Journal for Re Attach Therapy and Developmental Diversities
eISSN: 2589-7799
2023 May; 6 (5s): 510-516

Combination of Moringa Flour, Glutamine, and Unhydrate Glucose as a New Alternative Supplement to foster Vo2Max for Judo Athletes

Septa Katmawanti[1*], Sareena Hanim Hamzah[2], Dea Aflah Samah[1], Oktavia Sri Wahyuni[1], Aquila Ghafril Azizah[1]
[1]Department of Public Health, Universitas Negeri Malang, INDONESIA
[2]Faculty of Sports and Exercise Science, University of Malaya, MALAYSIA

Received: 19- March -2023
Revised: 22- April -2023
Accepted:25-May-2023

Abstract

Introduction: Athletes with very competitive judos have improved their very dynamic strength, muscular endurance, anaerobic strength and capacity, as well as their strength and aerobic capacity. VO2 Max is the lifeblood of an athlete's performance to encourage good physical activity. The solidity of moringa leaf and the efficacy of glutamine and unhydrated glucose are maximized in VO2, which is important for endurance athletes...

Objectives: The resolution of this learning was to determine the level of effectiveness of Moringa leaf pulp fortification using glutamine and unhydrated glucose in increasing VO2Max and Lactate Threshold (LT) substances for judo athletes

Methods: The research design used in this applied research uses experimental methods and uses the research design The Randomized Pretest – Posttest Control Group Design. The sample used was 30 athletes from Malang City judo plates. The samples were divided into two groups, namely experimental group (received treatment in the form of supplements and jogging) and the control group (received treatment in the form of jogging).

Results: P> had a p-0.855 and appeared in an experimental group based on the data processing results before and after the test, indicating that there were no important influences or differences in the experimental equipment before and after treatment..

Conclusions: More investigate is needed on the protective effects of moringa leaf supplements, glutamine, and glucose. fortification. A number of factors that occur during implementation in the field result in negligible changes".

Keywords: Moringa; glutamine; glucose, VO2Max; judo

1. Introduction

Conditions that are not optimal reduce the athlete's performance, going to effect achievement (Pocecco et al., 2013). Fostering judo athletes to improve their achievements on a national and international scale requires special attention. Coaching includes both physical and nutritional monitoring. Weight classes have been used in combat sports such as judo to promote fair competition by matching opponents of equal (or similar) body mass. Many athletes strive to compete at the lightest weight possible in the anticipation of competitiveness over their opponents. Pre-competition weight loss is a common occurrence among athletes, particularly in sports where weight categories are distinguished (Książek et al., 2017),(Lakicevic et al., 2020),(Fortes et al., 2017). Lively asset, well-built resolution, anaerobiotic asset and volume, and aerophilic asset and volume are all very developed in high-equal competitive judo athletes (Mahmood et al., 2017). For an athlete, VO2 max is the lifeblood of his presentation in order to Encourage good physical activity . VO2max is one of the most important components of physical fitness in judo. Physical exercise, nutritional intake, and increased ergogenic aids are all required to boost these components. According to various researchers, ergogenic aids can increase the body's or mind's work capacity to avoid fatigue. Currently, athletes, coaches, and sports nutritionists use natural ergogenic aids as an alternative. This is a solution to avoid the use of non-nutritional ergogenic aids in

athletes, which is prohibited by sports organization bodies such as the NCAA, IOS, and USOC, and many others.

There has already been research through into fortification of Moringa leaf pulp (Da Silva Athayde et al., 2018). No one, however, has ever blended Moringa leaves with glutamine and unhydrated glucose. Fortification is an effort to add one or more specialized micronutrient substances to the food supply or vehicle in order to improve the quality of nutrients at adjusted levels that are beneficial to public health while posing minimal risk to health. Food fortification is thought to be an effective method of overcoming nutritional deficiencies and additions.Moringa leaves (Moringa Oleifera) have 17.2 mg/100 grams is higher in iron than other vegetables. According to some other research, moringa leaves Vitamin C is equivalent to 7 oranges, vitamin A is equivalent to 4 carrots, calcium is equivalent to 4 glasses of milk, potassium is equivalent to 3 bananas and protein equivalent protein. Proteins. Two yogurts(Mahmood et al., 2017) Moringa leaves are high in calcium, iron, protein, vitamin A, vitamin B and vitamin C.(Misrawatie Goi, 2013). Moringa Leaves contain amino acids such as aspartic acid, glutamic acid, alanine, valine, leucine, isoleucine, histidine, lysine, arginine. Venilanine, Tryptophan, Cysteine and Methionine (Simbolon & Situmorang, 2017). Moringa leaves furthermore contain a high concentration of phenol. Phenol is an antioxidant that fights free radicals.

Glutamine is a nutritional ergogenic substance that is still used today (Syafrizar, & Welis, 2009). Glutamine is single of the best amino doses for the body (Cruzat et al., 2018). Glutamine can result in healthy and conquer disease. This is why the level of glutamine consumption by the body's immune system is nearly identical to the level of glucose consumption (Cruzat et al., 2018) as a result of which glutamine can improve the body's immune system. Unhydrated glucose, according to an article in the NCBI (National Center for Biotechnology Information), functions to replenish lost nutrients and electrolytes (Information., 2021). Unhydrated glucose solutions can help restore blood glucose levels and provide calories, as well as help minimize liver glycogen depletion and provide protein sustainability initiatives. Unhydrated glucose is also composed of proteins and lipid metabolism.
By analyzing the fortification content of Moringa leaves, as well as the function of glutamine and unhydrated glucose, it is possible to hypothesize that these substances can increase VO2max, which is important for endurance athletes. This is, of course, balanced by constant physical activity. Athletes' achievements have a significant impact on sports civilization, particularly in Indonesia. As a result, the synergy in athlete development governance must be maximized. Athletes require not only physical but also nutritional support.

2. Objectives

The resolution of this learning was to control the level of effectiveness of Moringa leaf pulp fortification using glutamine and unhydrated glucose in increasing VO2Max and Lactate Threshold (LT) substances for judo athletes. By conducting this research, trainers or sports nutrition experts can apply these innovations to athletes, especially in endurance sports. Thus, endurance sports are increasingly taking part in the national and international arena.

3. Methods

Participants

Fifty judo athletes worked as volunteers to participate in the study. Once assessed for electrity, 30 athletes were randomly awarded and assigned to the surrogate or placebo; The study was composed of thirty athletes (supplementary: n = 15. 22±2 years, height, 1,75±0,10 m; and placebo: n = 15; age, 21±5 yo; height, 1.74±0,05 m. All athletes competed in official judo (n = 30). Inclusion criteria were: (a) 18–25 years of age, (b) minimum training amount of 10 hours/km², and (c) minimum 6 years of experience in sports. Exclusion criteria were: (a) tobacco use, (b) use of drugs that affect the immune system in the past two months, (c) presence of infectious disease diagnosed in the last two months, (d) presence of infectious disease symptoms, and (e) use of any nutritional supplement containing moringa oleifera, glutamine, and glucose.. In Addition to the 30 athletes were randomized and all of athletes meet a specific inclusion criteria. The research ethics commission of the Bhakti

Wiyata Kediri Institute of Health Sciences approved the ethics of this study under the number 422/PP2M-KE/II/2021.

Study Design

The product in the form of this supplement consists of three compositions, namely Moringa leaf extract, glutamine, and unhydrate glucose. The weight of each composition in one capsule is 0.14 grams. The total net weight of one capsule is 0.5 grams. The research design used in this applied research uses experimental methods and The investigate project customs random pretest – posttest controller collection project. The example used was used to 30 athletes from the Malang City Judo Plate. The samples were separated into two collections, namely the investigational collection. (received treatment in supplement and jogging form) and control group (received treatment in jogging form).

Suplementation Protocol

The process of making products in the form of this supplement by mixing the three ingredients, namely Moringa leaf extract, glutamine and glucose unhydrate. Initially, all three materials were weighed with digital scales with a net weight of 0.14 grams each. Then, the three ingredients are stirred well until mixed. After mixing, make sure that the place where the contents of the capsule are filled with the shell of the capsule. Then, the material can be put into the shell of the capsule carefully so that nothing remains. Weigh the capsule that has been filled again, if it is 0.5 grams, the capsule can be put in a medicine bottle. However, make sure the medicine bottle is sterilized and given preservatives. When the bottle is fully filled, close it tightly.

Data collection

The following is the research flow used:

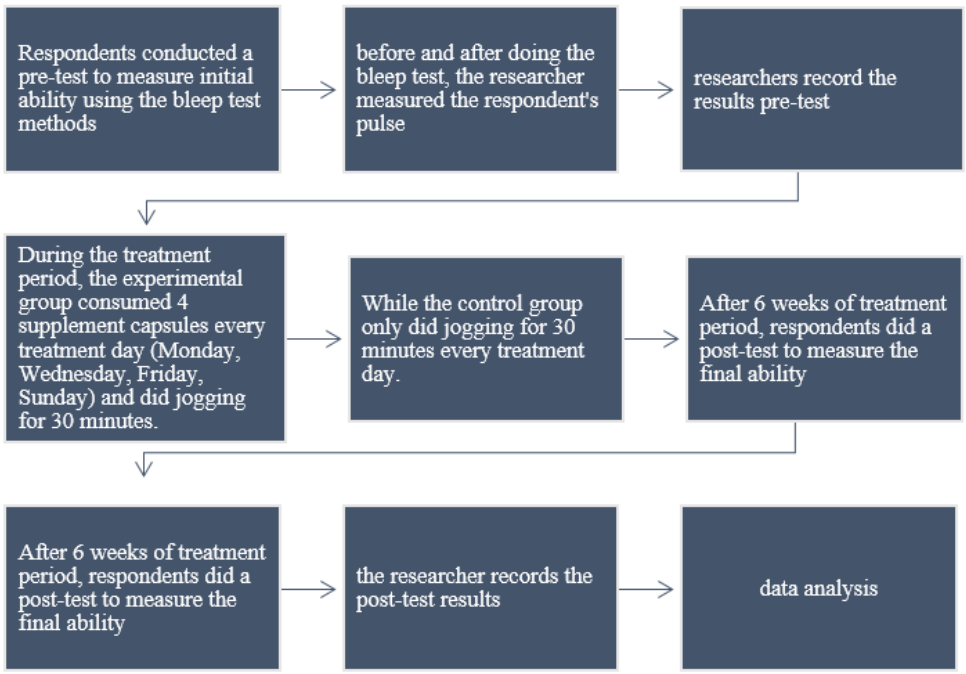

Fig 1. Research Flow

Statistical Analysis

The research design used is an experimental method and uses the investigate project The Randomized Pretest – Posttest Switch Collection Project.

4. Results

The process of making supplements is carried out by mixing three ingredients, namely Moringa leaf extract, glutamine, and unhydrous glucose. With the composition of one capsule the supplement consists of:

Table 1. Composition of One Supplement Capsule

ingredient	net weight
Moringa leaf extract	0.14 gram
Glutamin	0.14 gram
Glukosa Unhidrat	0.14 gram

After mixing, the supplements are packaged in bottles that have been sterilized and given preservatives. One bottle contains 50 supplement capsules. The process of making the supplement is as follows below

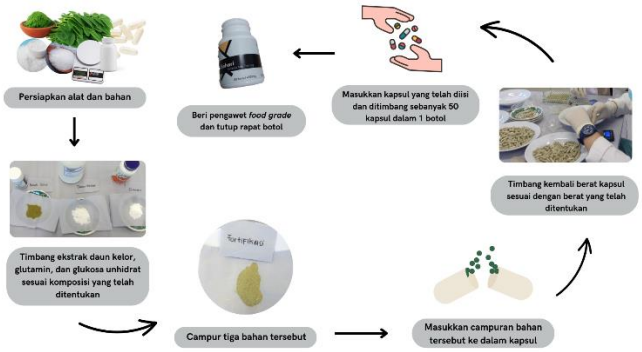

Figure 2 the process of making moringa leaf extract supplements, glutamine and unhydrous glucose

Characteristics of Respondents

The respondents used in this study were 30 people from judo athletes training branch in Malang City. The respondents were separated into two collections, namely the regulator collection and the experimental group. Information on respondents characteristics including age, weight, and gender can be seen in table 2.

Table 2. Features of Respondents

Features of Respondents	Sum	Present (%)
Age		
16 yo	1	3,33
17 yo	3	10
18 yo	1	3,33
20 yo	4	13,3
21 yo	14	46,6
22 yo	7	23,3
Total	**30**	**100%**
Weight Intervals		
≤ 40 kg	1	3,33
41 – 50 kg	4	13,3
51 – 60 kg	11	36,6
61 – 70 kg	10	33,3
71 – 80 kg	4	13,3
Total	**30**	**100%**
Gender		

Man	17	56,6
Woman	13	43,3
Total	**30**	**100%**

The distribution of respondents according to the characteristics of respondents was more aged 21 years (46.6 %) with a body weight of 51 – 60 kg (36.6 %) and male (56.6%). A difference test was performed to control whether there was a important average change among the pretest and posttest data. The difference test was performed using a paired t-test in the control group because all the data were normally distributed and using the wilcoxon test in the experimental group because the posttest data was not normally distributed. In the following table 3 are the results of different tests in the experimental group

Table 3. Experiment Class Difference Test

Test Statistics[a]

	Eksperimen Posttest - Eksperimen Pretest
Z	-3,408[b]
Asymp. Sig. (2-tailed)	,001

Based on the outcomes of the difference test in table 3 above, the Asymp Sig value of 0.001 was obtained where the value was less than α (0.05). Therefore, a decision was obtained to reject H0 with the conclusion that there was a important average change among the pretest and posttest data in the experimental class. This means that in posttest the average obtained is higher and significantly different from the pretest. Thus, information can be obtained that n fortification of Moringa leaf flour using glutamine and glucose unhydrate is effective in increasing the substance VO2Max for judo plate athletes in Malang City in the experimental class.

5. Discussion

Judo athletes must have good muscle strength throughout the body, including arm muscle strength, shoulder muscle strength, back muscle strength, abdominal muscle strength, and leg muscle strength. Each muscle force is formed using different exercise models. In addition, tannins, saponins, flavonoids, terpenoids and glycosides are among the bioactive compounds found in olifera moringa leaves, which are the most commonly used parts of the plant. Many of these molecules have been shown to be antioxidants, anti-doping agents, and anti-cancer agents.(Duranti et al., 2021) In addition, glutamine is a conditional amino acid and is widely used in sports nutrition, especially for its immunomodulatory properties. Based on Sasaki et al., before and after training, it was found that the glutamine additive can help to recover muscle damage early and eliminate the function of pneumophiles, especially in ros-producing activities, as well as in very intensive training periods. What's more, glutamine is introduced into other biological functions, including cells.. (Fister et al., 2019) Expansion, energy production, glycogenesis, ammonia slowdown and maintenance of acid-base balance, among others. Consequently, this amino acid began to investigate sports nutrition, beyond its effects on the immune system, and attributed glutamine to many properties, such as its antifatig role. In this sense, carbohydrates (CHO), especially glucose, are an important source of energy in a long and long exercise. Premature tiredness is associated with carbohydrate reduction (e.g., bloodglucose) and liver and muscle glycogen stores. Thus, carbohydrate intake before and during exercise improves exercise performance compared to fasting conditions... (Lamou et al., 2016),(Kaviani et al., 2020).

For this study, respondents were divided into two groups: a control group and an experimental group. As this group received a different treatment, such as taking additional liquids from moringas with glutamine and non-hydrated glucose, this discussion will be based on the changes that occurred in the experimental group, in view of the results of the pre- and post-tests. The processing of the data shown in the experimental group P> 0.05 was based on 0.001 results to process the data before and after the test.. (Table 3). These results showed that there

were significant consequences or differences in the experimental group before and after treatment. On the other hand, a study conducted by Trito in 2018 retained that it was not linked to lower glutamine levels, or that the glutamine additive was not effective compared to the immune loss of rapid weight loss. On the other hand, other studies have shown that the water summaries of M. olive leaves have antiphagic properties. The mice's ability to swim was increased due to delayed production of blood lactate and nitrogen, increased and use of lipids in the body, and loss of glycogen stores. The antioxidant activity of the abstract can be used in a way that shows antiphatic potential. Further study required to determine impact of extraction on continuous physical activity. (Lakicevic et al., 2020),(Kons et al., 2021).

The third formula improves the performance of athletes, since the previous exams are aimed at judo athletes. Judo is an Olympic sport in which athletes have to make a high-intensity effort with breaks. A judo match can be achieved aipon (the perfect throw), but most elite judo fights last about 3 minutes. In addition, it is common for an athlete to have several fights on the same day. Overall, these results suggest that judo is a very intensive athlete. Research has shown that judo wrestling has been a high demand for glycolytic metabolism, as evidenced by increased blood lactation levels following simulated and official judo wrestling. This suggests that in judo competition, the hydrogen catío (H+) is produced and deposited at a high rate, resulting in muscle acidosis.. (de Andrade Kratz et al., 2017),(Martins et al., 2019).

In doing the increase in VO2Max, there needs to be physical exercise, nutrient intake(Said et al., 2016) and *ergogenic acid. Previous studies have suggested that acid ergogenia may increase the body's ability to function or function mentally to ward off tiredness. Ergogenic acid in Indonesian plants, and one of them are moringa leaves.*.(Ilmu et al., 2019) According to Fahey (2005) Moring contains a wide variety of important foods such as vitamins, minerals, amino acids, beta-carotene, antioxidants, anti-inflammatories and omega-3s. In addition, studies conducted have observed that moringa sports benefit athletes, especially VO2 athletes. Glutamine and non-hydrated glucose were joined to the experimental glucose group's treatment, hoping to increase the peak value of VO2 in the research athletes. The glutamine of a given treatment is useful to increase the good amino acid levels for the body (Cruzat, 2018) (Sasaki et al., 2013). While unhidrous glucose serves to replenish lost nutrients and electrolytes (Barodia et al., 2022), (Štangar et al., 2022). Physically active people often acquire antioxidant additives or extractions from plants that reduce the likelihood of cell damage due to increased metabolism or reactive species produced by exercise. However, these additives are not always convenient and can rule out health benefits of physical activity if not taken in adequate quantity and time. Consequently, it is especially interesting to understand how these molecules or plant extracts affect the antioxidant network of skeletal muscles to evaluate any positive or negative effects. This is because healthy people or athletes often take additives.

Refrences

1. Barodia, K., Cheruku, S. P., Kanwal, A., Menon, A., Rajeevan, R., Rukade, A., Kumar Shenoy, R. U., Prabhu, C., Sharma, V., Divya, K. P., Sumalatha, S., Nayak, Y., & Kumar, N. (2022). Effect of Moringa oleifera leaf extract on exercise and dexamethasone-induced functional impairment in skeletal muscles. *Journal of Ayurveda and Integrative Medicine*, *13*(1), 100503. https://doi.org/10.1016/j.jaim.2021.07.019
2. Cruzat, V., Rogero, M. M., Keane, K. N., Curi, R., & Newsholme, P. (2018). Glutamine: Metabolism and immune function, supplementation and clinical translation. *Nutrients*, *10*(11), 1–31. https://doi.org/10.3390/nu10111564
3. Da Silva Athayde, M. S., Kons, R. L., & Detanico, D. (2018). Can caffeine intake improve neuromuscular and technical-tactical performance during judo matches? *Journal of Strength and Conditioning Research*, *32*(11), 3095–3102. https://doi.org/10.1519/JSC.0000000000002451
4. de Andrade Kratz, C., de Salles Painelli, V., de Andrade Nemezio, K. M., da Silva, R. P., Franchini, E., Zagatto, A. M., Gualano, B., & Artioli, G. G. (2017). Beta-alanine supplementation enhances judo-related performance in highly-trained athletes. *Journal of Science and Medicine in Sport*, *20*(4), 403–408. https://doi.org/10.1016/j.jsams.2016.08.014
5. Duranti, G., Maldini, M., Crognale, D., Horner, K., Dimauro, I., Sabatini, S., & Ceci, R. (2021). Moringa oleifera leaf extract upregulates nrf2/ho-1 expression and ameliorates redox status in c2c12 skeletal muscle cells. *Molecules*, *26*(16). https://doi.org/10.3390/molecules26165041
6. Fister, I., Fister, I., & Fister, D. (2019). Sports Nutrition. *Adaptation, Learning, and Optimization*,

22(i), 247–277. https://doi.org/10.1007/978-3-030-03490-0_11
7. Fortes, L. S., Costa, B. D. V., Paes, P. P., Cyrino, E. S., Vianna, J. M., & Franchini, E. (2017). Effect of rapid weight loss on physical performance in judo athletes: is rapid weight loss a help for judokas with weight problems?*. *International Journal of Performance Analysis in Sport*, *17*(5), 763–773. https://doi.org/10.1080/24748668.2017.1399323
8. Ilmu, J., Olahraga, F., Chandra, C., Ronald, H., Ray, D., Indonesia, U. P., Sciences, F. H., & Kanazawa, U. (2019). *Pengaruh konsumsi daun kelor (*. *1*(1), 13–19.
9. Information., N. C. for B. (2021). *Compound Summary D(+) -Glucose*. National Center for Biotechnology Information. https://pubchem.ncbi.nlm.nih.gov/compound/D-Glucose.
10. Kaviani, M., Chilibeck, P. D., Gall, S., Jochim, J., & Zello, G. A. (2020). The Effects of Low- and High-Glycemic Index Sport Recreational Soccer Players. *Nutrients*, 1–13.
11. Kons, R. L., Da Silva Junior, J. N., Follmer, B., Katcipis, L. F. G., Almansba, R., & Detanico, D. (2021). Validity of judo-specific tests to assess neuromuscular performance of judo athletes. *Sports Biomechanics*, *20*(2), 178–189. https://doi.org/10.1080/14763141.2018.1527942
12. Książek, A., Karpała, J., & Słowińska-Lisowska, M. (2017). An evaluation of diets in the Polish national judo team during the pre-competition weight loss period. *Archives of Budo*, *13*(June), 101–106.
13. Lakicevic, N., Roklicer, R., Bianco, A., Mani, D., Paoli, A., Trivic, T., Ostojic, S. M., Milovancev, A., Maksimovic, N., & Drid, P. (2020). Effects of rapid weight loss on judo athletes: A systematic review. *Nutrients*, *12*(5). https://doi.org/10.3390/nu12051220
14. Lamou, B., Taiwe, G. S., Hamadou, A., Abene, Houlray, J., Atour, M. M., & Tan, P. V. (2016). Antioxidant and antifatigue properties of the aqueous extract of moringa oleifera in rats subjected to forced swimming endurance test. *Oxidative Medicine and Cellular Longevity*, *2016*, 7–10. https://doi.org/10.1155/2016/3517824
15. Mahmood, H., Suleman, Y., Hazir, T., Akram, D. S., Uddin, S., Dibley, M. J., Abassi, S., Shakeel, A., Kazmi, N., & Thow, A. M. (2017). Overview of the infant and young child feeding policy environment in Pakistan: Federal, Sindh and Punjab context. *BMC Public Health*, *17*(Suppl 2). https://doi.org/10.1186/s12889-017-4341-5
16. Martins, H. S., Lüdtke, D. D., César de Oliveira Araújo, J., Cidral-Filho, F. J., Inoue Salgado, A. S., Viseux, F., & Martins, D. F. (2019). Effects of core strengthening on balance in university judo athletes. *Journal of Bodywork and Movement Therapies*, *23*(4), 758–765. https://doi.org/10.1016/j.jbmt.2019.05.009
17. Misrawatie Goi. (2013). Korelasi Asupan Zat Gizi Makro, Zat Gizi Mikro dan Aktifitas Fisik dengan Obesitas pada Mahasiswa Poltekkes Kemenkes Gorontalo. *Journal Health and Sport*, *5*(1), 1689–1699. https://doi.org/10.1017/CBO9781107415324.004
18. Pocecco, E., Ruedl, G., Stankovic, N., Sterkowicz, S., Del Vecchio, F. B., Gutiérrez-García, C., Rousseau, R., Wolf, M., Kopp, M., Miarka, B., Menz, V., Krüsmann, P., Calmet, M., Malliaropoulos, N., & Burtscher, M. (2013). Injuries in judo: A systematic literature review including suggestions for prevention. *British Journal of Sports Medicine*, *47*(18), 1139–1143. https://doi.org/10.1136/bjsports-2013-092886
19. Razis, A. F. A., Ibrahim, M. D., & Kntayya, S. B. (2014). Health benefits of Moringa oleifera. *Asian Pacific Journal of Cancer Prevention*, *15*(20), 8571–8576. https://doi.org/10.7314/APJCP.2014.15.20.8571
20. Said, M., Hadju, V., Masri, M., As, S., Alam, G., Razak, A., & Khuzaimah, A. (2016). *MO n honey to athlete-done*. *6*(2), 5406–5409.
21. Sasaki, E., Umeda, T., Takahashi, I., Arata, K., Yamamoto, Y., Tanabe, M., Oyamada, K., Hashizume, E., & Nakaji, S. (2013). Effect of glutamine supplementation on neutrophil function in male judoists. *Luminescence*, *28*(4), 442–449. https://doi.org/10.1002/bio.2474
22. Simbolon, N., & Situmorang, P. (2017). ANALISIS KESIAPSIAGAAN PERAWAT DALAM MEMBERIKAN PELAYANAN KEGAWATDARURATAN SISTEM PERNAFASAN AKIBAT BENCANA ALAM DI WILAYAH KERJA DINAS KESEHATAN KABUPATEN DELI SERDANG. *Elisabeth Health Jurnal*, *2*(1), 38–47.
23. Štangar, M., Štangar, A., Shtyrba, V., Cigić, B., & Benedik, E. (2022). Rapid weight loss among elite-level judo athletes: methods and nutrition in relation to competition performance. *Journal of the International Society of Sports Nutrition*, *19*(1), 380–396. https://doi.org/10.1080/15502783.2022.2099231
24. Syafrizar, & Welis, W. (2009). *Gizi Olahraga. Ilmu Gizi:Teori & Aplikasi*.