optimal water fluoridation[13]. An epidemiological survey of 12-year-old Arab children in northern Israel, however, revealed a relatively higher DMFT level of 3.81[14].

The effect of dental health education in Israeli schools and level of schoolchildren's (predominantly Jewish) dental knowledge has been reported[15,16]. Among 12-year-old Arab children in northern Israel, inadequate levels of dental knowledge were identified[14]. Low percentages were aware of the significance of fluoride in caries prevention: only 35.3 per cent chose brushing with a

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fluoridated toothpaste and 2.8 per cent optimal water fluoridation, as among the best methods for caries prevention[14].

The primary research question addressed in this study is whether northern Israel Arab schoolteachers are correctly informed concerning the existing scientific knowledge about caries prevention. Further objectives were to establish sources of knowledge and attitudes towards dental health.

Materials and methods

Study population

The public educational system in Israel is subdivided into: Hebrew, Arabic, secular and religious. In the Upper Galilee area of northern Israel, in the early 1990s, 2890 elementary schoolteachers were registered in 138 Arab schools. The number of children in these schools was about 10,000. All these elementary schools were numbered 1–2890 and weighted according to the number of teachers in each school. Thirty schools were then selected according to a list of random numbers. This number was chosen based on previous studies employing comparable methodology[9].

Dental knowledge

A previous study[7] had established an instrument measuring sources of dental knowledge, and knowledge and opinions about the efficacy and relative effectiveness of oral disease prevention methods, which has been applied to future and present schoolteachers in the USA[8,9]. This self-administered questionnaire was translated and adapted for Arab teachers in northern Israel and included questions covering knowledge about: reasons for oral hygiene, preventing caries among children, fluoride, optimal water fluoridation, whether local water is fluoridated, preventing gingival disease, as well as attitudes regarding teachers' roles in promoting oral health, and the sources of their knowledge. Teachers were requested to rank (1=very effective; 4=very ineffective) preventive dental methods, to answer whether statements were true or false, and to rank their opinions about different subjects (1= agree very much; 4= don't agree very much). After translation, the questionnaire was pre-tested in one village among 22 teachers who did not participate in the following study.

Data analysis

Knowledge and attitude data were descriptively presented, according to mean levels and percentages found. Independent variables included: gender, age, marital status, educational level, teaching experience, and place of residence (rural or urban). In statistical examination of the association between mean knowledge and attitude levels and independent variables, analysis of variance was employed. Level of significance was chosen at $P<0.05$.

Results

Study population

In the selected schools all 653 teachers present at the time of the study, out of the total 762, were included as the study population. Of this group, 597 agreed to participate, constituting a 91.4 per cent response rate. Of the total population, 51.5 per cent were females and 48.5 per cent males, 87.2 per cent were married, 80 per cent were parents, 78.9 per cent lived in villages, 72.3 per cent had been trained in teachers' seminars, 15.6 per cent had an academic education, 29.9 per cent had worked less than ten years, 48.7 per cent had worked 11–20 years as teachers and 21.4 per cent 21–40 years. The average age was 35.2 years (27.9 per cent were between ages 20–30 years, 24.3 per cent between 31–35, 28.1 per cent between 36–40, 15.4 per cent between 41–50, and 4.3 per cent were over the age of 50).

Sources of dental knowledge

Subjects were presented a list of 10 potential sources of information and were asked to indicate the main source. The predominant, primary source of information was the dentist (39.3 per cent of the teachers). The second and third most cited sources were books (25.3 per cent) and radio and television (12.4 per cent). Other sources were all cited by less than 10 per cent of the population (newspapers, elementary school, university/seminar, family and friends, high school, government agencies, doctor, in descending order).

Dental knowledge

Teachers were asked to 'rank the effectiveness of methods in preventing tooth decay in children'. The ranking was according to: very effective (score 1), effective (score 2), somewhat effective (score 3), not effective (score 4), or 'don't know'. *Table 1* presents mean ranks of each method as reported by teachers. On an average, the item ranked highest by teachers was brushing teeth with a fluoridated toothpaste, but 3.6 per cent did not know whether this method was effective. Second, third and fourth places were given to dental visits, fluoride mouthrinses and eating fewer sweet foods. Optimally fluoridated water was ranked fifth, with 20.5 per cent not knowing whether this method was effective in preventing children's caries. Sealants were cited second last, that is, as ineffective, with 39.6 per cent not knowing whether sealants were effective. Female schoolteachers,

Table 1 Caries preventive methods ranked by schoolteachers, by mean score and percentage not knowing

Method	mean score*	don't know %
Brush with fluoride toothpaste	1.24	3.6
Dental visits	1.32	1.0
Fluoride mouth rinses	1.66	7.4
Decreased sweet foods	1.68	1.0
Fluoridated water	2.07	20.5
Fluoride tablets	2.12	27.0
Professional fluoride applied	2.16	32.4
Dental floss	2.46	12.0
Fissure sealants	2.66	39.6
Brush without paste	2.92	3.2

*1=very effective; 2=effective; 3=quite effective; 4=not effective

Table 2 Percentage of schoolteachers reporting statements about fluoride as correct, incorrect, or not knowing.

Statement	correct %	incorrect %	don't know %
Strengthens enamel	86.3	3.4	10.3
Whitens teeth	46.5	34.6	18.9
Discloses where germs are	10.8	60.7	28.5
Cleans teeth	61.4	24.5	14.2
Nutrient in bone and teeth	51.9	25.6	22.4
Anti oral bacteria agent	68.5	16.5	15.0
Can heal initial cavities	13.3	60.9	25.8

Underlined percentages denote correct answers.

when ranking effectiveness of preventive methods demonstrated higher preference for optimal water fluoridation and fluoride tablets, than male teachers ($P<0.001$). Female teachers also had higher preference for fluoridated toothpaste, reduced sweet foods and dental visits than their male counterparts ($P<0.01$). These levels of significance were calculated according to analysis of variance.

Table 2 shows that 86.3 per cent of teachers were aware of the role of fluoride in strengthening enamel, 68.5 per cent knew of the antibacterial effect of fluoride ('reduces the amount of oral bacteria'), and 51.9 per cent agreed that fluoride is a nutrient, present in bone and teeth. Only 13.3 per cent knew that fluoride has a role in arresting primary caries.

In the study area water was not optimally fluoridated. It is interesting to note that 13.2 per cent of the teachers incorrectly believed that water in their region was fluoridated, 53.5 per cent correctly knew that water was not fluoridated, 33.3 per cent did not know whether or not water was fluoridated.

Dental attitudes

Teachers were asked regarding their attitude towards optimal water fluoridation. Most teachers (72 per cent) were in favour: 32.4 per cent cited optimal water fluoridation as very desirable and 39.6 per cent as desirable. A total of 15 per cent were either against or very much against fluoridation and 13.1 per cent did not know. These data were analysed by age, place of residence and education and no differences were detected. Female teachers, reacted more positively to optimal water fluoridation than males ($P=0.0002$, analysis of variance).

When asked whether they considered certain classroom roles were within the framework of their duties as schoolteachers, it was clear that those functions which demanded the least active input, of the teachers themselves, were most preferred. The highest levels of support for roles, as reported by teachers were (1=very much agree; 4= very much disagree): to encourage parents to help promote their children's oral health (1.24±0.44), to teach children how to care for their teeth (1.34±0.52), to encourage children to go to the dentist (1.35±0.50), to send children to the school nurse regarding dental problems (1.38±0.62). Lower on the list of priorities were: involvement in community dental programmes (1.50±0.56), to contact local dentists and encourage them to help underprivileged children (1.65±0.62), to make sure children regularly attend dental examinations (1.72±0.64). At the bottom of the list were: to supervise mouthrinse programmes (1.89±0.73), to supervise toothbrushing and flossing programmes (2.05±0.77), and finally, to encourage fissure sealant programmes at school (2.49± 0.81).

Besides the statistically significant differences described between male and female teachers, no clear associations were detected between knowledge and attitude levels of schoolteachers and the independent variables included in this study.

Discussion

Frazier has stated that 'given an existing body of scientific knowledge about measures for preventing oral diseases ... society has a responsibility to educate its youngsters about these measures'[18]. In the Declaration of Alma Ata, adopted by the WHO under the slogan of 'Health for All by the Year 2000' primary health care was defined as including 'at least: education concerning prevailing health problems and the methods of preventing and controlling them'[19].

Schoolteachers have traditionally been considered as potentially important primary agents of socialisation, with the capability of influencing the future knowledge attitude and behaviour of schoolchildren[5,17]. In some studies teachers have demonstrated willingness to participate in dental health education[4,6,10,11], while in others this role has not always been readily accepted by them[2]. In the present study teachers reported more support for roles such as 'encouraging parents to promote children's oral health', 'teaching children how to care for their teeth' and 'encouraging children to go to the dentist'. They seemed more reluctant to accept roles which involved dedicating school time and their active involvement, such as the supervision of brushing and flossing, mouthrinse programmes and fissure sealant programmes at school. It should be noted and remembered that teachers are committed to a teaching

rather than an administrative role. Their professional training includes little commitment to community health promotion in general or oral health in particular. If the aim is to utilise the potential of teachers, the dental profession should attempt to encourage the inclusion of oral health promotion within the curriculum of future schoolteachers.

Female teachers demonstrated more positive levels of dental knowledge and attitudes than their male counterparts. It should be noted that most elementary teachers in this and other populations are female.

Teachers in this study generally responded positively to most subjects regarding dental prevention. Inadequate knowledge levels were detected in certain areas, similar to results found among USA teachers[9]. Possible changes in knowledge and attitude levels revealed in this study cannot be evaluated, as this was the first reported study of its kind in Israel. Inevitable disagreements have been described in the literature concerning the aetiological factors involved in the dental caries process and epidemiological variables associated with caries prevalence. Nevertheless, there is a clear agreement among expert researchers that fluoride in general, and the topical effect of fluoridated toothpaste in particular, has a definite positive contribution towards caries prevention[20]. Optimal water fluoridation has been firmly established as the single most cost-effective public health measure known to science for preventing tooth decay[21]. With this evidence in mind, it appeared essential to measure the knowledge and attitudes of schoolteachers towards subjects related to fluoride.

Scientific reports have established the role of fluoride in preventing incipient carious lesions[22]. This knowledge was almost totally unknown by teachers surveyed in this study. Teachers correctly cited fluoride toothpaste as a very effective method of caries prevention. Dental visits were considered more effective than optimal water fluoridation and fissure sealants among schoolteachers in this survey. This is inconsistent with the literature[23]. The over-estimation of the effectiveness of dental visits in preventing caries was similar to that found in the study of USA teachers[9].

The effectiveness of fissure sealants, one of the more effective preventive measures, seems to be universally unknown to the public[24]. Even though sealants are the domain of dental professionals, public knowledge is important in the implementation of community programmes. Researchers have advocated the cost-effectiveness of sealants, only among high-risk caries groups, accompanied by an appropriate preventive maintenance regime[25]. According to the relatively high levels of caries prevalence in this[14] and other Israeli populations, fissure sealants are uniformly recommended as part of the national dental health policy. All Israeli children, Jewish and Arab, have access to dental practices. There is an oversupply of Israeli dentists[26] and there are adequate numbers of dental practices which should be capable of applying fissure sealants with appropriate maintenance.

Dental health promotion efforts in Israel and other Middle Eastern countries currently include optimal water fluoridation, school-based oral health education and sealant programmes. Teachers are, and should be, active partners in these efforts, and their correct related knowledge is therefore mandatory. Efforts should be encouraged to educate schoolteachers about modern preventive dentistry and the potential for oral health promotion among schoolchildren. Educational resources and aids, such as video tapes, games and instructional pamphlets should be devised, applied and evaluated. Continued educational workshops for teachers should be supported and encouraged.

The lack of direct association between dental knowledge and caries, as found in several studies, should not detract from the importance of correct dental knowledge. A significant knowledge gap exists between the public and the established scientific literature. This constitutes a significant obstacle when seeking the co-operation and support of teachers in school-based programmes. Schoolchildren, as educated by their teachers, are not only important as far as preventing disease among themselves in the present, but also in their future role as adults and opinion leaders of the next generation.

F

Connaissances et attitudes dentaires chez des enseignants arabes d'Israël du nord

Résumé

Une étude a été effectuée sur un échantillon représentatif pris au hasard de 597 enseignants arabes d'Israël du nord et portait sur les sources et niveaux de connaissances et les attitudes concernant la prévention des caries dentaires. Les données ont été évaluées selon un questionnaire personnel à partir d'un taux de réponses de 91,4 pour cent. Lorsqu'ils évaluaient l'efficacité des différentes mesures de prévention des caries, les enseignants indiquaient en moyenne la fluoration de l'eau potable comme très peu prioritaire par rapport au brossage des dents, aux rendez-vous chez le chirurgien-dentiste, aux bains de bouche fluorés et à l'ingestion d'un nombre moindre de produits sucrés. La pose de scellements de fissure était considérée comme la deuxième mesure préventive la moins efficace dont 39,6 pour cent ne connaissaient pas l'efficacité. Seulement 68,5 pour cent des enseignants connaissaient le rôle antimicrobien du fluor, alors qu'un nombre très peu important savait que le fluor avait le potentiel de traiter les caries initiales. Les enseignants semblaient moins motivés à participer à des programmes

de santé dentaire en milieu scolaire, auxquels il fallait qu'ils consacrent du temps pendant la journée scolaire et qui nécessitaient une participation active de leur part, notamment pour les programmes de scellement de fissures pendant la journée scolaire, la supervision du brossage et de la soie floche et les programmes de rinçage en milieu scolaire.. Les attitudes positives portaient sur ;'information des parents de l'importance de l'hygiène bucco-dentaire et l'enseignement aux enfants DE Cla dentisterie préventive. Selon les enseignants, la principale source de connaissances était le cabinet dentaire. Il appartient à la profession dentaire de s'assurer que les enseignants soient correctement informés des nouvelles connaissances, car ILS représentent un secteur d'influence potentielle importante des consommateurs de santé dentaire et des éducateurs de la santé.

D

Wissen und Einstellung zur Mundgesundheit auf seiten arabischer Lehrer im Norden Israels

Zusammenfassung

Für eine Repräsentativstudie wurden insgesamt 597 arabische Lehrer im Norden Israels nach dem Zufallsprinzip ausgewählt und danach befragt, wie sie ihr Wissen bzgl. der Prävention von Dentalkaries erworben haben, wie aktuell ihr Wissensstand war und welche Haltung zum Thema sie bezogen. Die Daten wurden mittels eines von den Teilnehmern selbständig ausgefüllten Fragebogens erhoben; die Teilnahmerate lag bei rund 91,4%. Im Rahmen der Beurteilung des Nutzens unterschiedlicher Präventionsmaßnahmen wurde der Wasserfluoridierung ein niedrigerer Stellenwert zugesprochen als Zähneputzen, regelmäßigen Zahnarztbesuchen, fluoridierten Mundspüllösungen und reduziertem Konsum von Süßigkeiten. Die Fissurenversieglung rangierte an zweiter Stelle der Liste ineffektiver Maßnahmen zur Kariesprävention, wobei 39,6% vom Erfolg dieser Methode noch nie zuvor gehört hatten. Lediglich 68,5% der befragten Lehrer waren sich der antibakteriellen Eigenschaften von Fluorid bewußt und nur eine kleine Gruppe wußte um die Heilwirkung von Fluorid bzgl. Karies im Anfangsstadium. In bezug auf die aktive Mitwirkung ihm Rahmen von schulischen Mundgesundheitsprogrammen bestand wenig Motivation, da dies die Bereitstellung von Unterrichtsstunden für Maßnahmen wie Fissurenversiegelung, Beaufsichtigung von Schülern beim Zähneputzen sowie bei der Anwendung von Zahnseide und Mundspüllösungen beinhaltete. Es war eine allgemein positive Haltung sowohl in bezug auf die Aufklärung von Eltern hinsichtlich des Stellenwerts der Oralhygiene als auch der Erziehung der Kinder zur selbständigen Durchführung von Präventivmaßnahmen feststellbar. Die Mehrzahl der Lehrer gab die Zahnarztpraxis als Quelle ihres Wissens an. Für den Zahnarzt ergibt sich somit die Notwendigkeit, dafür zu sorgen, daß Lehrer als wichtige und potentiell einflußreiche Berufsgruppe im Kontakt mit Verbrauchern und Mundgesundheitsstellen gleichermaßen stets mit aktuellen Informationen zur Mundgesundheit versorgt werden.

E

Conocimientos y actitudes relacionados con la salud dental entre los profesores árabes de colegios en el norte de Israel

Resumen

Se realizó una investigación en una muestra aleatoria representativa de 597 profesores árabes de colegios en el norte de Israel con respecto a la fuente y al nivel de conocimientos y actitudes sobre la prevención de la caries dental. Los datos fueron medidos de acuerdo a un cuestionario auto- administrado que tuvo una tasa de respuestas del 91,4 por ciento. Cuando se trató de clasificar la eficacia de diferentes medidas para prevenir la caries, el término medio de los profesores dió a la fluoración óptima del agua potable una menor prioridad que al cepillado de dientes, que a las visitas al dentista, que a los colutorios fluorados y que a un bajo consumo de productos dulces. La colocación de selladores de fisuras fue clasificada como la segunda medida menos eficaz para prevenir la caries, quedando en evidencia que un 39,6 por ciento de ellos no conocía su eficacia. Nada más que un 68,5 por ciento de los profesores estaban conscientes del papel antibacteriano de los fluoruros, y sólo una pequeña minoría conocía el potencial de los fluoruros para curar las caries incipientes. Los profesores parecían poco motivados a participar en los programas de salud escolar que requieren la dedicación de parte del horario de clases y su participación activa, como en los programas de selladores de fisuras en las escuelas, en los de supervisión del cepillado y uso de la seda dental y en los programas escolares de

colutorios. Ellos revelaron una actitud positiva con respecto a entregar información a los padres sobre la importancia de la higiene oral y para enseñar medidas dentales preventivas a los niños. Los profesores manifestaron que su fuente principal de conocimientos era la oficina dental. La profesión odontológica tiene la responsabilidad de asegurar que se de correctamente a los profesores un conocimiento actualizado, ya que constituyen un sector importante y potencialmente influyente de consumidores con respecto a salud dental y de agentes de educación para la salud.

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