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ANALYSIS OF MICRO NUTRITIONAL CONSUMPTION AND FERRITIN LEVELS OF ADOLESCENT WOMEN IN GIANYAR REGENCY, BALI PROVINCE

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Abstrak (indonesia)

Latar Belakang: Berdasarkan Riskesdas tahun 2018 menunjukkan prevalensi anemia pada wanita usia subur (WUS) di Indonesia sebesar 23,7% dengan penderita anemia usia 5-14 tahun sebesar 26,8%, penderita anemia usia 15-24 tahun sebesar 32,0%, anemia usia 25 tahun. -34 tahun sebesar 15,1% dan penderita anemia usia 35-44 tahun sebesar 16,7%. Di Bali penelitian tentang prevalensi anemia pada remaja sepengetahuan penulis masih sangat minim.

Tujuan: Tujuan penelitian tahun pertama ini adalah untuk mengetahui hubungan konsumsi zat gizi mikro dengan kadar ferritin pada remaja putri di Kabupaten Gianyar Provinsi Bali. Tujuan pada tahun kedua adalah untuk mengetahui efektivitas zat besi folat dan Multi Micronutrient Supplements (MMS) pada remaja putri yang kadar hemoglobin atau feritinnya di bawah normal. Penelitian ini merupakan studi epidemiologi gizi masyarakat yang akan dilaksanakan di Kabupaten Gianyar Provinsi Bali, tahun pertama bulan Maret sampai Oktober 2021 dan tahun kedua bulan Maret sampai Oktober 2022.

Metode: Metode penelitian tahun pertama menggunakan uji coba masyarakat dengan Desain Cross Sectional dengan jumlah sampel 168 sampel. Tahun kedua dengan desain subjek yang berbeda dengan jumlah sampel 86 sampel yang terdiri dari 43 kelompok kontrol dan 43 kelompok perlakuan.

Hasil: Hasil penelitian pada tahun 1 (2021) menunjukkan bahwa kadar Ferritin remaja putri di Kabupaten Gianyar Provinsi Bali menunjukkan 29,2% dalam kategori rendah (<30 g/l) dan 4,8% dalam kategori tinggi (>160 g/l). /l), Rata-rata konsumsi mikronutrien remaja putri di Kabupaten Gianyar Provinsi Bali yaitu zat besi (55%), seng (74,25%), asam folat (31,7%) dan vitamin C (39,2%), ada hubungan Konsumsi Zat Gizi Mikro yaitu Asam Folat dan Zinc dengan kadar feritin, sedangkan konsumsi Zat Besi dan Vitamin C

dengan kadar feritin pada remaja putri di Kabupaten Gianyar Provinsi Bali tidak ada hubungan.

Kesimpulan: Ada hubungan antara konsumsi zat gizi mikro yaitu Asam Folat dan Zinc dengan kadar feritin, sedangkan tidak ada hubungan antara konsumsi zat besi dan Vitamin C dengan kadar feritin pada remaja putri di Kabupaten Gianyar Provinsi Bali.

Kata kunci: kadar feritin; konsumsi besi; konsumsi vitamin C; konsumsi asam folat; konsumsi seng.

Abstract (English)

Background: *Based on Riskesdas, 2018 shows that the prevalence of anemia in women of childbearing age (WUS) in Indonesia is 23.7% with anemia sufferers aged 5-14 years at 26.8%, anemia sufferers aged 15-24 years at 32.0%, anemia aged 25-34 years by 15.1% and anemia patients aged 35-44 years by 16.7%. In Bali, research on the prevalence of anemia in adolescents as far as the author's knowledge is still very minimal.*

Objective: *The purpose of this research in the first year is to determine the relationship between consumption of micronutrients and ferritin levels in adolescent girls in Gianyar Regency, Bali Province. The aim in the second year was to determine the effectiveness of iron folate and Multi Micronutrient Supplements (MMS) in adolescent girls whose hemoglobin or ferritin levels were below normal. This research is an epidemiological study of community nutrition that will be carried out in Gianyar Regency, Bali Province, the first year from March to October 2021 and the second year from March to October 2022.*

Methods: *The first year research method used a community trial with a Cross Sectional design with a sample size of 168 samples. The second year with a different subject design with a sample size of 86 samples consisting of 43 control groups and 43 treatment groups.*

Results: *The results of the study in year 1 (2021) showed that the Ferritin levels of adolescent girls in Gianyar Regency, Bali Province showed 29.2% in the low category (<30 g/l) and 4.8% in the high category (>160 g/l), The average consumption of micronutrients for adolescent girls in Gianyar Regency, Bali Province, namely iron (55%), zinc (74.25%), folic acid (31.7%) and vitamin C (39.2%), there is a relationship Consumption of Micronutrients, namely Folic Acid and Zinc with ferritin levels, while there*

is no relationship between consumption of iron and Vitamin C with ferritin levels in adolescent girls in Gianyar Regency, Bali Province

Conslusion: *There is a relationship between consumption of micronutrients, namely Folic Acid and Zinc with ferritin levels, while there is no relationship between consumption of iron and Vitamin C with ferritin levels in young women in Gianyar Regency, Bali Province*.

Keyword*s: Ferritin levels; iron consumption; consumption of vitamin C; consumption of folic acid; zinc consumption.*

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INTRODUCTION

Anemia is a nutritional problem that often occurs in adolescents, especially young women. Anemia is a continuation of the impact of lack of macronutrients (carbohydrates, protein, fat) and micronutrients (vitamins, minerals). In young women, the need for iron increases because they experience periodic menstruation which releases a certain amount of iron every month. This increase in the need for total blood volume is often not followed by adequate iron consumption, especially when young women tend to want to have a slimmer body, so they often make various efforts, including doing a strict diet. Anemia is a medical condition in which the hemoglobin level is less than normal. Normal Hb levels in adolescent girls are > 12 g/dl. Adolescent girls are said to be anemic if the Hb level is <12 g/dl (Asfuah & Proverawati, 2009). Anemia is characterized by symptoms of tiredness, lethargy, pale, lack of energy, lack of appetite and cold hands and feet. These symptoms must be addressed immediately so as not to cause a more serious impact on the quality of human resources. The impact of anemia on adolescents includes decreased ability and concentration in learning, interferes with growth, decreases physical abilities, decreases endurance and work productivity and decreased fitness (Organization, 2006).

Anemia is a health problem throughout the world, especially developing countries where an estimated 30% of the world's population suffers from anemia. Anemia is common in society, especially in adolescents and pregnant women. Anemia in adolescent girls is still quite high, according to the World Health Organization (WHO). In 2013, the prevalence of anemia in the world ranged from 40-88%. (Organization, 2019). According to 2013 Basic Health Research data, the prevalence of anemia in Indonesia is 21.7%, with a distribution of 20.6% in urban areas and 22.8% in rural areas and the proportion of men 18.4% and 23.9 % woman. Meanwhile, based on age group, patients with anemia aged 5-14 years were 26.4% and 18.4% were in the age group 15-24 years. Based on (RISKESDAS, 2018) shows that the prevalence of anemia in women of childbearing age (WUS) in Indonesia is 23.7% with anemic patients aged 5-14 years at 26.8%, anemia patients aged 15-24 years at 32.0% , 15.1% of anemic patients aged 25-34 years and anemic patients aged 35-44 years were 16.7%. The prevalence of anemia in women of childbearing age (WUS) in Bali based on the results of Riskesdas in 2013 was 10.8%. The World Health Organization (WHO) targets to reduce anemia by 50 percent in 2025 for women of childbearing age (WUS) aged 15-49 years. In Bali, research on the prevalence of anemia in adolescents as far as the author's knowledge is still very minimal. Anemia can cause fatigue, decreased learning concentration so that learning achievement is low and can

reduce work productivity. In addition, it also lowers the body's resistance so that it is easy to get infections. The high prevalence of anemia among adolescents if not handled properly will continue into adulthood and contribute greatly to maternal mortality, premature birth, and babies with low birth weight. According to research results showed that 11.4% of subjects had anemia. Subjects with energy and protein intake in the less category are 37.1% and 50%. Intake of vitamins and micronutrients of the subject is still lacking, namely vitamin B2 by 72.9%, zinc 68.6%, iron 92.9%, and folic acid 90% and most of the subjects (68.6%) their vitamin C intake belongs to the category good.

Based on research conducted by Rossita Denistikasari in 2016 it was found that most of the students with low iron (Fe) intake and had anemia as many as 22 students (84.6%) and students with good iron intake and 5 students (41, 7%). Based on the results that have been tested, it is known and there is a relationship between intake of iron (Fe) and the incidence of anemia in female students of SMK Aviation Bina Dhirgantara Karanganyar. Based on this background, it encourages the author to examine the Analysis of Micronutrient Consumption and Ferritin Levels of Young Women in Gianyar Regency, Bali Province.

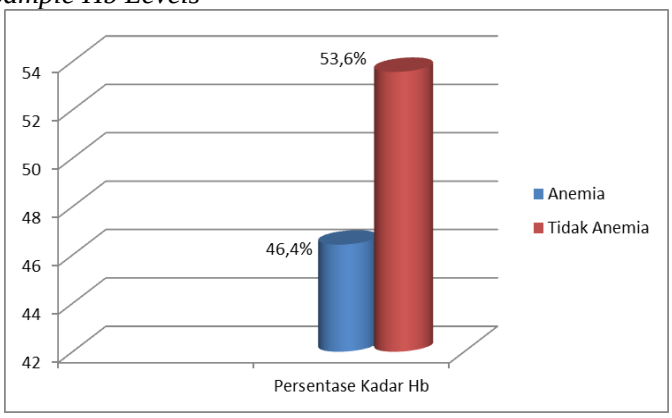
RESEARCH METHOD

This type of observational research with the research design used is cross sectional (Stevens, Sanders, Ward, McManus, & Heneghan, 2011). This research was carried out on high school students located throughout Gianyar Regency in Bali Province in May - Oktober 2022. The sample was part of the population, namely young women at SMAN 1 Gianyar and SMAN 1 Payangan located in Gianyar Regency in Bali Province. the number of samples as many as 168 samples taken by purposive sampling. The tools used are the Easy Touch GCHb brand hemoglobin check tool to check hemoglobin levels, clot activator tube to store blood to be checked for ferritin levels, sample biodata questionnaire and food recall form.

RESULTS AND DISCUSSION

The samples in this study were high school students in the Gianyar district and high school students in Payangan district, Gianyar district. The sample in this study selected 168 students of SMAN 1 Gianyar and SMAN 1 Payangan students. When grouped by age, most of the students were 16 years old (63%), 17 years old by 32%, 15 years old (4%), and 18 years old (1%). The average hemoglobin level of the sample was 11.9 mg/dl with a minimum value of 8.5 mg/dl and the highest being 14.8 mg/dl. From these results 53.6% of the sample did not experience anemia and 46.4% had anemia

Figure 1
Distribution of Sample Hb Levels



The lowest sample ferritin level was 2.6 g/l and the highest was 375.2 g/l with an average of 57.3 g/l . Most of the samples (66.1%) had normal ferritin levels, 29.2% samples had low ferritin levels and 4.8% had high ferritin levels. Because only a few samples with high ferritin content percentage category (4.8%) then in the next analysis stage the distribution of sample ferritin levels was only divided into 2 categories, namely low (<30) and Normal/high (>30).

Table 1
Distribution of Sample Ferritin Levels

Ferritin Levels	*Observations*	
	f	*%*
Normal/high	*119*	*70,8*
Low	*49*	*29,2*
Total	*168*	*100,0*

Consumption of Nutrients

Measurement of nutrient consumption in the sample is seen from the consumption of macronutrients and micronutrients (Vitamin C, Folic acid, Zinc and Iron). The measurement results show the average energy consumption of the sample is 59.1% where the lowest value is 19.4% and the highest is 138.6%, while the average protein and fat consumption is 80.4% and 56.4%, respectively. Meanwhile, the average consumption of micronutrients are Vitamin C (39.2%), Folic acid (31.7%), Zinc (74.23%) and Iron (55%). For simplification of the analysis, at the next stage of analysis the consumption of nutrients is divided into two categories, namely Enough and Less.

Based on the age of the samples aged 15 and 18 years, none had high ferritin levels, but samples aged 16 and 17 years experienced high ferritin levels respectively 1.2% and 3.6%. Based on Hb levels, samples with anemia had high ferritin levels of 3.6%, 29.2% sufficient and 13.7% low. Samples that were not anemic had a high ferritin level of 1.2%, 36.9% sufficient and 15.5% low. For simplification of the analysis, in the next stage of analysis, the Hb and ferritin levels are divided into only two categories, namely Enough and Less. The distribution results are as presented in table 14. After statistically analysis, the results show that there is no relationship between Hb levels and Ferritin levels with p value = 0.658. For more clarity, it can be seen in Table 2.

Table 2
Distribution of Hb Levels and Ferritin Levels

Hb Levels	*Kadar Feritin*	
	Normal	*Low*

	f	*%*	*f*	*%*
Normal	*55*	*46,2*	*23*	*45,9*
Anemia	*64*	*53,8*	*26*	*53,1*
Total	*119*	*100,0*	*49*	*100*

Consumption of Macro Nutrients

Distribution of Consumption of Energy, Protein, Fat and Carbohydrates and Ferritin Levels of the samples showed varying results. For simplification of the analysis, at the next stage of analysis the consumption of nutrients is divided into two categories, namely Enough and Less. The results of statistical tests showed that there was a relationship between consumption of energy, protein and carbohydrates with ferritin levels in the sample with p value <0.05, while fat consumption had no relationship with ferritin levels with p value> 0.05. For more details can be seen in table 3.

Table 3

Distribution of Consumption of Energy, Protein, Fat and Carbohydrates and Ferritin Level

Consumption	*Ferritin Levels*					
Energy	*High/Normal*		*Low*		*Total*	
	N	*%*	*n*	*%*	*n*	*%*
Over	*2*	*1,2*	*0*	*0,0*	*2*	*1,2*
Fine	*14*	*8,4*	*4*	*2,4*	*18*	*10,7*
Enough	*18*	*10,7*	*4*	*2,4*	*22*	*13,1*
Less	*85*	*50,6*	*41*	*24,4*	*126*	*75,0*
Total	*119*	*70,9*	*49*	*29,2*	*168*	*100,0*
Protein	*High/Normal*		*Low*		*Total*	
	n	*%*	*n*	*%*	*n*	*%*
Over	*14*	*8,3*	*0*	*0,0*	*14*	*8,3*
Fine	*20*	*11,9*	*9*	*5,4*	*29*	*17,3*
Enough	*38*	*22,6*	*17*	*10,1*	*55*	*32,7*
Less	*47*	*28,0*	*23*	*13,7*	*70*	*41,7*
Total	*119*	*70,9*	*49*	*29,2*	*168*	*100,0*
Lipid	*High/Normal*		*Low*		*Total*	
	N	*%*	*n*	*%*	*n*	*%*
Over	*6*	*3,6*	*0*	*0,0*	*6*	*3,6*
Fine	*7*	*4,2*	*2*	*1,2*	*9*	*5,4*
Enough	*21*	*12,5*	*11*	*6,5*	*32*	*19,0*
Less	*85*	*50,6*	*36*	*21,4*	*121*	*72,0*
Total	*119*	*70,9*	*49*	*29,2*	*168*	*100,0*
Carbohydrate	*High/Normal*		*Low*		*Total*	
	N	*%*	*n*	*%*	*n*	*%*
Over	*2*	*1,2*	*0*	*0,0*	*2*	*1,2*

Fine	12	7,2	4	2,4	16	9,5
Enough	16	9,5	4	2,4	20	11,9
Less	89	53,0	41	24,4	130	77,4
Total	119	70,9	49	29,2	168	100,0

Consumption of Iron and Ferritin Levels

Based on the consumption of iron (Fe) samples, it can be seen that samples with iron consumption above > 15 mg had low ferritin levels as much as 2.4%, Normal 4.8% and none had high ferritin levels. For simplification of the analysis, at the next stage of analysis the consumption of nutrients is divided into two categories, namely Enough and Less. The results of statistical tests showed that there was no relationship between iron consumption and ferritin levels in the samples with p value > 0.05.

Table 4

Distribution of Iron Consumption and Ferritin Levels

Iron Consumption	Ferritin Levels					
	High/Normal		Low		Total	
	n	%	n	%	n	%
> 15 mg	8	4,7	4	2,4	12	7,1
<15 mg	111	66,1	45	26,8	156	92,9
Total	119	70,9	49	29,2	168	100,0

Consumption of Folic Acid and Ferritin Levels

The consumption of folic acid in the sample showed that the sample whose consumption of folic acid was above > 400 mcg had low and high ferritin levels, while the ferritin level was normal at 3.6%. as much as 2.4%. The results of folic acid consumption below 400 mcg showed normal ferritin levels as much as 62.5%, low 29.2% and high as much as 4.8%. The results of statistical tests showed that there was a relationship between folic acid consumption and ferritin levels in the sample with a p value of < 0.05. The distribution of folic acid consumption levels with ferritin levels is shown in table 5.

Table 5

Distribution of Folic Acid Consumption and Ferritin Levels

Consumption	Ferritin Levels					
Folic Acid	Normal		Low		Total	
	N	%	n	%	n	%
> 400 mcg	6	3,6	0	0,0	6	3,6
<400 mcg	113	67,3	49	29,2	162	96,4
Total	119	70,9	49	29,2	168	100,0

Consumption of Vitamin C and Ferritin Levels

Based on the consumption of vitamin C, the sample showed that the sample whose consumption of vitamin C was above > 75 mg had a low ferritin level of 4.85, normal 10.1% and high as much as 2.4%. The results of vitamin C consumption below 75 mg showed normal ferritin levels as much as 56.0%, low 23.8% and high as much as 3.0%. The results of statistical tests showed that there was no relationship between vitamin C consumption and ferritin levels in the sample with p>0.05. The distribution of vitamin C consumption levels with ferritin levels is shown in table 6.

Table 6
Distribution of Vitamin C Consumption and Ferritin Levels

Consumption Vitamin C	*Ferritin Levels*					
	Normal		*Low*		*Total*	
	f	*%*	*f*	*%*	*f*	*%*
> 75 mg	*21*	*12,6*	*8*	*4,7*	*29*	*17,3*
<75 mg	*98*	*58,3*	*41*	*24,4*	*139*	*82,7*
Total	*119*	*70,9*	*49*	*29,2*	*168*	*100,0*

Consumption of Zinc and Ferritin Levels
Based on the consumption of zinc, the sample shows that the sample whose consumption of zinc is above > 9 mg does not have low ferritin levels, while those with normal ferritin levels are 6.5% and high are 1.8%. The results of zinc consumption below 9 mg showed normal ferritin levels as much as 59.5%, low 29.2% and high as much as 3.0%. The results of statistical tests showed that there was a relationship between zinc consumption and ferritin levels in the sample with p <0.05. The distribution of zinc consumption levels with ferritin levels is shown in table 7
Table 7
Distribution of Zinc Consumption and Ferritin Levels

Consumption Zinc	*Ferritin Levels*					
	Normal		*Low*		*Total*	
	N	*%*	*n*	*%*	*n*	*%*
> 9 mg	*14*	*7,4*	*0*	*0,0*	*6*	*7,4*
< 9 mg	*105*	*62,4*	*49*	*29,2*	*162*	*92,6*
Total	*119*	*70,8*	*49*	*29,2*	*168*	*100,0*

DISCUSSION
In general, the purpose of this study was to determine the relationship between consumption of micronutrients and ferritin levels in adolescent girls in Gianyar Regency, Bali Province. In order to achieve these goals, there are several specific objectives, namely Determining Ferritin Levels of Young Women, Determining Consumption of Micro Nutrients (Iron, Zinc, Folic Acid and Vitamin C) for Young Women and analyzing the relationship between Consumption of Micro Nutrients (Iron, Zinc, Folic Acid) and Vitamin C) with ferritin levels in adolescent girls in Gianyar Regency, Bali Province. The results showed that the prevalence of anemia in the sample was quite high, namely 46.4%. This shows a lower number than the research of Lukman Dwi Priyanto (2018) which found the incidence of anemia at 83.90% in students with Madrasah Tsanawiyah (MTs) education. There is no significant relationship between age, level of education and physical activity with the incidence of anemia in female students of Husada Poskestren Pondok Pesantren X Surabaya (Priyanto, 2018). *This study also showed that there was a relationship between the age of the sample and the occurrence of anemia (p<0.05) where the sample aged 16 and 17 years experienced anemia.*
The ferritin level of the sample showed 29.2% was in the low category (<30 g/ml) and 4.8% was in the high category (>160 g/ml). After statistical tests, it was found that there was no relationship between the incidence of anemia and ferritin levels in the sample. This is in

accordance with the research of Norashikin, 2006 with a study sample of 92 people where there is no relationship between hemoglobin levels and ferritin levels in blood donors in Malaysia (r2 = 0.05) with an average serum ferritin level in the sample of 62.0 g/ l and average Hb 14.9

Energy is needed by teenagers for the body's metabolic processes. Lack of energy nutrient intake may be caused by the inadequate intake of some young women. The density of school activities and not balanced with adequate food intake. Consumption of nutrients, especially energy, showed low results, namely the average energy consumption of the sample was 59.1%. This is the same as Agustina's research, 2018 that there is a significant relationship between energy intake, protein, iron, and menstrual patterns with the incidence of anemia in adolescent girls. Multivariate logistic regression analysis showed that the most influential variable on the incidence of anemia in adolescent girls was protein intake.

Protein functions as a builder, regulator and fuel for the body's metabolism. Protein is a provider of amino acids which are components of all cells in the body. Transferrin and ferritin are proteins that help transport and store iron. Lack of protein intake can result in low levels of hemoglobin which is the binding protein of globin and heme. Low protein consumption can be caused because protein consumption is dominated by vegetable protein rather than animal protein which should be balanced. Protein is used for the growth process and as an energy reserve if energy intake is lacking. Consumption of protein is quite good even though it is still below 100%, namely 80.4%, while fat is quite low, namely 56.4%.

Consumption of macronutrients, especially iron, showed that the average consumption of samples was very low, namely 55%, Vitamin C 39.2%, folic acid 31.7%. Iron is the main component of hemoglobin which functions to synthesize hemoglobin. Excess iron in the form of the protein ferritin is stored in the liver, spinal cord, spleen and muscles. An imbalance will occur if iron stores are not sufficient for the formation of red blood cells, resulting in decreased serum ferritin and iron deficiency anemia occurs. Iron has an important role in the body, including helping hemoglobin transport oxygen and helping various enzymes bind oxygen for the body's metabolism/burning process. The need for iron in adolescents increases from before adolescence by 0.7-0.9 mg Fe/day to 2.2 mg Fe/day, during heavy menstruation the need for Fe increases, adolescent iron needs by 26 mg/day. The lack of iron intake, which mostly occurs in adolescent girls, can be caused because most of the respondents did not take Fe supplements because there was no distribution of blood-added tablets from school during the pandemic. Low knowledge of anemia can be a factor that may cause a lack of nutritional intake with low iron content. Different results are shown in Adhisti's research (2011) in Agustina (2018) about the relationship between anthropometric status and nutritional intake with adolescent Hb and ferritin levels (Aji et al., 2021). *Women with the result that there was no significant relationship between nutritional intake with Hb levels and ferritin levels. Very low iron consumption causes anemia in adolescent girls in Gianyar Regency, Bali Province. When viewed iron consumption is quite good even though it is still below 100%, which is 74.25%. The results of data collection on consumption are not much different from several studies, such as this is in line with research by Ghassani Putri, 2016 which shows that there is no significant effect between protein, iron, and vitamin C intake and serum ferritin levels (p > 0.05) in the category normal nutritional status. Iron intake was significantly and positively correlated with serum ferritin (p<0.05) in overweight status* (Sanad, Osman, & Gharib, 2011). *Based on the results of observations on 149 young women at SMPN 9 Cimahi, it is known that protein intake is 43.6% less and vitamin C intake is less as much as 42.3%. Intake data was obtained using a questionnaire and the Semi Quantitative Food frequency Questionnaire (SQ-FFQ) table. Of the 71 female students aged 16-18 years observed at SMK Mahfilud Duror II, 50 students (70.4%) had a protein intake deficit and 68 (95.8%). Intake data obtained through interviews and food recall calculations 2 x 24 hours* (Sahay et al., 2020). *From the results of recall interviews, it is known that students of SMK*

Mahfilud Durror II often consume sweet tea and almost every day consume junk food in the form of sausages. In 70 young women who were observed at SMA Negeri 2 Purwokerto aged 15-17 years, it was found that 42 people (60%) lack protein intake and 62 people (88.6%) less vitamin C intake. Intake data was obtained from an open questionnaire in the form of a food recall form. The results of observations of 44 students of class X at SMAN 4 Surabaya revealed that 13 people had less protein intake (59.1%) and 19 people lacked vitamin C intake (86.3%). The level of consumption is measured by food recall 2x24 hours with non-consecutive days (weekends and weekdays) (Tan et al., 2021). *In 202 students at SMP Negeri 22 Jambi City, it was observed that 199 people (98.5%) lack protein intake and 163 people (80.7%) with less frequency of eating. Intake data was obtained from a questionnaire. Of the 100 young women who were observed at Pancur Batu Junior High School, Deli Serdang Regency, it was found that protein intake was less than 44% and vitamin C intake was less than 85%. Intake data was obtained from an open questionnaire in the form of a 24-hour food recall form. The results of the recall interview revealed that students at Pancur Batu Junior High School, Deli Serdang Regency often consumed staple foods in the form of rice, animal dishes such as eggs and fish. Vegetable side dish that is often consumed is tempeh. The most consumed fruits are oranges and bananas. And often consume meatballs, chicken noodles, fried foods, and donuts. The results of 76 female students who were observed at SMK Negeri 1 Mangosteen were found to have 34 students (44.7%) lacking protein intake and 41 (53.9%). The frequency of eating less than three times a day 23 people (30.3%). Intake data was obtained using a questionnaire and the Semi Quantitative Food frequency Questionnaire (SQ-FFQ) table. A recent Cochrane review published in March 2019, found several advantages of multiple micronutrient supplements compared to iron and zinc supplements.*

These advantages include: Reducing the number of babies born weighing < 2500 grams, Reducing the number of small babies based on gestational mass, Reducing the number of babies born at < 37 weeks' gestation. However, multiple supplements were not found to provide benefits or risks for maternal and infant mortality rates, anemia in third trimester pregnant women, the incidence of abortion, the need for cesarean section, and congenital anomalies. Micronutrient supplementation is relatively safe for consumption because it has almost no side effects. Although Sudfelt, et al are concerned about the possible increased risk of neonatal death in mothers taking micronutrient supplements. The results of existing studies refute this.

CONCLUSION

1. Ferritin levels in adolescent girls in Gianyar Regency, Bali Province showed 29.2% in the low category (<30 g/l) and 70.8% in the high/Normal category (>160 g/l).
2. Average Consumption of Micronutrients for Young Women in Gianyar Regency, Bali Province, namely Iron (55%), Zinc (74.25%), Folic Acid (31.7%) and Vitamin C (39.2%).
3. There is a relationship between consumption of micronutrients, namely Folic Acid and Zinc with ferritin levels, while there is no relationship between consumption of iron and Vitamin C with ferritin levels in young women in Gianyar Regency, Bali Province.

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