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Effectiveness of Poster, Animated Video and Live Youtube on Knowledge of Metabolic Syndrome and Sugar, Salt and Fat Consumption Recommendations (GGL)

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ABSTRACT

Introduction: Excessive consumption of sugar, salt and fat in society due to lack of knowledge is increasing from year to year and causing high incidence of metabolic syndrome. Efforts to handle it can be done through nutrition education.

Objective: The purpose of this study was to determine the effectiveness of the influence of the media namely posters, animated videos and Live Youtube on knowledge of metabolic syndrome and recommendations for consumption of sugar, salt and fat in women of the Al-Mutaqqin taklim assembly.

Method: The type of research is Quasi Experiment with Pretest – Posttest design group. A sample of 45 mothers were determined by purposive sampling technique. Knowledge is measured with a questionnaire instrument. Data were analyzed by using the Paired T Test and One Way Anova test using PostHoc and Tukey analysis.

Result: . It was found that there was an effect of nutrition education with the three media on knowledge of metabolic syndrome and recommendations for consuming GGL with $p < 0.005$. For Metabolic Syndrome Knowledge, Poster with live youtube with sig. of $0.027 < 0.05$ then H_0 is rejected. Live Youtube with posters with sig numbers. of $0.027 < 0.05$ then H_0 is rejected. It can be concluded that the group that was given the YouTube live media was better than the poster media and animated video media with the result that the knowledge of Metabolic Syndrome at the posttest increased more than the other media.

Conclusion: The conclusion of this study is that all media have an effect on increasing knowledge about metabolic syndrome and recommending the consumption of sugar, salt and fat. The most influential media is YouTube live media because of its advantages that other media don't have, namely interaction.

Keywords: Animated Video; Live Youtube; Media; Metabolic Syndrome; Poster

INTRODUCTION

The prevalence of metabolic syndrome based on the International Diabetes Federation epidemiological survey is between 20-25% (1). Riskesdas 2018 shows that the prevalence of non-communicable diseases continues to increase, especially in high blood pressure, obesity, and diabetes mellitus (2). Metabolic syndrome is a collection of symptoms of body metabolic abnormalities that include dyslipidemia (increased triglyceride levels and decreased high density lipoprotein/HDL), hyperglycemia, hypertension, and central obesity (3).

Metabolic syndrome is currently a worldwide health challenge associated with urbanization (changes in lifestyle and diet), excess energy consumption, increased prevalence of obesity and lack of knowledge. It is estimated that in the next five to ten years, the risk of type 2 diabetes mellitus (DM) will increase fivefold and cardiovascular disease will double. Patients with metabolic syndrome have two to four times the risk of stroke (3). In Indonesia, 23.34% of the total population has metabolic syndrome, 26.6% of whom are male and 21.4% are female (1).

Factors that influence the occurrence of metabolic syndrome are the community has not touched health services, especially cardiovascular and metabolic, the unavailability of health services in certain areas, modern lifestyles, not maintaining a diet, excessive intake of energy; sugar; salt; fat and still low public understanding of metabolic syndrome because they do not get enough correct information about health (4).

People's attitudes and knowledge about nutrition are still inaccurate, for example, the taste of food that tends to be preferred and prioritized is the taste of salty foods that are high in sodium, sweet drinks and fried foods that contain high fat without any consideration of good nutritional content. Some studies suggest that this has a relationship, one of which is "Excessive sugar consumption has a relationship related to the emergence of metabolic syndrome events" according to Semnani-Azad research (5). Based on the results of the study, high consumption of saturated fat in the community has a link with the incidence of metabolic syndrome (6).

Improving knowledge and behavior is one of the goals of patient or community education. Education can be delivered in various ways, including counseling, counseling, giving oral material or using assistive media, such as booklets, leaflets, posters, animated videos, material slides, games, and through social media. Social media, one of them is youtube is an innovation in health education media. YouTube enables independent and flexible learning. Students can access learning videos anytime and anywhere, without being bound by time and space. The YouTube platform provides a variety of useful services such as uploading, downloading, watching and sharing videos. This makes it easier for users to access and use educational content (7). In addition, on YouTube there is a live streaming feature that allows audiences to ask questions and get answers directly from educators, increasing interactivity and making it easier for audiences to understand the material presented (8).

Posters as educational media have the advantage of being durable and easy to use. Educators can put up posters everywhere, so that anyone can see them anytime and anywhere (9). The purpose of this study was to determine the effectiveness of the influence of media, namely posters, animated videos and Live Youtube on knowledge of metabolic syndrome and consumption recommendations for sugar, salt and fat in mothers of the Al-Mutaqqin taklim assembly.

METHOD

The research design used is Quasi Experiment with group pretest - posttest design. In this study there were three groups, namely the nutrition education intervention group using Poster media, the nutrition education intervention group using animated video media and the education intervention group using live YouTube interactive media. Which was conducted on May 11 - May 18, 2023.

The sample in this study were mothers of the Al-Mutaqqin taklim assembly totaling 45 people. Inclusion criteria are mothers who actively attend Al-Mutaqqin taklim assembly studies, have smartphones and whatsapp applications. Exclusion criteria are mothers of the taklim assembly who do not have smartphones and whatsapp applications. With purposive sampling technique respondents were divided into 3 groups.

The nutritional status indicator used is IMT / U with categories according to the Indonesian Ministry of Health. This study used a questionnaire as an instrument distributed via google form. The scale used in the instrument is a guttman scale. The Metabolic Syndrome knowledge questionnaire consists of 10 statements as well as the GGL consumption recommendation knowledge questionnaire. 1 statement is given a value of 10 so that the total score on each knowledge is 100 which is automatically converted into a percentage on google form. Knowledge is categorized based on (10), Good with a score of 76-100%, Sufficient with 56-75%, Less with a score of 40-55%.

Providing nutritional knowledge to respondents was carried out with media aids, namely A3 size posters attached to the Mosque mading, animated videos with a duration of 2 minutes 30 seconds, and YouTube live streaming. Aniamsi and live streaming videos are uploaded on the youtube channel "Nutrition Unsika 20".

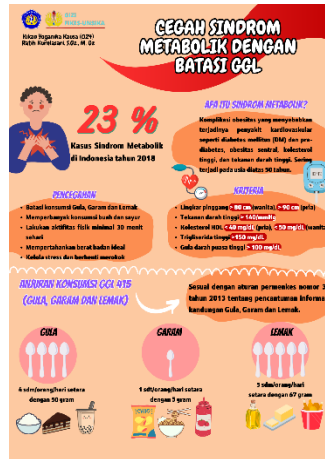


Figure 1. Poster Media



Figure 2. Media Animated Video

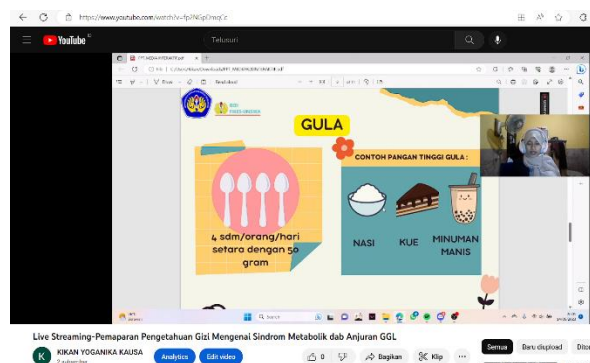


Figure 3. Youtube Live Media

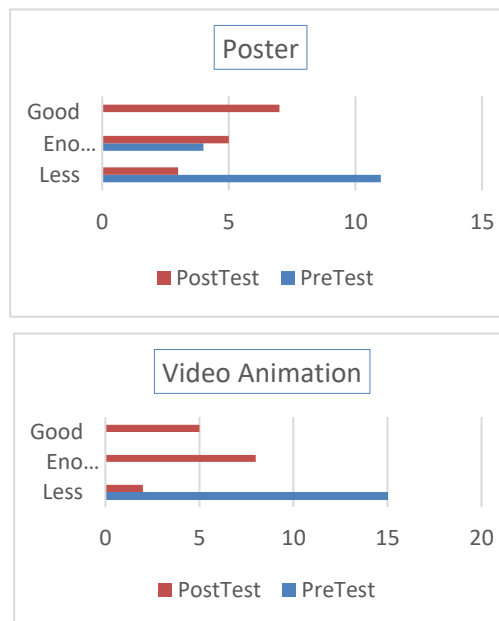
To measure the difference in knowledge of metabolic syndrome and GGL consumption recommendations before and after providing media to subjects through pretest and posttest. Data were analyzed univariately and bivariately. Before conducting bivariate analysis, a normality test using Shapiro-Wilk was first carried out, followed by using a paired t test to see the average difference in knowledge in mothers before and after being given media. The bivariate analysis that will be carried out in this study is to use the One-Way Anova statistical test calculation to compare the mean differences of more than two groups with a degree of significance $\alpha = 0.05$. To find out which group has a difference, a Post Hoc analysis is carried out with the Tukey Test. Then, the data processing process of the results of each variable is using the help of the Statistical Product for Social Science (SPSS) version 25 program.

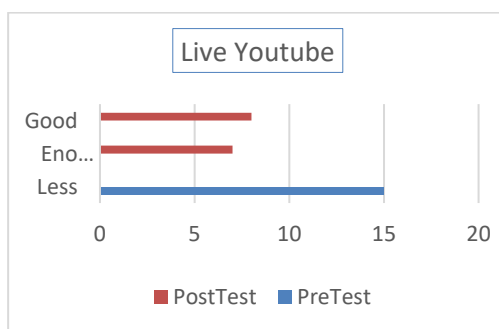
RESULTS
Qualitative Research

Table 1. Characteristic of respondents

| Characteristic | Category | n | % |
|----------------------------|--------------------|----|-----------|
| Age | 36-40 year | 10 | 22 |
| | 41-45 year | 24 | 54 |
| | 46-50 year | 6 | 13 |
| | >50 year | 5 | 11 |
| | Total | | 45 |
| Education | Junior High School | 2 | 5 |
| | Senior High School | 36 | 80 |
| | Bachelor | 6 | 13 |
| | Magister | 1 | 2 |
| | Total | | 45 |
| Occupation | Housewife | 33 | 70 |
| | Entrepreneur | 6 | 13 |
| | Civil Servant | 3 | 6 |
| | Teacher | 3 | 11 |
| | Total | | 45 |
| Nutritional Status (IMT/U) | Midly Thin | 0 | 0 |
| | Heavy Skinny | 0 | 0 |
| | Normal | 12 | 25 |
| | Overweight | 5 | 11 |
| | Obesity | 30 | 64 |
| | Total | | 45 |

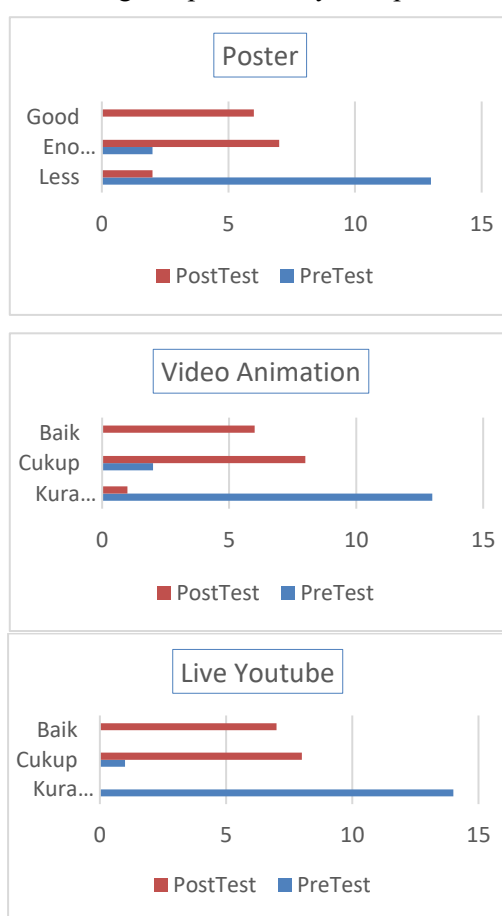
Table 1 contains data on the characteristics of respondents, namely age, education, occupation and nutritional status. The characteristics of respondents in this study were mostly aged 41-45 years with a percentage of 54%. Then Table 1. Shows that the education and occupation of respondents are mostly high school graduates at 80% and work as housewives at 70%. It can be seen in Table 1 that the nutritional status of mothers is more than half of them are obese with a percentage of 64%, namely 30 people. With a large percentage, it is hoped that this study can increase knowledge about metabolic syndrome and be aware of one of its factors, namely obesity. The frequency distribution of respondents' knowledge level before and after being given educationa media can be seen in graphs 1 and 2 below:





Graphic 1. Frequency Distribution of Respondents' Metabolic Syndrome Knowledge Before and After Given Media Posters, Animated Videos and Live Youtube.

Based on the graph above, it can be seen that all respondents (15 respondents) had poor knowledge before being given nutrition education using animated video media and live youtube respectively and almost all respondents (8 respondents) had good knowledge after being given nutrition education using live youtube media and for animated video media had an increase in good knowledge respondents by 5 respondents.



Graphic 2. Frequency Distribution of Respondents' Knowledge of Sugar, Salt and Fat Consumption Recommendations Respondents Before and After Given Media Posters, Animated Videos and Live Youtube

Based on the graph above, it can be seen that almost all respondents (13 respondents) had less knowledge before being given nutrition education using animated video media and posters respectively. For Live Youtube Media, 14 respondents had less knowledge. Then after giving the media, respondents who had less knowledge decreased. Live Youtube media has no respondents who have less knowledge, while poster media has 2 respondents who have knowledge. Based on the graph above, it can be seen that almost all respondents (13 respondents) had less knowledge before being given nutrition education using animated video media and posters respectively. For Live Youtube Media, 14 respondents had less knowledge. Then after giving the media, respondents who had less knowledge

decreased. Live Youtube media has no respondents who have less knowledge, while poster media has 2 respondents who have less knowledge. less after education.

Based on the table below, the results of the Paired T Test statistical test obtained a value of $p = 0.003$ ($p < 0.05$) means that there is a significant difference in the knowledge of Metabolic Syndrome respondents before and after being given nutrition education using poster media.

Table 2. Effect of Media Provision on Knowledge of Metabolic Syndrome

| Knowledge | | Mean±SD | p-value |
|-----------------|----------|-----------|---------|
| Poster | PreTest | 41,3±15 | 0,003 |
| | PostTest | 80,6±15,8 | |
| Video Animation | PreTest | 32,6±10,3 | 0,001 |
| | PostTest | 80,6±13,3 | |
| Live Youtube | PreTest | 31,3±9,1 | 0,001 |
| | PostTest | 84,6±11,8 | |

From the results of the statistical test, the value of $p=0.001$ ($p<0.05$) means that there is a significant difference in the knowledge of Metabolic Syndrome respondents before and after being given nutrition education using animated video media and live YouTube. Based on the table below, the results of the Paired T Test statistical test obtained a value of $p=0.002$ ($p<0.05$) means that there is a significant difference in the knowledge of GGL recommendations of respondents before and after being given nutrition education using poster media.

Table 3. Effect of Media Provision on Knowledge of Sugar, Salt and Fat Consumption Recommendations

| Knowledge | | Mean±SD | p-value |
|-----------------|----------|-----------|---------|
| Poster | PreTest | 46,6±14,9 | 0,002 |
| | PostTest | 81,3±13,5 | |
| Video Animation | PreTest | 34,6±13,5 | 0,001 |
| | PostTest | 82±11,4 | |
| Live Youtube | PreTest | 34±11,4 | 0,001 |
| | PostTest | 82,6±14,3 | |

From the results of statistical tests obtained a value of $p = 0.001$ ($p < 0.05$), meaning that there is a significant difference in the knowledge of GGL recommendations of respondents before and after being given nutrition education using animated video media and live youtube. The following is a bivariate analysis using the One Way Anova test to determine whether there is a difference between media on knowledge.

Table 4. The Effectiveness of Providing Media Posters, Animated Videos and Live Youtube on the Knowledge of Mothers of Majelis Taklim Al-Muttaqin

| Variable | | Sum of Squares | p-value |
|------------------------------------|----------------|----------------|---------|
| Methabolic syndrom | Between Groups | 2084.444 | 0,035 |
| | Within Groups | 12040.000 | |
| | Total | 14124.444 | |
| Sugar, salt and fat recommendation | Between Groups | 2253.333 | 0,031 |
| | Within Groups | 12546.667 | |
| | Total | 14800.000 | |

In table 4. above, it can be seen that the statistical test results state that there are differences in pretest and posttest knowledge after exposure to nutrition education using the three media with a p value < 0.05 . To find out which group has a difference, a post hoc analysis was performed. The tool to perform post hoc analysis for the One Way Anova test is the Tukey test.

Table 5. Average Difference in Knowledge of Respondents Given Poster Media, Animated Video and Live Youtube

| Methabolic Syndrome Knowledge | | | |
|--|--------|-----------------|--------------|
| Treatments | Poster | Video Animation | Live Youtube |
| Poster | | 0,349 | 0,027* |
| Video Animation | 0,349 | | 0,406 |
| Live Youtube | 0,027* | 0,406 | |
| Knowledge of GGL Consumption Recommendations | | | |
| Treatments | Poster | Video Animation | Live Youtube |
| Poster | | 0,364 | 0,024* |

| | | |
|-----------------|--------|-------|
| Video Animation | 0,364 | 0,364 |
| Live Youtube | 0,024* | 0,364 |

Can be seen from Table 5. in the p-value column which shows a significant value <0.05 . For Metabolic Syndrome Knowledge, Posters with live youtube with a sig. of $0.027 < 0.05$ then H_0 is rejected. Live Youtube with posters with a sig. of $0.027 < 0.05$ then H_0 is rejected. It can be concluded that the group given live youtube media is better than poster media and animated video media with the results of Metabolic Syndrome knowledge at posttest increasing more than other media.

For Knowledge of GGL Recommendations, Posters with live youtube with a sig. of $0.024 < 0.05$ then H_0 is rejected. Live Youtube with posters with a sig. of $0.024 < 0.05$ then H_0 is rejected. It can be concluded that the group given live YouTube media is better than poster media and animated video media with the results of Metabolic Syndrome knowledge at posttest increasing more than other media.

DISCUSSION

Characteristics of Respondents' Nutritional Status related to PreTest Knowledge of Metabolic Syndrome and GGL Recommendations

The results of the data on the characteristics of the nutritional status of respondents in table 1. show that more than half of the respondents have obese nutritional status. Then in graphs 1 and 2 almost all respondents from the three groups during the PreTest had poor knowledge results. This shows that lack of knowledge has a relationship with the nutritional status of respondents.

This study is in line with Jaminah's research (11) that there is a relationship between knowledge in female employees at the Nutrition Installation of Dr. Soetomo Hospital with the incidence of obesity ($p = 0.03$). Good nutritional knowledge can also help a person in controlling nutritional status by understanding the necessary nutritional components such as carbohydrates, proteins, fats, vitamins, and minerals, a person can plan a balanced diet that contains the nutrients needed by the body.

Effect of Poster Media on Knowledge about Metabolic Syndrome and GGL Recommendations

Based on the Paired T Test in tables 2 and 3, it shows an increase in respondents' knowledge about Metabolic Syndrome and GGL recommendations. These results show that health education, especially nutrition, can be supported with the help of communication media, one of which is poster media. This is in line with Angela's statement (12) that if someone reads the poster for a long time, the information conveyed in the poster can be understood and is expected to not only affect knowledge, but also motivate readers to follow the information contained there in. This study is in line with Nino's study, The distribution method of health education posters showed lower statistical significance but remained significant ($p < 0.05$) in relation to knowledge gained and attitude change between surveys conducted at different times (13).

Effect of Animated Video Media on Knowledge about Metabolic Syndrome and GGL Recommendations

The results of statistical tests in tables 2 and 3 show an increase in respondents' knowledge about Metabolic Syndrome and GGL recommendations. Researchers argue that the provision of animated video media can increase knowledge because animated videos can illustrate concepts or ideas in a visual and interesting way. By combining images, animations, and graphics, animated videos can help a person understand complex concepts more easily. With this clear visualization, the audience can see and understand the information better than just reading text or looking at still images. This research is in line with Diantika's research, animated videos can display various images, text, and sound accompanied by animation, making the material more interesting and easier to understand (14).

This study is in line with Angelina's research (15), that there is an increase in maternal knowledge about balanced nutrition in toddlers by providing animated video media education ($p < 0.05$), the results of the average value of maternal knowledge before education is 78.00 while the average value of maternal knowledge after education is 91.90.

Effect of Live Youtube Interactive Media on Knowledge of Metabolic Syndrome and GGL Recommendations

Based on tables 2 and 3, live YouTube media has an effect in increasing the knowledge of mothers of the Al-Mutaqqin taklim assembly regarding Metabolic Syndrome and GGL recommendations. According to researchers, providing education through live YouTube has several advantages, namely realtime interaction, namely interacting directly with the speaker through comments and chat features, easy access by simply pressing the link provided, and time flexibility because often the creator archives and is available as a recording. Through these advantages, education using live YouTube media can increase one's knowledge in an interactive, flexible and diverse way. Viewers can engage directly with the speaker and gain access to global insights. The results of Prasetya et al's research

show that YouTube can be an appropriate learning media in Indonesia and needs to be accompanied by infrastructure development information technology and communication (16). Using YouTube live as an educational medium requires a stable and strong internet network. Sometimes slow networks can disrupt the process of providing information, and some participants may have signal (17).

Effectiveness of Providing Media Posters, Animated Videos and Live Youtube on Knowledge of Metabolic Syndrome and GGL Recommendations

Based on the results of bivariate analysis in table 4, there are differences in the effect of giving the three media on increasing respondents' knowledge about Metabolic Syndrome. This is due to differences in the types of media used, namely 2D, 3D and interactive media, each of which has advantages and disadvantages.

To see which media has the most effect, Post Hoc Analysis with Tukey Test was conducted. In table 5. Shows that live YouTube media is more influential than the other two media in increasing knowledge about Metabolic Syndrome and GGL consumption recommendations. This is reinforced by the advantages of Live YouTube which have been discussed previously, namely information about nutrition obtained through live YouTube media directly causes respondents through material objects that can be observed, especially through the five senses of hearing, vision and the most prominent advantage is interaction. The effectiveness of distance education rests on the ability of each teacher to deliver teaching materials like a face-to-face educational process. In addition, the material or learning content presented by the teacher must be packaged in a language that is easy to understand so that each audience is able to understand the material presented properly (18).

Video streaming is a live broadcast to many people (viewers) at the same time as the original event. through communication facilities (networks) both wired and wireless. Live Streaming allows live video to be broadcast, recorded with a video camera so that it can be seen by anyone, anywhere at the same time. Viewers can also find out what is happening in a place with live streaming without having to be in the same place (19). The live streaming feature on YouTube has the advantage of two-way communication that allows audiences to ask questions and get answers directly from educators, increasing interactivity and making it easier for audiences to understand the material presented (20).

CONCLUSION

Of the three media given to respondents, all media have an effect in increasing knowledge about metabolic syndrome and consumption recommendations for sugar, salt and fat. The most influential media is YouTube live media because of its advantages that other media do not have, namely interaction. Researchers advise educators to create relevant and engaging educational content, such as video tutorials, scientific discussions and webinars. Make sure the content matches the needs and knowledge level of the target audience. Equitable distribution of technology infrastructure and internet networks by the government is also very important to reach remote communities.

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