Pop-up book as a media for dental promotion to increase knowledge of dental health in elementary school students

by Wiworo Haryani
Pop-up book as a media for dental promotion to increase knowledge of dental health in elementary school students

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Abstract

Background: Elementary school children have a high risk of dental caries. The use of pop-up books as a material for dental promotion increases the knowledge of dental health in elementary school students. Journal of Drug Delivery & Therapeutics 2022; 12(1):62-44

Methods: This study was a quasi-experimental with a pre-test-posttest with one group design. The sampling technique was purposive sampling as many as 56 students. This research was conducted at SDN Ngemplak Mlingi, Ujung Kidul Regency, Yogakarta Province from June to August 2019. The influence variable is the pop-up book media, while the dependent variable is the level of dental health knowledge of elementary school students. Results: The results of the test of material experts and pop-up book media design experts showed a value of 35.5, meaning the material was very valid and suitable to be used as a dental health education media. The significant value of the level of dental health knowledge before and after dental health education was carried out with pop-up book media (p=0.000). Conclusion: Pop-up book media about dental health is effective in increasing the dental health knowledge of elementary school students.

Keywords: Pop-up media, knowledge, dental health, elementary school students.

INTRODUCTION

The prevalence of people in Indonesia who have dental and oral problems is 25.9% in the population aged 10 years. The main factor that causes high dental and oral disease problems is the behavior of brushing teeth. The basic behavior for maintaining dental and oral health is brushing teeth properly and correctly. The definition of correct behavior in brushing teeth is the habit of brushing your teeth every day after breakfast and before going to bed at night. The data shows that the Indonesian population brushes their teeth in the morning and evening showers (76.6%), brushing their teeth properly after breakfast and before going to bed at night, for Indonesia, it is only 2.3%.

Efforts to improve dental and oral health are dental and oral health counseling to individuals, families, groups, and communities, therefore the promotion of dental and oral health that can be easily absorbed by the community is important so that it can be applied in daily life in prevention efforts. The occurrence of dental and oral diseases to improve the degree of optimal dental and oral health. Efforts to prevent dental and oral diseases can be carried out by examining plaque, training in proper and proper tooth brushing techniques, cleaning tartar, preventing cavities with fluoride and filling dental pits and fissures with fissure sealants.

Dental health education is a planned and directed effort to achieve the goal of changing dental health behavior that is able to support better dental health. Health promotion is carried out with the aim of changing individual/community behavior in the health sector, making health something of value to society, helping individuals/communities to achieve a healthy life, and encouraging the development and proper use of health care facilities.

Health promotion is also carried out as an effort to increase children’s knowledge. Lack of knowledge of children about dental and oral hygiene and its impact on health can affect children’s attitudes and actions. Health promotion activities are influenced by factors such as methods, materials/messages, officers, and props/aid/media used. Elmusuya et al. said that learning using media innovation is now important to improve the quality of learning.

Elementary school students are strategic targets for the implementation of health programs, because apart from the large number, elementary school students are also an easy target to reach because they are well organized to provide education and skills. Children entering elementary school age, in general, children will have difficulty understanding abstract learning material. Learning media can extend the boundaries of promotional space. Health promotion media are all means or efforts to display information messages to be conveyed by communicators so that targets can increase their knowledge which is ultimately expected to change their behavior in a positive direction towards health.

Efforts to increase knowledge through conventional counseling carried out with the oral lecture method for elementary school...
children showed that the increase in knowledge did not last long. It was supported by the opinion that approximately 75% of human knowledge is obtained through the eyes, while the other 25% is channeled through other senses, so that it can be said that visual media makes it easier to convey and receive health information.13–15

A preliminary study conducted using the observation method on students at SDN Balangan in January 2019 on 20 students, showed that 68% of students had a low level of knowledge about dental health and 65% of children had their teeth brushing skills not done properly and correctly. Learning about dental health in children has received less attention, and one of the reasons is the method used so far is still with lectures, children are less interested and feel bored, so that learning outcomes are not optimal.

Based on the preliminary study, the researcher will use a three-dimensional media, namely a pop-up book as an alternative to attract more students’ attention in supporting students’ understanding of dental health education. Pop-up book media is a book that can potentially move and interact through the use of paper mechanisms such as folds, slides, scrolls, and wheels. The advantages of pop-up book media are three-dimensional (3D) media, each page contains interesting pictures so that children are more active and more enthusiastic about learning. Pop-up books are also easy to use and practical, more interesting for children as learning media, so that they are expected to increase children’s motivation and learning outcomes.16–17

MATERIALS AND METHODS

The research design used a quasi-experimental design with a one-group pretest and posttest test design. This research was conducted at SDN Nglenggling, Minge District, Sleman Regency, Yogyakarta Province from June to August 2019. The sampling technique used a purposive sampling technique as many as 56 students.

The independent variable in this study was dental health promotion with pop-up book media, while the dependent variable was dental health knowledge. The instrument for measuring the dental health knowledge variable was measured using a questionnaire. The questionnaire consists of 15 questions which include brushing teeth with toothpaste, maintaining dental health, consuming foods that are good for dental health, and bad habits that affect dental health. Data analysis used paired sample test to analyze differences in knowledge before and after the intervention was given.

RESULT

Table 1. Pop-up book media validity results

| Validator   | Acquisition value | Maximum value | Percentage (%) |
|-------------|-------------------|---------------|----------------|
| Material expert | 36                | 40            | 90             |
| Design expert   | 35                | 40            | 87.5           |

Table 1 shows that the results of the material expert’s feasibility analysis show a total score of 36 (90%) with very valid criteria and design expert’s feasibility results show a total score of 35 (90.5%) with very valid criteria. The results of the analysis of material experts and design experts show that the dental health pop-up book media is very valid so it is suitable to be used as a dental health promotion media.

| No. | Variable | N  | Percentage (%) |
|-----|----------|----|----------------|
| 1   | Age      |    |                |
|     | 8–9 years | 28 | 50.0           |
|     | 10–11 years | 28 | 50.0           |
|     | total    | 56 | 100            |
| 2   | Gender   |    |                |
|     | Male     | 22 | 39.3           |
|     | Female   | 34 | 60.7           |
|     | total    | 56 | 100            |

Table 2 shows that the number of respondents aged 8–9 years is the same as those aged 10–11 years, namely 28 students (50.0%) and shows that there are more female respondents than male, namely 34 students (60.7%).

Table 3. Description of knowledge dental health

| Knowledge | Pre-test | Post-test |
|-----------|----------|-----------|
|           | n       | %        | n       | %        |
| Good      | 0       | 0        | 55      | 98.2     |
| Moderate  | 34      | 60.7     | 0       | 0        |
| Enough    | 22      | 39.3     | 1       | 1.8      |
| Total     | 56      | 100      | 56      | 100      |

Table 3 shows that the level of knowledge before promotion of dental health with pop-up media with moderate criteria was 60.7% and increased after promotion to 98.2% good criteria.

Table 4. The results of the effectiveness test of knowledge dental health before and after the intervention

| Knowledge | Mean±SD | Δ Mean | p-value |
|-----------|---------|-------|---------|
| Pre-test  | 5.34±1.133 |       |         |
| Post-test | 11.10±1.696 | -7.888 | 0.000   |

Table 4 shows that the results of the analysis of the difference test with the paired sample t-test there are differences in knowledge before and after intervention p=0.000 (p<0.05).

DISCUSSION

The showed that there were more female respondents than male. In this study, the number of female respondents was more than male. Male and female students have the same strong potential to develop their talents, apply knowledge, and interest.18

The distribution of respondents based on age shows the age of the respondents as much as 28 students (50%). Children at school age are very active in learning what is in their environment, so it needs to know and act on their environment is very large and the use of multimedia-based learning media can improve student learning outcomes because the learning process becomes effective, efficient, and fun for children.19–24

The level of knowledge before promotion with moderate criteria was 60.7% and increased after promotion to 98.2%. The benefits of dental health pop-up book media are to increase children’s imagination, increase children’s interest in reading and increase children’s creativity. Pop-up books have advantages, including providing an interesting story starting with a dimensional display, namely in the image and when the book page is opened in certain sections. The use of pop-up book media helps students to be more active and have an interest in learning and can increase children’s knowledge and learning motivation to start brushing their teeth, set the frequency of brushing teeth, which is twice per day, provide ways to maintain
toothbrushes and tell children to brush their teeth correctly.11,12

Health promotion of brushing teeth using dental health pop-
up book is done to increase a person’s knowledge from not
knowing to knowing and bad to good. This is reinforced by
the opinion of Andriany et al. that elementary school age
children always want to convey what they receive and know
from others.13 Another opinion states that the pop-up book
media is included in the very good and effective category as
a learning media because it can increase student interest in
learning, learning becomes interactive, pop-up books are
easy to carry and easy to use.14 Pop-up books have a great
influence on student learning outcomes. Pop-up books help
students understand the material presented because pop-up
books provide interesting stories, starting from a picture
display that can move when the book page is opened.15

CONCLUSION

Based on the results of the study, 3 can be concluded that
there is pop-up book media about dental health is effective
in increasing the dental health knowledge of elementary
school students.

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CONFLICT OF INTEREST

The authors declare that they have no conflict interests.

ETHICAL CLEARANCE

The study was conducted after obtaining approval from the
Research Ethics Commission, Faculty of Dentistry, Gadjah
Mada University No.00170/KKEP/FKGI-UGM/RC/2019.

REFERENCES

1. Kemenkes RI. Riset kesehatan dasar tahun 2013. Badan Penelitian
   dan Pengembangan Kesehatan Kementerian Kesehatan RI. 2013
2. Purwama T, Rasipin R, Santoso B. Pengaruh Pelatihan Telli’s
   Behavior Change Model pada Guru dan Orang Tua terhadap
   Keterampilan Menggunakan Gigi Anak Prasekolah. Qual J
   Kesmas 2015; 13(2):75-81. https://doi.org/10.34082/qjk.v13i2.80
3. Sandstrom A, Cressey J, Steecken-Bicka C. Toothbrushing
   behaviour in 6-12 year olds. Int J Paediatr Dent. 2011; 21(1):43-
   9. https://doi.org/10.1111/j.1365-263X.2010.01080.x
4. Jurgenen N, Petersen PE. Promoting oral health of children
   through schools: results from a WHO global survey 2012.
   Community Dent Heal. 2013; 30(4):284-18
5. Sutjarjo US. Profil Kesehatan Indonesia. Jakarta Kementerian
   Kesehatan RI. 2016;
6. Kemenkes RI. Pedoman Usaha Kesehatan Gigi Sekolah (UKGS).
   Jakarta Kementerian Kesehatan RI. 2012;
7. Pudendiana Ir RE, Sobandini SL, AMKG Sp. Bahan ajar pendidikan
   kesehatan gigi. 2019;
8. Notoatmaja S. Promosi Kesehatan Teori dan Aplikasi. RinekaCipta,
   Jakarta, 2010.
9. Leosu FM, Fangeman DH, Wovor VNS. Hubungan pengetahuan
   kesehatan gigi dan mulut dengan indeks gingivitis 3D Katolik St
   Frater Don Bosco Manado. e-Jurnal. 2015; 5(6).
10. Elmurshdy H, Hidayat WN, Asfan K. Interactive learning media
   innovation: utilization of augmented reality and pop-up book to
   improve user’s learning autonomy. In Journal of Physics: Conference
   Series. IOP Publishing; 2019, p. 12031.
11. Setiawati S, Shabana N, Suparlini Y, Santuri Y. The Influence of
   Health Education How to Care for Teeth and Mouths on Knowledge, Attitude
   and Skills and the Status of Dental and Oral Health in Elementary
   School. Asia J Appl Sci. 2018; 6(6).
12. Suwalowati D. Promosi Kesehatan, Kementerian Kesehatan RI. 2016;
13. Angelopoulos L, Kavodina K, Tsolokid K, Oulis GJ. Comparative
   clinical study testing the effectiveness of school based oral health
   education using experimental learning or traditional lecturing to
   10 year-old children. BMC Oral Health. 2015; 15(1):1-7.
14. Wahyuni R, Frazonsusari GN. Bulu Goi Braille sebagai Media
   Penilikid ke Anak Tuna Netra. Umnes J Public Heal. 2016; 5(1):
   57-66. https://doi.org/10.15294/umjph.v5i1.9704
15. Yuniwati C, Yunnaini Y, Khatimah K. Pengaruh Media Audio Visual
   Dan Media Leaflet Terhadap Tingkat Pengertian Remaja Mor Darul
   Ihsan Aceh Rosar Tentang Hiv/Aids. JIH PANNIMED (Pharmaceutic,
   Anal Nurse, Nutr Midwifery, Environt Dent. 2018; 13(2):116-20.
   https://doi.org/10.36911/jpannimedi.v13i2.390
16. Anggraeni W, Nurwahidah S, Anjari A, Refiayanti D, Ika N. D.
   Development of Pop-Up Book Integrated with Quranic Verses
   Learning Media on Temperature and Changes in Matter. In Journal of
   Physics: Conference Series. IOP Publishing; 2019, p. 12084.
17. Sarji NIE, Suryana D. Thematic Pop-Up Book as a Learning Media for
   Early Childhood Language Development. J Pendidik Uda Din. 2019;
   13(1):45-57. https://doi.org/10.21099/10.21099/jpud.131.04
18. Nia J. Perempuan Nusantara: traditionalisme dan kultur patriarki.
   Yayasan Pustaka Obor Indonesia. 2012;
19. Andriany P, Novita CF, Ay Minty S. Perbandingan efektivitas media
   penyuluhan poster dan kartun animasi terhadap
   pengetahuan kesehatan gigi dan mulut (Studi pada Siswa Kelas V
   SD24 Kota Bandung). J Syahika Kaidah Dent Soc. 2016; 8(1):
   65-72. https://doi.org/10.25273/app.v6i2.2702
20. Azyad MN. Penerangan Media Pembelajaran Berbasis Multimedia
   Interaktif Terhadap Mahasiswa UHP Padli Uzuno Malang. Jurnal A
   SeJ Dan Pembelajarannya. 2018; 6(2):180-91. https://doi.org/10.25273/app.v6i2.2702
21. Salykut H, Muhayyan S. Penggunaan Media Pop Up Book dan
   Pengaruhnya Terhadap Peningkatan Pemahaman Siswa dalam
   Memahami Teks-Teks Bahasa Arab. EL-IQTIKAR & Pendidik Bhs. Arab.
   2019; 8(1):53-77. https://doi.org/10.24235/etikmar.v8i1.4655
22. Rizikka N, Christooso S. Efektivitas buku pop-up terhadap
   pemahaman kesehatan gigi anak berkebutuhan khusus. Indonesian J
   Paeediatr Dent. 2018; 1(1):22-5.
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