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Research Article

Dental Health Education: Chewing Gum Containing Xylitol in Junior High School Students

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ABSTRACT

Background: The high number of adolescent complaints related to dental and oral problems is related to the level of knowledge of adolescents in maintaining dental and oral health. Chewing xylitol gum is an alternative that has been proven to be quite effective in cleaning teeth from debris and plaque. Objective: This study aims to analyze the knowledge of students of junior high school PGRI 10 South Jakarta before and after being given education about chewing gum containing xylitol. Methods: This type of research is a quasi-experimental. The sample in this study amounted to 62 students, conducted in April 2022. Data collection by distributing pre-test and post-test questionnaires to measure knowledge before and after being given education about chewing gum containing xylitol. Data analysis using paired sample test. Results: Before the education was conducted, there were 9 students in the good knowledge category with a percentage of 14.5%, in the sufficient knowledge category there were 31 students with a 50.0% percentage, in the poor knowledge category there were 22 students with a 35.5% percentage. After education, there were 61 students in the good knowledge category with a percentage of 98.4%, in the sufficient knowledge category there was 1 student with a 1.6% percentage, in the poor knowledge category there were no students with a 0% percentage. The comparison of the average pre-test score is 6.05 while the total post-test average score is 9.40 with a p-value of 0.001. Conclusion: Education about chewing gum containing xylitol is effective in increasing the dental health knowledge of junior high school students.

Key words: Education, knowledge, chewing gum, xylitol

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INTRODUCTION

ental and oral health is often the umpteenth priority for some people. Teeth and mouth are the gateway for germs and bacteria to enter so that they can cause problems in other organs of the body. The problem that is often experienced by the Indonesian people in the field of dental and oral health is dental caries in addition to gum disease.^{1–3}

The results of basic health research in 2018 show that 55.6% of adolescents aged 10-14 years and 51.9% of adolescents aged 15-24 years suffer from dental and oral diseases, dental and oral health maintenance behavior is known to be low. In fact, the prevalence of adolescents in Indonesia, it is reported that dental and oral health problems

increased from 25% in 2013 to 56% in 2018 and 73% had suffered from caries in 2018. 4,5

The high number of adolescent complaints related to dental and oral problems is related to the level of knowledge of adolescents in maintaining dental and oral health. Knowledge of dental and oral health is a person's ability to know everything about dental and oral health, knowledge is used as a self-education to achieve optimal dental and oral health.⁶⁻⁹

One of the causes of caries is the unavoidable collection of bacteria bound in plaque. Plaque control efforts can be pursued in two ways, namely mechanically and chemically which have been proven in various literatures. The mechanical method is to use a toothbrush, while the chemical method is to use chemicals that are anti-plaque such as toothpaste, mouthwash and xylitol gum. Chewing xylitol gum is an alternative that has been shown to be quite effective for cleaning teeth from debris and plaque, preventing periodontal disease, increasing salivary pH and stimulating saliva production.^{10–13}

Xylitol can neutralize the acidity in the mouth and increase the production of saliva to clean teeth. Xylitol is an organic chemical compound that was created as an artificial sweetener instead of sugar. Xylitol does not cause damage to teeth, it can even prevent bacteria in the mouth. Xylitol is a sweetener that is extracted from the wood fiber of the whitebirch tree.¹⁴⁻¹⁶

The benefits of chewing xylitol gum for dental and oral health after eating, have been shown to reduce gingivitis and increase salivary flow which reduces the amount of acid in the mouth, and chewing gum containing xylitol to reduce the number of bacteria in the mouth. Xylitol can inhibit the growth of plaque-forming bacteria. Xylitol is also able to reduce the synthesis of extracellular polysaccharides which can lead to the attachment of plaque bacteria. Xylitol does not produce any acid in plaque.

RESULTS

 Table 1: Frequency distribution of dental health knowledge before education about chewing gum containing xylitol

Knowledge	Frequency	Percentage (%)
Good	9	4 14.5
Sufficient	31	50.0
Less	22	35.5
Total	62	100

Table 1 shows that shows that the number of students who have knowledge about chewing gum containing xylitol before education is carried out, namely, in the good knowledge category there are 9 students with a percentage of 14.5%, in the category of sufficient knowledge there are 31 students with a percentage of 50.0%, in the category of less knowledge there are 22 students with a percentage of 35.5%.

 Table 2: Frequency distribution of dental health knowledge after education about chewing gum containing xylitol

Knowledge	Frequency	Percentage (%)
Good	61	98.4
Sufficient	1	1.6
Less	0	0.0
Total	62	100

Table 2 shows that the number of students who have knowledge about chewing gum containing xylitol after education, namely, the good knowledge category is 61 students with a percentage of 98.4%, the knowledge category is sufficient there is 1 student with a percentage of Several studies have shown that xylitol raises the pH and therefore this type of sugar is considered very safe for teeth. Xylitol can reduce cavities, plaque, and by itself will inhibit the development of streptococcus bacteria.^{17–19}

METHODS AND MATERIALS

The research design used was a quasi-experimental research. This research was conducted on seventh grade students of PGRI 10 Junior High School, South Jakarta in April 2022. Sampling carried out in the study was total sampling where the entire population became the research sample.²⁰

The research instrument used was a modified questionnaire sheet from previous research.²¹The mechanism of data collection was obtained by giving a questionnaire containing 10 questions to measure knowledge before and after giving education on chewing gum containing xylitol using power point media which was carried out in a class VII PGRI 10 Junior High School, South Jakarta. The form of the questionnaire in this study is multiple choice, with the provision of a certain value, namely where each correct answer is given a value of 1 (one) and if the wrong answer is given a value of 0 (zero). Analysis of the data used is the paired sample test.

1.6%, the knowledge category less there are no students with a percentage of 0%.

Table 3: Test	the effectiven	ess of dental health knowledge before and				
after intervention						

Variable		Knowledge	
×/		Mean	P- value
Knowledge	Pre-test	6.05	0.001
	Post-test	9.40	

Table 2 shows the results of the effectiveness test of the data before and after being given dental health promotion about chewing gum containing xylitolshowed that the p-value of the intervention group was 0.001 (p<0.05), meaning that the education about chewing gum containing xylitol is effective in increasing the dental health knowledge.

DISCUSSION

The results of the study on Knowledge before and after being given education about chewing gum containing xylitol in class VII students of PGRI 10 Junior High School, South Jakarta In 2022, there was an increase in the knowledge of students who previously did not know to know, with the results before being given education, the category of knowledge either there are 9 students with a percentage of 14.5%, the category of knowledge is sufficient there are 31 students with a percentage of 50.0%, the category of knowledge is less there are 22 students with a percentage of 35.5%. After being given education there are categories with good knowledge, there are 61 students with a percentage of 98.4%, in the category of sufficient knowledge there is 1 student with a percentage of

1.6%, in the category of lack of knowledge there are no students with a percentage of 0%.

The results of the comparison of knowledge before and after being given education about chewing gum containing xylitol can be seen in table 3 shows that the average score before being given education (pre-test) is 6.05 with sufficient knowledge category, while the average score after being given education (post-test) 9.40 with good knowledge category. There was an increase in the average score for the pre-test and post-test scores of 3.35 with p=0.001.

When compared with research conducted by Widyantari, in Denpasar Bali, it showed that the level of knowledge before being given counseling was in the sufficient category as many as 24 people (42.11%), while the level of knowledge after being given counseling was in the good category as many as 47 people (82,46%). The average level of knowledge before being given counseling was 58.80 (less) while the average level of knowledge after being given counseling was 58.70 (good).²²

Reinforced research Simbolon, in Cimindi Bandung shows that the percentage of knowledge 74.4% is in the sufficient category. While the presentation of knowledge after being given health counseling was 91.66%, which shows the value in the good category. The results obtained were an increase from the sufficient category before being given counseling and the good category after being given counseling.²³

The increase in respondent's knowledge is due to interesting dental health education using power point media, so that it has a positive impact in the form of increasing respondents' oral and dental health knowledge. According to Alfian et al.that there was a change in respondents' knowledge after counseling using power point media. Power point is a software that will help in compiling an effective, professional, and easy presentation or counseling. Power point will help an idea will be more interesting and clear in purpose when presented because power point will help in making slides, electronic presentation outlines, displaying dynamic slides, including attractive clip art, all of which are easily displayed on a computer screen.^{24–26}

CONCLUSIONS

Based on the research results, it can be concluded that there iseducation about chewing gum containing xylitol is effective in increasing the dental health knowledge of junior high school students.

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CONFLICTOF INTEREST

The authors declare that they have no conflict interests.

REFERENCES

1. Haryani W, Mindriasi F, Yuniarly E. Dental Health Status of Student Dormitory Residents in Yogyakarta, Indonesia. Int J Med Sci Dent Res. 2022;5(1):85–9.

- 2. Fadjeri I, Budiarti R, Purnama T. Dental Care Interventions as Efforts to Reduce PUFA Index and Improve Nutritional Status in Children aged 9-12 Years in Orphanages. Med Leg Updat. 2021;21(1):366–71.
- 3. Pudentiana RR, Fadjeri I, Priharti D, Mariyati M. Indeks DMF-T dan Periodontitis Pada Pasien diKlinik Pertamedika Yos Sudarso JakartaUtara. JDHT J Dent Hyg Ther. 2021;2(1):6–11.
- Riskesdas RI. Riset kesehatan dasar tahun 2013. Badan Penelitian dan Pengembangan Kesehatan Kementrian Kesehatan RI. 2013;
- 5. Kemenkes RI. Hasil utama riskesdas 2018. Jakarta Kemenkes RI. 2018;
- 6. Maida CA, Marcus M, Hays RD, Coulter ID, Ramos-Gomez F, Lee SY, et al. Child and adolescent perceptions of oral health over the life course. Qual Life Res. 2015;24(11):2739–51.
- Reddy V, Bennadi D, Gaduputi S, Kshetrimayum N, Siluvai S, Reddy CVK. Oral health related knowledge, attitude, and practice among the pre-university students of Mysore city. J Int Soc Prev Community Dent. 2014;4(3):154.
- Yulita I, Purnama T, Marliani Y. Knowledge and Attitudes of Dental and Oral Health Maintenance in Pregnant Women (Case Study: Obstetrics and Gynecology Polyclinic at Pertamina Central Hospital, Jakarta). Int Res J Pharm Med Sci. 2021;4(2):9– 11.
- Gayatri RW, Ariwinanti D. Tingkat Pengetahuan Kesehatan Gigi Anak Sekolah Dasar Negeri Kauman 2 Malang. Preventia. 2016;1(2).
- 10. Kidd EAM, Fejerskov O. Essentials of dental caries. Oxford University Press; 2016.
- 11. Nurilawaty V, Priharti D, Sukmawati AE, Purnama T. Effectiveness of Rosella Flower Extract (Hibiscus Sabdariffa L.) In Gel and Liquid form on the Growth of Streptococcus Mutans Bacteria. Int J Drug Res Dent Sci. 2022;4(2):1–9.
- 12. Duane B. Xylitol and caries prevention. Evid Based Dent. 2015;16(2):37-8.
- Janakiram C, Kumar CVD, Joseph J. Xylitol in preventing dental caries: A systematic review and meta-analyses. J Nat Sci Biol Med. 2017;8(1):16.
- 14. Nayak PA, Nayak UA, Khandelwal V. The effect of xylitol on dental caries and oral flora. Clin Cosmet Investig Dent. 2014;6:89.
- 15. De Siqueira Fraga EG, Campos FMT, da Silva Cavalcante MP, Martins LFB, Neto EMR, Mimica MJ. Xylitol, a promising allied for oral heath. J Young Pharm. 2020;12(3):197.
- 16. Agarwal B, Singh LK. Sugar and Sugar Alcohols: Xylitol. High Value Ferment Prod Hum Heal. 2019;1:285–307.
- 17. Kumar S, Sogi SHP, Indushekar KR. Comparative evaluation of the effects of xylitol and sugar-free chewing gums on salivary and dental plaque ph in children. J Indian Soc Pedod Prev Dent. 2013;31(4):240.
- Kaur K, Nekkanti S, Madiyal M, Choudhary P. Effect of chewing gums containing probiotics and xylitol on oral health in children: A randomized controlled trial. J Int Oral Heal. 2018;10(5):237.
- Ballini A, Cantore S, Signorini L, Saini R, Scacco S, Gnoni A, et al. Efficacy of sea salt-based mouthwash and xylitol in improving oral hygiene among adolescent population: a pilot study. Int J Environ Res Public Health. 2021;18(1):44.
- 20. Arikunto S. Prosedur Penelitian: Suatu Pendekatan Praktik. Revisi. Jakarta: Renika Cipta; 2010.
- 21. Prajanto A. Pengetahuan mahasiswa Kedokteran Gigi terhadap penggunaan xylitol sebagai usaha pencegahan karies gigi: kajian pada mahasiswa program profesi di klinik integrasi FKG Usakti (laporan penelitian). SKRIPSI-2012. 2017;

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- 22. WIDYANTARI NI, MARSITA M. Gambaran Tingkat Pengetahuan Tentang Pemeliharaan Kesehatan Gigi dan Mulut Sebelum dan Sesudah Diberikan Penyuluhan (Studi Dilakukan Pada Siswa Kelas V Di SDN 19 Pemecutan Tahun 2019). Poltekkes Kemenkes Denpasar; 2019.
- 23. Simbolon M. Pengetahuan Tentang Karies Gigi Sebelum Dan Sesudah Penyuluhan Kesehatan di Perguruan Advent Cimindi Bandung. J Sk Keperawatan. 2018;4(1):39–45.
- 24. Alfian M, Adiko MT, Isnanto I. Perbedaan penyuluhan menggunakan media model gigidan media powerpoint terhadap

pengetahuan masyarakat tentang karies. J Penelit Kesehatan" Suara Forikes"(Journal Heal Res Forikes Voice"). 2017;9(1):20-3.

- Ardiansah F, Miftakhi DR. Pelatihan Pembuatan Media Pembelajaran Interaktif Berbasis PowerPoint Bagi Tenaga Pendidik Paud Himpaudi Kecamatan Gabek Kota Pangkalpinang. J Pengabdi Kpd Masy Univ Bangka Belitung. 2019;6(1):16–24.
- 26. Nurhidayat O. Perbandingan Media Power Point Dengan Flip Chart Dalam Meningkatkan Pengetahuankesehatan Gigi Dan Mulut. Unnes J Public Heal. 2012;1(1).