Amerta Nutrition
e-ISSN: 2580-1163 (Online)
p-ISSN: 2580-9776 (Print)
Hardiansyah et al. | Amerta Nutrition Vol. 8 Issue 3 (September 2024). 350-355

RESEARCH STUDY
English Version
OPEN ACCESS

Correlation between Iron Consumption, Hemoglobin Level, and Nutritional Status on the Physical Fitness of Young Women at MA Al-Irsyad Gajah

Hubungan Konsumsi Zat Besi, Kadar Hemoglobin, dan Status Gizi Terhadap Kebugaran Jasmani Remaja Putri di MA Al-Irsyad Gajah

Angga Hardiansyah[1]*, Arini Noor Khasanah[2], Nur Hayati[1]

[1]Program Studi Gizi, Fakultas Psikologi dan Kesehatan, UIN Walisongo, Kota Semarang, Indonesia
[2]Departemen Gizi, Fakultas Kedokteran, Universitas Diponegoro, Semarang, Indonesia

ARTICLE INFO

Received: *01-07-2023*
Accepted: *02-02-2024*
Published online: *30-09-2024*

Correspondent:
Angga Hardiansyah
angga.hardi@gmail.com

DOI:
10.20473/amnt.v8i3.2024.350-355

Available online at:
https://e-journal.unair.ac.id/AMNT

Keywords:
Iron consumption, Hemoglobin level, Nutritional status, Physical fitness

ABSTRACT

Background: Good nutritional status, normal hemoglobin levels, and adequate iron consumption will help a person achieve good physical fitness. Lack of iron consumption causes a decrease in hemoglobin production. Low levels of hemoglobin cause disruption of oxygen transport to whole body associated with energy production. Malnutrition or excess nutritional status causes a person to have difficulty moving, which results in a lower level of physical fitness.
Objectives: To determine the relationship between iron consumption, hemoglobin level and nutritional status on the physical fitness of female adolescents.
Methods: The study used a cross-sectional design, with total sample of 65 respondents. The data were nutritional status from BMI/U, hemoglobin levels using the Easytouch GCHb (Glucose, Cholesterol, and Hemoglobin) tool, iron consumption using food recall, and physical fitness measured using beep test. Bivariate analysis was measured by Gamma correlation test and ordinal logistic regression test for multivariate analysis.
Results: Most of respondents had good nutritional status (55.4%), normal hemoglobin levels (69.2%), good iron consumption (58.5%), and sufficient physical fitness (60%). The results of bivariate analysis showed that nutritional status did not correlate with physical fitness (p=0.905). Meanwhile, hemoglobin level and iron consumption correlated with physical fitness (p=0.004). Multivariate analysis explained that hemoglobin levels had a 1.73 effect on physical fitness compared to iron intake which influenced physical fitness by 1.1 times.
Conclusions: There is a correlation between iron consumption and hemoglobin levels with physical fitness. There is no correlation between nutritional status and physical fitness.

INTRODUCTION

The body's capacity to carry out a variety of physical activities without becoming exhausted is known as physical fitness[1]. One aspect to support adolescent learning achievement is a good fitness aspect. Many teenagers' fitness has decreased due to lifestyle changes. This is because physical education lessons at school only meet once a week[2]. According to Sudiana (2014), physical fitness consists of two types: health-related and skill-related fitness. Muscular endurance, cardiovascular endurance, flexibility, and body composition are all components of health-related fitness. Agility, balance, coordination, movement speed, and power are all aspects of skill-related fitness[3].

Factors that have impacts on physical fitness include heredity, gender, physical activity, age, body temperature, nutrient intake, and rest. Physical fitness can be described as VO_2 max Level. VO_2 max is the body's ability to consume oxygen during activities[4]. The method that is widely applied to assess physical fitness is the Multistage Fitness Test (MFT) or Beep Test method[5]. The advantages of this test are that it is effective and efficient because this test can be carried out directly on many people at once, the procedure for carrying out this test is fairly easy, it is more economical because it does not require expensive equipment and the estimation results are close to tests in the laboratory[4]. The beep test also provides an overview of aspects of endurance fitness, which is determined by the efficiency of lung and heart function and is caused by the body's maximum oxygen consumption[4].

One of the efforts to support good fitness is influenced by intake, the intake that influences it is macronutrients. In addition to macronutrients consisting

How to cite: *Hardiansyah, A., Khasanah, A. N., & Hayati, N. (2024). Correlation between Iron Consumption, Hemoglobin Level, and Nutritional Status on the Physical Fitness of Young Women at MA Al-Irsyad Gajah: Hubungan Asupan Zat Besi, Kadar Hemoglobin, dan Status Giziterhadap Kebugaran Jasmani Remaja Putri di MA Al-Irsyad Gajah. Amerta Nutrition, 8(3), 350–355.*

of carbohydrates, proteins, fats, there are also micronutrients that support fitness. These micronutrients include mineral intake, including iron intake[6]. Iron is one of the nutrients in the form of micro minerals that are mostly found in the human body, and it is approximately 2-5 grams[7]. Iron in the reaction acts as a cofactor in the formation of energy. Formation of energy in mitochondria requires a series of enzymes that play a role in electron transport, namely cytochrome oxidase enzymes[8]. Iron, in its reaction works with the electron transport proteins present in every cell, then plays a role in the formation of energy. The electron transport protein converts oxygen into water (H_2O) by transferring hydrogen and electrons from foods that provide energy. The iron needed by young women aged 15-19 years is 15 mg/day[9]. Hemoglobin, which carries oxygen from the lungs throughout the body and returns carbon dioxide from every part of the body to the lungs, contains the majority of iron in the body. Myoglobin plays a role in storing, receiving and releasing oxygen into muscle cells[7]. The primary metallo protein present in red blood cells, hemoglobin serves as a means of carrying oxygen from the lungs to all peripheral tissues as well as carbon dioxide from those tissues back to the lungs, so that it can affect the person body fitness[6].

Body fitness can be related to a person's nutritional status. Nutritional status is the condition of a person's body which is the result of a balance between daily food intake and nutritional needs. Nutritional status can be regarded as one element that reflects a person's health status. If a person's nutritional intake is in accordance with the person needs, this nutritional status will be good. As for someone who has nutritional intake of food that is lacking, malnutrition will arise. If the nutritional intake is excessive, then there will be excess nutrition. It can be concluded that nutritional status is an interpretation of an individual's description as a result of their daily food intake[10]. Food intake is also important to understand the impact of iron consumption, hemoglobin levels, and nutritional status on physical fitness of young women.

METHODS

The research design applied to this study was a cross-sectional study design. This research was conducted at MA Al-Irsyad Gajah, Demak Regency, Central Java. The population in this study was 180 female students, where the sample after being calculated using the Slovin formula was 65 female students. The research obtained ethical permission from the health research ethics commission of Semarang State University with number: 239/KEPK/EC/2021. Iron consumption was measured using a 2x24 hour food recall questionnaire. The total amount of iron consumed is calculated based on food, drink, and supplements consumed through a questionnaire. Information on iron adequacy refers to the nutritional adequacy rate of iron for young women, which is 15 mg/day[9]. Hemoglobin level is a measure of the amount of hemoglobin in the body which functions to bind oxygen and transport it from the lung tissue to the peripheral tissues. This study measured hemoglobin levels using the GCHB easy touch tool. Information on the results of female adolescent Hb levels is less <11.9 g/dL, normal 12-16 g/dL and more >16.1 g/dL[11]. Nutritional status is the condition of a person's body due to the balance between consumption of nutrients and nutritional needs. The calculation uses the BMI/U z-score index. Then, categorized according to the BMI/U table according to age and gender. The results of the z-score were severely wasted <-3 SD, wasted -3 SD until +1 SD, normal -2 SD until +1 SD, possible risk of overweight >1 SD until +2 SD, overweight >2 SD until +3 SD, obese >+3 SD, obese >+3 SD[12]. Meanwhile, physical fitness was measured using a multistage fitness test instrument. This test was passed by running 20 m back and forth and following the rhythm of running. Then, it was included in the table norm and categorized. The number of values in the low category: <38.9, sufficient 31 – 34.9, good (normal) category 35 – 38.9, very good >39[5].

RESULTS AND DISCUSSIONS

Description of The Characteristics of The Respondents

Table 1 is the result of descriptive test calculations for categorical variables using a statistical program. The resulting data is a presentation of sample characteristic data with a 95% confidence interval. The results showed that the iron intake of the majority of respondents was good, namely 38 respondents (58.5%). The hemoglobin level variable shows that the majority of respondents' hemoglobin levels are normal, namely 45 respondents (69.2%). The results of the characteristics of nutritional status show that the majority of respondents have normal nutritional status, namely 36 respondents (55.4%). Univariate analysis was used to see the distribution of data analyzed that can be seen in Table 1 below.

Table 1. Characteristics of respondents

Characteristics of respondents	Category	n (%)
Iron consumption	Low	27 (41.5)
	Normal	38 (58.5)
	Total	65 (100)
Hemoglobin level	Low	11 (16.9)
	Normal	45 (69.2)
	Over	9 (13.8)
	Total	65 (100)
Nutritional status	Low	1 (1.5)
	Normal	36 (55.4)
	Over	28 (43.1)
	Total	65 (100)
Physical fitness	Low	9 (13.8)

How to cite: *Hardiansyah, A., Khasanah, A. N., & Hayati, N. (2024). Correlation between Iron Consumption, Hemoglobin Level, and Nutritional Status on the Physical Fitness of Young Women at MA Al-Irsyad Gajah: Hubungan Asupan Zat Besi, Kadar Hemoglobin, dan Status Giziterhadap Kebugaran Jasmani Remaja Putri di MA Al-Irsyad Gajah. Amerta Nutrition, 8(3), 350–355.*

Characteristics of respondents	Category	n (%)
	Enough	39 (60)
	Normal	17 (26.2)
	Total	65 (100)

The test result showed that most respondents had good iron consumption. This can be seen from the 2x24 hour food recall interview results with the respondents regarding the type of food selection. Most of the respondents eat meat (chicken, beef and processed meat products), offal (liver and gizzard), green vegetables (spinach, cassava leaves, kale, mustard greens), fish, shrimp, squid, tofu, tempeh, and nuts which are a source of iron. Iron absorption can be affected by the quality of iron in food (bioavailability). A good level of iron was observed among respondents because they always consumed iron-rich foods in every meal[13].

The majority of respondents' hemoglobin levels were normal. This can be illustrated by the intake of nutrients, especially iron intake of good respondents. The research respondents were also not menstruating when they checked their hemoglobin levels, so they did not lose a lot of blood and their hemoglobin levels in the blood were not affected. Hemoglobin is often used as an indicator to monitor a person's health status, where at the time of examination the respondent had no significant health problems. The primary metal protein in the body, hemoglobin's function is to carry oxygen from the lungs to all peripheral tissues and carbon dioxide from those tissues back to the lungs[14].

The nutritional status can be influenced by several factors, namely direct and indirect factors. Among the direct factors are food intake and disease. The indirect factors include economic factors, food production, social culture, environment and health facility services[15]. Based on a 2x24 hour food recall, most of the respondents had a nutritious and varied diet. Another factor is that the community's economic condition can be said to be good, where the profession of most of the people is as farmers and traders, so that food production is fulfilled. Health facilities in the Gajah sub-district are also sufficient, with health services at the village and public health facility levels so that the majority of the respondents' nutritional status in this study is good due to the several factors above.

Physical fitness is the body's ability to carry out activities without fatigue. Most of the respondents' physical fitness in this study was included in the moderate category. This is the result of students' physical activity during sport hours and various activities at home and at school, such as doing homework, walking to school, going up and down stairs to the classroom. Physical activity respondents such as resistance training has not been optimally implemented. Nutritional intake and dietary patterns of respondents also determine a person's physical fitness because these nutrients are then converted into fuel used for activities.

Correlation between Iron Consumption and Physical Fitness

The results of the Gamma correlation statistical test with a significance level (α) = 0.05 showed z score of 2.09 and p=0.004 (p<α) which means there is a correlation between iron consumption and physical fitness. The correlation strength value is 0.571 which means it has moderate correlation strength. The results of test of iron consumption with physical fitness can be explained on the Table 2 bellow.

Table 2. Correlation between iron consumption and physical fitness

			Physical Fitness			p-value
			Normal	Enough	Low	
Iron Consumption	**Low**	n	3	18	6	0.004
		(%)	17.6	46.2	66.7	
	Normal	n	14	21	3	
		(%)	82.4	53.8	33.3	
	Total	n	19	39	9	
		(%)	100	100	100	

Iron is a functional component of oxygen transport and energy production in humans and therefore is a critically important micronutrient for sport and exercise performance[16]. In the process, iron enters the body as ferric (Fe^{3+}) then enters the stomach. In the stomach, this iron will be converted into ferrous (Fe^{2+}) with the help of stomach acid and vitamin C. This ferrous iron enters the small intestine and is absorbed proximally. Once absorbed, iron binds to apotransferrin and enters the mucosal cells. Iron will split into three parts: some will remain bound to apotransferrin and form serum transferrin, some will bind to apoferritin and form ferritin, and some will bind to serum transferrin.

Iron that binds to serum transferrin will be distributed throughout the body, especially the liver, spleen, and bone marrow. Iron that binds to serum transferrin will enter the mitochondria, in the mitochondria iron will separate from serum transferrin and activate the cytochrome oxidase enzyme so that the krebs cycle process can be carried out. Iron that enters the bone marrow will bind to erythrocytes and porphyrins to form heme compounds. Heme binds to globulin and forms hemoglobin. Hemoglobin functions to bind and carry oxygen throughout the body as a material for carrying out the Krebs cycle process. The Krebs cycle process will produce energy. This energy is used for various physical fitness activities[8]. If a person is deficient

How to cite: *Hardiansyah, A., Khasanah, A. N., & Hayati, N. (2024). Correlation between Iron Consumption, Hemoglobin Level, and Nutritional Status on the Physical Fitness of Young Women at MA Al-Irsyad Gajah: Hubungan Asupan Zat Besi, Kadar Hemoglobin, dan Status Giziterhadap Kebugaran Jasmani Remaja Putri di MA Al-Irsyad Gajah. Amerta Nutrition, 8(3), 350–355.*

in iron, energy cannot be metabolized perfectly which results in decreased physical fitness and the body gets tired quickly[17].

Correlation between Hemoglobin Levels and Physical Fitness

Statistical test results using Gamma correlation with a significance level (α) = 0.05 showed a z score of 3.03 and a p=0.002 (p <0.005). This means that there is a correlation between hemoglobin levels and physical fitness. The correlation level is 0.675, this indicates that the correlation is strong. Bivariate analysis test between correlation hemoglobin levels and physical fitness can be seen in Table 3 bellow.

Table 3. Correlation between hemoglobin levels and physical fitness

			Physical Fitness			p-value
			Normal	Enough	Low	
Hemoglobin Level	**Low**	n	1	1	9	0.002
		(%)	5.9	2.6	100	
	Normal	n	13	32	0	
		(%)	76.5	82.1		
	Over	n	3	6	0	
		(%)	17.6	15.4		
	Total	n	17	39	9	
		(%)	100	100	100	

All tissues in the body may get oxygen from the lungs through hemoglobin which serves as a vehicle for this transfer, then used as fuel in energy metabolism. If a normal amount of hemoglobin binds oxygen, then aerobic metabolic processes will run smoother in producing energy for carrying out activities[18]. If a person has a hemoglobin level below normal, the circulation of oxygen in the blood will be disrupted, so that one part of the body does not receive oxygen supply optimally. This causes the formation of energy that is not optimal and the body does not have enough energy and gets tired quickly so that physical fitness decreases[8]. Low hemoglobin levels will cause decreased work ability, while high hemoglobin levels will cause disruption to blood flow which affects the transport of oxygen throughout the body[19]. Having normal hemoglobin can give you an opportunity to have an optimal physical fitness[20]. Given that hemoglobin has a role in energy metabolism, a student needs good hemoglobin levels to support activities at school.

Correlation between Nutritional Status and Physical Fitness

The results of the Gamma correlation statistical test with a significance level (α)=0.05 indicate that the z score is 0.028, p=0.905 (p>0.005). This means that there is no correlation between nutritional status and physical fitness. The coefficient is 0.0028, which means it has a very weak correlation strength. Nutritional status is a state of balance in a person's body due to the food consumed and their needs. There is no real contribution between nutritional status and physical fitness because someone with good nutritional status does not necessarily have good physical fitness. Table 4 below explains the test results of correlation between nutritional status and physical fitness.

Table 4. Correlation between nutritional status and physical fitness

			Physical Fitness			p-value
			Normal	Enough	Low	
Nutritional Status	**Low**	n	0	0	1	0.905
		(%)	0.0	0.0	11.1	
	Normal	n	9	24	3	
		(%)	52.9	61.5	33.3	
	Over	n	8	15	5	
		(%)	47.1	38.5	55.6	
	Total	n	17	39	9	
		(%)	100	100	100	

Nutritional status is a state of balance in a person's body due to the food consumed and their needs. There is no real contribution between nutritional status and physical fitness because someone with good nutritional status does not necessarily have good physical fitness. The body's health is determined by the body's ability to consume nutrients and utilize them. This is known as nutritional status. Nutritional status is related to fulfilling a person's nutritional adequacy rate, while physical fitness is related to a person's fitness condition. A person's fitness condition is influenced by a structured routine exercise. If a student has good nutritional status but does not practice, his physical fitness will not be good either. In this study, the only measure used to assess nutritional status was body weight, which classifies body weight into very thin, underweight, obese and obese and cannot compare body weight resulting from fat, bone weight and muscle mass, resulting in a low level of relationship between nutritional status and fitness. Physical fitness does not mean that people who are thin

How to cite: *Hardiansyah, A., Khasanah, A. N., & Hayati, N. (2024). Correlation between Iron Consumption, Hemoglobin Level, and Nutritional Status on the Physical Fitness of Young Women at MA Al-Irsyad Gajah: Hubungan Asupan Zat Besi, Kadar Hemoglobin, dan Status Giziterhadap Kebugaran Jasmani Remaja Putri di MA Al-Irsyad Gajah. Amerta Nutrition, 8(3), 350–355.*

or fat have low physical fitness[2]. The absence of a relationship between nutritional status and physical fitness is also caused by someone who is underweight or overweight, if doing physical activity regularly then that person will also have good physical fitness. In another study, nutritional status is affected by strenuous sports activities such as football because it is related to mobility. Poor nutritional status or obesity can affect energy use in metabolism of athlete. This causes energy efficiency to not optimal and can affect the performance of athletes[21].

Determinant Factor

One test that can be used in multivariate analysis is ordinal logistic regression analysis. Logistic regression is used if the dependent variable is an ordinal categorical variable[12]. In this study, the variables that have a relationship are the variable iron intake with physical fitness and the hemoglobin level variable with physical fitness. The following is the calculation result of the ordinal logistic regression model:

Table 5. Logistic regression models

Variable	Coefficient	S.E	Wald	df	p-value
Threshold					
Physical Fitness=1	4.776	1.289	13.729	1	0.001
Physical Fitness=2	0.225	0.744	0.091	1	0.000
Location					
Iron Consumption	1.029	0.619	2.763	1	0.096
Hemoglobin Level	5.510	0.783	0.163	1	0.000

Following are the results of the ordinal logistic regression model based on the table:

Logit (Y1) = 4.776 + 1.029 x_1 + 5.510 x_2

Logit (Y2) = 0.225 + 1.029 x_1 + 5.510 x_2

Then the ods ratio can be interpreted as follows:

a. OR iron consumption (X_1) = $e^{0.102}$ = 1.1
b. OR hemoglobin level (X_2) = $e^{0.551}$ = 1.73

Based on the logistic regression equation model, it was shown that hemoglobin levels had a 1.73 times greater effect on physical fitness than iron consumption, which had a 1.1 times effect on physical fitness. Hemoglobin plays a direct role in transporting oxygen from the lungs throughout the body, while one of its functions is iron to produce red blood cells, especially hemoglobin. Oxygen plays an important role in the formation of energy so that productivity is maintained and keeps the body from getting tired quickly. This means that hemoglobin levels have more influence on physical fitness, rather than iron consumption. Several factors affect physical fitness such as heredity which is an inborn trait that affects strength, and maximum lung capacity.

Another factor is that gender also has an influence on fitness, where men have more optimal fitness than women. Regular physical activity will be able to improve a person's standard of living and health status, so physical fitness will also be good if someone does regular physical activity and exercise. Then the age factor in adolescence, namely the age of 18-20 years, can increase the resistance of the respiratory system which is in line with the increase in muscle mass. Nutrient intake can affect the level of physical fitness because when teenagers are carrying out activities, they need sufficient energy and nutrients while carrying out activities.

CONCLUSIONS

Based on this study, it can be concludedthat iron consumption and physical fitness are related of female adolescents at MA Al-Irsyad Gajah. The p value is 0.004 (p <0.005) and the correlation strength is moderate (γ=0.571). There is a correlation between hemoglobin levels and the physical fitness of young women at MA Al-Irsyad Gajah. The p value is 0.002 (p<0.005) and the correlation strength is moderate (γ=0.675). There is no correlation between nutritional status and physical fitness of young women at MA Al-Irsyad Gajah. The determinant factor most related to physical fitness at MA Al-Irsyad Gajah between iron consumption and hemoglobin levels is hemoglobin levels.

ACKNOWLEDGEMENT

Acknowledgement was given to the supervising lecturer at the UIN Walisongo Nutrition study program, namely Mr. Angga Hardinsyah, S.Gz., M.Si. and Mrs. Nur Hayati, S.Pd. MSi. For all people who have assisted in data collection in this study, the midwife Amaliyatul Fitriyah A.Md.Keb. and my sister Rohmah Hidayah.

CONFLICT OF INTEREST AND FUNDING DISCLOSURE

This research is personal research that the author used as a final assignment for her undergraduate education. All funding comes from private funding. The enumerators involved in data collection are relatives of the author.

AUTHOR CONTRIBUTIONS

REFERENCES

1. Ruiz, J. R. *et al. Cardiorespiratory fitness and ideal cardiovascular health in European adolescents*. *Heart* **101**, 766–773 (2015).
2. Kasyifa, I. N., Rahfiludin, M. Z. & Suroto, S. *Hubungan Status GizidDan Aktivitas Fisik Dengan Kebugaran Jasmani Remaja*. *Med. Technol. Public Heal. J.* **2**, 133–142 (2018).
3. Sudiana, I. K. *Peran Kebugaran Jasmani bagi Tubuh*. in National Seminar Proceedings FMIPA UNDIKSHA IV 389–398 (2014).
4. Ardy Paramitha. Efe*ktivitas Instrumen Tes Pengukuran Nilai Konsumsi Oksigen Maksimal (VO2 Maks) untuk Siswa SMA (Studi Kasus di SMA PGRI 01 Kendal)*. (Universitas Negeri Semarang, 2008).
5. Widiastuti. *Tes dan Pengukuran Olahraga.* (Rajawali Press, 2019).

How to cite: *Hardiansyah, A., Khasanah, A. N., & Hayati, N. (2024). Correlation between Iron Consumption, Hemoglobin Level, and Nutritional Status on the Physical Fitness of Young Women at MA Al-Irsyad Gajah: Hubungan Asupan Zat Besi, Kadar Hemoglobin, dan Status Giziterhadap Kebugaran Jasmani Remaja Putri di MA Al-Irsyad Gajah. Amerta Nutrition, 8(3), 350–355.*

6. Irianto P. *Pedoman Gizi Lengkap dan Olahragawan*. (CV. Andi Offset, 2017).
7. Almatsier, S. *Prinsip Dasar Ilmu Gizi*. (Gramedia Pustaka Utama, 2010).
8. Tiyas, T. ayu setiyaning. H*ubungan Asupan Zat Besid Dan Kadar Hemoglobin dengan Kesegaran Jasmani(Vo2 Max) Pada Remaja Putri Di Sma Negeri 3 Semarang.* in Semin. Nas. Gizi 2017 Prodi Gizi Univ. Muhammadiyah Surakarta 4 (2009).
9. Kementerian Kesehatan Republik Indonesia. *Peraturan Menteri Kesehatan Republik Indonesia Nomor 75 Tahun 2013 Tentang Angka Kecukupan Gizi yang dianjurkan Bagi Bangsa Indonesia*. *J. Chem. Inf. Model.* **53**, 1689–1699 (2013).
10. Mustamin & Rauf, S. *Penilaian Status Gizi Metode Penilaian Status Gizi*. (Pusat Pendidikan Sumber Daya Manusia Kesehatan Kementrian Kesehatan republik Indonesia, 2021).
11. Giri, W. *Fisiologi dan Olahraga*, Yogyakarta. (Graha Ilmu, 2013).
12. Kementerian Kesehatan Republik Indonesia. *Peraturan Menteri Kesehatan Republik Indonesia Nomor 2 Tahun 2020 tentang Standar Antropometri Anak.* Kementerian Kesehatan Republik Indonesi*a* **vol. 2**, 1–12 at http://clik.dva.gov.au/rehabilitation-library/1-introduction-rehabilitation%0Ahttp://www.scirp.org/journal/doi.aspx?DOI=10.4236/as.2017.81005%0Ahttp://www.scirp.org/journal/PaperDownload.aspx?DOI=10.4236/as.2012.34066%0Ahttp://dx.doi.org/10.1016/j.pbi.201 (2020).
13. Indraswari, S. H., Rahfiludin, M. Z. & Rosidi, A. *Correlation between nutritional adequacy, Fe content, body fat percentage, and muscle mass percentage with physical fitness. J. Keolahragaan* **10**, 21–30 (2022).
14. Maylina, L. A. Hu*bungan Antara Konsumsi Pangan Sumber Protein, Zat Besi, Dan Vitamin C Dengan Kejadian Anemia Siswa Sekolah Dasar.* (Universitas Jember, 2016).
15. Ardania, Adinda. H*ubungan Pola Diet Vegetarian dan Faktor-Faktor yang Berhubungan dengan Kebugaran pada Kelompok Dewasa Muda di Pusdiklat Maitreyawira Jakarta Barat Tahun 2010.* (Universitas Indonesia,2010).
16. Alaunyte, I., Stojceska, V. & Plunkett, A. Iron and the female athlete: A *review of dietary treatment methods for improving iron status and exercise performance*. J. Int. Soc. Sports Nutr. **12**, 1 (2015).
17. Sari, R. P., Maria, E., Silaban, L. & Merry, Y. A. C*orrelation of Hemoglobin Levels with Nutritional Status in Adolescent Girls : A Health Promotion Perspective. J.* Promosi Kesehat. Indones. *Vol* **18**, (2023).
18. B, B. H*ubungan Kadar Hemoglobin dan Indeks Massa Tubuh dengan VO2Max pada Atlet Futsal SMA Negeri 2 Sinjai. Int. J. Hypertens.* **1**, 1–171 (2020).
19. Rezeky Dayu Putra & Arif Fadli Muchlis. *Hubungan Kadar Hemoglobin Dengan Kesegaran Jasmani Siswa Smk Negeri 1 Pariaman.* Jurusan. *Kesehat. dan Rekreasi* **3**, (2020).
20. Nur Istiqomah, I. P., Kristiyanto, A. & Ardyanto, T. T*he Correlation between Hemoglobin Levels and Physical Fitness in Teenage Taekwondo Athletes. Int. J. Hum. Heal. Sci.* **6**, 204 (2022).
21. Harfika, A. & Hidayat, F. *The Correlation between Nutritional and Hydration Status with Physical Fitness in Young Soccer Athletes*. *J. Appl. Food Nutr.* **3**, 1–6 (2021).

How to cite: *Hardiansyah, A., Khasanah, A. N., & Hayati, N. (2024). Correlation between Iron Consumption, Hemoglobin Level, and Nutritional Status on the Physical Fitness of Young Women at MA Al-Irsyad Gajah: Hubungan Asupan Zat Besi, Kadar Hemoglobin, dan Status Giziterhadap Kebugaran Jasmani Remaja Putri di MA Al-Irsyad Gajah. Amerta Nutrition, 8(3), 350–355.*