PROCEEDING
5th International Conference of Health Polytechnic of Jambi 2025
icon@poltekkesjambi.ac.id
http://journal.poltekkesjambi.ac.id/index.php/ICoHPJ
doi.org/10.35910/icohpj.v5i0

NUTRITION COMMUNICATION VIA TIKTOK AND IMPLICATIONS ON HEALTH PROBLEMS OF ADOLESCENT GIRLS IN MATARAM

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ABSTRACT

Background: *Anemia is one of the five main nutritional problems in Indonesia. Adolescent girls are a group that is prone to anemia. Anemia is a condition where the number of red blood cells or hemoglobin concentration in them is lower than normal. This study aims to determine the differences between TikTok and Leaflet video media in nutrition education on knowledge, attitudes about anemia, iron intake and adherence to consuming iron tablets among young women at SMA Mataram City.*
Methods: *This research is a quasi-experimental research. The research subjects were 64 people consisting of 32 treatment groups and 32 control groups. The instruments used were questionnaire forms and record forms to determine knowledge, attitudes about anemia, iron intake and compliance with consuming iron tablets or blood supplement tablets.*
Results: *Data were tested using the Wilcoxon and Mann Whitney U tests. Fe intake was obtained using the method of recording food consumption once every 24 hours. There are differences between TikTok and Leaflet video media in nutrition education on knowledge, attitudes with a p value of 0.000 (< α = 0.05) and compliance with iron tablet consumption with a p value of 0.027 (< α = 0.05) and there is no significant difference in iron intake (p value 0.707).*
Conclusion: *There are significant differences before and after treatment in the variables of knowledge, attitude and compliance with the consumption of iron tablets in both groups. And there were no significant differences before and after treatment using Tiktok and Leaflet media on the subjects' iron intake variables.*

Keywords: *Anemia, Adolescents, Tiktok*

INTRODUCTION

Anemia is a global health problem facing people around the world, especially in developing countries as the largest contributor (Kinyoki D et al., 2021). Several factors can cause anemia, such as vitamin A, vitamin B12, folate and iron deficiency, chronic inflammation, parasitic infections, and congenital conditions (WHO, 2021). Iron is necessary for the production of red bloodcells, iron deficiency anemia is the leading cause worldwide. Anemia can lead to an increase in pregnancy complications, such as low birth weight (BBLR), premature birth, neonatal death (Tesfaya et al., 2021). Anemia also negatively affects physical ability, development, performance and immunity, and has the potential to have a long-term impact on women of childbearing age, including adolescent girls (N.N et al., 2021). Previous research has shown that adolescents and women of childbearing age are more likely to suffer from anemia have the opportunity to suffer from anemia due to blood loss during menstruation and puerperium and this causes iron (Fe) in their red blood cells to be lost (J & K, 2014). Adolescent girls are a group that is susceptible to developing anemia based on the prevalence of anemia in the age group of 5 to 14 years and 15 to 24 years old by 26.8% and

32%, respectively 15 to 24 years old by 26.8% and 32%, respectivel (Health, 2018).

Adolescent girls experience a variety of psychological changes in addition to physiological changes, which can overall impact their body image and the way they react to social pressures. According to recent research, adolescent girls who experience early menarche may be more likely to communicate through social media than face-to-face socialization because face-to-face socialization allows them to offer a more ideal version of themselves (C. et al., 2021) (I. Y, 2019). Promotive and preventive efforts in overcoming anemia need to be intervened from early adolescence, namely when entering puberty so as to suppress the early continuation of anemia in later pregnancy. According to Rusdi et al. (2021), The impact of anemia on adolescent girls can be prevented by providing information about balanced nutrition so that it can be a guideline in eating, doing physical activity, and maintaining a normal weight (Rusdi et al., 2021).

Social media is a platform that can be used as a means of nutrition education because the targets achieved are more and are not limited by space and time. Social media with the internet has great potential in health promotion because it makes it easier to achieve goals at every level (Leonita & Jalinus, 2018) . One of the social media that can be used is TikTok. This application provides access to users in creating videos, editing, and can also share them easily which is equipped with supporting features. Based on the Business of Apps report, Tiktok's monthly active users in the second quarter of 2022 amounted to 1.46 billion active users worldwide, an increase of 62.52 percent compared to the previous year. Tiktok's active users have increased rapidly since the beginning of the pandemic in 2020. When compared to the previous five years, Tiktok users increased by more than 1.000 percent. A study conducted in Canada stated that social media use among adolescent girls is twice as great when compared to adolescent boys with a duration of more than two hours a day (Sampasa-Kanyinga et al., 2020). Health education in schools plays a major role in improving students' knowledge, attitudes, and practices (R. et al., 2020). In addition, questions of attitudes and practices related to anemia are used to identify the level of correct attitudes and practices towards health. Therefore, researchers want to conduct research on the influence of nutrition education through TikTok on changes in health problems in Mataram City.

METHODS

This study is a quasi-experimental research with a pretest posttest design with a control group, a pretest posttest design with an experimental group being educated using TikTok video media for two months and a control group being educated using Leaflet media. The subjects in this study were 64 students of SMAN 5 Mataram and SMAN 9 Mataram who were divided into two groups, namely 32 people in the treatment group and 32 people in the control group. This research was carried out in August-October 2022 where intervention activities were given for 2 months. This study took place at SMAN 5 Mataram and SMAN 9 Mataram, the sampling technique was purposive sampling, and the variables measured were knowledge, attitude, iron intake and compliance with consuming iron tablets (blood supplement tablets). In this study, the data analyzed was not normally distributed where the significance value was < 0.05 so that to see the difference between pretest and posttest in one group (paired data), namely the treatment group or control group, a study was conducted. using a non-parametric test, namely Wilcoxon Signed Test Rank and tests were carried out Nonparametric use of the Mann Whitney U test to determine the differences between the two media on knowledge, attitudes, Fe intake and adherence to consuming blood supplement tablets. This research has

been approved by the Ethical Approval Commission of the Health Polytechnic of the Ministry of Health of Mataram Number: LB.01.03/6/5788/2022.

RESULTS AND DISCUSSION

Subject Characteristics

Subject Characteristics in the treatment group, the majority of subjects aged 15-16 years were 24 people (75%), while in the control group aged 16-17 years, it was 16 people (50%).

Table 1. Subject Characteristics

Characteristics	Intervention		Control	
	N	%	N	%
Age				
15-16 years	24	75.0	16	50.0
17-18 years	8	25.0	16	50.0
Total	32	100.0	32	100.0
Family size (people)				
Small family (1-4)	18	56.3	11	34.4
Medium family (5-7)	14	43.8	20	62.5
Big family (≥ 8)	0	0.0	1	3.1
Total	32	100.0	32	100.0
Father's education				
Higher	24	75.0	16	50.0
Secondary	6	18.8	10	31.3
Primary	2	6.3	6	18.8
Total	32	100.0	32	100.0
Mother's education				
Higher	15	46.9	8	25.0
Secondary	14	43.8	14	43.8
Primary	3	9.4	10	31.3
Total	32	100.0	32	100.0
Father's work				
Civil servant	9	28.1	9	28.1
Entrepreneur	13	40.6	14	43.8
Private employee	7	21.9	4	12.5
others	3	9.4	5	15.6
Total	32	100.0	32	100.0
Mother's work				
Civil servant	3	9.38	3	9.4
Entrepreneur	5	15.6	4	12.5
Private employee	4	12.5	1	3.1
Housewife	20	62.5	19	59.4
Others	0	0.0	5	15.6
Total	32	100.0	32	100.0
Father's income (Based on the Minimum Wage of the People of Mataram City Rp.2.400.000.- in 2023)				
> UMR	14	43.8	15	46.9
< UMR	18	56.3	17	53.1
Total	32	100.0	32	100.0
Mother's income (Based on the Minimum Wage of the People of Mataram City Rp.2.400.000.- in 2023)				
> UMR	4	12.5	4	12.5
< UMR	28	87.5	28	87.5
Total	32	100.0	32	100.0

The subjects in the treatment group were mostly included in the small family category, which was 18 subjects (56.3%), while in the control group, the majority of subjects were included in the medium family category, which was 20 subjects (62.5%). In the treatment group, most of the subjects of father's education included higher education, which was 24 people (75%), while in the control group, the subjects were highly educated, namely 16 people (50.0%). The most fathers' jobs were in the self-employed category, which was 13 people (40.6%), and the most mothers' jobs were as housewives, which was 20 people (62.5). Meanwhile, in the control group, most of the fathers' jobs were self-employed, namely 14 people (43.4%) and the mothers' jobs were mostly as housewives as many as 19 people (59.4).

Parents' work has a direct influence on income or income in a family and is also closely related to what the family needs. Fathers' income was mostly under the UMR, which was 18 people (56.3%), and most of the mothers' income was under the UMR, which was 27 people (84.4%), while in the control group, the majority of fathers' income was under the minimum wage, which was 17 people (53.1%), and income above the minimum wage was 15 people (46.9%).

Based on table 2, it is known that in the intervention group, the majority of subjects have knowledge about anemia which is included in the adequate category those are 31 people (96.9%), after the treatment in the intervention group, the majority of subjects have knowledge. about anemia that is included in the good category. while in the control group

most of the subjects had knowledge about anemia which was included in the adequate category those are 30 people (93.8%) and after being educated, most of the subjects had knowledge about anemia which was included in the good category as many as 16 people (50%), and adequate knowledge about anemia as many as 15 people (46.9%).

Table 2. Distribution of variables based on treatment

Variable	Intervention				Control			
	Pre		Post		Pre		Post	
	N	%	N	%	N	%	N	%
Knowledge								
Good	0	0.0	25	78.1	0	0.0	15	46.9
Adequate	31	96.9	7	21.9	30	93.8	16	50.0
Poor	1	3.1	0	0.0	2	6.3	1	3.1
Attitude								
Good	0	0.0	31	96.9	0	0.0	29	90.6
Adequate	32	100	1	3.1	31	96.9	3	9.4
Poor	0	0.0	0	0.0	1	3.1	0	0.0
Iron Intake								
Above sufficiency	1	3.1	2	6.3	1	3.1	3	9.4
Normal	3	9.4	5	15.6	1	3.1	5	15.6
Mild level deficit	0	0.0	4	12.5	2	6.3	4	12.5
Moderate level deficit	2	6.3	5	15.6	5	15.6	2	6.3
Severe deficit	26	81.3	16	50.0	23	71.9	18	56.3
Compliance Consumption of blood supplement tablets								
Obedient	0	0.0	24	75.0	0	100	15	46.9
Disobedient	32	100	8	25.0	32	100	17	53.1

In the intervention group, the majority of subjects had an attitude about anemia in the adequate category, which was 32 people (100.0%), after the treatment in the intervention group, the majority of subjects had an attitude about anemia in the good category, namely 31 people (96.9%). Meanwhile, in the control group, the majority of subjects had attitudes about anemia which was included in the adequate category, namely 31 people (96.9%), and 3 people (3.1%) had attitudes about anemia which was included in the poor category afterwards. After being given nutrition education, most of the subjects had attitudes about anemia which was included in the good category, namely 29 people (90.6%).

The iron intake of the subjects in the treatment group was mostly in the severe deficit category, which was as many as 26 people (81.3%), after being given the treatment in the intervention group, most of the iron intake of the subjects still in the severe deficit category, but the number decreased to 16 people (50.0%). Meanwhile, in the control group, it was seen that the iron intake of most subjects was included in the category of severe deficit, namely 23 people (71.9%), after being given education, the iron intake of most subjects was still included in the category of severe deficit, namely 23 people (71.9%), in the category of severe deficit but the number decreased to as many as 18 people (56.3%).

Most of the subjects, both the intervention group and the control group, were included in the category of disobedient with taking iron tablets, namely 32 people (100.0%) each after being given the intervention. In the intervention group, most of the subjects were included in the category of obedient to taking iron tablets, which was 24 people (75.0%), while in the control group, it was seen that the majority of subjects were included in the category of disobedient with taking blood supplement tablets, namely 17 people (53.1%).

Comparison of mean values between the two groups.

Based on table 3, it is known that the results of the statistical test using the Wilcoxon Signed Rank Test in the intervention group obtained a significance value (p) = 0.000 smaller than $\alpha = 0.005$ so that the hypothesis is accepted, namely that there is a difference in knowledge scores before and after being given nutrition education using TikTok video media. Meanwhile, in the Wilcoxon test group, a significance value (p) = 0.000 was obtained smaller than $\alpha = 0.005$ so that the hypothesis was accepted, namely there was a difference in knowledge scores before and after nutrition education using leaflet media. There was an increase in two groups, namely the treatment group and the control group after being given the treatment. It can be said that there is an

increase in adolescent girls' knowledge about anemia after receiving nutrition education compared to before receiving nutrition education, this can be seen from the average results of pretest and post test scores that have increased.

The results of the statistical test of the use of TikTok and Leaflet media on knowledge and attitudes about anemia using the Mann Whitney U test showed that the value (p) was smaller than α = 0.05 so that the hypothesis was accepted, namely that there was a significant influence of differences. The results of the statistical test of the use of TikTok media in nutrition education for iron intake using the Wilcoxon sign rank test obtained a result (p) = 0.007 smaller than α = 0.05 so that the hypothesis is accepted, it's mean there is a difference in iron intake before and after being given nutrition education using TikTok video media.

Table 3. Average difference before and after education

Variable	Average ± Standard Deviation (Min-Max) Intervention	Control
Knowledge		
Before	71.3 ± 6.1 (52-57)	73.7 ± 5.4 (56-80)
After	92.3 ± 10.2 (72-110)	83.3±11 (80-108)
p-value (Wilcoxon Signed Test Rank)	0.000	0.000
P-value Mann Whitney U	0.003	
Attitude		
Before	57.5±3.5 (50-60)	58.1±3.5 (44-60)
After	71.2±5.7 (56-80)	67.5±7.2 (52-80)
p-value (Wilcoxon Signed Test Rank)	0.000	0.000
P-value Mann Whitney U	0.028	
Iron Intake		
Before	8.2±35.7 (4.8-20.3)	8.5±33.7 (4.3-19.2)
After	10.8±39.2 (5.1-22.5)	10.5±44.4 (4.5-21.3)
p-value (Wilcoxon Signed Test Rank)	0.007	0.051
P-value Mann Whitney U	0.707	
Compliance Consumption of blood supplement tablets		
Before	0.97±1.2 (0-4)	1.6±1.0 (0-4)
After	3.5±1.0 (0-4)	2.9±1.2 (0-4)
p-value (Wilcoxon Signed Test Rank)	0.000	0.000
P-value Mann Whitney U	0.021	

Meanwhile, in the control group (leaflet media), the Wilcoxon sign rank test p = 0.051 was bigger than α = 0.05 so that the hypothesis was rejected that there was no difference in knowledge scores before and after being given nutrition education using leaflet media. The results of statistical tests in the intervention and control groups using the Wilcoxon Signed Rank Test showed that the p result was less than α = 0.05 or there was a significant difference in the use of TikTok and Leaflet video media on the subject's compliance with taking iron tablets.

The age of 15-17 years is considered a teenager. At this time, adolescents are more comfortable with their own circumstances, like to discuss, begin to make friends with the opposite sex and draw up future plans. Table 1 shows that the characteristics between the intervention and control groups are not significantly different. However, there are significant differences in the big variables of family and father's education. The majority of adolescents in the intervention group lived with their families. Living with parents can influence adolescents to seek information about anemia through social media, electronic media, and the environment. In contrast, living in a dorm can limit access to social media and make them only dependent on information from the environment, such as friends and teachers. Therefore, teachers are expected to actively disseminate knowledge about anemia and its prevention. Health education has been an important part of increasing knowledge about anemia prevention (S. H. et al., 2012) (F. S. et al., 2016).

Health education is an important factor, as a basis for changing knowledge, attitudes and practices in preventing anemia (N.I. & F, 2021). A person's opinion or assessment of matters related to health services is the meaning of attitude, while practice is all activities of people in order to maintain health (Nation,

2014). Adolescent health behaviors depend on trustworthy sources (M.A. et al., 2013). The inability to access credible, reliable, and accurate information can negatively impact knowledge (D. & T, 2009).

This study was developed based on theoretical concepts and extensive literature searches and its content is comprehensive because it considers foods or drinks that can be consumed along with iron supplements such as fruits rich in vitamin C, as well as foods that must be avoided such as coffee, tea, milk, and rice when consuming iron or iron-rich tablets. food due to the promotion or inhibition of iron absorption. This research applies social media as a means of delivering interventions. Conveying educational interventions using mobile phone applications on the use of smart phones is increasing. The content of these interventions is presented in attractive infographics with clear animations and audio explanations to provide a better understanding compared to traditional health promotion methods.

Based on research conducted by Rusdi (2021), it explains the results that nutrition e-education using Instagram has an influence and is effective in changing knowledge about balanced nutrition in adolescent girls (R. F. Y. et al., 2021). According to Murdiningrum & Handayani's (2021) research, conventional lectures rank last on the list of the most effective nutrition teaching media, followed by social media such as Instagram, Whatsapp, and Twitter, as well as the combination of lectures with videos, games, and quizzes (M. S & H, 2021).

In addition, Khotimah (2019) research shows that there is a variation in the understanding of adolescent girls in Tebas Kuala Village about anemia before and after receiving nutrition counseling through social media. Protein intake varies between those who receive nutrition education through anemia Instagram and receive nutrition counseling through Instagram media. Likewise, with nutrition education through Instagram for their varied vitamin C intake (K. H et al., 2019). This study showed a change in improvement practices during the intervention. The reasons for behavioral changes to anemia are multifactorial and complex.

There are many possible factors that affect success in changing behavior, such as self-motivation, understanding in applying habits. In addition, the ideal time to improve behavior is six months or more (S.J. et al., 2013). Research conducted by Singh et al. explains that the most important strategy in preventing anemia is knowledge and practice. Supported by research conducted by Ghosh at al., despite having good knowledge and a positive attitude, very few practices are applied (G. S. et al., 2020). The educational methods and strategies used in this study are different from others. This study uses an interactive learning approach, which is basically a combination of limited face-to-face education and education on social media. Meanwhile, online education is carried out by disseminating nutritional information in the form of videos on social media such as TikTok in a structured and systematic manner. A systematic review by Lroche et al. (2020) found that social media may be considered as a means of communication to promote healthy lifestyle habits in organizations; However, some authors have recommended additional research on this technology to evaluate the additional impact of social media and promote a healthy lifestyle (E et al., 2020).

Another study conducted in Purwokerto, Indonesia showed an increase in nutrition knowledge, energy intake, and protein after social media-based nutrition education in rural and urban areas (I et al., 2019). A systematic review by Chau et al. (2018) found that social media is a promising nutrition intervention platform for adolescents and young adults (MM et al., 2018).

CONCLUSION

Based on the results of the study, most of the subjects are 15-16 years old, most of the subjects belong to the category of medium families, some of the subjects' fathers are higher education, while most of the subjects' mothers are secondary education, the father's job is mostly entrepreneur, and the parents' income is mostly under the regional minimum wage. There were significant differences in knowledge, attitudes and compliance consumption of blood-boosting tablets in the intervention group and the control group. There was no significant difference in the use of tiktok media or leaflets in iron consumption intake in the two treatment groups.

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ACKNOWLEDGMENT

The author wishes to express sincere gratitude to all individuals and institutions who have contributed to the development and completion of this article.

CONFLICT OF INTEREST

The author declarate no conflict of interest.

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