

XYLITOL CHEWING GUM CONSUMPTION in a GROUP of 12 YEAR OLD ISTANBUL SCHOOL CHILDREN

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Summary:

Objectives. The present study aims to describe the use of xylitol among some adolescents in Turkey, being the first step of future studies.

Key words: chewing gum, human behaviour, Istanbul, xylitol.

Introduction. Motivation

Data was collected using a one page, standardized questionnaire. Questionnaires were answered anonymously in school classrooms. The sample (190 girls, 194 boys) was representative of 12 year old Istanbul school children. The samples were randomly selected from 8 private funded schools of downtown Istanbul.

Results

From 384 children questioned, 42 % of them (77 girls, 83 boys) knew what xylitol was. From the children attended, only 19 % used xylitol chewing gum on a daily basis. More boys (21%) used xylitol chewing gum than girls on a daily basis (18%).

Conclusions

It may be concluded that use of xylitol chewing gum in a group of Istanbul school children is not common.

Chewing of sugar-free chewing gum three or more times daily for prolonged peri-

ods of time may reduce caries incidence. Significant reductions in dental caries occurred associated with the use of chewing gum containing xylitol [1-2]. The positive effect of xylitol on dental caries were detected during clinical trials, the Turku Sugar Studies, in Finland in 1971-1973 [3]. Recently, clinical and epidemiological xylitol studies in different countries were carried to promote caries preventive measures [4-20]. Besides noimportant adverse side effects are undermined in recent literature. In Turkey, water fluoridation is not available [21] and mean caries increment 2.73 DMFS among 12 years old children [22]; which makes additional caries preventive attitudes such as xylitol consumption important.

Xylitol chewing gum became commercially available in Finland in 1975. In 1977, the frequency of daily use of xylitol chewing gum among Finnish adolescents was rare, at about 1% [23]. It increased quite rapidly during the 1980's, reaching 15% among boys and 32% among girls by 1991 [24]. In a region near Turku, as many as 80% of all 3 year olds were using xylitol chewing gum by 1990 [19]. A special xylitol campaign called 'Smart Habit' was organized in Finland in

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1992, involving 13 year old school children. 41% of children involved used xylitol chewing gum [20]. In 1999, the percentage of xylitol chewing gum users were 47% and 46% among 11 and 13 year old boys and 57% and 65% among 11 and 13 year old girls respectively [25]. However there is no data regarding the awareness and use of xylitol among children out Finland. The present study describes the use of xylitol among some adolescents in Turkey, being the first step of future studies. Oral health knowledge, attitudes and behaviour as well as oral health status are closely linked with various socio-economic factors. Children from letter group have more favorable attitudes, behaviour and oral health knowledge than the more socially disadvantaged groups [26]. In Turkey, xylitol chewing gum for children has been in market for the last decade and there is a social change in public regarding entrance into European Union. Xylitol chewing gum practice can be expected to take place first among children, who usually adopt innovations first.

The aim of the present study was to find out how common the recommended habit of using xylitol chewing gum on a daily basis was among 12 year old Istanbul school children from private funded schools.

Methods

A one page, standardized questionnaire was prepared. Questionnaires were answered anonymously in school classrooms during the fall term 2004. The sample (190 girls, 194 boys) was representative of 12 year old (in grade 6) Istanbul school children from eight private funded schools. Age 12 was selected as this age constitutes the biggest population in Turkish society. The response rate was 100%. Information concerning daily use xylitol chewing gum was collected by the questions below.

- ‘Do you know what is xylitol?’ i)no, ii)yes
- ‘If yes, where did you hear of it?’ i)TV, ii) newspaper, iii) family advice, iv) school, v) friends vi) dentist & pediatrician, vii) other, viii) more than one of these
- ‘Do you use chewing gum on a daily basis?’
 - yes
 - no
- ‘Do you prefer any type of chewing gum?’
 - no
 - yes, xylitol sweetened chewing gum
 - yes, other sweetened chewing gum
- ‘Do you brush your teeth? i) less than once a day, ii)once a day, iii)more than once a day

Information about gender and brushing habits were also collected. No attempt was made to follow up on children who were absent on the day of the survey. Appropriate statistical analysis was performed by means of the version 10.0 of the SPSS software for Windows. Statistical significances were calculated using the Chi-square test.

Results

From 384 children questioned 42 % of them (77 girls, 83 boys) knew what xylitol was. More than half of the children who are aware of xylitol (54%) stated they heard it from TV advertorials. It is an interesting fact that only 9% of the children heard xylitol from their dentist or pediatrician (Table 1). Regarding type of chewing gum used, 54% did not notice the type of gum, while 19% preferred xylitol chewing gum (Table 2). From the children attended, 37% used chewing gum on a daily basis while only 19 % used xylitol chewing gum on a daily basis (Figure 1). In daily basis, more boys chew gum than

girls. ($p = 0.000$) More boys (21%) used xylitol chewing gum than girls on a daily basis (18%) ($p = 0.000$).

Table 1. Source of xylitol information received (n:160)

	n	%
TV	86	54
Newspaper	3	2
Family	7	4
School	1	0
Friends	8	5
Dentist/Pediatrician	15	10
Other	13	9
More than one source	27	16
Total	160	100

Table 2. Use (%) of xylitol and other chewing gum among Istanbul school children (n:384)

	Boys	Girls	Total	
	n	n	n	%
No response	19	9	28	7
Any type of chewing gum	97	110	207	54
Sweetened chewing gum	20	15	35	9
Xylitol chewing gum	40	34	74	19
Xylitol/artificial sweetened chewing gum	1	2	3	1
Other	17	20	37	10

Discussion

Dental caries is still a big problem among Turkish children and adolescents and xylitol should be one of the therapeutic agents to solve this health problem. Xylitol exerts its antibacterial action through hampering bacterial growth through metabolic reactions. Xylitol is incorporated in the cell

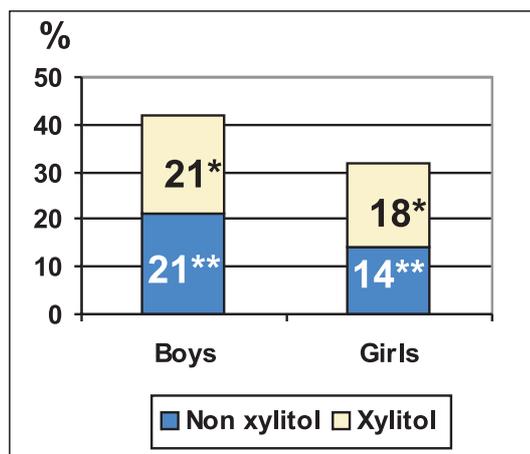


Figure 1. Daily use of xylitol chewing gum (n:74) in relation with daily chewing gum users (n:142) among Istanbul school children
* $p=0.000$, ** $p=0.000$

with help of the fructose-specific phosphotransferase system and phosphorylated to xylitol-5-phosphate [27]. This substance inhibits further intracellular metabolism of the bacterial cell and the process consumes energy. After exposure to xylitol, a shift towards xylitol-resistant mutans streptococci has been shown in saliva [28] and it has been suggested that those strains have a reduced ability to adhere to the tooth surfaces [29]. However there are also some health concerns regarding usage of xylitol such as abdominal distress, osmotic diarrhea when 3-60 gr xylitol consumed per day [30-33].

While introducing xylitol to children, media seems to be the most effective way for children to learn xylitol. Today AAPD supports preventive strategies aimed specifically at long term caries pathogen suppression and caries (dmf) reduction using commercially available non-cariogenic sugar substitutes such as xylitol [34].

The term 'xylitol' seems to be familiar to nearly half of the study population. At this point, media seems to be important in emphasizing xylitol and chewing gum. However most of the children described xylitol as: 'gives freshness to oral cavity' (10%), 'whitens teeth' (44%), 'prevents from dental caries' (42%), 'eliminate bad odour'

(4%). Regarding these statements, it seems that children are affected from xylitol advertorials on TV. Dentists and pediatricians should be educated regarding recommendation xylitol chewing gum to children. However it should also be noted that regular use of xylitol is more likely to reduce the numbers of mutans streptococci in saliva and plaque however, not all studies on the effect of xylitol confirm a mutans-reducing effect.

The daily use of xylitol chewing gum among 12 year old children is limited (19%). Nearly half of daily chewing gum users do not prefer xylitol. There may be several explanations for this attitude. Xylitol chewing gum is not presented as a caries preventive agent. Secondly Turkish Dental Association did not give its endorsement of the use of xylitol. However in last decade, Turkish dental schools emphasize the role of xylitol in dental health education in their curriculum.

In the present study, more boys used xylitol chewing gum than girls on a daily basis. This finding is interesting to point out social change in daily Turkish life. In recent

decades, it was a misbehaviour for boys and men to chew gum, as it seemed as a feminine attitude in Turkish culture. Our findings are in contrast of Honkala et al [23-25] where xylitol chewing gum has been found to be more prevalent among girls than boys.

In the present study, the frequency of toothbrushing was significantly related to daily use of xylitol chewing gum. Obviously the economic situation of the family and toothbrushing frequency seems to be strongly interrelated in other studies [24-25]. In the present study, families rather belong to high socioeconomic class and toothbrushing seems to be important as 61% of children brush their teeth more than once a day.

Conclusion

It may be concluded that use of xylitol chewing gum usage among Istanbul school children is not common. However educational activities should be further encouraged regarding xylitol's preventive measures against dental caries.

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