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Research Article

5-Lap Run Weight Loss Achievement

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Abstract:
A condition known as dehydration occurs when the body lacks fluid and experiences problems with its metabolic functions. The study provides the impact of dehydration on running 5 laps at GOR SSA PONTIANAK by comparing weight loss before and after running. The research method was experimental, with a sample of 16 students. Performed with the measurement procedure of the 5 lap running test, and body weight before and after running. The results showed there was a decrease in body weight with an average decrease of 0.78 grams, this figure is equivalent to approximately 5% of fluid levels in the body assuming fluid in the body is 60%-70% of body weight. Weight loss of up to 2% is statistically insignificant, but physiologically this is the recommended limit of weight loss in one exercise.
Keywords: Dehydration, Running, Weight Loss

1. INTRODUCTION

The prevalence of obesity is increasing with changing lifestyles in children and adolescents, high-intensity exercise is recommended to address this (Morcel et al., 2024). Obesity is becoming a global problem crisis, this occurs in industrialized countries according to WHO records 30-40%, Europe 20-30%, Asia, Africa 10-20%, and continues to increase from 1990-2010 increased 7%. Until 2020 this trend is predicted to be 60 million. In Mexico 34% of children and adolescents aged 5-19 years are obese (Rivera-Ochoa et al., 2023).

One way to combat this is through exercise. Because more water exits the body during exercise than enters it, dehydration is a state of fluid shortage in the body. The impact of dehydration is the risk of obesity and decreased fluid concentration (K et al., 2021). Good hydration occurs when athletes drink enough water before, during, and after exercise (Haetami et al., 2022).

This study sought to examine the connection between water consumption, exercise, and the development of dehydration symptoms (Li et al., 2024). In this instance, there was no discernible difference in fluid levels or pulse recovery between the groups who received guava juice or isotonic beverages. Numerous variables, such as a heated work environment and dietary condition, can lead to dehydration (Ramadhan et al., 2024).

People who are exhausted or who are still exhausted have faster heart rates than those who are not, as measured by the number of beats per minute. A healthy Vo2 max affects how well the heart performs during running; yet, during high-intensity exercise, the anaerobic glycolytic metabolic pathway generates lactic acid as a byproduct. Body posture influences the pulse recovery process; for example, lying down has the largest percentage of lowering the pulse rate during the recovery phase because electrolyte fluids may stabilize the body during this period, particularly the pulse rate (Barrenetxea-García et al., 2024).

Studies state that high-intensity exercise is better for improving fitness and reducing body fat % compared to traditional exercise (Koh et al., 2024). Both in children and adolescents (González-Gálvez et al., 2024), reducing blood sugar and pulse rate (Lin et al., 2024), against obese people. These studies recommend that people exercise at high intensity, in reality, high-intensity exercise is not everyone can immediately do. In this study, it will be tested what if the exercise performed is only running for 2km. Whether this exercise has an impact on individuals on weight loss is considered from the incidence of dehydration that occurs.

2. MATERIAL AND METHOD

This research was conducted as a test and measurement study. Give the treatment of running 5 laps (2 km) then find the difference in body weight before and after running 2 km. The research was conducted at the SSA pontianak field. Sample 16

sports coaching education students 4 women and 12 men. A five-lap jogging track and a stopwatch are among the data collecting tools. Data were analyzed using SPSS statistics by comparing differences in body weight before and after treatment. Data analysis using SPSS series 26 IMB. Wicoxon t-test was conducted.

3. RESULT AND DISCUSSION

1.1 Result

Data were analyzed using SPSS statistical software by comparing changes in pulse rate before and after dehydration in a 5-lap run. Statistical tests, normality test and non-parametric t-test.

Table 1. Description of Pulse Rate Results Before and After Dehydration

Statistics		Initial Weight	Final Weight	Difference
N	Valid	13	13	13
	Missing	0	0	0
Mean		48,70.	46.43.	0,75
Median		57.25.00	52.42.00	0,75
Mode		50.7.00[a]	54.8.00[a]	7.00[a]
Std. Deviation		2.632	2.4.[35]	2.918
Minimum		507.00	54.8.00	7.00
Maximum		79,86.00	76.72.00	1,28

Based on table 1 above with the results of 16 sample data with initial body weight mean 48.70, median 57.25, mode 50, std. Deviation 2.632. Body weight value after dehydration mean 46.43, median, mode 54.8.00, std. Deviation 2.4

Table 2. Results of Data Normality Calculation

Tests of Normality						
	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Initial Weight	.215	16	.046	.832	16	.008
Final Weight	.251	16	.008	.842	16	.010

All data is considered abnormal if it is calculated less than 0.05. It can be concluded that the data is not normal. If the data is normal, you can run non-parametric tests. Parametric tests can be done with the paired wocoxon test.

Table 3. Non-parametric Statistical Test Results

Ranks				
		N	Mean Rank	Sum of Ranks
Initial Weight – Final Weight	Negative Ranks	13[a]	7.38	96.00
	Positive Ranks	3[b]	13.33	40.00
	Ties	0[c]		
	Total	16		

Table 4. Non-parametric Statistical Test Results

Test Statistics[a]	
	Initial Weight – Final Weight
Z	-1.448[b]
Asymp. Sig. (2-tailed)	.148
a. Wilcoxon Signed Ranks Test	
b. Based on positive ranks.	

Table 3 and table 4 above the sig value (2 tailed) with the sample obtained = .148 (p>0.05). So that the test results of the non-parametric statistical test of the median test show, the weight change is not significant.

1.2 Discussion

The results of non-parametric statistical tests explain that there is no significant difference in body weight and after running. In relation to this, there is a hydration factor that occurs when we do excessive sports activities or not in accordance with the body's

abilities (Samodra, 2021). During exercise, hot weather factors affect the increase in excessive sweat output and have an effect on health. Temperatures above 37ºC can affect the cardiovascular system Pressure increases and dehydration progresses faster than resistance to rising body temperature. The first condition that we feel when the body temperature rises can be felt from the saliva content, therefore a good temperature for exercise is 20-23ºC.

Fluid in the body is 70-75% of the entire body weight (Stoev, 2024). According to (Atciyurt et al., 2024) fluid deprivation 20-30% of people will die, (Vila et al., 2024) measuring checking dehydration, (Volkert et al., 2024) so education about hydration is important.

Therefore, electrolyte fluids are needed when doing excessive physical activity, especially sports, to avoid dehydration. Drinking coconut water before exercise can increase exercise endurance especially in adult men (Jalil et al., 2023). The effect of honey pineapple juice on pulse rate and blood pressure after long distance running (Herlambang et al., 2022). Basically, exercise again 400 meters does not have a side effect of dehydration but is good for the health of the body when doing the right movement (Mujahidin, 2020). Running is good for body health, but this sport can trigger a heart attack (Setiarini et al., 2021). Shows the difference in impact between 3-corner running training and lateral jump running on resting heart rate (Silva et al., 2023).

Measurements such as body temperature, heart rate based on pulse, sweating, breathing, etc. can be measured using tools and applications (Derisma & Saputra, 2020). Most people, especially overweight people, would want to lose weight quickly. In this case, there is no doubt that the symptoms of dehydration are quite severe. It is recommended that you do not exercise or experience extreme weight loss of up to 4%, as it will adversely affect the body's performance processes.

Negative emotions, such as anger, confusion, tense depression, and fatigue increase when dehydration is at levels above 1%. Research conducted up to 4% mood disorders occur, (Yüksel & Akıl, 2024) dehydration level 1.36% decrease in concentration (Rosinger et al., 2024) dehydration above 1% reduces working memory performance: (Moes et al., 2024) humans up to 2.6% cognition function is still safe (McCurtin et al., 2024) states that the threshold limit for cognition and movement skills is 1-2%.

4. CONCLUSION

After the implementation of the 5-lap running test was carried out before and after fluid loss that caused weight loss. Statistically the decrease that occurs is not significant, but the decrease that occurs with running 5 laps is up to 2.6%. this gives an idea that the decrease that occurs is still tolerable for body activity.

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REFFERENCE

Atciyurt, K., Heybeli, C., Smith, L., Veronese, N., & Soysal, P. (2024). The prevalence, risk factors and clinical implications of dehydration in older patients: a cross-sectional study. *Acta Clinica Belgica*, *79*(1), 12–18. https://doi.org/10.1080/17843286.2023.2275922

Barrenetxea-García, J., Nuell, S., Garai, S., Murua-Ruiz, A., Mielgo-Ayuso, J., Calleja-González, J., & Sáez de Villarreal, E. (2024). Effect of Foam Roll recovery method on performance in water polo players: a randomized controlled trial. *The Physician and Sportsmedicine*, *52*(3), 262–270. https://doi.org/10.1080/00913847.2023.2240274

Derisma, D., & Saputra, Moch. H. (2020). Prototype Sistem Monitoring Kesehatan Terintegrasi dengan Keluaran Pada Smartphone Android. *Komputika : Jurnal Sistem Komputer*, *9*(1), 35–41. https://doi.org/10.34010/komputika.v9i1.2785

González-Gálvez, N., López-Gil, J. F., Espeso-Garcia, A., Abenza-Cano, L., Mateo-Orcajada, A., & Vaquero-Cristóbal, R. (2024). Effectiveness of high intensity and sprint

interval training on metabolic biomarkers, body composition, and physical fitness in adolescents: randomized controlled trial. *Frontiers in Public Health*, *12*. https://doi.org/10.3389/fpubh.2024.1425191

Haetami, M., Gandasari, M. F., Sastaman, P., & Suwanto, W. (2022). Status Dehidrasi Setelah Latihan Man To Man Pada Cabang Olahraga Futsal. *Jurnal Pendidikan Olahraga*, *11*(2), 317–329. https://doi.org/10.31571/jpo.v11i2.4905

Herlambang, Y., Kurniawati, D. M., & Ali, M. A. (2022). Pengaruh Jus Nanas Madu Terhadap Denyut Nadi Dan Tekanan Darah Pada Siswa Sekolah Sepak Bola Pasca Lari Jarak Jauh 10 Km. *Journal of Nutrition College*, *11*(3), 182–187. https://doi.org/10.14710/jnc.v11i3.33136

Jalil, R., Ahmad, A., Hidayat, R., Kahar, I., Riswanto, A. H., & Nur, S. (2023). *Endurance of Pencak Silat Athletes: Palm Sugar and Coconut Water Treatment* (pp. 144–152). https://doi.org/10.2991/978-94-6463-354-2_21

K, F. R., Pratama, M. V., Sutarna, N., & Purwanti, B. S. R. (2021). Sistem Pendeteksi Keasaman dan Warna Urine sebagai Indikasi Dini Dehidrasi. *ELECTRICES*, *2*(2), 57–61. https://doi.org/10.32722/ees.v2i2.3570

Koh, S., Kim, D., Kim, M., & Kim, T. (2024). Aerobic exercise effects on systolic blood pressure and endothelial inflammation in obese and non-obese elderly women with isolated systolic hypertension. *Journal of Hypertension*, *42*(10), 1743–1749. https://doi.org/10.1097/HJH.0000000000003794

Li, H., Early, K. S., Zhang, G., Ma, P., & Wang, H. (2024). Personalized Hydration Strategy to Improve Fluid Balance and Intermittent Exercise Performance in the Heat. *Nutrients*, *16*(9), 1341. https://doi.org/10.3390/nu16091341

Lin, W. W., Su, H., Lan, X. Y., Ni, Q. Y., Wang, X. Y., Cui, K. Y., & Zhang, L. (2024). Effects of high-intensity interval training (HIIT) and maximum fat oxidation intensity training (MFOIT) on body composition, inflammation in overweight and obese adults. *Science & Sports*, *39*(4), 348–357. https://doi.org/10.1016/j.scispo.2023.09.002

McCurtin, A., Collins, L., King, L., Lazenby-Paterson, T., Lisiecka, D., Leslie, P., McInerney, M., Moran, A., O'Keeffe, S., & Smith, A. (2024). Beyond thickened liquids: for your consideration. *Journal of Clinical Practice in Speech-Language Pathology*, *26*(2), 128–166. https://doi.org/10.1080/22000259.2024.2359368

Moes, M. I., Elia, A., Gennser, M., & Keramidas, M. E. (2024). Combined effects of mild hypothermia and nitrous-oxide-induced narcosis on manual and cognitive performance. *American Journal of Physiology-Regulatory, Integrative and Comparative Physiology*, *326*(3), R197–R209. https://doi.org/10.1152/ajpregu.00246.2023

Morcel, J., Béghin, L., Michels, N., De Ruyter, T., Drumez, E., Cailliau, E., Polito, A., Le Donne, C., Barnaba, L., Azzini, E., De Henauw, S., Miguel Berges, M. L., Cacau, L. T., Moreno, L. A., & Gottrand, F. (2024). Nutritional and physical fitness parameters in adolescence impact cardiovascular health in adulthood. *Clinical Nutrition*, *43*(8), 1857–1864. https://doi.org/10.1016/j.clnu.2024.06.022

Mujahidin. (2020). Kondisi Sistem Kardiovaskular dan Kejadian Nyeri Tungkai Bawah Sesudah Lari Sprint 400 Meter Pada Siswa Sekolah Olahraga. *Jurnal Kesehatan Dan Pembangunan*, *10*(19), 63–69. https://doi.org/10.52047/jkp.v10i19.62

Ramadhan, W., Pratiwi, Y., & Hartono, D. Q. D. (2024). Overview of Increased Lactic Acid and Work Fatigue in Harvesting Workers at PT. X Kampar Regency. *International Journal of Medicine and Health*, *3*(3), 126–133. https://doi.org/10.55606/ijmh.v3i3.4192

Rivera-Ochoa, M., López-Gil, J. F., Brazo-Sayavera, J., Pantoja-Arévalo, L., González-Gross, M., Vizmanos-Lamotte, B., & Guadalupe-Grau, A. (2023). Clustering Health Behaviors in Mexican Adolescents: The HELENA-MEX Study. *Research Quarterly for Exercise and Sport*, 1–8. https://doi.org/10.1080/02701367.2023.2195458

Rosinger, A. Y., John, J. D., & Murdock, K. W. (2024). Ad libitum dehydration is associated with poorer performance on a sustained attention task but not other measures of cognitive performance among middle-to-older aged community-dwelling adults: A short-term longitudinal study. *American Journal of Human Biology*, *36*(6). https://doi.org/10.1002/ajhb.24051

Samodra, Y. T. J. (2021). Pengaruh Kehilangan Cairan (Dehidrasi) sampai dengan 4% Terhadap Kinerja An-Aerobik. *Jurnal Pendidikan Jasmani, Olahraga Dan Kesehatan Undiksha*, *8*(2), 58–68. https://doi.org/10.23887/jjp.v8i2.33756

Setiarini, A., Laksana, M. W., & Winarno, B. (2021). Sistem Monitoring Frekuensi Denyut Nadi pada Pelari Menggunakan Metode Photoplethysmographic. *Jurnal Teknologi Informasi Dan Ilmu Komputer*, *8*(6), 1255. https://doi.org/10.25126/jtiik.2021863729

Silva, L., Figueiredo, L. S., Gomes, A., & Teichrieb, V. (2023). GoThrough: A tool to render and interact with arbitrary planar transformative portals. *Entertainment Computing*, *44*, 100529. https://doi.org/10.1016/j.entcom.2022.100529

Stoev, S. D. (2024). Food Security and Foodborne Mycotoxicoses—What Should Be the Adequate Risk Assessment and Regulation? *Microorganisms*, *12*(3), 580. https://doi.org/10.3390/microorganisms12030580

Vila, E., Bezerra, P., Silva, B., & Cancela, J. M. (2024). BIA-assessed cellular hydration and strength in healthy older adults. *Clinical Nutrition ESPEN*, *64*, 144–148. https://doi.org/10.1016/j.clnesp.2024.09.010

Volkert, D., Beck, A. M., Faxén-Irving, G., Frühwald, T., Hooper, L., Keller, H., Porter, J., Rothenberg, E., Suominen, M., Wirth, R., & Chourdakis, M. (2024). ESPEN guideline on nutrition and hydration in dementia – Update 2024. *Clinical Nutrition*, *43*(6), 1599–1626. https://doi.org/10.1016/j.clnu.2024.04.039

Yüksel, S., & Akıl, M. (2024). Mild Dehydration Triggered by Exercise Reduces Cognitive Performance in Children, But Does Not Affect Their Motor Skills. *Journal of the American Nutrition Association*, *43*(7), 627–635. https://doi.org/10.1080/27697061.2024.2362709