



Differences in Pulse Rate of Mineral Water and Natural Cyclic Drink (Young Coconut Water) After 1600m Run

Received : April 5, 2024

Revised : May 20, 2024

Accepted: May 25, 2024

Publish : May 31, 2024

Muhammad Rizki Rahmadiansyah*, Rubiyatno, Putra Sastaman

Abstract:

The purpose of this study was to test the difference between coconut water and mineral water on the effect of dehydration speed. The effectiveness of this liquid is still a question mark among sportsmen. The research method used experiments with 20 people as a sample consisting of 10 people per group. First of all, the initial pulse measurement was carried out then warmed up and ran for 1600 meters. The first group after finishing was given 250 ml of coconut water and 5 minutes after checking the pulse rate, as well as the second group with the same dose but given mineral water. Data were analyzed with non-parametric tests. The results of the non-parametric test explained that there was no difference between the administration of mineral water and coconut water on the achievement of the pulse rate after 5 minutes.

Keywords: Coconut Water, Dehydration, Electrolyte Fluid, Mineral Water, Pulse

1. INTRODUCTION

Health is important for humans, without good health, everyone will find it difficult to carry out their daily activities. According to Zubaida et al. (2022), the increasingly dense activities carried out by a person make them ignore the problem of exercising, therefore Sports is a forum for people to explore their athletic experiences. According to Pudyastuti et al. (2023), research shows that exercise can improve health and improve quality of life and sports activities must be introduced from an early age, even if the sport is unstructured such as walking, cycling, or jumping rope. Through motor activity, it improves children's motor skills and optimizes their developmental bodies to be optimal. Therefore, exercise or physical activity is defined as muscle movements that are repeated or rhythmic, which are planned and carried out with measurable intensity and occur within a certain period of time. The human body is mostly composed of fluids such as water and substances contained in body fluids are very important for nerve and muscle function (Rumbold et al., 2022).

Publisher Note:

CV Media Inti Teknologi stays neutral with regard to jurisdictional claims in published maps and institutional affiliations.



Copyright

©2024 by the author(s).

Licensee CV Media Inti Teknologi, Bengkulu, Indonesia. This article is an open access article distributed under the terms and conditions of the Creative Commons Attribution-ShareAlike (CC BY-SA) license (<https://creativecommons.org/licenses/by-sa/4.0/>).

Physical exercises such as aerobic exercise, anaerobic exercise, and strength training on a regular basis and can reduce body weight, and reduce body fat in obese patients (Oroh et al., 2021). Among the various variations of moderate intensity aerobic exercise is more effective in determining blood pressure than low or high intensity aerobic exercise (Nurdesia et al., 2022). Aerobics is very suitable for people with joint problems. and also injuries to bones and muscles, in the elderly and pregnant women. Aerobic running is an exercise that is carried out continuously to meet the body's oxygen needs and allows it to reach speed over time.

Fluid intake is very important because it has an important function for various compounds and melukul in the body (Arista & Wahyudin, 2021). According to Darma et al. (2023), coconut water is better as an isotonic drink than plain water or other drinks containing artificial electrolytes. According to Wong et al. (2021), mineral water tastes fresh while isotonic drinks are fresh and contain more minerals that the body needs and previously lost through sweat. Therefore, regulating water intake is one way to avoid dehydration and improve performance. During exercise, the body needs fluids and carbohydrates, so drink 600-1.500 ml of water per hour and add 24-100 grams of carbohydrates (4-7% carbohydrate solution) from drinks containing carbohydrates and electrolytes, in addition to drinking these, coconut water is also a potential liquid to be a natural sports drink.

According to Hasibuan & Simanullang (2019) besides these drinks, coconut water is also a liquid that has the potential to become a natural sports drink. Coconut water is a natural isotonic fluid and contains 1125 ml of the electrolyte sodium chloride. Fajarwaty

et al. (2021) suggests that "Coconut water contains electrolytes and glucose which are isotonic so it is very good to drink. Minerals found in coconut water include potassium, calcium, phosphorus, zinc, sodium and magnesium. In addition, the selection of young coconut water is a priority for isotonics made from coconut water, some people still cannot utilize coconut water properly because of the lack of knowledge about its content. The mineral content and isotonic properties of coconut water have the potential to be used as a sports drink. The intensity of exercise must be considered. Lack of physical activity has been identified as the fourth risk factor for global mortality. Physical activity is any body movement that can increase energy expenditure and energy (Yusuf et al., 2020). When the body lacks fluid needs, the body will become dehydrated. Very heavy aerobic physical activity will affect the increase in pulse rate and the need for efforts to overcome this recovery. Recovery is needed to restore the body's condition due to high-intensity aerobic physical activity. The period for recovery time ranges from 5 to 9 minutes after the activity.

Physical exercise performed at mild to moderate intensity can have a positive impact on the body. Exercise performed to the maximum pulse rate will cause fatigue and can be dangerous. Based on observations that ordinary sportsmen choose to consume a variety of isotonic drinks ranging from mineral water and other drinks, but in this study researchers want to know the comparison of various kinds of drinks including isotonic drinks or mineral water which is better. The focus of this study on the difference between coconut water and mineral water on the maintenance of the endurance system of the heart, lungs, blood vessels that will observe the increase in VO₂ max. the sport studied is aerobic running. However, sports need to be proven whether there are really benefits for the body related to the above and can be to determine the benefits of aerobic running exercises on endurance.

2. MATERIAL AND METHOD

This research is a simple experimental research, using two groups of research subjects with each group of 10 students.

Research data collection will be carried out at several stages as Pretest of research subjects before data

collection, participants are given directions in advance by researchers on how to measure the pulse rate of each participant. Before participants run 1600 with mineral water for the first test and isotonic drinks for the second test, each participant will measure the pulse through the wrist for 30 seconds and then multiplied by 2 to determine the normal pulse.

After doing the 1600 M running activity, the research subjects were instructed to consume mineral water drinks for the first test of running 1600 M and 250 ml isotonic drinks for the second test of running 1600 m after that immediately measure the pulse rate of each participant from each participant in each test to determine the difference between mineral water and isotonic drinks through the recovery pulse after a 5-minute break. This study uses data analysis techniques in Descriptive Statistics, Normality Test, Non-parametric difference test using SPSS 26.

3. RESULT AND DISCUSSION

3.1 Result

In this study the authors present the results of research obtained from the results of data collection in the field. The sample used was 2023 students in the sports coaching education program at Tanjungpura University Pontianak (UNTAN) totaling 20 people by doing two tests on different days. The results of this study were obtained from tests and measurements in the field conducted by researchers.

This study examines the difference in giving mineral water and natural isotonic drinks young coconut water to the recovery of the pulse running 1600 M.

On the first day of the study we conducted a test using mineral water as an ingredient for conducting the second day test we conducted a posttest using young coconut water as an ingredient for the second day test. The following is a description of the results of the study.

Table 1. Mineral Water Pulse Rate Results and Coconut Water Pulse Rate Results

Mineral Water				Coconut Water			
No	Subject	Initial Pulse	Recovery Pulse	No	Subject	Initial Pulse	Recovery Pulse
1	S1	72	160	1	S11	70	158
2	S2	84	138	2	S12	78	120

Mineral Water				Coconut Water			
No	Subject	Initial Pulse	Recovery Pulse	No	Subject	Initial Pulse	Recovery Pulse
3	S3	92	120	3	S13	74	110
4	S4	80	124	4	S14	76	120
5	S5	80	120	5	S15	62	100
6	S6	90	120	6	S16	78	72
7	S7	92	148	7	S17	96	128
8	S8	52	120	8	S18	88	120
9	S9	70	124	9	S19	72	110
10	S10	62	110	10	S20	78	124
Average Value		77.4	128.4	Average Value		77.2	116.2

Based on Table 1, it is explained that the average value of the initial pulse of mineral water is 77.4 and the initial pulse of coconut water is 77.2 and the average value of the recovery pulse of mineral water is 128.4 and the value of the recovery pulse of

coconut water is 116.2. The next normality test is a test carried out with the aim of assessing the distribution of data in a group of data or variables, whether the distribution of the data is normally distributed or not.

Table 2. Shapiro-Wilk Results

Statistic	Shapiro-Wilk	
	df	sig.
.925	10	.403
.843	10	.047
.938	10	.532
.920	10	.358

Normality test used to calculate whether the data obtained is normally distributed or not. Based on the results of the Shapiro-wilk spss calculation, the mineral pretest value is 0.403 > 0.05, the data is normally distributed and the mineral posttest value is

0.047 < 0.05, the data is not normally distributed and the coconut pretest value is 0.532 > 0.05, the data is normally distributed and the coconut posttest value is 0.350 > 0.05, the data is normally distributed. So the next analysis uses non-parametric tests.

Table 3. Non-parametric Difference Test Results

Test Statistics ^a	Datapost
Mann-Whitney U	32.000
Wilcoxon W	87.000
Z	-1.395
Asymp. Sig. (2-tailed)	.163
Exact Sig. [2*(1-tailed Sig.)]	.190 ^b

Based on the Test Statistics output above, it is known that Asymp .sig .(1eb2-taillet) is worth 0.163 because the value of 0.163 is greater than > 0.05, it can be concluded that Ha is rejected, meaning that there is no difference between the results of mineral water and isotonic drinks or coconut water for tests and posttests so it can be concluded that there is no difference in the provision of mineral water and natural isotonic drinks or young coconut water to run 1600 M.

3.2 Discussion

Based on the results of data collection, it is known that there is no difference between mineral and coconut water on pulse recovery, 5 minutes after

running 1600m. Measurement to see how fast a person's body's ability to recover after doing strenuous activity (Nasution, 2020). This fluid administration has a relationship with the recovery process. It turns out that based on the results of this study, both the provision of coconut water or mineral water has no significant difference.

Pulse rate is a general indicator that is used to see the exercise process which indicates the performance of the body (Gemael & Kurniawan, 2020). The effect of adaptation from exercise will reduce the resting pulse rate (Anuar et al., 2021; Oliveira-Dantas et al., 2020), this can occur due to the process of adaptation to long-term exercise. Some types of recommended exercises are jogging Danubisma & Dewi (2023) running in a

treatmile with an intensity of 70% - 85% Siregar et al. (2022) aerobic exercise Saini et al. (2022) futsal, soccer, basketball, Nemčić & Calleja-González (2021), moderate to high intensity exercise Y. T. J. Samodra et al. (2022) high intensity as an indicator can be seen from the pulse achievement, adaptation is also ultimately seen from the basal pulse achievement. An important part is getting enough sleep 7-9 hours per day (Doherty et al., 2021).

Recovery is defined as the ability to return to normal to perform sports activities again (Bunt et al., 2021). This is important to prevent injury to athletes (Szabo & Kennedy, 2022). Active recovery will be better than passive Brilian et al. (2021) on the mechanism of reducing lactic acid, another way that can be done is by massage, this is positive for passive recovery which is beneficial for neutralizing temperature or pulse (Hidayat & Ibrahim, 2021). So this study provides a message that the achievement of recovery can be done either actively or passively with assistance. Active by keeping moving, passive can be done by providing massage manipulation. This is intended to maintain fitness and speed up recovery. As the opinion of T. J. Samodra (2021) rest Shi et al. (2020) by doing enough rest, there will be a decrease in basal pulse rate, Stoner et al. (2020) the next thing is a change in pulse rhythm improvement.

Measurement of dehydration levels Belval et al. (2019) can be done by comparing body weight before and after exercise and daily records of fluid intake. If dehydration is greater than 1.1% it will feel thirsty, darker urine color. Francisco et al. (2024), trial participants (14 people) dehydrated to up to 3.2% had a significant perception of fatigue. The study concluded that recovery with soaking and cold water and active recovery recovery is more positive in reducing fatigue (Yarar et al., 2021). Stated by Scanlon & Norton (2024) if it occurs to more than 2% it will have an impact on endurance. Furthermore, it is confirmed that 1.02% dehydration occurs in people who do sports, this data is taken from 430 samples (Scanlon & Norton, 2024). Such is the importance of hydration levels to exercise performance, the results of this study provide information that coconut or mineral water drinks have the same effect at 1600 meters running distance on pulse recovery.

Subsequent events in sports regarding the study of this liquid have been carried out Scanlon & Norton (2024) athletes who start training by drinking achieve better results. Green coconut water is effective in quickly reducing aerobic exercise pulse (Yusuf et al., 2020). This research review also further confirms the link between various types of exercise and the effect on the quality of blood vessels and the pulse that undergoes adaptation to exercise loading. It was

concluded that training with will have an impact on pulse rate, and stated above that there will be strengthening, elasticity, systole ability and a decrease in basal pulse. Fluid administration will aid in faster recovery. There is a choice between active or passive recovery. In fact, drinking has its own impact on accelerating recovery.

CONCLUSION

This study aims to test the difference between coconut water and mineral water on the effect of dehydration speed. Based on the results of the study it turns out that these two liquids with the treatment of running 1600 meters after the finish is given a drink with a dose of 250ml each, after 6 minutes the measurement is taken. It turns out that the results on the pulse rate are the same. Against these results can be used as a reference that up to a distance of 1600 is declared the same. This provides an opportunity for further research if done with more distance or high intensity for a long time as in the context of playing.

AUTHOR INFORMATION

Corresponding Authors

Rubiyatno, Universitas Tanjungpura, Pontianak, Indonesia

 <https://orcid.org/0000-0001-7841-7955>

Email: rubiyatno@fkip.untan.ac.id

Putra Sastaman, Universitas Tanjungpura, Pontianak, Indonesia

 <https://orcid.org/0000-0003-0535-7191>

Email: putrasastaman@fkip.untan.ac.id

Authors

Muhammad Rizki Rahmadiansyah, Universitas Tanjungpura, Pontianak, Indonesia

 <https://orcid.org/0009-0002-9928-0227>

Email: f1251201002@studen.untan.ac.id

REFERENCE

- Anuar, R., Imani, D. R., & Norlinta, S. N. O. (2021). Pengaruh Latihan Fisik Terhadap Kebugaran Lansia Dalam Masa Pandemi Covid-19: Narrative Review. *FISIO MU: Physiotherapy Evidences*, 2(2), 95–106. <https://doi.org/10.23917/fisiomu.v2i2.13978>
- Arista, L., & Wahyudin, A. A. (2021). Faktor-Faktor Yang Berhubungan Dengan Status Hidrasi Mahasiswa Program Profesi Ners Fakultas Ilmu Keperawatan Universitas Indonesia. *Jurnal Ilmu Keperawatan Medikal Bedah*, 4(2), 36–47. <https://doi.org/10.32584/jikmb.v4i2.669>
- Belval, L. N., Hosokawa, Y., Casa, D. J., Adams, W. M., Armstrong, L. E., Baker, L. B., Burke, L.,

- Chevront, S., Chiampas, G., González-Alonso, J., Huggins, R. A., Kavouras, S. A., Lee, E. C., McDermott, B. P., Miller, K., Schlader, Z., Sims, S., Stearns, R. L., Troyanos, C., & Wingo, J. (2019). Practical Hydration Solutions for Sports. *Nutrients*, *11*(7), 1550. <https://doi.org/10.3390/nu11071550>
- Brilian, M., Ugelta, S., & Pitriani, P. (2021). The Impact of Giving Sports Massage and Active Recovery on Lactate Recovery. *JUARA : Jurnal Olahraga*, *6*(2), 179–187. <https://doi.org/10.33222/juara.v6i2.1193>
- Bunt, S. C., Meredith-Duliba, T., Didehhan, N., Hynan, L. S., LoBue, C., Stokes, M., Miller, S. M., Bell, K., Batjer, H., & Cullum, C. M. (2021). Resilience and recovery from sports related concussion in adolescents and young adults. *Journal of Clinical and Experimental Neuropsychology*, *43*(7), 677–688. <https://doi.org/10.1080/13803395.2021.1990214>
- Danubisma, I., & Dewi, R. C. (2023). Pengaruh Latihan Skipping Terhadap Daya Tahan Kardiovaskular (Vo2max) dan Daya Ledak Otot Tungkai Atlet Taekwondo Mapan Club Surabaya. *Gelanggang Olahraga: Jurnal Pendidikan Jasmani Dan Olahraga (JPJO)*, *7*(1), 125–134. <https://doi.org/10.31539/jpjo.v7i1.6989>
- Darma, Samodra, Y. T. J., Yosika, G. F., Gandasari, M. F., & Wati, I. D. P. (2023). Pengaruh Pemberian Minuman Yang Berbeda Terhadap Denyut Nadi Pemulihan Setelah Melakukan Aktivitas Fisik. *Jurnal Kejaora (Kesehatan Jasmani Dan Olah Raga)*, *8*(1), 19–26. <https://doi.org/10.36526/kejaora.v8i1.2444>
- Doherty, R., Madigan, S. M., Nevill, A., Warrington, G., & Ellis, J. G. (2021). The Sleep and Recovery Practices of Athletes. *Nutrients*, *13*(4), 1330. <https://doi.org/10.3390/nu13041330>
- Fajarwaty, H. P., Nurmayanti, D., & Hermiyanti, P. (2021). Minuman Isotonik Pengganti Kandungan Elektrolit Natrium (Na) dan Klorida (Cl) Dalam Darah Tenaga Kerja Setelah Terpapar Panas (Study Pada Home Industry Tahu Muncul Surabaya Tahun 2020). *Jurnal Ilmiah Mahasiswa Kesehatan Masyarakat*, *6*(3). <https://doi.org/10.37887/jimkesmas.v6i3.20337>
- Francisco, R., Jesus, F., Nunes, C. L., Santos, P., Alvim, M., Campa, F., Schoeller, D. A., Lukaski, H., Mendonca, G. V., Sardinha, L. F. C. B., & Silva, A. M. L. de A. (2024). H2O Athletes study protocol: effects of hydration changes on neuromuscular function in athletes. *British Journal of Nutrition*, *131*(9), 1579–1590. <https://doi.org/10.1017/S0007114524000308>
- Gemael, Q. A., & Kurniawan, F. (2020). Pengaruh Latihan Kelincahan Dengan Intensitas Tinggi Dan Intensitas Sedang Terhadap Keterampilan Menggiring Bola Dalam Permainan Sepakbola. *COMPETITOR: Jurnal Pendidikan Kepelatihan Olahraga*, *11*(3), 155. <https://doi.org/10.26858/com.v11i3.13403>
- Hasibuan, R., & Simanullang, R. J. (2019). Pengaruh Pemberian Air Kelapa Muda Terhadap Tingkat Status Hidrasi Cairan Tubuh Setelah Melakukan Aktivitas Olahraga. *Sains Olahraga : Jurnal Ilmiah Ilmu Keolahragaan*, *2*(1), 42. <https://doi.org/10.24114/so.v2i1.12874>
- Hidayat, R. R., & Ibrahim, I. (2021). Pemulihan Suhu Tubuh Dan Denyut Jantung Dengan Metode Sport Massage Dan Stretching Statis Setelah Berenang. *Sport Science And Education Journal*, *2*(1), 1–20. <https://doi.org/10.33365/ssej.v2i1.1000>
- Nasution, A. P. (2020). Pengaruh pemberian air kelapa terhadap denyut nadi pemulihan paska berolahraga. *Jorpres (Jurnal Olahraga Prestasi)*, *16*(1), 1–6. <https://doi.org/10.21831/jorpres.v16i1.24665>
- Nemčić, T., & Calleja-González, J. (2021). Evidence-based recovery strategies in futsal. *Kinesiology*, *53*(1), 131–140. <https://doi.org/10.26582/k.53.1.16>
- Nurdesia, M., Ali, M., & Sativani, Z. (2022). Effect Of Aerobic Exercise On Blood Pressure In Patients With Hypertension: A Literature Study. *Indonesian Journal of Physiotherapy*, *1*(2), 69–80. <https://doi.org/10.52019/ijpt.v1i2.3333>
- Oliveira-Dantas, F. F., Brasileiro-Santos, M. do S., Thomas, S. G., Silva, A. S., Silva, D. C., Browne, R. A. V., Farias-Junior, L. F., Costa, E. C., & Santos, A. da C. (2020). Short-Term Resistance Training Improves Cardiac Autonomic Modulation and Blood Pressure in Hypertensive Older Women: A Randomized Controlled Trial. *Journal of Strength and Conditioning Research*, *34*(1), 37–45. <https://doi.org/10.1519/JSC.00000000000003182>
- Oroh, P. J., Wungow, H. I. S., & Engka, J. N. A. (2021). Latihan Fisik Pada Pasien Obesitas. *Jurnal Biomedik (JBM)*, *13*(1), 34–43. <https://doi.org/10.35790/jbm.13.1.2021.31773>
- Pudyastuti, R. R., Kariyadi, K., Martiningsih, M. A.,

- Horhoruw, A., & Rahmawati, U. (2023). Refocusing Senam Hipertensi Bagi Lansia Untuk Mengaktifkan Kembali Kegiatan Posyandu Lansia Pada Masa New Normal. *EJOIN: Jurnal Pengabdian Masyarakat*, 1(3), 78–89. <https://doi.org/10.55681/ejoin.v1i3.614>
- Rumbold, P., McCulloch, N., Boldon, R., Haskell-Ramsay, C., James, L., Stevenson, E., & Green, B. (2022). The potential nutrition-, physical- and health-related benefits of cow's milk for primary-school-aged children. *Nutrition Research Reviews*, 35(1), 50–69. <https://doi.org/10.1017/S095442242100007X>
- Saini, R., Kacker, S., & Gupta, R. (2022). Relationship between Autonomic Functional Status and Maximal Aerobic Capacity. *Journal Of Clinical And Diagnostic Research*. <https://doi.org/10.7860/JCDR/2022/56005.16753>
- Samodra, T. J. (2021). The Differences of Pulse on The Day of Training Based on Hours Sleep. *Journal Sport Area*, 6(1), 97–107. [https://doi.org/10.25299/sportarea.2021.vol6\(1\).5996](https://doi.org/10.25299/sportarea.2021.vol6(1).5996)
- Samodra, Y. T. J., Gustian, U., Puspita Wati, I. D., & Supriatna, E. (2022). Perbedaan Percepatan Recovery Berdasarkan Perbedaan Nadi Tinggi dan Rendah. *Jurnal Penjaskesrek*, 9(1), 26–37. <https://doi.org/10.46244/penjaskesrek.v9i1.1695>
- Scanlon, S., & Norton, C. (2024). Investigating Nutrition and Hydration Knowledge and Practice among a Cohort of Age-Grade Rugby Union Players. *Nutrients*, 16(4), 533. <https://doi.org/10.3390/nu16040533>
- Shi, S., Shi, J., Jia, Q., Shi, S., Yuan, G., & Hu, Y. (2020). Efficacy of Physical Exercise on the Quality of Life, Exercise Ability, and Cardiopulmonary Fitness of Patients With Atrial Fibrillation: A Systematic Review and Meta-Analysis. *Frontiers in Physiology*, 11. <https://doi.org/10.3389/fphys.2020.00740>
- Siregar, P. S., Samodra, Y. T. J., Supriatna, E., Gustian, U., & Puspita Wati, I. D. (2022). Pengaruh Latihan Sirkuit Pada Saat Puasa terhadap Denyut Nadi. *Jurnal Patriot*, 4(2), 139–149. <https://doi.org/10.24036/patriot.v4i2.849>
- Stoner, L., Kucharska-Newton, A., & Meyer, M. L. (2020). Cardiometabolic Health and Carotid-Femoral Pulse Wave Velocity in Children: A Systematic Review and Meta-Regression. *The Journal of Pediatrics*, 218, 98–105.e3. <https://doi.org/10.1016/j.jpeds.2019.10.065>
- Szabo, S. W., & Kennedy, M. D. (2022). Practitioner perspectives of athlete recovery in paralympic sport. *International Journal of Sports Science & Coaching*, 17(2), 274–284. <https://doi.org/10.1177/17479541211022706>
- Wong, J., Ler, H., Thed, S., Kyu, M. L., & Wong, S. (2021). Effects of coconut sport gel on hydration measures, cognitive performance and anaerobic capacity in soccer players: A double-blind, randomised, cross-over study. *Malaysian Journal of Movement, Health & Exercise*, 10(2), 84. https://doi.org/10.4103/mohe.mohe_22_21
- Yarar, H., Gök, Ü., Dağtekin, A., Saçan, Y., & Eroğlu, H. (2021). The effects of different recovery methods on anaerobic performance in combat sports athletes. *Acta Gymnica*, 51. <https://doi.org/10.5507/ag.2021.017>
- Yusuf, J., Muthoharoh, A., & Setyawan, M. G. M. (2020). Pengaruh Air Kelapa Hijau (Cocos Nucifera) Sebelum Aktifitas Fisik Aerobik Terhadap Pemulihan Denyut Nadi Pada Atlet Atletik. *Jendela Olahraga*, 5(2), 79–88. <https://doi.org/10.26877/jo.v5i2.6164>
- Zubaida, I., Fernanda, R. A., & Firdaus, W. W. N. (2022). Olahraga Kesehatan: Memasyarakatkan Olahraga Untuk Peningkatan Kesehatan. *Journal of Sport Science and Tourism Activity (JOSITA)*, 1(1), 11. <https://doi.org/10.52742/josita.v1i1.15422>