Polish School Nurses’ Attitudes and Knowledge towards Topical Fluoride Treatment

Stajališta i znanja školskih medicinskih sestara o topikalnoj primjeni fluorida u Poljskoj

Introduction

Dental caries is the most widespread disease in the world (1). Even though a continuous decrease in caries prevalence and experience in Polish children is observed, these levels are still very high (2). This disease has a great impact on child’s life, results in lowering the quality of life, and generates many economic costs (3, 4). As caries is a lifestyle disease, the measures to prevent cavity development should be taken from the childhood. There are three main subject areas within the scope of oral health promotion – oral hygiene, proper nutrition and the use of fluoride compounds.

Fluoride (F) has been the most efficient caries preventive agent responsible for the decline in dental caries over the last decades (5). The mechanism of its actions is multidirectional. Fluoride reduces dental plaque formation, inhibits enolase resulting in a decrease in the level of glycolytic intermediates, affects bacterial cellular membrane permeability, inhibits demineralization and increases remineralization. If F is present in the biofilm environment and the pH is not lower than 5.5, fluoride treatment.

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Conclusion: Polish school nurses had a positive opinion on topical fluoride treatment. However, there are gaps in their knowledge and the institutional training is needed.

Uvod

Karijes je najraširenija bolest na svijetu (1). Iako je uočeno stalno smanjenje prevalencije karijesa kod djece u Poljskoj, razina je još veoma visoka (2). Bolest snažno utječe na dijete i rezultira lošijom kvalitetom života, a ima i velik ekonomski utjecaj (3, 4). Budući da je karijes bolest na koju utječe način života, mjere za njegovu prevenciju trebaju se provoditi od djetinjstva. Tri su glavna područja djelovanja u promidžbi oralnoga zdravlja – oralna higijena, pravilna prehrana i primjena preparata fluorida.

Fluor (F) je najučinkovitije sredstvo za prevenciju karijesa i zaslužan je za njegovo smanjenje u posljednjih nekoliko desetljeća (5). Mehanizam njegova djelovanja je višestruk. Fluor smanjuje stvaranje dentalnoga plaka, inhibira enolazu i razinu glukoličkih intermedijarnih spojeva te povećava remineralizaciju. Ako se nalazi u okolini biofilma, a pH nije manji od 5,5, otapanje hidroksiapatita (HA) potiče stvaranje fluoridapatita (FA). Kako se ciklusi demineralizacije i remineralizacije ponavljaju, vanjske slojeve cakline čine otpornijima na kise-
the dissolution of hydroxyapatite (HA) promotes the Fluor apatite (FA) formation. Repeated cycles of demineralization and remineralization make the outer parts of enamel more resistance to acidic environment (5, 6). Fluoride can be delivered to the organism orally and topically. Using fluoride toothpaste twice a day is considered to be a basic caries-preventive strategy. Apart from daily hygiene routine, the home-used or professionally-applied high concentration topical agents should be used in high risk populations (7). The application of a high concentration of F ions results in the calcium fluoride-like globules formation on the tooth surface. They are mineral reservoirs releasing calcium, phosphate and fluoride after acid attacks (8). For professional application the gels, foams and varnishes with a concentration between 0.5 and 5% are recommended. Currently, the indications for fluoride prophylaxis and the frequency of application depend on the individual caries risk; fluoride applications are recommended in individuals with a moderate and high caries risk (7).

Despite its positive effect on teeth, fluoride may cause an acute and chronic toxicity. An overexposure to small doses during first years of life results in enamel development disturbances named fluorosis. People living in areas where the fluoride level in drinking water is above 1.5 mg/l (1.5 ppm) are exposed to fluorosis. Currently, multiple sources of fluoride exposure, e.g. fluoride-containing dental products, fluoride enriched food and water are considered to be a reason for a growing number of children with fluorosis symptoms (9, 10). Potentially, a harmful effect may result from a daily ingestion of topical fluoride, from toothpaste or from home use gels. An acute poisoning may occur after the ingestion of one or more doses of fluoride over a short time period. First symptoms are nausea, abdominal pain, bloody vomiting and diarrhea. They are followed by headache, cardiac arrhythmia, excess salivation, collapse with paleness, weakness, wet, cold skin, shallow breathing, spasms, muscle paralysis, and tetany. The abovementioned symptoms are an effect of metabolic disturbances named fluorosis. People living in areas where the fluoride level in drinking water exceeds 1 mg/l. Joining the program requires a written parental consent. The procedure is supervised by a school nurse or school hygienist. Therefore, school nurses play an important role in caries prevention with topical fluoride in Poland, but little is known about their opinions li okoliš (5, 6). Fluor se može primjenjivati oralno i topikal-
about this program as well as their knowledge in this area. The purpose of this study was to evaluate school nurses’ opinions on the topical fluoride treatment and their knowledge of acute fluoride toxicity.

Material and methods

A descriptive cross-sectional study with the use of a self-administered questionnaire was conducted from January to April 2014 on randomly selected school nurses. The survey concerned several aspects of the role of school nurse in maintaining oral health in pupils, e.g. caries prevention and first aid in dental trauma. The protocol of the study was approved by the Bioethical Committee of the Medical University of Białystok, Poland.

Study population

Three hundred and thirty-three school nurses were selected from the internet database of the Central Statistical Office of Poland. The following assumptions were made to establish the minimum sample size for the evaluation of the role of school nurses in caries prevention: the number of school nurses based on data from the Polish Ministry of Health to be about 8,000, the percentage of nurses whose duties include the application of topical fluoride (estimated sample size) based on a pilot study to be 95%, the confidence level 95%, maximum error 5%. The minimum sample size was estimated to be 72 nurses. All participants received a questionnaire with a pre-paid return envelope, notes on the aim of the study and a participation consent form.

Questionnaire

A structured self-administrative questionnaire was tested in a pilot study on 37 school nurses. After the pilot study, one question about the time of eruption of primary and permanent teeth was removed because it was not relevant to the study. The final questionnaire comprised questions concerning the duration of employment as school nurse, the education level, the work location type, previous training on caries prevention, actions taken at school, and cooperation with dentists. The questionnaire contained also a part concerning the topical fluoride application program; this part was completed by the nurses who accomplished the NHS program. Questions regarded the percentage of pupils having fluoride prophylaxis, their opinion about the effectiveness and safety of fluoride application and 5 questions evaluating nurse’s knowledge of fluoride toxicity. The knowledge was assessed by counting points for every correct answer. Due to two questions in multiple response type, the maximum number of points was 12.

Statistical analysis

Data were analyzed using the Statistica 12.0. The Kruskal-Wallis and Chi square tests with the level of statistical significance at p<0.05 were used.

Results

Since 164 nurses responded to the survey, the response rate for this study was 49.25%. The duration of employment...
as school nurse varied (from 1 year to 43 years), but the majority of nurses had a long experience, with the average period of 23±9.1. A large number of respondents had secondary education; only 39 (23.3%) persons had a university degree - there were 20 nurses with a Bachelor’s degree and 19 with a Master’s degree. The location of nurses’ working place was as follows: city over 100 000 – 45 (27.4%), town up to 100 000 – 70 (42.7%), town up to 20 000 – 28 (17.1%) and village – 14 (8.5%). Six nurses did not answer the question about their education and seven missed the question about the working place.

Only 10 (6.1%) nurses declared that oral health was not included in their duties and for 71 (43.3%) subjects dental issues took a substantial part of their practice. They were as follows: lectures on caries prevention (135, 81.8%), topical fluoride applications (134, 81.2%), oral hygiene instructions (124, 75.1%), lectures on dental trauma prevention and screening for caries and malocclusion (7, 4.2%). A statistical analysis revealed that nurses working at schools located in big cities and villages more often than those from towns provided lectures on caries prevention and topical fluoride applications (respectively p=0.033 and p=0.021, chi2 test). Almost all respondents (95.6%) declared that pupils asked them for advice in the case of such dental problems as toothache, gum bleeding or halitosis. The statistical analysis showed that children from schools located in villages more often asked for such help than their colleagues from towns and cities (p=0.025, chi2 test). Only 40 nurses (24.4%) established the cooperation with a dentist. Such cooperation was most frequently declared by nurses from small towns (31.4%) and most seldom by respondents from villages (10.9%), however, the results were not statistically significant. More than a half of the respondents (86, 52.4%) never attended any training concerning caries prevention. There were no differences depending on nurse education and location of school.

In the evaluated group, 134 (81.7%) nurses accomplished the NHS program for topical fluoride application in pupils. They assumed the percentage of children taking part in this program to be from 40% to 100%, on average 90.25%. Generally, nurses had a positive opinion on the effectiveness of fluoride application: 39 (29.1%) of them noticed a great value of such program and 84 (62.7%) considered its effects to be sufficient. Only 7 (5.2%) subjects thought the program did not have any influence on pupils’ dentition, and 4 (3%) nurses did not have any opinion. They also had a positive opinion on the safety of topical fluoride application. 99 (73.9%) respondents correctly answered that this method was safe subject to proper procedures and (20.2%) considered it to be totally safe. There were only 6 (4.4%) subjects who had any doubts about it, and 4 (3%) nurses were convinced that the methods involved a great risk of overexposure to fluoride.

The evaluation of nurses’ knowledge of fluoride acute toxicity revealed some gaps (Table 1). They had problems with choosing all symptoms of fluoride poisoning and proper first aid measures in acute fluoride toxicity. Only a half of the respondents knew the probable toxic dose of fluoride and almost one fifth of the respondents did not know the concentration of fluoride in gel they used. The average number of sestra varirao je od 1 do 43 godine, ali većina je imala veliko iskustvo – prosječna vrijednost bila je 23 ± 9.1. Većina je na- vela da je završila srednju školu, a samo 39 (23,8%) imalo je fakultetsko obrazovanje – 20 sestara bile su prvostupnice (ba- kalureatkinje), a 19 magistre. Kad je riječ o radnom mjestu, raspodjela je bila sljedeća: u gradovima s više od 100 000 sta- novnika radilo je 45 (8,5 %) sestara, u gradovima do 100 000 stanovnika 70 (42,7 %), u gradovima do 20 000 stanovnika 28 (17,1 %), a u selima 14 (8,5 %) sestara. Šest ispitanica ni- je odgovorilo na pitanje o edukaciji, a sedam je preskočilo pi- tanje o radnom mjestu.

Samo 10 sestara (6,1 %) izjavilo je da je oralno zdravlje ni- je uključeno u njihovu obvezu, a za 71 ispitanicu (43,3 %) dentalna su pitanja bila važan dio njihova rada. Ta su pitanja uključivala pripremavanje o prevenciji karijesa (135 – 81,8 %), topicalnu primjenu fluorida (134 – 81,2 %), upute u oralnoj higiijeni (124 – 75,1 %), predavanja o prevenciji traume zuba te pregleda zbog anomaliija (7 – 4,2 %). Statistička analiza pokazala je da je djeca iz seoskih škola češće traže pomoć od svojih vršnjaka u većim i manjim gradovima (p = 0,025 – hi-kvadrat test). Samo 40 sestara (24,4 %) surađivalo je s doktorom dentalne medicine. To se događalo uglavnom u manjim gradovima (31,4 %), a najrjeđe u selima (10,9 %), no razlike nisu bile statistički zna- čajne. Više od pola ispitanica (86 – 52,4 %) nikada nije bilo na edukaciji o prevenciji karijesa. Nije bilo razlike kad je riječ o izobrazbi sestara i o lokaciji škole.

U ispitivanoj skupini 134 sestre (81,7 %) sudjelovale su u edukaciji o topicalnoj fluoridaciji djece u organizaciji držav- noga zdravstvenog sustava. Pretpostavljale su da je postotak djece koja sudjeluju u tom programu između 40 i 100 % – u prosjeku 90,25 %. Općenito su sestre imale pozitivno mišlje- nje o učinkovitosti primjene fluorida – njih 39 (29,1 %) istaknulo je visoku vrijednost tog programa, a 84 (62,7 %) sma- tralo je da učinci zadovoljavaju. Samo 7 ispitanica (5,3 %) istaknulo je da program ne utječe na denticiju učenika, a 4 sestre (3 %) nisu imale mišljenje. Pozitivno mišljenje imale su i o sigurnosti topicalne primjene fluorida. Da je metoda sigur- na ako se provodi prema određenom protokolu, točno je od- govorilo njih 99 (73,9 %), a (20,2 %) smatralo je da je pot- puno sigurna. Samo 6 ispitanica (4,4 %) izrazilo je sumnju, a 4 sestre (3 %) bile su uvjerenje da se djeca izlažu riziku od pre- velike količine fluora.

Procjena znanja sestara o akutnoj toksičnosti fluorida ot- krila je neke manjkavosti u tom znanju (tablica 1). Imale su problema s odabirom svih simptoma trajanja fluoridima te pravilnih mjera prve pomoći u slučaju akutnog ozljetovanja. Sa- mo pola ispitanica znalo je kolike su vjerojatne toksične doze, a gotovo petina nije znala koncentraciju fluora u gelu kojim su se djeca koristila. Prosječan broj bodova bio je 6,29 ± 2,6. Statistička analiza pokazala je da su sestre sa završenom sred- njom školom imale znatno nižu razinu znanja (5,9 ± 2,55) od sestara koje su završile viši stupanj obrazovanja – bakala-
points obtained by the nurses was 6.29±2.6. The statistical analysis showed that the nurses with secondary education had a significantly lower level of knowledge (5.9±2.55) than the respondents with higher education, respectively Bachelor’s and Master’s degree, 7.29±3 and 7.6±2.16 (p=0.019, the Kruskal-Wallis test). Nije bilo razlika u razini znanja ovisno o mjestu škole i sudjelovanju u izobrazbi o prevenciji karijesa (tablica 2.). No, znanje je bilo povezano s mišljenjem o učinkovitosti i sigurnosti terapije fluoridima. Sestre koje nisu bile

| Table 1 | Percentage of nurses who correctly answered to questions about fluoride toxicity. Postotak sestara koje su točno odgovorile na pitanja o toksičnosti fluorida |
|---|---|
| Question • Pitanje | N (134) | % |
| Do you know the level of fluoride in drinking water in your area? • Znate li kolika je razina fluora u vodi za piće u vašoj okolici? | yes • da | 77 | 57.5 |

| Question • Pitanje | Broj bodova (SD) |
|---|---|
| Which are real symptoms of acute fluoride toxicity?* • Koji su pravi simptomi akutnoga trovanja fluorom? | 6.29±2.6 |
| nausea, vomiting • mučnina, povraćanje | 111 | 82.8 |
| abdominal pain • bol u trbuhu | 101 | 75.4 |
| excess salivation • hipersalivacija | 59 | 44 |
| headache • glavobolja | 40 | 29.9 |
| cardiac arrhythmia • srčana aritmija | 58 | 43.3 |
| tetany • tetanija | 36 | 26.9 |
| What is the first aid procedure in acute fluoride toxicity?* • Kako se pruža prva pomoć u slučaju akutnog trovanja fluorom? | 6.29±2.6 |
| giving milk • konzumiranjem mlijeca | 60 | 44.8 |
| inducing vomiting • poticanjem povraćanja | 47 | 35.1 |
| quick referral to hospital • brzim prijevozom u bolnicu | 75 | 56 |
| What is a PTD in children • Koja je doza vjerojatno toksična za djecu? | 1-5 mg/kg | 69 | 51.5 |
| What is the content of fluorides in gel for topical use? • Koji je udio fluorida u gelu za topikalnu primjenu? | 12.5 mg/1g | 110 | 82.1 |

* multiple-response question • pitanja s više odgovora

| Table 2 | Factors influencing nurses’ knowledge. Čimbenici koji utječu na znanje sestara |
|---|---|
| Education • Školovanje: | No. of points • Broj bodova (SD) |
| secondary • srednja škola | 5.9 (2.55) |
| Bachelor’s degree • bakalaureat | 7.29 (3.0) |
| Master’s degree • magisterij | 7.6 (2.16) |
| Location of school • Lokacija škole: | 5.3 (2.59) |
| city • grad | 6.39 (2.77) |
| town up to 100 000 • grad do 100 000 | 6.68 (2.54) |
| village • selo | 7.36 (2.02) |
| Training on caries prevention • Izobrazba o prevenciji karijesa: | 6.19 (2.04) |
| yes • da | 6.43 (2.63) |
| no • ne | 5.5 (0.7) |
| Opinion about the effectiveness of topical fluoride treatment • Mišljenje o učinkovitosti topikalne primjene fluorida: | 6.31 (2.76) |
| very efficient • vrlo učinkovito | 6.32 (2.33) |
| sufficient • zadovoljava | 5.57 (2.22) |
| without any influence • bez utjecaja | 6.38 (3.71) |
| no opinion • nemam mišljenje | 4.47 (2.02) |
| Opinion about safety of topical fluoride treatment • Mišljenje o sigurnosti topikalne primjene fluorida: | 6.85 (2.54) |
| totally safe • potpuno sigurno | 5.83 (3.12) |
| safe subject to proper procedures • sigurno, ali ako se pravilno provodi | 6.0 (3.46) |
| doubts about safety • sumnja o sigurnosti | <0.000 |
| great risk of overexposure to fluorides • veliki rizik u slučaju prevelike izloženosti fluoridima | <0.000 |

* Kruskal-Wallis test • Kruskal-Wallisov test

points obtained by the nurses was 6.29±2.6. The statistical analysis showed that the nurses with secondary education had a significantly lower level of knowledge (5.9±2.55) than the respondents with higher education, respectively Bachelor’s and Master’s degree, 7.29±3 and 7.6±2.16 (p=0.019, the Kruskal-Wallis test). Nije bilo razlika u razini znanja ovisno o mjestu škole i sudjelovanju u izobrazbi o prevenciji karijesa (tablica 2.). No, znanje je bilo povezano s mišljenjem o učinkovitosti i sigurnosti terapije fluoridima. Sestre koje nisu bile
Kruskal-Wallis test). There were no differences in the level of knowledge depending on location of school and participation in training on caries prevention (Tab. 2). However, the knowledge was associated with nurses’ opinions about the effectiveness and safety of fluoride treatment. Nurses who were not aware of a potential harmful effect of fluoride and those with a negative opinion about the effectiveness of the fluoride program at school had a statistically significantly lower level of knowledge (Table 2).

Discussion

Apart from home, healthy behaviors should also be introduced and developed at school. A motivating influence of school with regard to oral health also reaches, through children, the families and local communities. School nurses may be promoters of oral health behaviors and providers of caries prophylaxis (16). Almost all investigated nurses included oral health topics in their duties. They discussed the role of hygiene and diet in caries development, instructed pupils how to brush teeth and provided the fluoride topical treatment. Moreover, almost a half of the respondents declared that caries prevention took a substantial part of their work time with pupils. Also children, especially from rural locations, felt that the school nurse was the appropriate person to ask for an oral health consultation.

The school-based oral hygiene programs may be effective in improving oral health (17,18). Extensive evidence points to a high effectiveness in dental caries prevention by a regular use of fluoride preparations in the school environment, which was confirmed by the opinion of evaluated nurses. The advantages of such prevention include primarily an easy accessibility to the children and the possibility to regularly perform the procedures. The Polish school-based fluoride program is addressed to all children attending primary schools. However, the latest research by the Mother and Child Institute (19) revealed that a large group of school nurses (above 1/3) had difficulties in performing the fluoridation in pupils. Nurses most frequently report the reluctance of pupils to take part in the procedures (68.8%), difficulties in obtaining toothbrushes (52.9%), difficulties related to excusing pupils from class for the time of fluoridation (29.4%), difficulties resulting from the lack of place for the storage of toothbrushes (17%) (19). In our study, the mean percentage of pupils taking part in the program constituting more than 90% of the school population was significant. However, in several cases the nurses declared that less than a half of the pupils took part in the fluoridation. The refusal of parents to give consent to the participation of their child in caries prevention procedures at school may be due to numerous reasons: the lack of indication for fluoridation in individuals with a low risk of caries, the lack of parents’ awareness of advantages of this procedure, the lack of trust in public healthcare as well as the avoidance of preparations containing fluoride. According to the study of Hendaus et al. (20), many parents are not sure of the safety of fluoride preparations used in children. Therefore, it is important that the nurses are convinced of the safety of using fluoride prevention and are able to give svjesne potencijalno štetnog djelovanja fluorida i one koje su imale negativno stajalište o učinkovitosti programa fluoridacije u školama, imale su statistički značajno nižu razinu znanja (tablica 2.).

Rasprava

Zdrav način života trebao bi se uvesti i promicati kod kuće i u školama. Motivirajući utjecaj škole, kad je riječ o oralnome zdravlju, obuhvaća, zahvaljujući djeci, i obitelji i lokalnu zajednicu. Školske medicinske sestre mogu biti promotorice oralnoga zdravlja i pružateljice mjera za zaštitu od karijesa (16). Gotovo sve sestre koje su sudjelovale u istraživanju uvrstile su u svoje dužnosti i teme o oralnome zdravlju. Razgovaraju s učenicima o ulozi higijene i prehrane u razvoju karijesa, pokazuju im kako četkati zube te topikalno primjenjuju fluorid. Nadalje, gotovo polovina anketiranih izjavila je da je prevencija karijesa važan dio njihova rada s učenicima. Djeca, posebno u seoskim područjima, imaju osjećaj da je školska medicinska sestra prava osoba za razgovor i konzulzaciju o oralnoj higijeni.

Programi oralne higijene koji se provode u školama učinkovito poboljšavaju oralnu higijenu (17, 18). Mnogobrojni su dokazi koji pokazuju da je redovito korištenje preparata fluora visoko učinkovito u prevenciji karijesa, a to mišljenje potvrdile su i medicinske sestre. Prednosti toga načina prevencije su dostupnost djece i mogućnost redovite provedbe procedure. Poljski programi fluoridacije za škole uključuju svu djecu koja pohađaju osnovnu školu, no novije istraživanje Instituta za majku i dijete (19) pokazalo je da velika skupina (više od 1/3) školskih medicinskih sestara ima poteškoće u provedbi toga postupka. Sestre najčešće navode nevoljnost djece da sudjeluju u postupcima (68,8 %), probleme zbog odlaska djece s nastave kako bi se obavila fluoridacija (29,4 %) te poteškoće u vezi s nedostatkom mjesta za skladištenje četkica za zube (17 %). U našem istraživanju je prosječan postotak djece koja sudjeluju u programu iznosio više od 90 % školske populacije te je bio znatan. No, u nekoliko slučajeva sestre su izjavile da je manje od pola učenika sudjelovalo u fluoridaciji. Razlozi za to su višestruki – nedostatak indikacije za fluoridaciju kod pojedincima s niskim rizikom od karijesa, premala svijest roditelja o prednostima tog postupka, premalo povjerenja u javni zdravstveni sustav te izbjegavanje preparata koji sadržavaju fluor. Prema istraživanju Hendausa i suradnika (20), velik broj roditelja ne vjeruje u sigurnost preparata fluor za djecu. Zato je važno da su sestre uvjerene u sigurnost upotrebe fluorida u prevenciji te da mogu dati objašnjenja roditeljima koji su zabrinuti zbog tih postupaka. Posebno je to važno zbog mnogobrojnih pokreta protiv upotrebe fluorida (21). U našem istraživanju manje je od 6 % sestara sumnjalo u sigurnost visokih koncentracija fluorida. Većina je vjerovala da pravilna procedura jamči sigurnost.
explanations to parents being anxious about such procedures. It is particularly important in the context of numerous movements against the use of fluoride (21). In our study, less than 6% of nurses themselves had doubts about the safety of high concentration of fluorides. The majority of nurses correctly believed that the proper procedure guaranteed its safety.

In fact, the risk of hazardous effects of fluoride ingestion is very low in school-based programs, but the staff responsible for the application of gels or varnishes should be familiar with the symptoms of acute toxicity. We revealed the gap existing in this area. Many respondents did not know the level of fluoride in drinking water despite the fact that it is an important aspect of indications for the topical application of fluorides. In areas where the optimal level of fluoride in drinking water (0.8-1.2 ppm) is exceeded, there is no indication to apply fluorides topically. An acute fluoride poisoning has many symptoms, but evaluated nurses were not able to identify all of them. Moreover, less than a half of the respondents knew that the administration of milk is the first aid for a victim.

It has to be stressed that such gaps in knowledge could be expected. Golinveaux et al. (22) found that pediatric nurses were not able to correctly answer the questions related to the hazardous effect of fluoride ingestion. The lack of knowledge of fluorides was also found in dental staff, even in dentists (23, 24). It is obvious that nurses need to acquire knowledge to become competent and skilled to take action against caries. A study on pediatric nurses showed that gaps were improved by the interdisciplinary, multifaceted education (22). We found that the level of knowledge was dependent on education, to the disadvantage of respondents who did not have a university diploma. Unfortunately, most Polish school nurses have only secondary education. The lack of knowledge corresponded with the conviction of complete safety of fluorides in children, which may result in less supervision of the children during the procedure.

Our study revealed that the cooperation between school nurses and local dentists was insufficient and there was no obligatory training for them with regard to the application of topical fluorides and other aspects of caries prevention. It seems that it is time to call for action to prepare an educational program for school nurses to help them with their role as oral health promoters. New media such as the Internet can be used for the communication with nurses to save their time and effort.

Conclusion

Polish school nurses have the ability to incorporate oral health at the school setting. They have positive attitudes toward topical fluoride treatment in pupils. The gaps in their knowledge should be filled by increasing the education level and developing institutional training.

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Authors would like to express their gratitude to all participants for their time and effort during filling in the questionnaires. It is particularly important in the context of numerous movements against the use of fluoride (21). In our study, less than 6% of nurses themselves had doubts about the safety of high concentration of fluorides. The majority of nurses correctly believed that the proper procedure guaranteed its safety.

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Our study revealed that the cooperation between school nurses and local dentists was insufficient and there was no obligatory training for them with regard to the application of topical fluorides and other aspects of caries prevention. It seems that it is time to call for action to prepare an educational program for school nurses to help them with their role as oral health promoters. New media such as the Internet can be used for the communication with nurses to save their time and effort.

Zaključak

Školske medicinske sestre u Poljskoj znaju primijeniti mjere za oralno zdravlje u školskom okružju. Imaju pozitivna stajališta o topikalnoj primjeni fluorida i o drugim aspektima prevencije karijesa. Čini se da je trenutak da se pripremi novih znanja kako bi bile kompetentne i spremljene u vezi s djece i školama. U našem istraživanju istaknuto je da suradnja između školskih medicinskih sestara i lokalnih doktora oralne medicine nije dovoljna, te da nema obvezne izobrazbe sestara o topikalnoj primjeni fluorida i o drugim aspektima prevencije karijesa. Čini se da je trenutak da se pripremi edukacijski program za školske sestre koji će im pomoći u ulozi promotorica oralnoga zdravlja. Novi mediji, ponajprije internet, mogu se iskoristiti za kontakt sa sestrama, čime bi se uštedjelo njihovo vrijeme, ali i smanjio napor.

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Conflict of interest

The authors report no conflict of interest

Sukob interesa

Autori nisu bili u sukobu interesa.

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