

The Influence of Knowledge, Peers and Social Media on Immunonutrition Intake of Adolescent Girls in the New Normal Era

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Abstract: The purpose of this study was to determine the influence of knowledge, peers, and social media on the immunonutrition intake of adolescent girls. This research is an analytic observational study using a cross sectional design. The study was conducted at the Dinniyah Putri School in Lampung from August to October 2021. The sample was 82 students of Kulliyatul Mu'alimat El Islamiyah, which were taken using purposive sampling technique. Data on immunonutrition intake using a 2x24 hour food recall questionnaire, data on knowledge, peer influence and social media were obtained from interviews using a validated questionnaire. Data were analyzed using univariate, bivariate (chi-square) and multivariate (logistical regression). The results showed that inadequate immunonutrition intake was 73.2%. Most of the adolescent girls have good knowledge (58.5%), no peer influence (56.1%), and no social media influence (52.4%). The results showed that knowledge ($p=0.019$), peers ($p=0.037$), and social media ($p=0.048$) had an effect on the immunonutrition intake of adolescent girls. The most influential factors on the immunonutrition intake of adolescent girls are knowledge and social media.

1 INTRODUCTION

The World Health Organization (WHO) revealed that the outbreak due to the COVID-19 virus was designated a global pandemic on March 11, 2020. This status was declared after there was a thirteen-fold increase in positive cases outside China in 114 countries with the death toll at that time reaching 4,291 (Valerisha & Putra, 2020). Positive confirmed cases of Covid 19 in Indonesia continue to increase. Data on June 29, 2021, the number of positive confirmed cases in Indonesia reached 2,156,465 cases, 1,869,606 cases recovered, and 58,024 cases died. Meanwhile, the 10 provinces in Indonesia with the highest confirmed cases are: East Java, DKI Jakarta, South Sulawesi, Central Java, West Java, South Kalimantan, South Sumatra, Papua, North Sumatra and Banten (Kemenkes RI, 2021).

Maintaining a healthy diet is especially important during the Covid 19 Pandemic. While no food or dietary supplement can prevent COVID 19 infection, maintaining a healthy balanced nutritional diet is essential in promoting a good immune system and lowering the risk of chronic disease and infection.

Things that can be done to increase endurance are: eating balanced nutritious food, washing hands with running water and soap, and exercising regularly (Kemenkes RI, 2020).

Optimal nutritional status ensures the main modulation of oxidative and inflammatory stress, both of which are related to the immune system. In fact, several nutrients and their metabolism are direct regulators of gene expression in the immune compartment and are involved in the maturation, differentiation, and response of immune cells. Basically, proper nutrition will form a state of the immune system that can face any kind of confrontation. Conversely, poor nutrition will make the immune system unable to respond well (Di Renzo et al., 2020). Specific nutrients that can modulate the immune system are also called immunonutrients, to maintain optimal immune system we need to increase the consumption of these immunonutrient foods such as foods containing vitamins A, C, E and zinc (Angraini & Ayu, 2015).

Protein is very important in the body because it plays a role in the formation of cells and body tissues, repairing damaged cells and maintaining muscle

tissue (Tirtawinata, 2006). Protein is absorbed by the body in the form of amino acids. Arginine and glutamine are forms of amino acids that are more effective in maintaining immune function and reducing post-surgical infections (Fatmah, 2006).

Vitamin C has an important role in the formation of collagen so it is needed to maintain the integrity of blood vessels. Vitamin C is a powerful water-soluble antioxidant, so it is spread throughout the body. Vitamin C is very potent to scavenge free radicals, and sometimes works together with vitamin E (Hartono, 2006). Vitamin C increases interferon levels and immune cell activity in the elderly, increases lymphocyte and macrophage activity, and improves leukocyte migration and mobility from viral infections, such as the influenza virus (Fatmah, 2006), such as the corona virus that is currently engulfing the world as a global pandemic.

Dietary behavior in adolescents, including the behavior of immunonutrition intake is influenced by many factors including knowledge, the influence of social media, peers, family and others. According to the perception of diet is influenced by knowledge of nutrition and knowledge of the diet itself. The level of knowledge affects a person's attitude. Another influencing factor is self-esteem. Knowledge of diet also turns out to have a relationship with dietary behavior (Kumalasari, 2010).

The influence of the mass media, the influence of family and the influence of peers is considered to directly put pressure on young women, this makes them dissatisfied with their body shape, causing the desire to be thin by dieting. The influence of mass media, the influence of the appearance of figures appearing in the mass media, and pressure from their parents make them go on a diet. Friends and family can also provide information on how to diet. The influence of friends and family will quickly affect the behavior of teenagers to go on a diet (Firi, 2018). This also applies not only to weight loss diets, but also diets in the intake of immunonutrients, which are currently needed to increase the body's immunity in the face of viral, bacterial and other attacks.

Research on immunonutrition intake in adolescent girls, especially in Indonesia, has not been widely carried out. More research on children, obese patients, infectious patients and not about the immunonutrition intake. Whereas adolescents, especially adolescent girls, are a group that is very vulnerable to suffering from infectious diseases and lacks in meeting immunonutrients. Immunonutrition dietary behavior in adolescents is strongly influenced by knowledge, social media and peers. This research is important because it can be used as a basis for

activities to improve the health of adolescent girls, as prospective mothers, which will indirectly improve the health of mothers and children. The purpose of this study was to determine the effect of knowledge, peers and social media on dietary behavior, especially related to immunonutrition intake in adolescent girls in the new normal era.

2 SUBJECT AND METHOD

This research is an observational analytic study with a cross-sectional research design. The study was conducted at the Dinniyah Putri School in Pesawaran district from August to October 2021. The population in this study were students at the Dinniyah Putri School in Pesawaran district. Based on the results of the sample calculation, the minimum number of samples that must be met is 82 people, which students of Kulliyatul Mu'alimat El Islamiyah Dinniyah Putri School in Pesawaran district. The sample size calculation uses the sample size formula for unpaired categorical comparative analytics with a 95% confidence value, the power of the test is 80%. Sampling was done by the purposive sampling method. The inclusion criteria for this research sample were adolescent girl students aged 16-18 years and willing to participate in the research process. The exclusion criteria for this study were adolescent girls with chronic infectious disease, suffering from covid-19 and currently on a weight loss diet program.

The independent variables in this study were knowledge, peers and social media. The dependent variable in this study is immunonutrition intake. Immunonutrition intake (protein and vitamin C) data was measured using a 2x24h food recall questionnaire in weekday dan weekend, to assess consumption of protein and vitamin C in grams/day, then compared with the recommended nutritional adequacy rate (RDA) so that the nutritional adequacy level is obtained. data on knowledge, peer influence and social media were obtained from interviews using a validated questionnaire. Data collection was carried out by researchers with the help of 2 enumerators who had been given previous guidance and training. The data was analyzed with a significant degree of 95% ($p < 0.05$) univariate, bivariate with chi-square test, and multivariate logistic regression. This research was carried out after obtaining a research ethical clearance letter from the Ethics Committee of the Faculty of Medicine, the University of Lampung with number 228/UN26.18/PP.05.02.00/2021.

3 RESULTS

The results showed that inadequate immunonutrition intake in adolescent girls was 60 people (73,2%) and adequate immunonutrition intake was 22 people (26,8%), poor knowledge was 34 people (41,5) and good knowledge was 48 people (58,5%), have peers influence was 36 people (43,9%) and no peers influence was 46 people (56,1%), and have social media influence was 39 people (47,6%) and no social media influence was 43 people (52,4%).

Table 1: Characteristic of Study Subject.

Variable	n	%
Immunonutriton Intake		
a. Inadequate	60	73,2
b. Adequate	22	26,8
Knowledge		
a. Poor	34	41,5
b. Good	48	58,5
Peers Influence		
a. Yes	36	43,9
b. No	46	56,1
Social Media Influence		
a. Yes	39	47,6
b. No	43	52,4

The results of cross-tabulation as shown in table 2, the adolescent girls with poor knowledge and inadequate immunonutrition intake, were 88,2% higher than those with good knowledge and inadequate immunonutrition intake, which was 62,5%. The results showed that knowledge influence immunonutrition intake of adolescent girls ($p = 0,019$) and poor knowledge was a risk factor for inadequate immunonutrition intake in adolescent girls with $OR = 4,5$ (95% CI; 1,36-14,87), which means the adolescent girls with poor knowledge are 4,5 times more likely to have inadequate immunonutrition intake than those with good knowledge.

The results of cross-tabulation as shown in table 2, the adolescent girls with peer's influence and inadequate immunonutrition intake, were 86,1% higher than those with no peers influence and inadequate immunonutrition intake, which was 63%. The results showed that peers influence immunonutrition intake of adolescent girls ($p = 0,037$) and peers influence was a risk factor for inadequate immunonutrition intake in adolescent girls with $OR = 3,6$ (95% CI; 1,18-11,12), which means the adolescent girls who have peers influence are 3,6 times more likely to have inadequate

immunonutrition intake than those with no peers influence.

The results of cross-tabulation as shown in table 2, the adolescent girls with social media influence and inadequate immunonutrition intake, were 84,6% higher than those with no social media influence and inadequate immunonutrition intake, which was 62,8%. The results showed that social media influence immunonutrition intake of adolescent girls ($p = 0,048$) and social media influence was a risk factor for inadequate immunonutrition intake in adolescent girls with $OR = 3,2$ (95% CI; 1,12-9,47), which means the adolescent girls who have social media influence are 3,2 times more likely to have inadequate immunonutrition intake than those with no social media influence.

Table 2: The Influence of Knowledge, Peers and Social Media on Immunonutrition Intake of Adolescent Girls.

Variable	Immunonutrition Intake				p	OR	95% CI
	Inadequate		Adequate				
	n	%	n	%			
Knowledge							
a. Poor	30	88,2	4	11,8	0,019	4,5	1,36-14,87
b. Good	30	62,5	18	37,5			
Peers Influence							
a. Yes	31	86,1	5	13,9	0,037	3,6	1,18-11,12
b. No	29	63	17	37			
Social Media Influence							
a. Yes	33	84,6	6	15,4	0,048	3,2	1,12-9,47
b. No	27	62,8	16	37,2			

Based on the results of the bivariate analysis using the chi-square test, the independent variables were determined as candidates in the multivariate analysis; is the variable with p -value $<0,25$. The candidate variables included in the multivariate analysis were knowledge, peers influence and social media influence. The results of the multivariate analysis using binary logistic regression with the backward stepwise method as shown in table 3 found that the factors that most contributed to the nutritional status of pregnant women were knowledge and social media. The null hypothesis in the Hosmer and Lemeshow test has a p -value of 0.998 so that the null hypothesis is accepted. This means that there is no difference between the observed value and the expected value/expectation so that it can be concluded that the obtained equation is well-calibrated (Dahlan, 2012).

Table 3: Initial Model and Final Model of Binary Logistic Regression Analysis of Factors Contribute to the Immunonutrition Intake of Adolescent Girls.

	B	p	OR	95% CI
Initial Model				
a. Knowledge	1,744	0,008	7,4	1,21-46,31
b. Peers	1,145	0,062	8,6	1,47-50,21
c. Social Media	1,500	0,013	6	1,12-32,75
Constant	-8,154			
Final Model				
a. Knowledge	1,887	0,004	6,6	1,86-62,05
b. Social Media	1,593	0,074	4,9	2,14-60,86
Constant	-6,685			

Based on the results of the analysis obtained the following equation:

Inadequate Immunonutrition Intake in Adolescent Girls = $-6,685 + (1,887 * \text{knowledge}) + (1,593 * \text{social media influence})$

4 DISCUSSIONS

This study shows adolescent girls in Pesawaran District, Lampung Province, have inadequate immunonutrition intake as many as 60 people (73,2%). Low intake of immunonutrients risks lowering the immune system. Low immunity will cause the body to be susceptible to disease, especially in the new normal era. Adequate intake of immunonutrition is believed to be able to modulate the immune system and improve inflammatory processes that occur due to exposure to viruses, bacteria, etc (Derbyshire & Delange, 2020).

The results of the study show that knowledge affect the intake of immunonutrition. Good nutritional knowledge will enable adolescent girls to be able to choose good food and form healthy eating behaviors so that they have adequate immunonutrition intake (Naeeni et al., 2014). Respondents poor of knowledge because they generally do not know and do not understand well about the importance of immunonutrition intake, lack of information seeking in mass media or electronic media, and have never been given health education on immunonutrition.

The results of the study show that peers affect the intake of immunonutrition. Peers can influence dietary behavior and intake of immunonutrition in adolescent girls. Peers play an important role in the formation of adolescent self-concept. The influence of peers is high because most of the adolescent girls time is spent at school or other places with friends, so that peers can change good and healthy behaviors and

habits related to healthy eating behaviors such as immunonutrition intake (Chung et al., 2021).

The results of the study show that social media affect the intake of immunonutrition. Adolescents with an average age of 13 years are actively using social media, 75% of girls and 70% of boys claim to have at least one social media account. Social media is influential in providing new knowledge about everything related to human welfare in life (Kennedy, 2019). Knowledge spread by social media includes knowledge on how to maintain a healthy body, prevent disease, and eat well. Through social media, adolescent girls know how to maintain a healthy body, prevent disease (Chau et al., 2018), including the importance of immunonutrition intake in the new normal era.

Among female adolescents, the duration of exposure to food and beverage content from social media was associated with food selection after controlling for body image. Food selection was associated with energy and protein intake. Thus, the duration of exposure to social media was associated with energy and protein intake. The longer duration of social media exposure on food and beverage content led to higher energy and protein intake (Adiba, 2020).

Social media plays both positive and negative effects on health of adolescents. It is a fact that social media is very beneficial as it keeps us in contact with everyone all over the world and provides us with the latest information but everything has its drawbacks too and the most common drawback is that youth has decreased spending time and enjoying healthy meals with their families. They have moved on from these healthy eating habits and become reserved to their peer circle that is majorly influencing their health as they are more focused towards junk food (Aslam et al., 2021).

5 CONCLUSIONS

The most influential factors on the immunonutrition intake of adolescent girls are knowledge and social media. Social media that contains information on how to maintain health, prevent disease, and good eating behavior can increase the knowledge of adolescent girls to choose good food and form healthy eating behaviors such as having adequate immunonutrition intake.

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