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Optimizing Health Promotion Through Visual Media Innovation for Youth Soccer Athletes

Optimalisasi Promosi Kesehatan Melalui Inovasi Media Visual Bagi Atlet Sepak Bola Remaja

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ABSTRACT

Background: The inconsistency of performance for adolescent soccer athletes is caused by inappropriate nutrition practices. The study on U-14 to U-18 soccer athletes showed 20% of athletes lacked fluid intake and 87% of athletes had low energy and protein intake. **Objective:** This study aims to develop health promotion media for youth soccer athletes. **Methods:** This study assessed the feasibility of the developed media which consists of two stages. The first stage is the media feasibility assessment conducted by experts who focused on developing health promotion media. **Results:** The feasibility of sports nutrition pyramid poster, meal plate poster, and infographic is 3.2; 3.4; and 3.3. The sports nutrition pyramid poster has scores of 3 (layout); 3.5 (design); 3.2 (content). The meal plate poster has scores of 3.25 (layout); 3 (design); 3.7 (content). The infographic has scores of 3 (layout); 3 (design); 3.7 (content). There was an increase in the athlete's knowledge score from 65 to 79 (p=0.001).
Conclusion: All media are feasible to be used as athletes' health promotion media.

ABSTRAK

Latar Belakang: Inkonsistensi performa atlet sepak bola remaja disebabkan oleh praktik gizi yang tidak tepat. Studi pada atlet sepak bola U-14 hingga U-18 menunjukkan 20% atlet kekurangan asupan cairan dan sebanyak 87% atlet memiliki asupan energi dan protein rendah.**Tujuan:**Studi ini bertujuan untuk mengembangkan media promosi kesehatan bagi atlet sepak bola remaja. **Metode:** Studi ini menilai kelayakan media yang dikembangkan yang terdiri dari dua tahap. Tahap pertama adalah penilaian kelayakan media yang dilakukan oleh para ahli yang fokus pada pengembangan media promosi kesehatan. Tahap kedua adalah pengujian media kepada atlet untuk mengetahui kenaikan skor pengetahuan sebelum dan sesudah edukasi menggunakan media yang sudah dikembangkan. **Hasil:** Kelayakan poster piramida gizi olahraga, poster piring makan, dan infografis adalah 3,2; 3,4; dan 3,3. Poster piramida gizi olahraga memiliki skor 3 (tata letak); 3,5 (desain); 3,2 (isi). Poster piring makan memiliki skor 3,25 (tata letak); 3 (desain); 3,7 (isi). Infografis memiliki skor 3 (tata letak); 3 (desain); 3,7 (isi). Terjadi peningkatan skor pengetahuan atlet dari 65 menjadi 79 (p=0,001). **Kesimpulan:** Semua media layak digunakan sebagai media promosi kesehatan atlet.

INTRODUCTION

Achievement is one of the main targets in a sports competition. One of the athlete's achievements is supported by optimal performance. Various inconsistencies in the performance of athletes still occur in soccer players. A study conducted at the Guntur FC and HW UMY Club showed that there were still almost 80% of student soccer athletes with poor fitness with Vo2max of 47.18 ml/kg/minute, and only 21% with good fitness with an average vo2max of 52.71. ml/kg/minute.[1] Another study conducted on soccer athletes at Ahmad Dahlan University also showed the athlete's Vo2max was 44.02 ml/kg/minute in the less fitness category.[2]

The athlete's performance has not been optimal due to the provision of nutrition according to the athlete's needs not being implemented so several indicators of performance have not been achieved optimally. It was found that 16.67% of young soccer players had anemia with 50% of athletes having low energy intake, 87% of athletes with low protein intake, 37% of athletes with low iron intake, and 20% of athletes having low vitamin C intake.[3] Another indicator shows uric acid levels in 85% of youth soccer athletes are in the high category (7.05 mg/dL). The high level of uric acid is influenced by the lack of optimal fluid consumption of athletes.[4]

Providing education to athletes can be a solution to increasing knowledge related to balanced nutrition and appropriate fluid intake. There was an increase in knowledge scores from a range of 50 points to a range of 70 points before and after education.[5,6]

Studies conducted on U-14 to U-18 athletes at PSS Sleman showed that 15% of athletes were overfat, 8% under fat, 8% were at risk of undernutrition, 11% over nutritional status, more than 50% experienced hyperuricemia with 87% of athletes having low energy and protein intake, and 20% of athletes have low fluid intake, especially some athletes still have poor fluid consumption habits.[7,8]

Efforts to increase knowledge have been carried out at PSS Sleman Development Center, in the form of online education using zoom media. There was an increase in knowledge from a score of 40 to 53.5. This increase has not yet reached the category of good knowledge score.[7] Online education related to handling athlete's injuries has also been carried out, but only able to increase the knowledge score from 41.4 to 57.3.[9] Low levels of athletes' nutritional knowledge cause a lack of optimal performance of athletes.

The preparation of educational media aims as one way to improve the literacy of the subject. Nowadays, the majority of teenagers spend their time in front of the media, almost all actions are influenced by the media. Based on social learning theory, adolescents learn by observing and adopting what they see on their screens. The application of technology can improve the learning teaching process.[10,11] Based on the interviews with coaches and several athletes, athletes have not used

gadgets optimally, especially in seeking health information. In addition, several athletes stated that their literacy was still minimal and they were still reluctant to read information carefully. This study aims to develop educational media or health promotion media that are suitable for youth soccer athletes.

METHODS

This study assessed the feasibility of the developed media which consists of two stages. The first stage was a descriptive study. This stage was conducted in September – October 2022. The stage began with the development of educational media.

The previous media used to educate athletes were videos containing power point slide presentations. The educational video is 60 minutes long which consists of four materials related to nutrition in sports. The long duration of the video causes athletes to be reluctant to listen to the material until finished, especially since the video hasn't been equipped with interesting pictures. The media to be developed is in the form of visual media which is equipped with various pictures and also description of its applications in the daily lives of athletes.

The educational media developed included 1) a sports nutrition pyramid poster, 2) an athlete meal plate poster, and 3) an infographic on nutrition practices for athletes. Media development was carried out in September 2022. The basis for media development was content related to the sports nutrition pyramid, in particular the application of balanced nutrition and the provision of sports food based on the athlete's meal plate in accordance with the training period.

Next, on October 2022 the media was tested for feasibility by two experts who focused on developing educational media and sports nutrition. Based on previous studies, the feasibility of media content needs to be tested by at least two experts.[12] The feasibility study was carried out by filling out the media feasibility questionnaire; which includes layout, design, and content. The rating range is 1 (very unattractive), 2 (less attractive), 3 (attractive), 4 (very attractive). The feasibility analysis on the layout includes 1) a combination of appropriate and proportional images and text, and 2) illustration images/ photos. The feasibility of the designs studied was 1) overall color and 2) title and font. While the content section assesses 1) the purpose of the media, 2) the acceptance of the message, and 3) the suitability of the message/invitation. The final step of media development was media revision based on the results of expert review. The data were tested by univariate analysis using tables and figures and also tested descriptively on each health promotion media.

The second stage was experimental study using pre-posttest without control group by testing the media to 16 athletes, who are members of PSS Sleman Development Center, to know the increase in knowledge scores before and after education using the

media. This stage was conducted on October 2022 in PSS athlete dorm.

The athlete's knowledge data was then processed statistically using Shapiro Wilk test to determine the distribution of data. Based on Shapiro Wilk test, the pretest score was not normally distributed (p=0.024) and the posttest score was normally distributed (p=0.233). Then, Wilcoxon rank sum test was carried out to determine the effectiveness of using media in educating athletes.

RESULTS AND DISCUSSION

The overall feasibility for being educational media of 1) a sports nutrition pyramid poster, 2) an athlete meal plate poster, and 3) an infographic on nutrition practices for athletes is 3.2; 3.4; and 3.3, respectively. The sports nutrition pyramid poster has a score of 3 for layout, 3.5 for design, and 3.2 for content. The athlete meal plate poster has a score of 3.25 for layout, 3 for design, and 3.7 for content. While the infographic on nutrition practices has a score of 3 for layout, 3 for design, and 3.7 for content (**Table 1**). The value achieved has reached the expected target with a minimum value of each assessment item is 3 (attractive).

Sports Nutrition Pyramid Poster

The review from the first expert related to the 1st poster is to streamline writing and images so that there is no repetition of information. Also, the poster can have more illustrations of the sport-specific nutrition section and place more emphasis on urgency and examples of the use of sport-specific nutrition. While the review from the second expert is to use a brighter base color and minimize the use of brown. The second expert suggested a change in the use of the term “basal diet” to a term that is easy to understand considering the use of the word "basal" has an ambiguous meaning with "basal" as the body's basic needs.

Based on input from experts, poster changes have been made to optimize the text and color layout. In addition, the term was changed from “basal diet” to “basic diet” considering that the bottom part of the pyramid for athletes is the application of balanced nutrition while still meeting the needs of basic foods, side dishes, vegetables, and fruit (Figure 1(a) and 1(b)).

Table 1. Results of the Feasibility of Educational Media by Experts

Criteria	Media 1*	Media 2**	Media 3***
Layout			
Combination of images and text	3	3.5	3
Illustration images/ photos	3	3	3
Mean	3	3.25	3
Design			
Color	3.5	3	3
Title and font	3.5	3	3
Mean	3.5	3	3
Content			
Purpose	3.5	3.5	3.5
Acceptance of the message	3	3.5	3.5
Suitability of the message	3	4	4
Mean	3.2	3.7	3.7

*Sports nutrition pyramid poster; **Athlete meal plate poster; ***Infographic on nutrition practices for athletes

(a) Media 1 Before Expert Judgment

(b) Media 1 After Expert Judgmen

Athlete Meal Plate Poster

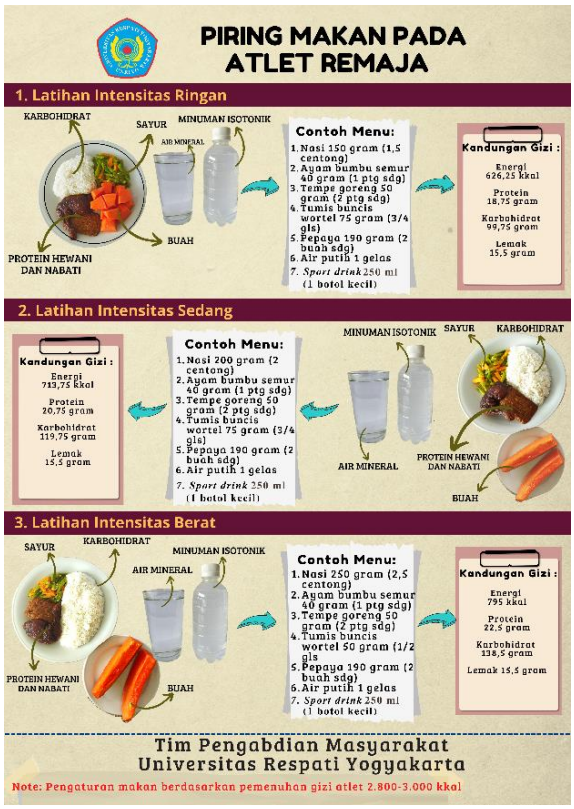
The review from the first expert directed that the menu section should simply write down the size of the household, and there is no need to add grams of each dish so that the poster section is not too full. A review from the second expert directs to combine the use of color to make it look brighter. Experts stated that the media developed were innovative and interesting and made it easier for athletes to apply in everyday life.

Changes have been made by removing grams of each dish so that the layout doesn't look too crowded. In addition, color changes have been made to make the poster look more attractive (**Figure 2(a) and 2(b)**).

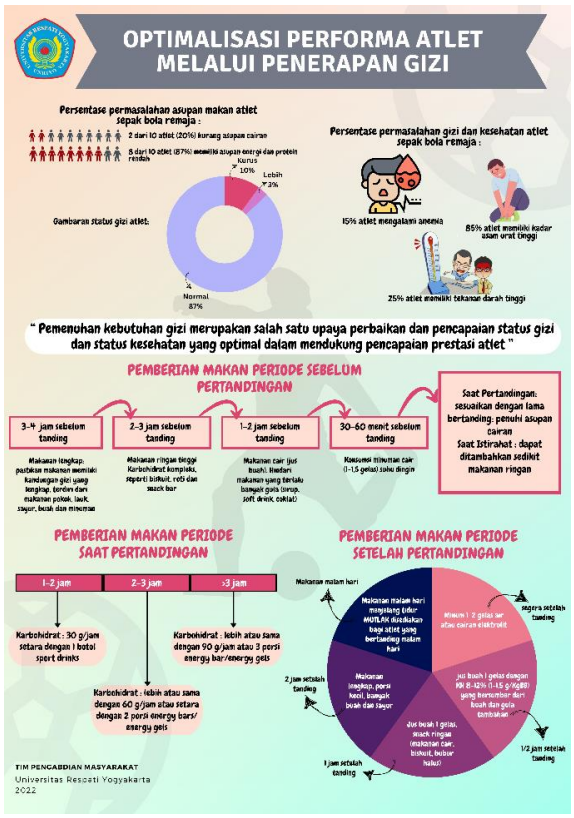
Infographic on Nutrition Practices for Athletes

The first expert suggests that the empty area can be filled with interesting information or pictures. The second experts suggested that the nutritional problems section of athletes could be highlighted or in bold so that athletes could understand the problems they were facing. Experts are very interested in the content of infographics and stated that infographics were useful for athletes, especially regarding eating arrangements based on periodization.

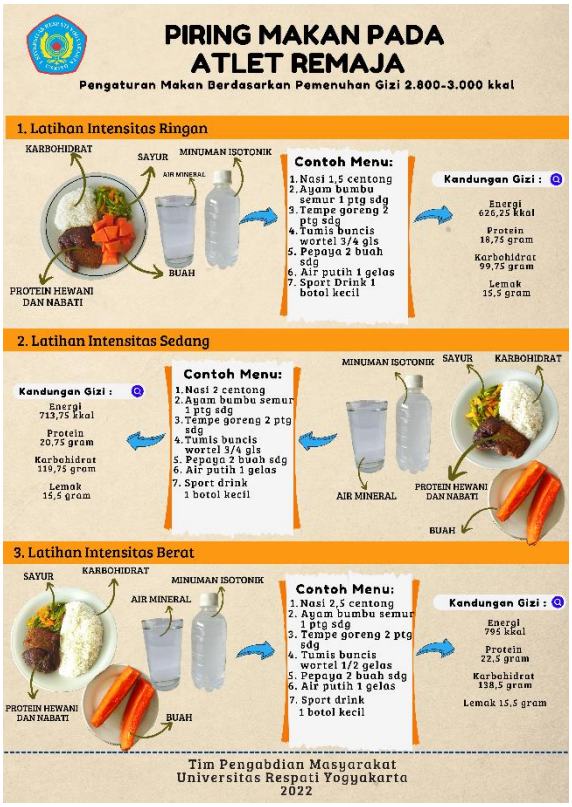
As with other media, changes have been made to infographics by optimizing the blanks (**Figure 3(a) and 3(b)**).



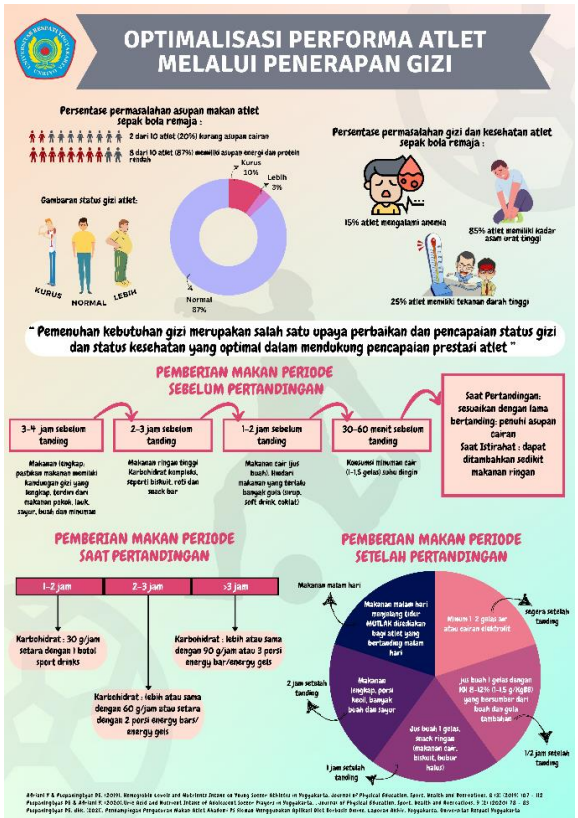
(a) Media 2 Before Expert Judgment;



(a) Media 3 Before Expert Judgment



(b) Media 2 After Expert Judgment



(b) Media 3 After Expert Judgment

Knowledge Before and After Education

There was an increase in the athlete's knowledge score from 65 to 79 (14 points) (p=0.001) with minimum and maximum score at posttest were 60 and 93 (**Table 2**).

Table 2. Knowledge Changes of PSS Sleman Development Center Athletes Before-After Education

Time	Mean±SD	Range	p
Before education	65±14	33-93	0.001
After education	79±8	60-93	

Media is any tool that plays a role in moving information from one place to another. Media is used in the teaching and learning process so that the process runs effectively. [13] Media plays a role in providing students with knowledge, skills, and attitudes. One example of media is graphic media in the form of posters, diagrams, and infographics. This graphic media is also known as visual media. Media development criteria include 1) quality of content and objectives (accuracy, importance, completeness, and balance, interesting, correct, and appropriate to the target); 2) the quality of the instruction or solicitation; 3) technical quality (easy to read, easy to use, good layout quality).[14]

Making educational media in the form of posters, especially digital posters, is one solution to increase subject knowledge considering that social media is an important part of the lives of today's teenagers and the majority of teenagers spend their time in front of the media, almost all actions are influenced by the media. This study showed that there was an increase in the knowledge score from the use of the poster media. In line with previous study, there was an increase in adolescent's knowledge score before and after education using visual and audiovisual media. [13]

Previous studies on adolescents in the United States showed that many teenagers use social media in their daily lives, especially with the increase in cellphone ownership. Social media is something in the lives of teenagers and young adults, which has a systemic effect on other contexts, including education at all levels. The reach of social media, however, goes far beyond learning.[10,15,16] According to social learning theory, adolescents learn by observing and adopting what they see on their screens. The application of technology can improve the learning and teaching process.[11]

Good learning media must be able to encourage students to get knowledge easily. The content of learning materials must be developed carefully. The teaching and learning media developed must be able to stimulate critical thinking skills in students. Mass media or learning media in the form of text are media that combine language in the form of communication-visual images. Media language must mean how the language conveys an idea, how the language is familiar or known, how the language structure is appropriate, and how the language genre is (formal or informal). Audience from the media

must be one of the concerns in media development, namely who the target audience is, and how is the use of information on the media in the daily life of the target.[17]

The most important thing that must be considered is how to ensure that the content of the material in the learning media can be understood and attracts students' interest in learning the material.[18]

Some articles or papers or educational media can be disseminated through social media which will later be used or applied in the lives of teenagers. Teenagers who don't like going to the library, buying books, or reading books can use other educational media as learning media, one of which is the use of digital posters in their social media. Studies show that 76% of social media is used for sharing learning experiences and research, 59% for academic activities, and 92% used to get the latest information.[19]

This educational media in the form of posters can be disseminated through other electronic media considering that previous studies showed that the most widely used social media were Facebook, Twitter, Instagram, and WhatsApp.[20–22] Data from the Ministry of Technology and Information in 2014 showed that internet users in Indonesia reached 82 million people. with 80% coming from the age range of 15-19 years.[20] Another study showed that 87% of adolescents used social media to access health information related to stress, depression, fitness, and fatigue. Other sought-after information related to diet, fitness, and body image. Social media is expected to be able to increase the knowledge and awareness of teenagers to change their behavior to be fitter and implement good physical activity.[22]

The existence of innovation in media preparation is a process of responding to technological changes. Media innovation must have an additional impact such as economic or social impact.[23] This study showed that this media give social impact especially on increase the nutritional knowledge of athletes. The existence of innovation in educational media is expected to have an impact on improving the health status of youth athletes.

CONCLUSION

Based on the expert's judgment and the study on athletes' knowledge changes, the developed health promotion media deserves to be used as educational media for adolescent athletes. Further studies are needed to examine the impact of media provision on increasing attitude and behavior of athletes related to the application of nutrition in sports.

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