



The effectiveness of dental and oral health promotion with audiovisual media on knowledge level and oral hygiene status of deaf children

La efectividad de la promoción de la salud bucal y dental con medios audiovisuales sobre el nivel de conocimiento y el estado de higiene bucal de los niños sordos

 Dwi Kurniawati¹ Faculty of Dentistry of Universitas Muhammadiyah Surakarta, E-mail: dwi.kurniawati@ums.ac.id

 Selma Fatiha Bernice Faculty of Dentistry of Universitas Muhammadiyah Surakarta, E-mail: selmafatiha1@gmail.com

 Farah Rahmah Annisa Pasha Faculty of Dentistry of Universitas Muhammadiyah Surakarta, E-mail: farahpasha16@gmail.com

Received/Recibido: 11/24/2021 Accepted/Aceptado: 02/19/2022 Published/Publicado: 02/25/2022 DOI: <http://doi.org/10.5281/zenodo.6481810>

Abstract

Deaf children are children with hearing loss. This condition results in gaining limited knowledge, including knowledge about dental and oral health. It causes poor hygiene status so that the prevalence of dental and oral diseases is higher than normal children. Health promotion aims to prevent disease and is proven to increase knowledge. Health promotion requires delivery media to be more attractive and to increase understanding. This study aims to determine the effectiveness of dental and oral health promotion with audiovisual media on the level of knowledge and oral hygiene status of deaf children.

This type of research was quasi-experimental with one group pretest-posttest design. A total of 41 deaf children in SLB-B YRTRW Surakarta were selected as samples. Health promotion in this study was completed for three consecutive days using audiovisual media in the form of video and was instructed to brush teeth twice a day. Knowledge and status of oral hygiene were measured before and after

health promotion. The questionnaire was implemented to measure knowledge and oral hygiene status measured by the PHP-M plaque index score. The data were analyzed utilizing the Wilcoxon test and paired T-test.

From the results of the Wilcoxon test, it was revealed that there was a difference in the mean score of knowledge before (10.39 ± 2.11) and after health promotion (12.73 ± 1.92) with a significance score of 0.000. Paired T-test showed that there is a difference in the mean plaque score before and after being given health promotion with audiovisual media (initial mean 24.95 ± 10.01 and final mean 12.51 ± 7.44), with a significance (p) = 0.000.

Based on the study results, it is concluded that the promotion of oral health with audiovisual media is effective in increasing the knowledge and oral hygiene status of deaf children.

Keywords: deaf children, health promotion, audiovisual media, knowledge, oral hygiene status

Los niños sordos son niños con pérdida auditiva. Esta condición da como resultado la obtención de conocimientos limitados, incluido el conocimiento sobre la salud dental y bucal. Provoca un estado de higiene deficiente, por lo que la prevalencia de enfermedades dentales y orales es más alta que la de los niños normales. La promoción de la salud tiene como objetivo prevenir la enfermedad y está comprobado que aumenta el conocimiento. La promoción de la salud requiere que los medios de comunicación sean más atractivos y aumenten la comprensión. Este estudio tiene como objetivo determinar la efectividad de la promoción de la salud bucal y dental con medios audiovisuales sobre el nivel de conocimiento y el estado de higiene bucal de los niños sordos.

Este tipo de investigación fue cuasi-experimental con un diseño pretest-postest de un solo grupo. Se seleccionó como muestra un total de 41 niños sordos en SLB-B YR-TRW Surakarta. La promoción de la salud en este estudio se completó durante tres días consecutivos utilizando medios audiovisuales en forma de video y se le indicó que se cepillara los dientes dos veces al día. Se midió el conocimiento y el estado de la higiene oral antes y después de la promoción de la salud. El cuestionario se implementó para medir el conocimiento y el estado de higiene oral medido por el puntaje del índice de placa PHP-M. Los datos se analizaron utilizando la prueba de Wilcoxon y la prueba T pareada.

A partir de los resultados de la prueba de Wilcoxon, se reveló que hubo diferencia en el puntaje medio de conocimiento antes ($10,39 \pm 2,11$) y después de la promoción de la salud ($12,73 \pm 1,92$) con un puntaje de significancia de 0,000. La prueba T pareada mostró que existe una diferencia en el puntaje medio de placa antes y después de recibir promoción de la salud con medios audiovisuales (media inicial $24,95 \pm 10,01$ y media final $12,51 \pm 7,44$), con una significancia (p) = 0,000.

Con base en los resultados del estudio, se concluye que la promoción de la salud bucal con medios audiovisuales es eficaz para incrementar el conocimiento y el estado de higiene bucal de los niños sordos.

Palabras clave: niños sordos, promoción de la salud, medios audiovisuales, conocimientos, estado de higiene bucal.

The World Health Organization (WHO) stated that more than 5% of the world's population has a hearing loss and requires rehabilitation, with a proportion of 432 million adults and 34 million children. It is estimated that by 2050 more than 700 million people or one out of ten people will experience hearing loss¹. The results of Basic Health Research (Risksedas) conducted by the National Institute of Health Research and Development (NIHRD) of the Ministry of Health in 2018 showed the proportion of deafness from birth in children aged 24-59 months in Indonesia was 0.11%. This number increased with age².

Deafness is a general term used for hearing loss caused by damage or malfunction of the hearing organs³. The deaf is divided into two categories: totally deaf (deaf) and partially deaf (hard of hearing). Deaf children are unable to hear any sound. Partially deaf children still have residual hearing, so it is still possible to hear the process of hearing both with and without hearing aids. Partially deaf children have better language skills than totally deaf children⁴.

Health information is frequently distributed through hearing means, allowing deaf children to receive messages relevant to their health⁵. Many health message makers are not aware that hearing loss can affect and hinder the ability of deaf children to receive health messages⁵. It causes knowledge about health to be lower than normal children so that it has an impact on their health conditions, including the lower oral hygiene status of deaf children and a higher prevalence of dental and oral diseases compared to normal children^{6,7}.

Knowledge improvement and disease prevention can be made through health promotion⁸. Health promotion requires methods and media to facilitate the delivery of information so that the target can understand the information provided and influence his behavior in a positive direction. Audiovisual media is a means of health promotion that contains elements of sound and images. The advantages of these media include clarifying and facilitating information delivery, avoiding misperceptions, and displaying objects that have never been seen before⁹.

Audiovisual media can be used as a means of health promotion for partially deaf children because they can still use their remaining hearing ability to receive knowledge. The use of these abilities can simultaneously train their hearing to be more sensitive and maximize their speech function¹⁰. This study aims to determine the effectiveness of dental and oral health promotion with audiovisual media on the level of knowledge and oral hygiene status of deaf children.

Literature Review

Dental and oral health promotion is a process of providing information that arises based on dental and oral health needs, which aims to obtain good oral health conditions, prevent dental and oral diseases, and improve people's quality of life¹⁰. Health promotion requires media in its delivery. Media are all tools or means that can assist in conveying information to the target to increase their knowledge⁸. Media are divided into three types¹ visual media; tools or facilities that can only be watched or using the sense of sight, such as books, newspapers, and maps, ²audio media; tools or facilities that can only be heard or use the sense of hearing only, such as radio, ³audiovisual media; tools or facilities that can be watched and heard, such as films and videos¹¹.

Audiovisual media are means or intermediaries that contain elements of sound and images that can be seen and heard. These media are considered better and more attractive due to those two elements above: films, videos, and sound slides¹². The advantages of audiovisual media include facilitating information delivery because they utilize moving images and sound to explain the material. They can be played repeatedly to increase understanding and attract attention to increase targets' motivations. Moreover, the delivery of information is more varied so that the targets do not get bored quickly and the person who conveys the information does not run out of energy. If the information is conveyed repeatedly, it will attract the targets' attention more so that it can increase the targets' motivations in a positive direction¹³. Disadvantages of audiovisual media include audio elements that use voice and verbal language that can only be understood by targets who have a good level of mastery of words and language and do not present object details perfectly. Furthermore, creating media takes a long time, costs a lot, and requires skills in its application^{14,15}.

Knowledge results from someone's observation or learning obtained through the sensing process. Everyone has different sensing abilities and affects their level of knowledge. Knowledge of dental and oral health includes equipment and the importance of brushing teeth, frequency and time of brushing teeth, when to change toothbrushes, types, and functions of teeth, proper food and drink for teeth, brushing techniques, and regular visits to the dentist.

Deaf children are children with hearing loss, either partially or totally, so deaf children tend to have difficulty obtaining information and communicating⁴. Classification of deaf children based on the degree of hearing loss, including³:

(1) Totally deaf or deaf causes the children to be unable to hear at all with or without hearing aids,

(2) Partially deaf (hard of hearing), which is divided into:

a) Mild deafness occurs to the children who have difficulty communicating over long distances or more or less a maximum of three meters. On Audiology Pure-Tone Testing, speech frequency dropped by 15 dB to 30 dB.

b) Moderate deafness occurs to the children who have difficulty communicating near and far to not follow daily conversations. At a distance of one meter, the patients have difficulty to understand the meaning of the word. Audiology Pure-Tone Testing shows the frequency of the conversation dropped by 30 dB-60 dB.

c) Severe deafness occurs to the patients who can no longer be invited to communicate with a normal voice, it takes effort to raise the voice (increase the amplitude) by shouting or with an amplifier megaphone. On Audiology Pure-Tone, the conversational frequency dropped by 60 dB or more.

Dental hygiene can be seen by observing the amount of plaque in the oral cavity. Several methods of measuring plaque index are Personal Hygiene Performance Modified (PHP-M), O'Leary Index, Loe, and Silness Index, and the modification of Turesky Gilmore Glickman from Quigley-Hein. The PHP-M (Patient Hygiene Performance-Modified) dental and oral hygiene index is an index that has been modified from the PHP index. The PHP-M method checked oral and dental hygiene in the mixed dentition period. The surfaces tested are the buccal and lingual parts¹⁵. Plaque measurement with PHP-M using six index teeth, namely¹⁶:

a) The most posterior teeth growing in the right upper quadrant.

b) Primary or permanent maxillary right canine; if this tooth does not exist, other anterior teeth can be used.

c) Primary maxillary left first molar or maxillary left first premolar.

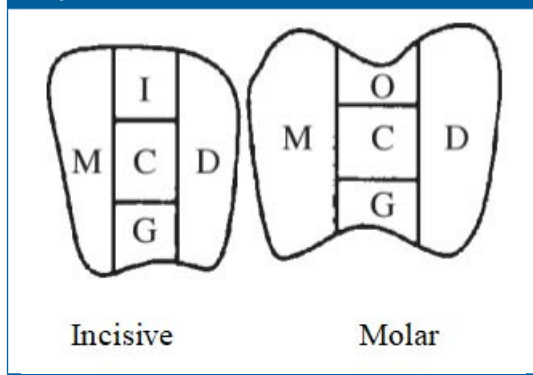
d) The most posterior tooth growing in the left lower quadrant.

e) Primary or permanent mandibular left canine; if this tooth does not exist, other anterior teeth can be used.

f) Primary mandibular right first molar or mandibular right first premolar.

The stage of determining the PHP-M score for the assessment begins by making imaginary lines on the teeth to form five imaginary lines. If plaque is seen in one area, then it is given a 1 score; if there is no plaque, it is given a 0 score. The results of the plaque assessment are by adding up each plaque score on each tooth surface. Hence, the plaque score for each tooth can range from 0-10. Plaque scores for all teeth can range from 0-60. The value of dental and oral hygiene based on the PHP-M plaque index is categorized into three: good if the total score is 0-20, fair if the total score is 21-40, poor if the total score is 41-60¹⁶.

Figure 1. Tooth Surface Subdivision in the PHP-M Plaque Index¹⁵.



This type of research was quasi-experimental with one group pretest-posttest design. A total of 41 partially deaf children were selected as samples. The sample consisted of the first-the sixth-grade elementary school students who were chosen using a total sampling technique. The research was conducted at SLB-B YRTRW Surakarta. Willingness to be a research subject was obtained from the signing of informed consent by parents/guardians. Inclusion criteria in this study were children who are partially deaf (hard of hearing), who do not have mental disabilities, can see with or without visual aids, can use limbs, and have teeth.

This research received approval from the research ethics committee number 143/I/HREC/2020. The research subjects were given health promotion with audiovisual media in the form of a 2-minute video and played two times for three consecutive days. The material in the video contained the types and functions of teeth, choosing a good and correct toothbrush, the right time and frequency of brushing your teeth, the type and size of using the proper toothpaste, brushing techniques, problems due to not brushing teeth, period of changing toothbrush, proper food and drinks for teeth, and regular visits to the dentist. The final plaque score and knowledge measurement were tested on the fourth day.

Although Quasi-experiments hold lower internal validity than actual experiments, they generally own higher external validity as they are able to utilize real-world interventions rather than artificial laboratory settings. Hence, knowledge was measured using a standard questionnaire that is usually tested for validity and reliability of similar surveys¹⁶⁻¹⁹. The questionnaire contained ten materials on dental and oral health knowledge contained in the video and consisted of 15 questions. If the respondents answered correctly, the children were given one score, and if they answered incorrectly, they were given a 0 score. Knowledge variables were interpreted into three categories: high if they

could answer correctly 76-100% of all questions, fair if they could answer correctly 56-75% of all questions, and low if the correct answer was less than 55%.

Oral hygiene was observed from the accumulation of plaque in the oral cavity, measured using the PHP-M plaque index. Plaque scores were categorized into three categories: good (score 0-20), fair (score 21-40), and poor (score 41-60). Data were analyzed by the Wilcoxon test and paired T-test.

Based on the data that have been obtained, the following figure shows the characteristics of the respondents.

Table 1. Description of Respondents Characteristics

Variable	Category	Frequency	Percentage
Gender	Male	19	46,3
	Female	22	53,7
Age	7-9 years old	18	43,9
	10-12 years old	16	39
	13-14 years old	7	17,1

Based on table 1, the female respondents were 22 children, and the male respondents were 19 children. The age group of 7 to 9 years had the highest number of children with a total of 18 children. The respondents with the least number were in the age range of 13-14 years with seven children.

Table 2. Knowledge score results

Group	N	Median	Mean ± SD
Before treatment	41	11.00	10.39 ± 2.108
After treatment	41	13.00	12.73 ± 1.924

Table 2 shows that the number of samples was 41 children, the middle score or median at the pretest was 11 with a mean of 10.39. The median score at the posttest was 13, with a mean of 12.73.

No.	Material	Number of correct answers before treatment N (%)	Number of wrong answers after treatment N (%)
1.	Reasons for brushing teeth	40 (97.5)	41 (100)
2.	Tools used for brushing teeth	40 (97.5)	40 (97.5)
3.	Frequency of brushing teeth	11 (26.8)	32 (78)
4.	The right time to brush your teeth	26 (63.4)	38 (92.6)
5.	The right shape of the toothbrush	36 (87.8)	38 (92.6)
6.	Reasons for brushing teeth	38 (92.6)	39 (95.1)
7.	Time to change toothbrush	30 (73.1)	41 (100)
8.	Proper foods and drinks for teeth	15 (36.5)	19 (46.3)
9.	Proper foods and drinks for teeth	11 (26.8)	22 (53.6)
10.	Proper foods and drinks for teeth	35 (85.3)	39 (95.1)
11.	Regular visits to the dentist	11 (26.8)	38 (92.6)
12.	Teeth brushing technique	36 (87.8)	38 (92.6)
13.	Teeth brushing technique	29 (70.7)	39 (95.1)
14.	Types and functions of teeth	27 (65.8)	33 (80.4)
15.	Types and functions of teeth	24 (58.5)	26 (63.4)

Based on table 3, there was an increase in the number of respondents who answered correctly on each questionnaire number. The lowest percentage before the intervention was revealed in the number of respondents who answered correctly on numbers 3 and 11, while the highest percentage before the intervention was in the number of respondents who answered correctly on numbers 1 and 2.

Plaque Index Category	Before treatment		After treatment	
	Frequency	Percentage	Frequency	Percentage
Good (1-20)	16	39.0	36	87.8
Fair (21-40)	23	56.1	5	12.2
Poor (41-60)	2	4.9	0	0

Table 4 shows that when examining the final plaque score (posttest), the number of children in the good plaque index category increased, and the number of children in the fair and poor categories decreased compared to the pretest.

Plaque Score Group	N	Mean ± SD	Plaque Index Category
Before treatment	41	24.95 ± 10.007	Fair
After treatment	41	12.51 ± 7.436	Good

Table 5 shows that the mean plaque score decreased after being given oral health promotion with audiovisual media.

Group	Median	Z stat	Asym. Sig. (2-tailed)
Before treatment	11.00	-4.338	0.000
After treatment	13.00		

The Wilcoxon test was used to perceive the effectiveness of audiovisual media in health promotion on the level of knowledge. The results showed that the significance value was 0.000. Hence, this study concluded that there is a significant difference between children's knowledge and the hard of hearing before and after being given treatment (health promotion with audiovisual media).

Group	N	Mean	Std. Deviation	t-test Sig. (2-tailed)
Before treatment	41	24.95	10.007	0.000
After treatment	41	12.51	7.436	

Paired T-Test was used to perceive the effectiveness of audiovisual media in health promotion on oral hygiene status, which was evaluated by plaque score in this study. The results obtained a significance of $p < 0.05$, which indicated a significant difference in plaque scores before and after being given health promotion using audiovisual.

Partially deaf children have limited hearing and minimal vocabulary mastery. However, they can still receive information and communicate with their remaining hearing abilities. Partially deaf children are easier to obtain information and have better language skills than totally deaf children. The condition of deaf children is different, but their physical condition is similar to normal children. Partially deaf children usually experience obstacles and difficulties in language development. Thus, it is difficult to understand the lessons appropriately given⁴. This problem affects the children's education so that the children's level of knowledge is low, especially in the field of dental and oral health¹¹. Providing knowledge and understanding about dental and oral health for school children can be done by providing health promotion about dental and oral health¹⁷.

Based on observations, deaf children in SLB-B YRTRW Surakarta, consisting of 41 elementary school students aged 7-14 years, had good motor skills similar to normal children in the comparable age. The greatest obstacle for deaf children is the sense of hearing. Hence, it is expected to maximize the other senses to provide information, for example, the sense of sight¹⁸.

There is no specific picture in the oral cavity of children who are deaf. However, the limitations of deaf children make it difficult for them to gain knowledge and make the prevalence of dental and oral diseases higher when compared to normal children¹⁹ It can be prevented by promoting dental and oral health that aims to prevent disease. Dental and oral health promotion contains information about brushing teeth twice using fluoridated toothpaste at the right time, choosing a toothbrush, proper and improper food for dental health, and regular visits to the dentist⁸.

Health promotion requires media to facilitate the delivery of information and make information more attractive so

that the targets can more easily understand the information provided and influence their behavior positively. The choice of media is essential considering the limitations of deaf children. Excellent promotional media can make the targets think, be creative, and innovate, but not boring. The selection of media in health promotion is highly supportive of the successful delivery of the material. The process of remembering someone using verbal combination visual techniques such as audiovisual media can increase a person's memory ability by 85% compared to verbal (70%) and only visual (72%)¹⁹. A survey in the field showed that 99% of deaf people, even with the most severe level of impairment, still have the remaining ability to hear. Only 1% of deaf children totally cannot hear⁴.

Audiovisual media can support the successful delivery of dental and oral health promotion. The advantages of audiovisual media are that they are more attractive due to the combination of audio and visual, so that the message is more easily conveyed and understood by children, they also avoid misperceptions, display objects that have never been seen directly, and can be played repeatedly to increase understanding^{20,21}. Audiovisual media can be in the form of animated videos or cartoons. Animated videos make the message presented can be informative, educative, or instructional. The use of animated videos is also more attractive due to the technological revolution and is more frequently watched by today's generation of children²². Audiovisual media can be used to promote health in partially deaf children because these media can take advantage of the children's observing ability and utilize and train the remaining hearing remaining in deaf children to understand information so that their hearing becomes more sensitive²³.

Several issues that need to be considered in designing audiovisual media for deaf children are to use subtitles instead of sign language. The type and color of the letters in the subtitles are made consistent, provided that the font type is Times New Roman or Sans Serif with size 12, black background, and white text color. Subtitles can use all capital letters or all lowercase. Subtitles are made in two lines at a rate of 9 seconds per two lines. Sound effects and animations should not be excessive so as not to distract the children's focus. The use of visual masking should also be avoided because it can obscure information and interfere with the children's focus. An example of using visual masking is that the object you want to display is a circle shape, but there is another shape behind the circle shape, such as a square^{21,23}.

In this study, dental and oral health promotion was completed repeatedly for three consecutive days by playing audiovisual media in the form of a 2-minute video and played two times. Interventions for deaf children are completed repeatedly because not all deaf children can quickly catch the material presented^{24,25}. Repeated interventions can make children better understand the material presented to be implemented properly to create better knowledge and oral hygiene.

This study showed an increase in knowledge that is indicated by an increase in the mean score of respondents and an increase in the percentage of correct answers on each question in the questionnaire. Increased knowledge can occur due to additional information through effective media and repeated interventions so that it can increase respondents' understanding and turn into suitable habits²⁶. This study used audiovisual media, which consisted of sound and image elements and was added with the help of subtitles. The use of these media aims to utilize the ability to see partially deaf children and the remaining hearing abilities because they can still understand information and communicate with the remaining hearing they have⁴. This study also discovered some respondents who experienced a decrease in knowledge caused by low comprehension. It is in line with Lian's research, which stated that the decline in knowledge occurs due to limited understanding in children^{27,28}.

The results also indicated a decrease in plaque index after giving oral health promotion. It showed that there is a change in the students' habits which initially did not pay attention to dental and oral health to become more concerned about dental and oral health. Therefore, the status of oral hygiene increased. This result is supported by a theory that stated the need for a creative and visually attractive delivery in conveying dental and oral health promotion²⁹⁻³².

Conclusions

Based on the theory and research results, it is concluded that the promotion of oral health with audiovisual media is effective in increasing the knowledge and oral hygiene status of deaf children.

Source of funding: no funding.

Conflict of interest: there is no conflict of interest.

Acknowledgments: not applicable.

References

1. World Health Organization (WHO). Deafness and hearing lost. Diakses pada 10 Agustus 2021, dari <https://www.who.int/news-room/fact-sheets/detail/deafness-and-hearing-loss>
2. Balitbang Kemenkes RI. Riset Kesehatan Dasar; RISKESDAS. Jakarta: Balitbang Kemenkes RI.2018.
3. Achmad, MH, Adam AM, Horax S, Handayani H, Ramadany S. Perawatan Rongga Mulut Anak Berkebutuhan Khusus, Jakarta: CV. Sagung Seto, hal. 2016:51-57.
4. Atmaja JR. Pendidikan dan Bimbingan Anak Berkebutuhan Khusus, PT Remaja Rosdakarya, Bandung. 2018.
5. McKee M, Moreland C, Atcherson S, Zazove P. Hearing loss: Communicating with the patient who is deaf or hard of hearing. FP essen-

- tials.2015;434:24–28.
6. McKee M. Deaf or Hard of Hearing Message Recipient Sociodemographic Characteristics. In *Oxford Research Encyclopedia of Communication*. 2017.
 7. Purohit BM, Abhina S. Oral Health Status of 1-year-old Children with Disabilities and Control in Southern India [Original Research], *WHO South East Journal of Public Health*.2012;1(3):330-338.
 8. Mitchell L, Mitchell DA, McCaul L. *Oxford Handbook of Clinical Dentistry*, fifth edition, Oxford University Press, United Kingdom, Terjemahan Purwanto, 2014, Kedokteran Gigi Klinik Semua Bidang Kedokteran Gigi, EGC, Jakarta.2014.
 9. Susilowati D. *Promosi Kesehatan, Badan Pengembangan dan Pemberdayaan Sumber Daya Manusia Kesehatan, Jakarta Selatan*. 2016.
 10. National Council for Special Education. *The Education of Deaf and Hard of Hearing Children in Ireland, NCSE Policy Advice Paper, Ireland*.2011.
 11. Anwar AI, Zulkifli A, Syafar M, Jafar N. Effectiveness of counseling with cartoon animation audiovisual methods in increasing tooth brushing knowledge children ages 10–12 years. *Enfermeria clinica*.2020;30:285-288.
 12. Marya CM. *A textbook of public health dentistry*. New Delhi: Jaypee Brothers Medical Publisher, hal. 2011;276
 13. Sanjaya W. *Perencanaan dan Desain Sistem Pembelajaran*, PT Fajar Interpratama, Jakarta.2011.
 14. Putri MH, Herijulianti E, Nurjannah N. *Ilmu Pencegahan Penyakit Jaringan Keras dan Jaringan Pendukung Gigi*, Jakarta: Penerbit Buku Kedokteran EGC, hal. 2011:99-107.
 15. Arika A, Olufemi S. Influence of Audiovisual Aids on Teaching of Physical and Health education in Kuniar Secondary Schools in Ikere Local Government Area, Ekiti State, Nigeria, *International Journal of Research and Analytical Reviews*.2018;5(2):2348 –1269
 16. Jatmika SED, Maulana M. Dental and Oral Health Education for Elementary School Students through Patient Hygiene Performance Index Indicator. *International Journal of Evaluation and Research in Education*.2018;7(4):259-263.
 17. Al-Darwish MS. Oral health knowledge, behaviour and practices among school children in Qatar, *Dental Research Journal*.2016;13(4):342–353. <https://doi.org/10.4103/1735-3327.187885>
 18. Indahwati E, Mantik Max FJ, Gunawan PN. Perbandingan Status Kebersihan Gigi dan Mulut Pada Anak Berkebutuhan Khusus SLB-B dan SLB-C Kota Tomohon. *Jurnal e-GiGi (eG)*. 2015;3(2):361-366
 19. Trifitriana M, Fadilah M, Mulawarman R. Effectiveness of Health Promotion Through Audiovisual Media and Lecture Methods on the Level of Knowledge in Elementary School Children About TB Disease. *Medicinus*.2020;7(6):174-183.
 20. Mellisa M, dan Yanda YD. Developing audiovisual learning media based on video documentary on tissue culture explant of *Dendrobium bigibbum*, *JPBI (Jurnal Pendidikan Biologi Indonesia)*.2019;5(3): 379-386
 21. Cavender AC, Bigham JP, Ladner RE. *Class In Focus: Enabling Improved Visual Attention Strategies for Deaf and Hard of Hearing Students*. *ASSETS'09*.2009:25-28
 22. Alhayek AI, Alsulaiman MJ, Almuhanha HA, Alsalem MA, Althaqib MA, Alyousef AA. The effect of conventional oral health education versus animation on the perception of Saudi males in primary school children. *J Int Oral Health*. 2018;10 (3):121-126.
 23. Nilakusumawati DPE, Sumarjaya IW. *Panduan Perancangan Media Pembelajaran Audio Visual Untuk Siswa Tuna Rungu, Jurusan Matematika Fakultas Matematika Dan Ilmu Pengetahuan Alam Universitas Udayana, Denpasar*.2014.
 24. Yanti GN, Alamsyah RM, Natassa SE. Effectiveness of dental health education using cartoons video showing method on knowledge and oral hygiene of deaf children in Yayasan Karya Murni Medan, *International Journal of Applied Dental Sciences*.2017;3(2):86-90.
 25. Arunakul M, Kuphasuk Y, Boonyathanasit R. Effectiveness of oral hygiene instruction media on periodontal health among hearing impaired children, *Southeast Asian J Trop Med Public Health*.2012;43(5):1297-1303.
 26. Riznika Adhani R, Oktiani BW, dan Hatta I. Perbedaan Skor Indeks Plak Sebelum Dan Sesudah Dilakukan Penyuluhan Dengan Media Video Dan Model Studi Tinjauan Pada Siswa Tunarungu Di Smlpb Dan Smalb B Dharma Wanita Banjarmasin, *Dentino (Jur. Ked. Gigi)*.2017;2(1):44-49.
 27. Doichinova L, Mitova N, Bakardjlev P. *Assessment of the Effectiveness Methodologies for Oral Hygiene Training, Department of Pediatric Dentistry, Faculty of Dental Medicine, Medical University, Bulgaria*.2015.
 28. Lian CW, Phing TS, Chat CS, Shin BC, Baharuddin LH, Jalil ZB. Oral Health Knowledge, Attitude and Practice Among Secondary School Students in Kuching, Sarawak, *Archives of Orofacial Sciences*.2010;5(1):9-16
 29. Petersen PE, Hunsrisakhun A, Thearmontree S, Pithpornchaiyakul Hinto J, Jurgensen N, Ellwood RP. *Schol-based Intervention for Improving the Oral Health of Children in Southern Thailand, Community Dental Health*.2015;32(1):44-50.
 30. Od EG, Od ÁM, MgSc AM, MgSc JV, Mgsc RV, Od JO, Od PP, MgSc CE, Zambrano AD, MgSc MD, Inv ZD. Nivel de estrés radicular en premolares superiores y presión ejercida en tejidos adyacentes: un modelo mecánico en 3D. *Archivos Venezolanos de Farmacología y Terapéutica*. 2021;40(9):942-5.
 31. Chacín M, Carrillo S, Arenas V, Martínez M, Hernández Lalinde JD, Anderson H, Salazar J, Bermúdez-Pirela V. Prevalencia de sobrepeso y obesidad en escolares de San José de Cúcuta, Norte de Santander, Colombia.
 32. Antonio B. Educación ambiental para la sostenibilidad: Una alternativa para una disposición adecuada de medicamentos en el hogar. *Archivos Venezolanos de Farmacología y Terapéutica*. 2021;40(9):934-41.