

Evaluating the Provision of Oral Health Education Material in Schools in Finland

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Interventions: The Finnish Dental Association donated new oral health education material (OHEM) to all upper comprehensive schools in 2008. **Objective:** The aim of this study was to determine whether that OHEM was noticed, received and used in schools, and whether oral health teaching and teachers' attitudes towards oral health changed after distribution of the OHEM. **Methods:** Surveys were conducted using online questionnaires for all health education teachers in upper comprehensive schools in Finland. Schools response rates were 39% in 2008, and 40% in 2009. Statistical significances between the teachers and between the schools according to background variables were analysed using a Pearson's Chi-square test for nominal data and Mantel-Haenszel Chi-square test for ordinal data. Changes between 2008 and 2009 were evaluated using percentage change and confidence intervals. **Results:** Of the responding teachers, 46% reported that they had received the OHEM and 33% had used it in their teaching. The number of teachers teaching oral health did not change after the OHEM, but teachers who taught oral health reported teaching all oral-health-related topics more frequently than they did before. Female teachers more often reported having received the OHEM (48% vs 32%, $p=0.011$) and having used it (36% vs 22%, $p=0.017$) than did male teachers. **Conclusions:** The OHEM may not lead more teachers to teach oral health, but it provides them with the resources to teach the subject more comprehensively. The OHEM must be planned in close co-operation between schools and local dental health care professionals, to make it better known and accepted among teachers, especially male teachers.

Keywords: health education, health promotion, oral health, adolescent, schools, Finland

Introduction

In Finland there is free, taxation-funded, compulsory comprehensive schooling to the age of 17 completed by 99.7% of adolescents. More than 98% of comprehensive schools are run by the municipality (FNBE, 2004). The school environment plays an important role in shaping the behaviours of children (Christensen, 2004). Moreover, schools provide an excellent setting for promoting oral health using different strategies, one of which is to increase health literacy among children (World Health Organization, WHO, 2003). Health literacy programmes are useful ways to promote health among children and adolescents as long as these programmes are properly developed and administered with cooperation between health care professionals and schools (Naito *et al.*, 2007).

In 1997, the WHO suggested that health education should become a specific subject in schools all over the world, and that health-education-related topics be integrated into other subjects as well (WHO, 1997). Since 2004, health education has been a core subject in Finnish upper comprehensive schools. Health education, if it is divided equally into each of the three school years, is taught for one hour each week. Health education is also a subject at college level and it is possible to take the equivalent of an A level in it. Oral health is not mentioned specifically in the national core curriculum of health education but the objectives set up include recognising nutritional needs and problems, smoking, taking care of one's health and recognising the need for prevention (FNBE, 2004).

Finnish school children have a positive attitude towards health education, girls more often than boys (Kannas *et al.*, 2009). There are more women than men among health education teachers. Almost half of these teachers teach physical education as their main subject and two out of three are qualified to teach health education (Kannas *et al.*, 2009). However, teachers reported a lack of oral health material since oral health was not handled in all textbooks and there was no specific material for oral health teaching (Dadi, 2007).

To help the teachers plan and deliver oral health education as a part of their health education teaching, the Finnish Dental Association developed new oral health education material (OHEM), which they donated to all Finnish upper comprehensive schools in 2008. The OHEM included accurate information and practical examples to help health education teachers teach oral-health-related topics comprehensively (Jormanainen and Järvinen, 2008).

The aim of this study was to determine whether the OHEM was noticed, received and used in Finnish schools, and whether oral health teaching and teachers' attitudes towards oral health changed after the OHEM. Another aim was to find out if there were differences according to the characteristics of the schools and teachers.

Material and methods

This study was implemented as a part of the World Dental Federation's LiveLearnLaugh project in 2008 and 2009. The study population consisted of the health education

core subject teachers of all Finnish upper comprehensive schools (n=970), grades 7-9, where pupils were aged 13 to 16 years.

The OHEM was delivered to every Finnish upper comprehensive school in autumn 2008. The OHEM consisted of an over 100-page Oral Health Handbook for use by all health education teachers in the school and a DVD containing the same material, which teachers could freely use to print exercises and homework for pupils. The OHEM was created by a teacher of biology and a dental hygienist before pre-testing in five upper comprehensive schools in the city of Joensuu.

Before delivering the OHEM to schools in 2008, and one year later, in 2009, an email questionnaire was sent to every upper comprehensive school in Finland. The school was asked to forward the email to all health education core subject teachers in the school. The forthcoming OHEM was briefly mentioned in the email sent to teachers in the 2008 baseline study. In 2009, the questionnaire was also sent personally to all those teachers who gave their email address when responding to the 2008 questionnaire. Oral hygiene products were raffled among those who replied.

The teachers answered the questionnaire via the Internet using the Webropol-program. Two reminders were sent in both years. In 2008, 563 health education core subject teachers from 374 schools, and in 2009, 477 teachers from 391 schools answered the questionnaire after inadequate and double answers were excluded.

To find out whether the OHEM was noticed, received and used in the schools, in 2009 teachers were asked if they had answered the baseline study, if they were aware of the OHEM, if they had got it or used it, and if they considered it suitable for teaching oral health in health education (scale from 1, fully agree to 5, fully disagree).

In both years oral-health teaching and teachers' attitudes towards it were measured by asking the teachers if they taught oral health and how important they considered six oral health topics in teaching health education (scale from 1, very important to 5, not important at all). The frequency of teaching was assessed by asking the teachers who reported that they teach oral health, how often different topics were handled (scale from 1, taught to every age group to 5, not taught at all). Teachers, who reported not teaching oral health, were asked for the two most important reasons for this. The alternatives were: 1, oral health is taught in some other subject; 2, oral health is not mentioned in the core curriculum; 3, there is no material for teaching oral health; 4, oral health is not handled in our textbook; 5, there is no time to teach oral health; 6, oral health teaching is the municipal health centre's responsibility; and 7, some other reason.

The changes in oral health teaching and in teachers' attitudes towards oral health after sending the OHEM were evaluated by comparing the percentages of teachers teaching oral health in 2008 and 2009, by assessing whether there was a difference in the frequency of teaching different topics, in teachers' opinions about the importance of teaching different topics, and in the reasons for not teaching oral health between 2008 and 2009.

There were also two open-ended questions in the questionnaire. Teachers were asked to mention three categories in the OHEM which had helped their teaching most, and to write freely about the OHEM.

The number of pupils in the school, the province, and the teaching language (Finnish, Swedish) of the school, the age and gender of the respondent, and answering the baseline study were used as background variables. The results were described as proportions of teachers from two cross-sectional data sets. Statistical significances between the teachers and between the schools according to background variables were analysed using the Pearson's Chi-square test for nominal data and the Mantel-Haenszel Chi-square test for ordinal data. Changes between 2008 and 2009 were evaluated using percentage change and confidence intervals.

Results

Of the responding teachers in 2009, 61% reported that they were aware of the OHEM and 46% that they had received it. Of the teachers who had received the OHEM, 73% actually used it in their teaching, i.e. 33% of all the responding teachers (Figure 1).

The proportion of teachers who reported teaching oral health as part of health education did not change after the OHEM, being 89% in 2008 (n=563) and 91% in 2009 (n=475). There were no statistically significant differences in oral health teaching according to the number of pupils in the school, the province or the teaching language of the school, or according to the age or gender of the teacher in 2008 or 2009.

In 2009, teachers who taught oral health reported teaching all oral-health-related topics more frequently than they did in 2008. The number of teachers who taught twice-a-day tooth brushing, flossing, using fluoride tooth paste, and using xylitol products to at least two age groups increased significantly. In health hazards of tobacco products and in restriction of sweet products the increases were not statistically significant (Table 1). Results were similar when a different cut-off point (taught to at least one age group) was used.

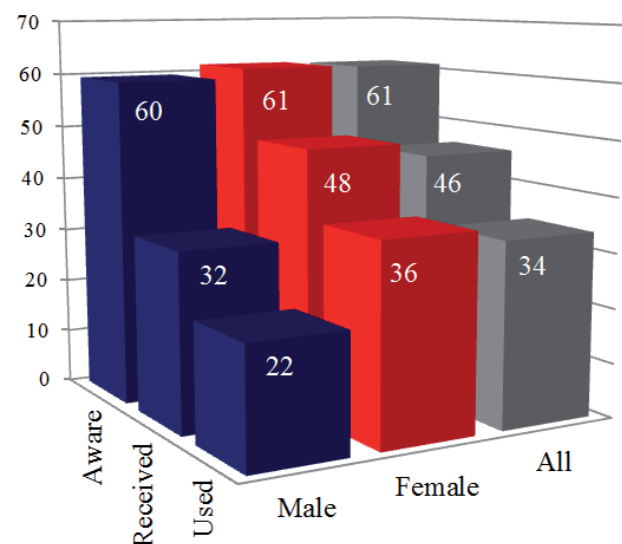


Figure 1. Percentages of male, female and all teachers who were aware of, received or used the oral health education material in 2009

The teachers who reported not teaching oral health in 2008 (n=65) gave the absence of oral-health-related topics in their textbook (52%) and the lack of proper material for teaching oral health (34%) as the most important reasons why they did not teach oral health. The percentages of these reasons decreased in 2009 (n=44) being 27% and 18%, respectively.

Teachers considered twice-a-day tooth brushing, the health hazards of tobacco products and restriction of sweet product consumption the most important themes of oral health education in both years. However, in both years, there were oral-health-related topics, which female teachers considered more important to be taught than male teachers did. In both years, female teachers considered the teaching of almost all oral-health-related topics more important than male teachers did. The only statistically significant changes in the attitudes from 2008 to 2009 for both genders were a fall in flossing, and, for female teachers, an increase in using xylitol products (Table 2).

In 2009, oral health teaching was more common among teachers who were aware of the OHEM and who had received it than among those who were not aware of it and those who had not received it. Of the teachers who were aware of the OHEM, 93% taught oral health, while it was taught by 87% of the teachers who were not aware of the OHEM (p=0.009). Of the teachers who had received the OHEM, 95% taught oral health compared with 87% of those who had not (p=0.002). Of the 476 teachers who answered in 2009, females more often than males reported having received the OHEM (48% vs 32%, p=0.011) and having used it (36% vs 22%, p=0.017).

There were no gender differences in the proportions of teachers who taught oral health and who were aware of the OHEM (Figure 1).

In 2009, teachers who reported that they had answered the baseline questionnaire in 2008 were more often aware of the OHEM, had received it and used it than those who reported not having answered the baseline questionnaire. Of the teachers who reported they had answered the baseline questionnaire: 78% were aware of the OHEM compared to 49% of those who had not (p<0.001); 56% had received the OHEM compared to 38% of those who had not (p<0.001); and 45% had used the OHEM compared to 25% of those who had not (p<0.001). There were no significant differences in likelihood of teachers' awareness, receipt or use of the OHEM by the size of school.

Of the teachers using the OHEM, 88% considered it very or quite suitable for oral health education, and there were no differences according to background variables. However, in the open-ended questions, some teachers reported that the OHEM was too wide to teach within the time available and asked for instructions on which themes would be important to teach and for summaries of each theme that could be taught more easily.

Schools' response rates were 39% in 2008, and 40% in 2009. The response activity of the teachers could not be calculated accurately because the total number of health education teachers in Finland was not available. In 2008, of the responding teachers, 80% were female and 20% male; in 2009, 84% and 16%, respectively.

Discussion

Producing the OHEM did not increase the already large proportion of teachers who taught oral health in Finnish upper comprehensive schools, but teachers started to cover many oral health topics more frequently. The OHEM was considered suitable by the teachers who started to use it, but it did not reach over half of the teachers.

The response rate of the study was moderate, as two out of five teachers in the upper comprehensive schools in Finland responded both years. It would have been useful to know the total number of all the health education teachers in Finland to be able to calculate the exact response rate of the teachers. For both study years,

Table 1. Percentages of teachers who reported teaching oral health topics in 2008 and in 2009 to at least two age groups

	2008 n=498	2009 n=431	% change, (95% CI)
Twice-a-day tooth brushing	43	50	16 (1–34)
Flossing	24	36	50 (23–83)
Use fluoride tooth paste	34	41	21 (2–42)
Use xylitol products	46	54	17 (3–34)
Tobacco's health hazards	73	75	3 (–5–11)
Restricting sweet products	80	83	4 (–2–10)

Table 2. Percentages among all responding teachers reporting in 2008 and 2009 different oral- health-related topics as being very important to teach in health education

	2008(n=563)			2009 (n=477)			Percentage change, (95% CI)	
	Males	Females	p	Males	Females	p	Males	Females
Twice-a-day tooth brushing	86	88	0.473	77	90	0.002	-13 (-24 – 1)	2 (-2 – 7)
Flossing	45	54	0.073	23	31	0.145	*-49 (-68 – -19)	*-43 (-52 – -32)
Using fluoride tooth paste	65	69	0.372	57	74	0.002	-12 (-31 – 11)	7 (-1 – 17)
Using xylitol products	39	54	0.004	42	63	0.001	8 (-24 – 53)	*17 (4 – 31)
Health hazards of tobacco	85	86	0.906	77	86	0.041	-9 (-22 – 5)	0 (-5 – 6)
Restriction of sweet products	77	91	<0.001	77	93	<0.001	0 (-15 – 17)	2 (-2 – 6)

p-value for χ^2 -test between genders.

* statistically significant change from 2008 to 2009.

the geographical distribution of the responding schools was almost identical to the geographical distribution of all the schools in Finland. The distribution of Finnish health education teachers according to gender was not known, but the distribution was similar for both years and corresponded to the gender distribution found in former studies (Kannas *et al.*, 2009). The distribution of the teachers according to age was similar for both years. It is possible that the teachers who are active oral health educators were also more active in answering this kind of voluntary questionnaire, which means that the results may show a better picture than warranted by the real situation. However, attempts were made to get more passive teachers to answer by raffling oral hygiene products among those who replied. The study population can be considered representative enough for the results to be generalised to health education teachers of the Finnish upper comprehensive schools at least at the school level.

As we found no other studies evaluating the production of oral health material for school health education teachers, the results cannot be directly compared. However, in the Finnish study on a medicine education programme, teachers in upper comprehensive schools asked for additional topics and more detailed information to material (Hämeen-Anttila *et al.*, 2006). In our study health education teachers reported that the OHEM was too much to teach within the time available. Teachers asked for guidance about themes that are most important to teach and brief notes about each theme to help in their teaching. However, in both study years, teachers considered the right things, i.e. twice-a-day tooth brushing, the health hazards of tobacco products, and restriction of sweet product consumption, to be the most important themes of oral health education. Teaching of these themes is especially important in Finland since tooth-brushing habits of Finnish children are among the worst in Europe (WHO, 2008) and 46% of Finnish upper level comprehensive schools sell sweets, soft drinks or other sweet products to their pupils (Kankaanpää *et al.*, 2012). Moreover, the majority of Finnish schools have no clearly defined oral-health-promoting policies (Anttila *et al.*, 2012).

The OHEM did not increase the number of the teachers teaching oral health. A Finnish study found almost half of health education teachers had physical education as their main subject and two out of five believed that they were working as a health education teacher simply to fill their timetables (Kannas *et al.*, 2009). This could be one reason for these teachers' lack of motivation for oral health teaching.

Moreover, after the OHEM, the teachers' most important reason for not teaching oral health was no longer a lack of oral health material. It seems that every tenth teacher does not have the preparedness to teach oral health even if there is material available. These teachers may be the ones who need ready-to-use packages or even a totally different kind of way to teach oral health to their pupils. This could be, for example, oral health care professionals' visits to health education lessons. A previous study in Finland reported that four out of five of the health education teachers considered this kind of co-operation essential (Dadi, 2007). In another Finnish study, only 30% of the pupils reported that a dentist

and 13% that an oral hygienist had visited their health education lessons (Kannas *et al.*, 2009). To encourage co-operation between schools and oral health care professionals, the OHEM was also delivered to the dental clinic of all health centres in Finland. It is important to remember that the release of this kind of material does not remove the responsibility of local oral health care professionals to be leaders in oral health promotion in the form of school visits and other public appearances when necessary. This is a way to strengthen community actions and develop personal skills, both of which are mentioned in the Ottawa charter (WHO, 1986).

Women, however, considered different themes more important to teach than men did. Women also received the OHEM and used it more often than men did, even though there were no gender differences in oral health teaching and awareness of the OHEM. These results suggest that women's attitudes towards oral health teaching are more positive than men's which may be the reason why women are also more active in starting to use the OHEM. Male teachers should be informed of the importance of oral health and their role as models in health education especially for boys, who are known to be, for example, poorer tooth-brushers than girls (WHO, 2008).

Answering the baseline questionnaire increased teachers' awareness of, receiving, and using the OHEM. This means that the baseline study worked as an intervention since the forthcoming material was mentioned in the email sent to teachers at baseline. This kind of information presentation is important and ethically indispensable when releasing and evaluating new material. The material should also be well advertised beforehand to increase its uptake. It is also very important to use teachers' existing knowledge when planning the content of the material.

Although health education teachers using the OHEM considered it suitable for teaching, it did not reach over half of the teachers. The problem seemed not to be in the contents, since three out of four of the teachers receiving the OHEM started to use it in their teaching, and almost all of them considered it suitable for teaching, but rather in the marketing and delivery. Many teachers were not aware that the OHEM was available and even those who knew of it, many had not got hold of it. Especially in the larger schools one copy of the OHEM is not enough as there can be as many as ten health education teachers in a school. Schools should probably have been asked beforehand, in what form and in what quantities the OHEM should be delivered. In many health promotion programmes, steps are taken in the wrong order and without proper planning: First, some material is probably available as a result of a former project. Immediately after getting funding, material is produced and delivered, without planning, giving information, and evaluation. This leads to a single-component intervention instead of a wider multi-modal programme. For example, in smoking prevention in schools, multi-modal programmes have proved to be more effective than single-component interventions (Thomas and Perera, 2006).

To make this project multi-modal and based on the results of this study, the Finnish Dental Association has already released the OHEM to be freely downloaded from their Internet page so that the schools and teachers still not having it can easily get it. Teachers are also

regularly informed about the availability of the OHEM in the Internet. The effects of the availability of the Internet version of the OHEM will also be evaluated in the future.

Producing the OHEM might not get more teachers to teach oral health, but it gives them information and equipment with which to teach the subject more often and more comprehensively. The OHEM should be planned and delivered in co-operation between schools' health education teachers and local dental health care professionals, because this enables not only better acceptance but may also provide a bridge between school and local oral health care for further co-operation.

Acknowledgements

The Finnish Dental Association supported the study as part of the LiveLearnLaugh project.

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