

## e-HERO (Electronic oral health promotion) as an educational media

### e-HERO (Electronic oral health promotion) sebagai media edukasi

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#### ABSTRACT

**Background:** WHO survey in 2017 shows that oral disease is one of the most common diseases in the world. Indonesian Ministry of Health Survey in 2013 shows that prevalence of oral diseases is 25,9%. South Sulawesi Province has the highest prevalence of 36,2%. The high number of prevalence is mainly influenced by the number of dentists, health facilities and lack of public awareness and knowledge of oral health, especially in the rural areas. The efforts in improving the knowledge in oral health can be done through the health promotion such as multimedia method as well as the efforts in preventing oral disease can be done by early detection. **Objectives:** To develop e-Hero as an innovation of media education about dental health education, and to know the effect of e-Hero on oral health knowledge on elementary school aged 10-11 years in SDI Baraya I, Makassar. **Method:** This research used pre-experiment method with one group pretest-posttest design. Samples were 40 people. Data were collected using questionnaires consisting of 22 questions. The assessment of knowledge consists of pretest, posttest I and posttest II. Data were analyzed using Chi-square test. **Result:** The results of all questions showed statistically significant improve knowledge except for questions about fluoride and toothbrush type that did not show significant at significance  $p < 0.05$  after using e-Hero. **Conclusions:** Dental health education media based on e-Hero can improve knowledge about oral health in students aged 10-11 years.

#### ABSTRAK

**Latar belakang:** Survei WHO tahun 2017 menunjukkan bahwa penyakit gigi dan mulut merupakan salah satu penyakit yang paling banyak diderita di dunia. Survei Kementerian Kesehatan RI tahun 2013 menunjukkan prevalensi penyakit mulut 25,9% dan Provinsi Sulawesi Selatan tertinggi, yaitu 36,2%. Tingginya angka prevalensi tersebut terutama dipengaruhi oleh jumlah dokter gigi, fasilitas kesehatan dan tingginya kesadaran serta minimnya kesadaran dan pengetahuan masyarakat terhadap kesehatan gigi dan mulut, terutama di daerah pedesaan. Upaya peningkatan pengetahuan tentang kesehatan mulut dapat dilakukan melalui promosikesehatan menggunakan metode multimedia serta upaya pencegahan penyakit mulut dapat dilakukan dengan deteksi dini. **Tujuan:** Mengembangkan e-Hero sebagai inovasi media edukasi tentang pendidikan kesehatan gigi dan mulut, serta untuk mengetahui pengaruh e-Hero terhadap pengetahuan kesehatan mulut pada sekolah dasar usia 10-11 tahun di SDI Baraya I Makassar. **Metode:** Penelitian rancangan *one group pretest-posttest* ini menggunakan metode pra-eksperimen dengan sampel 40 orang. Data dikumpulkan dengan menggunakan kuesioner yang terdiri dari 22 pertanyaan. Penilaian pengetahuan terdiri atas *pretest* dan *posttest*. Data dianalisis menggunakan uji Chi-square. **Hasil:** Hasil semua pertanyaan menunjukkan peningkatan pengetahuan yang signifikan secara statistik kecuali pertanyaan tentang fluoride dan jenis sikat gigi tidak signifikan ( $p < 0,05$ ) setelah menggunakan e-Hero. **Simpulan:** Media edukasi kesehatan gigi berbasis e-Hero meningkatkan pengetahuan tentang kesehatan mulut pada siswa usia 10-11 tahun.

**Kata kunci:** edukasi kesehatan gigi dan mulut, media edukasi, promosi kesehatan

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#### INTRODUCTION

According to the WHO in 2017, oral disease is one of the most common diseases in the world.<sup>1</sup> Indonesian Ministry of Health Survey in 2013 shows that prevalence of oral diseases was 25,9%.<sup>2</sup> The most common oral diseases in Indonesia, such as caries, periodontal disease, tooth loss, oral cancer, bacteria, viruses and fungi infections.<sup>1</sup> For the tooth decay, according to Riskesdas in 2013, DMF-T Index in Indonesia is 4.6 with D-T value = 1.6; M-T value = 2.9; F-T value = 0.08 which means that tooth decay in Indonesian po-

pulation are 460 teeth per 100 people. In addition, the prevalence of caries in 2013 is higher than the prevalence of caries in 2007, from 43.4 in 2007 which increased to 53.2 in 2013, with the largest sufferer are the infants.<sup>2</sup> For periodontal disease, based on SKRT in 2011 the prevalence of periodontal disease in Indonesia is around 70%, with prevalence ratio in villages higher than city, that is 48.9% in village and 42.5% in city.<sup>3</sup> While for South Sulawesi prevalence of tooth decay about 36.2%, which is the highest compared to other province in Indonesia<sup>2</sup>, children aged 5-14 years have

prevalence 42.5% with active caries 39%.<sup>4</sup> Gowa regency is the highest 3 cases of tooth and mouth problems, which is 34.2%.<sup>5</sup>

The high number of prevalence of the oral disease especially in the rural areas is mainly influenced by the number of dentists, health facilities and the less awareness and knowledge of public regarding the importance of oral health. Based on the Indonesian Medical Council in 2017, the number of dentists in Indonesia were 27.214 but 70% were domiciled in Java Island, 30% were domiciled in outside Java island, and only located in big cities in Indonesia.<sup>6</sup> The lack of dentists in the rural areas leads to a lack of public information about the importance of maintaining oral health; the information and knowledge are important to improving the degree of oral health.

Dental health education (DHE) is one of the promotive methods and the most frequently is DHE with play method, multimedia method such as PowerPoint, educational video, and multimedia-based educational game.<sup>7</sup> But the various methods are not yet effective enough to be applied at all ages.<sup>8</sup>

Because of the above problems the authors want to create a multimedia technology device by combining some more innovative methods of oral health promotion targeting in rural and suburban communities and to realize the government program of national action plan in the implementation of oral health services that are the realization of quality oral services.

## METHODS

This study was a pre-experiment study with one group pretest-posttest design and has been held on June 25<sup>th</sup> 2018. This research was conducted in the SDI Baraya I, Makassar. The subjects of this research were 40 students aged 10-11 years in the 5<sup>th</sup> class that were selected by simple random sampling with inclusion criteria of the subjects were present at the time of the study, willing to engage in research. Exclusion criteria were students who did not complete the game and returned the questionnaire but were not completed.

The instrument in this study were used e-Hero, a media education consists a wide range of dental health education and questionnaires comprising pretest, posttest. Data were collected using questionnaires consisted of 22 questions. The assessment of knowledge consists of pretest and posttest.

The data was processed and the results were statistically analyzed with SPSS version 24; a chi-square test was used to examine the effect of using e-Hero media on dental health education to the level of prior oral pretest knowledge, immediately after play (posttest). Level of significance and confidence level were set at 5% and 95%, respectively.

## RESULT

Table 1 shows the characteristics of respondents based on age is 10 years old ie 13 people (32.5%) and 11 years ie 27 people (67.5%), characteristics of respondents based on gender, boys are 24 people (60%) and girls are 16 people (40%).

**Table 1** Characteristics of respondents based on gender and age (n=40)

Characteristic	Total (n)	Percentage (%)
<b>Gender</b>		
Boy	24	60.0
Girl	16	40.0
<b>Age</b>		
10	13	32.5
11	27	67.5

On the basis of correct answers obtained, all the questions showed statistically significant improvement in knowledge, except two question "what is fluoride" and "what type of toothbrush bristles that should be used" after being educated through the e-Hero.

Most of the children were unaware about the reasons of bleeding gums before using e-hero but after using e-hero more than half of the children responded correctly. Also on the question about dental floss increased from 77.5-95% as well as on the question about regular cleaning of mouth can prevent dental caries increased from 80-97.5%. After using e-Hero, subjects become aware of the importance of visiting the dentist for oral health could be maintained increased from 60-90% and 87% of them began to believe that improving and maintaining their health was under their control, in contrast to, 53% before using e-Hero. There was also a significant improvement in knowledge related to oral health after using e-Hero; and 82.5%, 85% and 95% of children began to understand the importance of replacing toothbrushes, cleansing the tongue and use oral hygiene aids (Table 2).

## DISCUSSION

The selection of 10-11 year olds is based on the material given. According to Astoeti, the delivery of extension materials should be matched with the target.<sup>9</sup> In grade 5, students (mean aged 10-11 years) have a period of critical and real thinking, and also based on Riskesdas result shows high prevalence of dental and oral disease in age group 10-14 year is 25.2%.<sup>2</sup> The result from Kiswalyo's study, showed that children in aged 7-10 year had a high prevalence of dental caries (95.6%) in Wuluhan Puskesmas working area of SD Tanjung Rejo.<sup>10</sup>

The results of the research have shown that there is a significant difference after being educated through e-Hero as a media education almost on all kinds of

**Table 2** Assessment of differences in oral health knowledge before and after using e-Hero

Questions	Pre-test		Post-test I		% Change	p-value
	n	%	N	%		
1. Is oral health a part of general health?	38	95	40	100	5	0,152
2. How many primary teeth do we have?	16	40	36	90	50	0.000
3. How many permanent teeth do we have?	28	70	39	97.5	27.5	0.001
4. What are the most common diseases affecting oral cavity?	38	95	40	100	5	0.152
5. Why do we get dental problems?	37	92.5	40	100	7,5	0.077
6. What is the reason for tooth decay?	36	90	40	100	10	0.040
7. What is the reason for bleeding gums?	26	65	35	87.5	22.5	0.018
8. How can we prevent dental problems?	35	87.5	40	100	12.5	0.021
9. What is fluoride?	25	62.5	29	72.5	10	0.340
10. What is dental floss?	31	77.5	38	95	17.5	0.023
11. Regular cleaning of mouth can prevent dental caries	32	80	39	97.5	17.5	0.013
12. maintaining healthy mouth is individual responsibility?	34	85	39	97.5	12.5	0.048
13. improving and maintaining health of the mouth is in your control?	33	82.5	39	97.5	15	0.025
14. it is required to visit a dentist periodically to maintain health of your mouth?	24	60	36	90	30	0.002
15. How do you clean your teeth?	35	87.5	40	100	12.5	0.021
16. How often we should clean our teeth?	37	92.5	40	100	7.5	0.077
17. What type of toothbrush bristles we should use?	31	77.5	33	82.5	5	0.576
18. Do you rinse your mouth after meals?	31	77.5	38	95	17.5	0.023
19. How do you brush your teeth?	20	50	32	80	30	0.005
20. How often do you change your toothbrush?	19	47.5	33	82.5	35	0.001
21. Do you clean your tongue?	22	55	34	85	30	0.003
22. Do you use oral hygiene aids?	18	45	34	85	40	0.000

\*Chi-Square test;  $p < 0.05$

questions. This is in accordance with the results of research conducted by Listyantika and Adhani in 2016 that dental health education by game method shows greater knowledge, attitude and practices than the lecture media.<sup>11</sup> In line with the research conducted Sadnadya in 2014 there is an increasing number of children who answered correctly before and after being given a dental health education program assessed using the most frequently answered questionnaires right by the child that is between the causes of cavities, understanding dental floss and clean mouth regularly.<sup>12</sup>

Factors influencing the development of knowledge include experience, education, verbal instruction and the acceptance of verbal information, age, information and media. Health education is used to improve knowledge and awareness that can affect the habit of good oral hygiene.<sup>8,13</sup> e-Hero as a media education has its own charm because it uses multimedia technology that interest children in learning and playing so that in accordance with style of learning elementary school, consist learning materials to improve the knowledge of dental and oral health in the children.

The role of learning media through multimedia in improving knowledge has been proven through research conducted by Novianty et al stating that there is a significant difference between the knowledge level of the students before and after given DHE media in the form of game application "Si Manggis Celebes" to the students of kindergarten.<sup>14</sup> Also in the study conducted by Shilpa and Swammy with the significant increase of the student knowledge after given an education with playing system such as role play.<sup>15</sup> This happens because human brain is able to absorb 80% of information when using multimedia technology. That's why multimedia is becoming the best medium on learning.<sup>16</sup>

Multimedia approach for learning process for children has been proven effective enough.<sup>17</sup> Based on research conducted by Listyantika and Adhani which stated that dental health education with game method shows more increase knowledge, attitude and practices is bigger than media lecture.<sup>11</sup>

It is concluded that dental health education media based on e-Hero can improve knowledge about oral health in students aged 10-11 years.

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