

wahyu.hilmy

by Arfa Cees

Submission date: 02-Feb-2024 10:41PM (UTC-0800)

Submission ID: 2285167292

File name: wahyu.hilmy.pdf (563.21K)

Word count: 4071

Character count: 22892




Impact Of Oxygen Levels In Beverages On The Acceleration Of Pulse Rate Reduction After Physical Activity

Wahyu Setia Kuscahyaning Putri¹, Hilmy Aliriad²

^{1,2}Prodi Pendidikan Jasmani Kesehatan dan rekreasi, fakultas ilmu Pendidikan,
Universitas Nahdlatul Ulama Sunan Giri

email: wahyu10unugiri@gmail.com, hilmy@unugiri.ac.id

 <https://doi.org/10.20884/1.paju.2023.5.1.9082>

Abstract

This study examines the effect of drinking water with oxygen levels to decrease the pulse rate after physical activity in students of Physical Education Health and Recreation. The research method used is experimental research with Pretest-Posttest Control Group Design. Two groups were formed: a control group and an experimental group of 20 UNUGIRI Health and Recreation Physical Education Study Program students. Sampling is done randomly (Random sampling). The pulse rate is measured before and after running for 20 minutes. The results of the analysis showed a significant difference between the provision of oxygenated drinking water (experimental group) and ordinary drinking water (control group) on the acceleration of pulse rate reduction after running activities. The significance value obtained was 0.057, indicating a significant difference between the two groups. The average pulse of the experimental group was 89.44, while the average pulse of the control group was 98.33. The administration of drinking water with an oxygen content has a positive effect on the decrease in the pulse rate after physical exertion. Subjects who consumed oxygenated drinking water after a 20-minute run had a faster pulse rate decrease than those who consumed only plain water. The conclusion of this study shows that the provision of oxygenated drinking water positively affects the decrease in pulse rate after physical activity in health and Recreation physical education students. Oxygenated drinking water can be an effective alternative to accelerate pulse recovery after intense physical exertion. This research provides a better understanding of the benefits of oxygenated drinking water in maintaining health and accelerating physical recovery after sports activities.

Keywords: Oxygenated Drinking Water, Decreased Pulse, Physical Activity

Correspondent Address : Universitas Nahdlatul Ulama Sunan Giri

Email: hilmy@unugiri.ac.id



Journal of Physical Activity Journal (PAJU) is licensed under a [Creative Commons Attribution-ShareAlike 4.0 International License](https://creativecommons.org/licenses/by-sa/4.0/).

INTRODUCTION

Physical activity has many health benefits, including improving cardiovascular fitness, strengthening muscles, improving energy balance, and maintaining a healthy weight (Aliriad, Priadana et al., 2023; Aliriad, Soegiyanto et al., 2023). When doing physical activity, the body needs enough oxygen to meet energy needs. Oxygen plays an important role in aerobic respiration, in which nutrients are converted into energy needed by the body's cells (Franklin et al., 2022; White et al., 2013). The pulse rate, the number of heartbeats per minute, is an important indicator for evaluating a person's cardiovascular activity and fitness level. A high pulse after physical exertion signals stress on the cardiovascular system and the need for a longer recovery. They were lowering the pulse to normal after physical exertion, which is important in the body's recovery process.

During physical activity, the body produces energy by converting glucose into ATP (adenosine triphosphate) through aerobic respiration (Choi et al., 2021; Netzer et al., 2023). However, the body will switch to anaerobic respiration if the need for oxygen is unmet, such as during intense physical activity. Anaerobic respiration produces ATP without needing oxygen, producing lactic acid as a by-product. The accumulation of lactic acid in the muscles can lead to fatigue and increased pulse.

Oxygenated drinks have become increasingly popular among athletes and physically active people (Pratama & Bafirman, 2020). This drink is claimed to increase oxygen supply to the body's cells, accelerate recovery, and improve physical performance. In oxygenated beverages, oxygen is dissolved in water at a certain pressure and temperature, thus allowing oxygen to be more easily absorbed by the body.

Intense physical activity can increase oxygen demand in the body (Krismawati et al., 2019; Sumantri, 2021). Oxygenated drinks have become increasingly popular among athletes and physically active people (Pratama & Bafirman, 2020). This drink is claimed to increase oxygen supply to the body's cells, accelerate recovery, and improve physical performance. In oxygenated beverages, oxygen is dissolved in water at a certain pressure and temperature, thus allowing oxygen to be more easily absorbed by the body.

Intense physical activity can increase oxygen demand in the body (Krismawati et al., 2019; Sumantri, 2021). Adequate oxygen levels are important to maintain the body's health and ensure the organs' proper functioning. However, after physical exertion, the body needs time to recover and return the pulse to a normal level. In this context, it is

necessary to investigate whether administering drinks with oxygen levels can accelerate lowering the pulse rate after physical exertion.

Humans need oxygen for the body's respiratory and metabolic processes. Oxygen in the body can be met through the normal breathing process, but oxygen levels can be reduced during physical activity (Almy & Sukadiyanto, 2014). Physical activity leads to decreased fluid, and the body tries to balance the temperature due to the energy expended. Lack of oxygen during physical activity converts aerobic respiration into anaerobic respiration, which triggers the heart to deliver oxygen and nutrients to needy organs faster.

Lack of body fluids can also occur during physical exertion, leading to dehydration. Dehydration can impair concentration reaction speed, increase body temperature, and slow energy production. Even a lack of water, as much as 1% of body weight, can affect the brain and thinking ability, while a lack of fluid, as much as 2%, can weaken the ability to think short-term, focus, and memory. It is important to balance body fluids after physical activity, and the easiest way to do this is to drink mineral water. However, there is a special type of drinking water called oxygenated. Oxygenated drinking water has been prepared so that more oxygen is bound. Oxygenated drinks are known to have a higher oxygen content than ordinary drinking water, about 7-10 times.

Based on this background, the problem is whether administering drinks with oxygen levels can affect ²the acceleration of the decrease in the pulse rate after physical exertion in individuals. Are drinks with oxygen levels more effective in accelerating pulse recovery than regular drinks after physical exertion? Several previous studies have explored the effects of oxygenated beverages on sports performance. Oxygenated drinks can accelerate the decrease in pulse after physical exertion compared to regular drinks (Sulaeman, 2022).

The study's results showed the potential benefits of oxygenated drinks in helping the body recover faster after physical activity. Previous research has shown that oxygenated drinking water can positively affect oxygen supply throughout the body, dissolving nutrients and distributing them. Oxygenated drinking water has a higher oxygen content than ordinary drinking water (Budiman & Ray, 2021; Muhyi, 2015). Lack of body fluids after physical activity can lead to dehydration, negatively affecting concentration,

reaction speed, body temperature, and energy production (Bahri et al., 2012; Samudera & Ashadi, 2019). Therefore, it is important to balance body fluids after physical activity.

This study aims to determine the effect of oxygen levels in beverages and test the provision of beverages to accelerate the decline in pulse rate after physical activity in health and Recreation physical education students. This study will test whether administering drinks with oxygen levels can accelerate pulse recovery after physical activity. Hopefully, this study can provide a better understanding of the benefits of oxygenated drinking water in maintaining health and accelerating physical recovery after sports activities.

METHODS (Aliriad, Adi, et al., 2023; Aliriad, Da'i, et al., 2023; Endrawan & Aliriad, 2023)

The research method used in this study is experimental research with Pretest-Posttest Control Group Design (Andriani et al., 2017). This design involves the division of research subjects into two groups, namely the control group and the experimental group (Aliriad, Adi, et al., 2023; Aliriad, Da'i, et al., 2023; Endrawan & Aliriad, 2023). This design aimed to compare the effect of administering drinks with oxygen levels on the decrease in pulse after physical activity between the two groups. The research subjects in this study were students of the Physical Education Health and Recreation program UNUGIRI, as many as 20 people. Sampling was accomplished using the Random Sampling technique, in which subjects were randomly selected from the population following the study's inclusion criteria.

The criteria for very high oxygen content from laboratory tests show that the oxygen content in Oxygen Water reaches ten times the saturated oxygen content in ordinary water. Water naturally contains ten ppm of oxygen (parts per million = 10 milligrams per liter). At lower temperatures (e.g., in a refrigerator), the oxygen content can increase to a maximum of 15 ppm. The benefits of oxygenated drinking water include the prevention of kidney and urinary stones, the prevention of bile deposits, the reduction of toxins in the blood, the increase in metabolism, the relief of the heart, and the stabilization of blood pressure. The study procedure began with Pulse measurements in all subjects before running for 20 minutes. After that, the subjects were divided into two groups at random. The control group will be given ordinary drinking water, while the experimental group will be given oxygen-containing drinking water. Once the drink is administered, all subjects will be rested for 5 minutes to allow time for the body to react to the drink

consumed. After rest, the pulse rate will be measured again in both groups. The recorded Pulse Data will be analyzed using statistical methods. Descriptive calculations will show each group's average pulse value before and after physical activity (Sandi, 2016). In addition, inferential statistical calculations will also be performed to test for significant differences between the control group and the experimental group.

The difference analysis will use the significance value (p-value) to determine whether the difference between the two groups is statistically significant. Suppose the p-value is less than the previously determined significance level. In that case, there is a significant difference between administering drinks with oxygen content and ordinary drinking water and a decrease in the pulse rate after physical exertion.

The method of this study was designed to test the hypothesis that the administration of drinks with oxygen content can accelerate the decrease in pulse rate after physical exertion. This research uses a robust experimental study design so that the results can provide a clearer understanding of the effect of oxygenated beverages on pulse and recovery after physical activity.

RESULTS

The results of descriptive calculation analysis showed a significant difference between the provision of oxygenated drinking water (experimental group) and ordinary drinking water (control group) on the acceleration of Pulse reduction after running for 20 minutes in UNUGIRI Health and Recreation physical education students. The value of significance (p-value) obtained by 0.057 indicates that the difference has almost reached the level of significance previously determined.

Table 1. Pulse rate results (bpm)

Sample	Pretest	Posttest
Sample 1	90	97
Sample 2	88	99
Sample 3	90	98
Sample 4	87	97
Sample 5	89	99
Sample 6	90	97
Sample 7	89	100
Sample 8	91	98
Sample 9	88	99
Sample 10	87	98
Sample 11	90	100
Sample 12	89	98

Sample 13	90	99
Sample 14	99	97
Sample 15	90	98
Sample 16	87	99
Sample 17	89	97
Sample 18	91	98
Sample 19	89	99
Sample 20	88	97

Table 2 shows the results of the analysis of differences between the two groups. The experimental group given oxygenated drinking water had an average pulse rate of 89.44, while the control group given plain drinking water had an average pulse rate of 98.33. There was an average difference of 8.89% between the two groups. hasil penelitian yang menunjukkan denyut nadi dalam sampel

Table 2. Analysis Of Differences

	N	Group	Mean	Difference	Sig.
Pulse rate	10	Ex. Experiments	89,44	8,89	0,057
	10	Ex. Control	98,33		

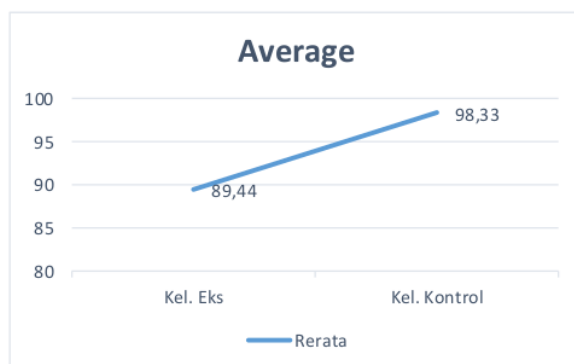


Figure 1. Difference Between Ex. Experiments and ex. Control

Figure 1 illustrates the mean difference between the experimental and control groups. Graph Data showed that administering beverages with oxygen levels significantly affected pulse rate reduction in UNUGIRI Health and Recreation physical education students. The average pulse rate of the experimental group (89.44%) was lower than the average pulse rate of the control group (98.33%). This study also involved several related variables that need to be considered. The independent variable in this study was the type

of drink given, namely oxygenated drinking water and ordinary drinking water.

The dependent variable is a decrease in the pulse rate after 20 minutes of running activity. In addition, factors such as gender, age, and fitness level of the subject can also be confounding variables that need to be considered in the analysis of the results. The results of this study support the hypothesis that the administration of drinks with oxygen levels can accelerate the decrease in pulse after physical exertion. Oxygenated drinks are believed to provide additional oxygen to the body, thereby speeding up recovery and reducing the time it takes to return to a normal pulse after intense physical activity. However, it should be borne in mind that the obtained significance value (0.057) is close to the previously specified significance level. Therefore, the results of this study need to be further confirmed with further studies involving a larger number of subjects and taking into account disruptive factors that may have influenced the results. Overall, the study provides interesting preliminary evidence on the effect of oxygenated beverages on decreased pulse rate after physical activity. These results may provide a better understanding of the importance of oxygen in the body's recovery after physical activity and provide practical implications in the field of sport and health.

DISCUSSION

Based on the results of research on the provision of oxygenated beverages, the decrease in pulse rate can be faster because of the additional oxygen supply that helps in the recovery of the body (Yulianto et al., 2022). The results of this study are also consistent with previous findings linking physical activity to a decrease in pulse rate. Intense physical activity can increase the pulse rate as the body responds to increased oxygen demand (Satria et al., 2023). Previous studies have shown that oxygenated beverages can improve oxygen supply throughout the body (Netzer et al., 2023). It can provide additional benefits for the respiratory process, muscle recovery, and decreased pulse rate after physical activity (Budiman & Ray, 2021). The higher oxygen content in oxygenated beverages allows oxygen to be more effectively transported into the blood and distributed throughout the body (Awwal, 2019; Muhyi, 2015). As a result, the body's recovery processes can be accelerated so the pulse can return to normal levels more quickly.

Research results have also shown that a faster decrease in pulse rate after physical activity may be associated with improved cardiorespiratory fitness (Andrastea et

al., 2018). By consuming oxygenated beverages that accelerate the decrease in pulse, individuals can optimize their exercise and obtain greater health benefits. In the context of Health and Recreation physical education students, improved cardiorespiratory fitness can provide an advantage in carrying out their duties and responsibilities as aspiring professionals in the field of sports and health.

Oxygenated drinking water can also be an attractive alternative for individuals who have difficulty meeting their body's oxygen needs (Kusuma, 2020; Tirajoh et al., 2016). For example, individuals with certain health conditions or living in areas with poor air quality may face challenges getting enough oxygen through regular breathing. In this case, oxygenated drinks can be a useful option to obtain the additional oxygen supply needed by the body.

The influence of administering oxygenated drinks on the decrease in the pulse after physical exertion has different needs. Age, gender, fitness level, and health conditions can influence the body's response to oxygenated beverages (Knowles et al., 2018; Kurniawan et al., 2020). Therefore, consult a health professional before adopting oxygenated beverages as part of the exercise or recovery routine.

Overall, the results of this study provide a deeper understanding of the effect of giving drinks with oxygen levels on the decrease in pulse rate after physical activity. By speeding up the body's recovery process, oxygenated drinks can be a strategy that can improve exercise performance, speed recovery, and overall well-being. However, more research is needed to corroborate these findings, elucidate the mechanisms involved, and identify the populations most benefit from using oxygenated beverages.

CONCLUSION

2
The administration of drinks with oxygen content significantly affects the acceleration of the decrease in the pulse rate after physical exertion. Subjects who consumed oxygenated drinking water had a faster pulse decrease than those who consumed only plain water. Supplemental oxygen administration through oxygenated beverages helps improve oxygen supply throughout the body, accelerate muscle recovery, and optimize cardiorespiratory performance. This research makes an important contribution to enriching our understanding of the benefits of oxygenated beverages in the

context of physical activity. Oxygenated drinks can be an interesting alternative for individuals who want to speed up their body's recovery after exercise.

REFERENCES

- Aliriad, H., Adi, S., Fahrudi, A., Apriyanto, R., & Da'i, M. (2023). Exploring the relationship between body mass index and physical fitness: Implications from a comprehensive study in a secondary school setting. *Edu Sportivo: Indonesian Journal of Physical Education*, 4(2), 136–147.
- Aliriad, H., Da'i, M., Adi, S., & Apriyanto, R. (2023). Strategi Peningkatan Motorik untuk Menstimulus Motorik Anak Usia Dini melalui Pendekatan Aktivitas Luar Ruangan. *Jurnal Obsesi: Jurnal Pendidikan Anak Usia Dini*, 7(4), 4609–4623.
- Aliriad, H., Priadana, B. W., & Kurniawan, B. E. Y. (2023). Development of Kickboxing Tool Media for Pencak Silat Athletes. *Journal Coaching Education Sports*, 4(1), 95–104.
- Aliriad, H., Soegiyanto, S., Setijono, H., & Sulaiman, S. (2023). Effect of the Project-based Learning Model, Age, and Motor Educability on Fundamental Motor Skills in Early Children. *Health Education and Health Promotion*, 11(1), 125–131.
- Almy, M. A., & Sukadiyanto, S. (2014). Perbedaan pengaruh circuit training dan fartlek training terhadap peningkatan VO2Max dan indeks massa tubuh. *Jurnal Keolahragaan*, 2(1), 59–68.
- Andrastea, K. D. P., Karmaya, I. N. M., & Wardana, I. N. G. (2018). Hubungan indeks massa tubuh dengan tingkat kebugaran kardiovaskular pada mahasiswi Program Studi Pendidikan Dokter, Fakultas Kedokteran Universitas Udayana usia 18-21 tahun. *Bali Anatomy Journal*, 1(2), 30–34.
- Andriani, D. P., Setyanto, N. W., & Kusuma, L. T. W. N. (2017). *Desain dan Analisis Eksperimen untuk Rekayasa Kualitas*. Universitas Brawijaya Press.
- Awwal, A. S. S. (2019). *Pengaruh Pemberian Minuman Suplemen Berenergi Terhadap Peningkatan Vo2max Atlet Bulutangkis FIK UNM*. Universitas Negeri Makassar.
- Bahri, S., Sigit, J. I., Apriantono, T., Syafriani, R., Dwita, L. P., & Octaviar, Y. H. (2012). Penanganan Rehidrasi Setelah Olahraga dengan Air Kelapa (Cocos NuciferaL.), Air Kelapa ditambah Gula Putih, Minuman Suplemen, dan Air Putih. *Jurnal Matematika Dan Sains*, 17(1).
- Budiman, S. T., & Ray, H. R. D. (2021). Perbandingan Pengaruh Air Kelapa dan Minuman Isotonik Terhadap Tingkat Hidrasi Atlet Cabang Olahraga Bola Basket. *Jurnal Ilmu Faal Olahraga Indonesia*, 2(1), 12–19.

- Choi, H., Lim, J., & Lee, S. (2021). Body fat-related differences in gait parameters and physical fitness level in weight-matched male adults. *Clinical Biomechanics*, p. 81, 105243. <https://doi.org/https://doi.org/10.1016/j.clinbiomech.2020.105243>
- Endrawan, I. B., & Aliriad, H. (2023). *Problem-Based Collaborative Learning Model Improves Physical Education Learning Outcomes for Elementary School Students*.
- Franklin, B. A., Eijsvogels, T. M. H., Pandey, A., Quindry, J., & Toth, P. P. (2022). Physical activity, cardiorespiratory fitness, and cardiovascular health: A clinical practice statement of the American Society for Preventive Cardiology Part II: Physical activity, cardiorespiratory fitness, minimum, and goal intensities for exercise train. *American Journal of Preventive Cardiology*, 12, 100425. <https://doi.org/https://doi.org/10.1016/j.ajpc.2022.100425>
- Knowles, A., Wallhead, T. L., & Readdy, T. (2018). Exploring the synergy between sport education and in-school sport participation. *Journal of Teaching in Physical Education*, 37(2), 113–122.
- Krismawati, L. D. E., Andayani, N. L. N., & Wahyuni, N. (2019). Hubungan antara aktivitas fisik dengan indeks massa tubuh (IMT) pada remaja usia 16-18 tahun di SMA Negeri 2 Denpasar. *Majalah Ilmiah Fisioterapi Indonesia*, 7(1), 29–32.
- Kurniawan, W., Pramono, H., & Rumini, R. (2020). Effects of Intelligence Quotient, Emotional Quotient, and Motor Educability on Players Ability to Tact in Soccer Games. *Journal of Physical Education and Sports*, 9(1), 44–49.
- Kusuma, M. N. H. (2020). Efek minuman berbasis alkali terhadap kadar laktat darah dan denyut nadi istirahat setelah aktivitas fisik intensitas tinggi pada pemain sepak bola. *Jurnal SPORTIF: Jurnal Penelitian Pembelajaran*, 6(2), 348–363.
- Muhyi, M. (2015). Pengaruh Minuman Suplemen, Minuman Elektrolit dan Air Normal Terhadap Kinerja Olahraga. *Jurnal Ilmiah Adiraga ISSN*, 2477, 2445.
- Netzer, N. C., Faulhaber, M., Gatterer, H., Dünwald, T., Schobersberger, W., Strohl, K. P., & Pramsohler, S. (2023). The Question is Still Open: Is Supplemental Oxygen Enhancing Performance in Professional Athletes at High Altitude or Not? *Sports Medicine*, 53(5), 1101–1102.
- Pratama, R., & Bafirman, B. (2020). Pengaruh Circuit Training Terhadap Volume Oksigen Maksimal (Vo2Max) Atlet Sepakbola Rajawali Tanjung Jati Kabupaten Lima Puluh Kota. *Jurnal Stamina*, 3(5), 240–254.
- Samudera, I. P. P., & Ashadi, K. (2019). Perbandingan Beragam Jenis Air Minum Terhadap Status Hidrasi Melalui Aktivitas Fisik 5000 Meter. *Multilateral: Jurnal Pendidikan Jasmani Dan Olahraga*, 18(1).
- Sandi, I. N. (2016). Pengaruh latihan fisik terhadap frekuensi denyut nadi. *Sport and Fitness Journal*, 4(2), 1–6.

- Satria, M. H., Aliriad, H., Kesumawati, S. A., Fahrtsani, H., Endrawan, I. B., & Adi, S. (2023). Model Pengembangan Keterampilan Motorik My Home Environment terhadap Anak Disabilitas Intelektual. *Jurnal Obsesi: Jurnal Pendidikan Anak Usia Dini*, 7(2), 2336–2347.
- Sulaiman, S. (2022). Pengaruh Kadar Oksigen Dalam Minuman Terhadap Percepatan Penurunan Denyut Nadi Setelah Latihan Pada Mahasiswa Prodi Ilmu Keolahragaan FIK UNM. *Jurnal Sport Science*, 12(1), 27–32.
- Sumantri, I. S. (2021). *Survei Minat Siswa Dalam Melakukan Aktivitas Fisik Pada Pembelajaran Pjok Di Masa Pandemi Covid-19 (Penelitian Deskriptif pada Peserta Didik Kelas XI MIPA dan IPS SMA Negeri 1 Ciawi Kabupaten Tasikmalaya Tahun Ajaran 2021/2022)*. Universitas Siliwangi.
- Tirajoh, M. W. E., Rumampuk, J. F., & Lintong, F. (2016). Pengaruh Minuman Berkadar Oksigen Tinggi Terhadap Saturasi Oksigen Pada Olahraga Lari. *JKK (Jurnal Kedokteran Klinik)*, 1(1), 76–82.
- White, J., Dawson, B., Landers, G., Croft, K., & Peeling, P. (2013). Effect of supplemental oxygen on post-exercise inflammatory response and oxidative stress. *European Journal of Applied Physiology*, pp. 113, 1059–1067.
- Yulianto, S. M., Setyaningsih, P., & Santoso, D. A. (2022). Efektifitas Minuman Air Beroksigen terhadap Perubahan Kadar Hemoglobin melalui Aktifitas Fisik. *JUSTE (Journal of Science and Technology)*, 3(1), 90–98.

ORIGINALITY REPORT

14%

SIMILARITY INDEX

13%

INTERNET SOURCES

3%

PUBLICATIONS

4%

STUDENT PAPERS

PRIMARY SOURCES

1	www.researchgate.net Internet Source	5%
2	journal2.um.ac.id Internet Source	1%
3	proceedings.upi.edu Internet Source	1%
4	journal.unugiri.ac.id Internet Source	1%
5	jurnal.upmk.ac.id Internet Source	1%
6	Hanoi National University of Education Publication	1%
7	hehp.modares.ac.ir Internet Source	1%
8	Submitted to University of Limerick Student Paper	1%
9	jurnal.stokbinaguna.ac.id Internet Source	<1%

10	ejurnal.ubharajaya.ac.id Internet Source	<1 %
11	jurnal.univpgri-palembang.ac.id Internet Source	<1 %
12	ojs.unpkediri.ac.id Internet Source	<1 %
13	repository.ubharajaya.ac.id Internet Source	<1 %
14	www.science.gov Internet Source	<1 %
15	ijhp.net Internet Source	<1 %
16	pusdikra-publishing.com Internet Source	<1 %
17	worldwidescience.org Internet Source	<1 %
18	www.frontiersin.org Internet Source	<1 %

Exclude quotes On

Exclude matches Off

Exclude bibliography On

FINAL GRADE

GENERAL COMMENTS

/0

PAGE 1

PAGE 2

PAGE 3

PAGE 4

PAGE 5

PAGE 6

PAGE 7

PAGE 8

PAGE 9

PAGE 10

PAGE 11
