



Development of educational video feeding practice for children with cerebral palsy

Pengembangan video edukasi feeding practice anak cerebral palsy

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Abstract

Feeding practice videos containing nutritional content for caregivers of children with cerebral palsy (CP) are often found in English. This study aimed to develop an educational video of feeding practices for children with CP that is feasible in Indonesia to improve the nutritional knowledge and skills of caregivers regarding feeding and drinking. The Research and Development method was used with the ADDIE model, which consisted of analysis, design, development, implementation, and evaluation stages. Small-group and field-group trials were conducted at the PNTC, IFA, and YPAC Surakarta pediatric physiotherapy clinics from February to April 2023. Video validation was performed by three experts: nutritionists, physiotherapists, and media experts who were competent in their fields. The video results based on nutritionist validation were 76,4%, physiotherapist validation results were 85,5%, and 82,4% media expert validation results. These results indicate that the video feeding practice developed as an educational media is suitable for use with minor improvements, according to expert advice. The trial results for the small group comprised ten respondents and obtained highly feasible results (90,3%). A field trial with 15 respondents obtained a result of 89,7% in the feasible category. In conclusion, an educational video of feeding practices for caregivers of children with cerebral palsy is feasible.

Keywords: Cerebral palsy, educational video, feeding practice

Abstrak

Video *feeding practice* bagi pengasuh anak *cerebral palsy* (CP) dengan konten gizi seringkali ditemukan dalam bahasa Inggris. Tujuan penelitian ini untuk mengembangkan video edukasi *feeding practice* anak CP yang layak dan berbahasa Indonesia untuk meningkatkan pengetahuan gizi dan keterampilan pengasuh dalam pemberian makan dan minum untuk menunjang kemampuan makan dan minum anak CP. Penelitian menggunakan metode *Research and Development* dengan model ADDIE yang terdiri dari tahap *analysis, design, development, implementation, and evaluation*. Uji coba *small group* dan *field group* dilakukan di klinik fisioterapi anak PNTC, IFA, dan YPAC Surakarta pada bulan Februari hingga April 2023. Validasi video dilakukan oleh tiga orang ahli terdiri dari ahli gizi, fisioterapis dan ahli media yang berkompeten di bidangnya. Hasil, video berdasarkan validasi ahli gizi adalah 76,4%, hasil validasi fisioterapis 85,5%, dan 82,4% hasil validasi ahli media. Hasil ini menunjukkan bahwa video *feeding practice* yang dikembangkan sebagai media edukasi, layak untuk digunakan dengan perbaikan minor sesuai dengan saran ahli. Hasil uji coba pada *small group* sebanyak 10 responden dan diperoleh hasil sangat layak (90,3%). Uji coba pada *field group* dengan 15 responden memperoleh hasil 89,7% dengan kategori layak. Kesimpulan, bahwa video edukasi tentang *feeding practice* bagi pengasuh anak *cerebral palsy* dinyatakan layak untuk digunakan.

Kata Kunci: *Cerebral palsy, feeding practice, video edukasi*

Introduction

Children with cerebral palsy (CP) are children with permanent motor impairments caused by the presence of non-progressive disorders or abnormalities of the developing or immature brain (Blair & Cans, 2018). CP children have difficulty eating and drinking due to motor impairments in functional activities of eating and drinking such as sucking, biting, chewing, swallowing, and storing food or liquids in the mouth. Children need caregivers who have knowledge and skills in feeding and drinking for CP children (Tschirren et al., 2018). The practice of feeding CP children by caregivers with less knowledge and skills can cause the position of CP children to change when eating and drinking is not appropriate and the duration of eating is longer, which is more than 60 minutes, so that the quality of life of CP children and families decreases (Omar et al., 2017).

Caregivers of CP children have an important role in implementing feeding practices for CP children. Caregiver knowledge of feeding that emphasizes feeding position, food texture, and food diversity can support nutrition in CP children. Postural abnormalities that occur in CP children cause the body to not be ideal in a parallel position, thus disrupting the dynamics of swallowing food and drinks, so there needs to be an understanding of caregivers about positioning and posture when CP children eat (Maggioni & Araújo, 2020).

Fulfillment of nutritional intake and health of CP children is related to the knowledge of good caregivers in order to influence changes in attitudes toward feeding. So, caregivers need to know and understand about feeding positions, food textures, feeding aids, swallowing processes, family or caregiver knowledge, and attitudes at meal times (Taylor et al., 2022). Cerebral palsy children with chewing and swallowing disorders will find it difficult to get a diverse food intake, so caregivers need to make food modifications (Donkor et al., 2019).

Efforts that can be made to increase the knowledge or understanding of caregivers are through nutrition education, which aims to instill understanding in caregivers so that it is manifested in attitudes and actions and can become good habits towards eating behavior (Aroni, 2016). According to research (Harumi, 2017), the knowledge of family members given

the CP handling module increased by 0,84 points compared to those not given the module. In addition, caregivers who receive feeding guidelines for CP children from speech therapists can improve their knowledge related to the child's posture, eating utensils, safe food consistency, and performance of eating maneuvers (Maggioni & Araújo, 2020).

Feeding practice education for CP Children have used several methods, and one of them is the lecture method. Giving lectures to caregivers on the topics of swallowing dynamics, swallowing disorders, care of children with dysphagia, and caregiver behavior in dealing with children's difficulties while eating (Carvalho et al., 2013). Education with film media has been carried out by Arora et al. (2014). Which explains the role of parental involvement in the child's training in language, play, social communication, and motor skills. In addition, education through book media about eating posture, food texture, eating utensils, and signs of aspiration risk in CP children also received a good response from caregivers because it provided solutions for overcoming feeding difficulties in CP children (Maggioni & Araújo, 2020). Education with a combination of media in the form of books and videos by the Hambisela Project about "Feeding Your Child" in English, but videos are not publicly accessible (Hambisela Project, 2015).

Therefore, researchers developed educational videos on feeding practice in Indonesian to help caregivers gain knowledge and improve feeding skills for CP children. The development of educational videos based on expert validation and evaluation results in the field can be feasible and applied to the caregiver learning process (Azzahra et al., 2022). In addition, based on the results of interviews with several caregivers to find out the needs of caregivers, it was found that caregivers had never received education about feeding practices and had the desire to learn how to position children when eating and drinking and food lectures and expected the media used to be in the form of videos.

Based on the background above, researchers developed feeding practice educational videos for caregivers with content on diet, food texture, food diversity, the position of CP children when eating and drinking, how to swallow and chew food, how to drink, how to eat

and drink independently, responsive feeding, and practical nutrition instructions that are expected to meet the needs of caregivers about feeding practices for CP children. The development of feeding practice educational videos aims to improve nutrition knowledge and caregiver skills in feeding and drinking practices to support the ability of CP children to eat and drink.

Methods

The research method used is research and development (R & D) with the ADDIE model, namely analysis, design, development, implementation, and evaluation (Molenda, 2015). The study was carried out from February to April 2023 at the Pediatric Neurodevelopmental Therapy Center (PNTC), Intan Physiotherapy Anak (IFA), and Yayasan Pembinaan Anak Disabilities (YPAC) Surakarta, in accordance with permission from the Research Ethics Committee of the Faculty of Medicine, Universitas Sebelas Maret with Letter Number 35/UN27.06.11/KEP/EC/2023.

The analysis phase aims to analyze the potential and problems of caregivers regarding feeding CP children using an in-depth interview method using questionnaires. Caregivers are fathers, mothers, families, and other people who are employed as caregivers for CP children and are the caregivers who play the most role in feeding and drinking CP children. The list of questions given was: whether the caregiver felt difficult or stressed when feeding the child; whether the caregiver had received education about feeding CP children; the educational media expected during education; and what educational materials were desired during the implementation of education. The caregivers interviewed were caregivers who came with CP children to undergo physiotherapy at PNTC, IFA, and YPAC Surakarta clinics. They were willing to be interviewed and obtained as many as 30 CP child caregivers. The interviews showed that 28 caregivers had never received feeding practice education for CP children and expected educational media in the form of videos to be seen and heard when caring for CP children.

At the design stage, researchers designed an education with video media consisting of dietary content, food texture, food diversity, the position of CP children when eating and

drinking, how to swallow and chew food, how to drink, how to eat and drink independently, responsive feeding, and practical nutrition instructions. Feeding practice educational content refers to several guidelines, namely modules from the Hambisela Project "Feeding Your Child", Guidelines for Balanced Nutrition contained in the Regulation of the Minister of Health of the Republic of Indonesia No. 41 of 2014, and Guidelines for the Eating and Drinking Ability Classification System (EDACS) for CP children written by Sellers et al. (2014) in collaboration with Chailey Heritage Clinical Services, Sussex Community NHS Trust, and Children with Eating and Drinking Difficulties (2017) guidelines published by Multi-Agency International Training and Support (MAITS) and several other reference books. The video concept is designed in a storyline, which is in the form of writing about the material and images that will be included in the video, then processed with the help of Canva Pro, Adobe Premiere Pro 2019, and Adobe After Effects 2015.



Figure 1. Examples of storyline and video design

The video is designed in three parts: the first video consists of food diversity content, diet, food texture, and the position of CP children when eating and drinking; the second video consists of content on how to swallow and chew food; how to drink; and how to eat and drink independently; and the third video consists of responsive feeding content and practical nutrition instructions.

The three videos that have been made by researchers then enter the development stage.

Video development at the development stage is validated by material experts, namely nutritionists and physiotherapists, and one video media expert. Validators have a strata 2 (S-2) educational background and are competent in their fields. Validators conduct video assessments by putting a check mark (√) on the assessment form sheet. The assessment uses the Likert scale, which is 1 = very not good, 2 = not good, 3 = enough, 4 = good, and 5 = very good. After providing an assessment, the validator writes a suggestion for the researcher that is used as a reference for the revision of the video.

The implementation phase of the educational video was tested on CP childcaregivers at special child physiotherapy clinics PNTC, IFA, and YPAC Surakarta. This trial was carried out in two stages, namely the small group test and the field group test. The product usage trial for CP's small group of babysitters consisted of 10 CP babysitters who were willing to conduct video assessments. According to Mulyatiningsih (2014), small group test subjects were carried out on 6–12 respondents in conducting product trials. The implementation phase of the field group consists of 15 CP child caregivers. This is in accordance with Sugiyono (2017) regarding the use of the minimum number of samples used in the experimental group, which is 15 people. The sampling technique is a non-probability sampling technique, namely a type of purposive sampling (Probandari et al., 2020), with the criteria that caregivers are the people who play the most role in the eating and drinking activities of CP children, and CP children who are cared for do not use nasogastric tubes (NGT). Feeding practice educational videos uploaded by researchers on Google Drive with https://drive.google.com/drive/folders/15pwSPMoi50hSPOQvtMvdCf1XZCERod8t?usp=drive_link links that are easily accessible to CP childcaregivers via smartphones or laptops.

At the evaluation stage, the data that has been collected will be calculated and then interpreted. This is to assess the feasibility of the video developed by assessing the video in the form column using the Likert scale, namely 1 = very not good, 2 = not good, 3 = enough, 4 = good, and 5 = very good. Assessments and suggestions

from validators, small groups, and field groups will be used for revision of the developed video. The assessment results are then calculated using the following formula (Purwanto, 2014):

$$NP = \frac{R}{SM} \times 100 \%$$

Information:

NP	=	Percentage value
R	=	Scores obtained
SM	=	Maximum score

The percentage value obtained as a result of validation calculations carried out by validators and evaluations from small groups and field groups is then converted according to the eligibility criteria for educational videos, both material and video media, in Table 1 (Tegeh et al., 2014).

Table 1. Educational video eligibility criteria

Percentage Value	Criterion	Information
90-100%	Excellent	It is very feasible and does not need revision
75-89%	Good	Appropriate and revised as necessary
65-74%	Enough	Quite decent and pretty much revised
55-64%	Less	Less feasible and widely revised
0-54%	Very lacking	Not feasible and totally revised

The educational video feeding practice for children with cerebral palsy that has been made has been registered as the intellectual property rights of Universitas Sebelas Maret as the copyright holder and the researcher as the creator.

Result and Discussion

Feeding practice educational videos are developed through five stages according to the ADDIE model, namely analysis, design, development, implementation, and evaluation.

Analysis Phase

At the analysis stage, literature analysis and analysis of the needs of CP childcares are carried out. Riskesdas data in 2018 found that 8,6% of all residents in Central Java suffered from CP, consisting of 2,9% aged 5–17 years, 3,2% aged 18–59 years, and 2,5% aged >60 years. The Indonesian Ministry of Health estimates that the incidence of CP is 1–5 per 1000 live births.

Educational video media about feeding practices for CP children often use English. A preliminary study on CP child caregivers to analyze the needs of caregivers for feeding practice education found that 1) caregivers often find it difficult or stressful when feeding CP children; 2) caregivers have never received counseling or education about feeding for CP children; 3) the educational media expected by caregivers is video media; and 4) the desired counseling material is about feeding practice. Based on the literature analysis and needs analysis obtained, the development of educational videos on feeding practices for CP children for caregivers was carried out.

Design Phase

The planning stage is carried out by making a storyline that contains a description of the video flow that will exist from the beginning to the end of the video, and then making educational videos is carried out using the Canva Pro application, Adobe Premiere Pro 2019, and Adobe After Effects 2015.

Furthermore, the process of filling in the voice is adjusted to the images and video animations that have been made. The resulting video is as many as three videos with a duration of 7–11 minutes per video. The first video contains content on food diversity, diet, food texture, and the position of CP children when eating and drinking. The second video consists of content on how to swallow and chew food, how to drink, and how to eat and drink independently. Third video with responsive feeding content and practical nutrition instructions.



a. Video cover display

b. Display of video material

Figure 2. Video cover display and content

Development Phase

The educational videos that have been made then enter the development stage, namely videos validated by nutritionists and physiotherapists as video material experts and one video media expert. The material expert

assessment consists of 11 questions with a Likert scale of 5, so the maximum score that can be obtained is 55 points. The following are the results of the material expert assessment, namely expert score I given by nutritionists and expert score II given by physiotherapists.

Table 2. Material expert validation results

Assessment Aspect	Expert Score I	Expert Score II
Suitability of the material to the learning objectives	4	4
Material up-to-date	4	4
Concept or theory description	4	5
The order of presentation of the material	4	4
Suitability of material coverage to purpose	4	5
Suitability of the depth of the material to the purpose	4	4
Ease of understanding terms and formulations	4	4
Suitability of examples or illustrations to the material	3	5
Summary provision	4	4
Compatibility of time duration with presentation material	3	4
Use of spelling and grammar of presentation	4	4

The total nutritional assessment score above is then calculated as a percentage value as follows:

$$NP = \frac{42}{55} \times 100 \% = 76,4 \%$$

The results of the nutritionist validation calculation were obtained at 76.4% and included in the criteria for eligible educational videos, but with revisions in accordance with the suggestions given. The total physiotherapist score in Table 2 above is then calculated as a percentage value as follows:

$$NP = \frac{47}{55} \times 100 \% = 85,5\%$$

The result of the validation calculation by the physiotherapist as a material expert is 85.5%. This value is then converted to the educational video eligibility criteria in Table 1 and is included in the eligible video category, but with revisions according to the advice given.

Media expert assessment with 25 questions, and the maximum score that can be obtained is 125 points. The results of the

assessment by media experts are presented in the following table.

Table 3. Media expert validation results

Assessment Aspect	Media Expert Score
Media screen layout	4
In-media menu facilities	4
Acceleration of letters, numbers and symbols	5
Visual quality (resolution) of a graph or image	5
Color composition and resolution	5
Match the text color with the background	4
Text, visual, audio, and animation acceleration	4
Narrator audio quality	4
Use of language in narrative	4
Noise-free narrative quality	4
The communicative nature of the narrative	3
Background compatibility with the material	4
Background settings	3
Interlaced and progressive scan quality	4
Use of video/animation resolution (pixels)	5
Suitability of objects/videos/animations to the material	4
Visualization of objects on concepts/abstracts of material	4
Reduction of misperceptions of media objects	4
Application of spatial principles	5
Use of temporal principle	4
Use of clue and signaling	3
Reduction of redundancy effect	4
Application of the principle of coherence	5
Use of modality principle	4
Reduction of cognitive load for users	4

The total score above is then calculated as a percentage value as follows:

$$NP = \frac{103}{125} \times 100 \% = 82,4\%$$

The result of the validation calculation by media experts is 82,4%. This percentage is then converted to the eligibility criteria for educational videos in Table 1 and is included in the category of eligible video media, but with revisions according to the advice given. Suggestions from validators become a reference for revising educational videos so that the final product meets the criteria of a good product (Cahyadi, 2019).

Implementation and Evaluation Phase

Educational videos that have been validated by validators and revised by researchers according to validator suggestions are then tested on small groups of CP childcares at PNTC, IFA, and YPAC Surakarta clinics. The implementation stage in the small group was carried out on 10 respondents. The assessment consists of 26 questions summarized in 4 aspects of assessment with a Likert scale of 5, so that the maximum score that can be obtained is 130 points for one respondent, and the following are the results of the small group assessment.

Table 4. Educational videos based on assessment aspects

Aspects of Assessment	Group Test Results	
	Small	Field
Media characteristics	587	881
Material	311	470
Audio and visual	185	264
Animation	93	135
Total Score	1176	1750

The total assessment score of the small group trial is 1176, which is then entered into the percentage value formula, obtaining the following results:

$$NP = \frac{1176}{(130 \times 10)} \times 100 \% = 90,5\%$$

The results of the small group calculation get a result of 90,5% and are included in the very feasible criteria according to the eligibility criteria for educational videos in Table 1.

Educational videos that have gone through the small group trial stage were then implemented with respondents, namely CP child caregivers at PNTC, IFA, and YPAC Surakarta clinics. A field group test was conducted on 15 caregiver respondents with 26 questions

summarized in 4 aspects of assessment on a Likert scale of 5, and the maximum score that can be obtained is 130 points per respondent. The results obtained can be seen in Table 4. The total assessment score based on the field group test is 1750, which is then calculated as a percentage value with the following results:

$$NP = \frac{1750}{(130 \times 15)} \times 100 \% = 89,7\%$$

The results of the field group calculation get a result of 89,7% and are included in the eligibility criteria, with revisions as necessary in accordance with the eligibility criteria for educational videos in Table 1.

The development of educational videos about feeding practices for CP children for caregivers was chosen as an educational medium because it is audiovisual in nature and can display image illustrations accompanied by informative explanations so that they can be played repeatedly. The target of education is the caregivers of CP children, such as parents, families, or other people who play the most role in feeding CP children. CP caregivers need knowledge about feeding practices so that CP children's eating and drinking skills can be further developed, and educational videos with content that uses Indonesian can be more easily understood for CP child caregivers.

Efforts to influence nutritional knowledge and behavior are made by using educational media as a tool to clarify educational messages and information (Aroni, 2016; Al Rahmad, 2022). Based on the evaluation results, it shows that users, namely CP child caregivers, feel that educational video media provides what users need, so they are interested in learning by using educational video media to feed practice CP children. As for the validation results from the expert team and assessment in the small group test, it can be seen that the educational video media developed is good and suitable for use in nutrition education for CP child caregivers.

Common difficulties experienced by caregivers when feeding CP children include food that is often spilled; children experience choking and vomiting. Children with CP have chewing and swallowing problems that can interfere with feeding and drinking, so this is a big concern for caregivers, especially parents (Marques & Sá, 2016). So, education about

good feeding practice guidelines will change caregiver practices in terms of food texture, cutlery, and position when eating (Maggioni & Araújo, 2020; Sidiq et al., 2021).

The use of video media in the educational process is preferred because it is not only interesting in terms of appearance but also has interesting audio so that users can more easily understand the message and information provided, which is expected to have an impact on nutritional behavior (Aisah et al., 2021). Videos can display realistic images and facilitate learning so that they can increase enthusiasm for learning, provide experience, and increase the efficiency of learning time (Hardianti & Asri, 2017). Nutrition education provides useful information for caregivers that helps reduce the burden on caregivers in managing feeding difficulties in children with CP. Factors that affect a child's ability to eat and drink are the texture of food, eating and drinking utensils, posture when eating or drinking, the environment, and the person who plays a role in feeding the child (Benfer et al., 2017).

The feeding practice educational video has an MP4 format with a duration of 11 minutes and 18 seconds (video 1), 8 minutes and 16 seconds (video 2), and 7 minutes and 57 seconds (video 3). The average duration to deliver the material is recommended to be 6–10 minutes, or a maximum of 15 minutes, which aims to prevent education recipients from experiencing boredom (Ratnaningsih, 2022). Educational video media is delivered in CP parenting education meetings and then uploaded on Google Drive with links that can be accessed by caregivers via smartphones and laptops. This makes it easier for caregivers to learn to use this medium while caring for CP children. Feeding practice educational media in the form of videos are able to combine audio and visual to become an advantage of media that is able to present more interesting health education. The use of audio-visual media is effective in increasing maternal knowledge and feeding practices among CP children (Mohammed et al., 2020).

One of the characteristics of audio-visual media is the ability to present dynamic visuals, but in the video that has been developed, there is quite a lot of writing accompanying video animation images so that it can be improved in

terms of balance between writing and animation to make it more attractive. The animation displayed represents the content in the video, and there are some real video images, especially for the type of food texture. This is so that caregivers can find out, in real terms, the texture of the food referred to in the feeding practice educational video material. The video content consists of nine materials, divided into three educational videos. All content is material related to feeding practice, but some content can be selected that is needed by caregivers in CP child feeding practices to be more effective and efficient when implementing it with caregivers. The limitation of this research is that at the development stage, there is one video with a duration of more than 10 minutes, so it requires more time and attention when compared to the other two videos. In addition, the number of respondents in the field group at the time of implementation is a minimal number of samples, so the acceptability of video in a wider scope of respondents cannot be known.

Conclusion

It can be concluded from the development of CP children's feeding practice educational videos for caregivers with the ADDIE model that the videos are good and feasible to be implemented in accordance with the validation results of the expert team, small group tests, and field group tests. CP caregivers gain enthusiasm for learning in order to be able to have good feeding practice knowledge and skills for CP children.

The suggestion is that videos on feeding practices can be used for caregiver training on CP child feeding practices, which can further assess the effectiveness of video feeding practices in improving the knowledge and skills of CP child caregivers.

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