



## JUARA: Jurnal Olahraga

E-ISSN 2655-1896 ISSN 2443-1117  
<https://doi.org/10.33222/juara.v8i2.3272>



### The Impact of Sports and Health Physical Education Learning on Body Mass Index and Physical Fitness Before and During the Covid-19 Pandemic at SMP Negeri 1 Losari Cirebon

Ibnu Riyadi<sup>1</sup>, Setya Rahayu<sup>2</sup>, Sri Sumartiningsih<sup>3</sup>

<sup>1,2,3</sup> Faculty of Sport Science, Universitas Negeri Semarang, Semarang City, Central Java 50229, Indonesia

\*e-mail: [ibnu\\_riyadi@students.unnes.ac.id](mailto:ibnu_riyadi@students.unnes.ac.id)

#### Info Artikel

##### Article History:

Received 29 March 2023

Approved 25 July 2023

Published 28 July 2023

##### Keywords:

Buoy, leg length, breaststroke, swimming speed

#### Abstract

This exercise aims to discover the Impact of Physical Education, Learning Sports, and Health on Body Mass Index and Physical Fitness Before and During the Covid 19 Pandemic at SMP Negeri 1 Losari Cirebon. Comparative research design with a research sample of 120 students. The sample in the study was taken by total sampling. The test instrument for measuring body mass index is measuring body weight with a kilogram scale and height with a meter in cm. Meanwhile, physical fitness is measured by the bleep test. The results of the study showed (1) There was an impact of learning sports and health physical education on body mass index before the covid 19 pandemic at SMP Negeri 1 Losari Cirebon (2) There was an impact of learning physical education sports and health on physical fitness before the covid 19 pandemic at SMP Negeri 1 Losari Cirebon.

© 2023 Ibnu Riyadi, Setya Rahayu, Sri Sumartiningsih  
Under the license CC BY-SA 4.0

✉ Alamat korespondensi: Kampus Pascasarjana UNNES Jl. Kelud Utara 3, Gajahmungkur Semarang

E-mail: [ibnu\\_riyadi@students.unnes.ac.id](mailto:ibnu_riyadi@students.unnes.ac.id)

## INTRODUCTION

The pandemic of the coronavirus disease 2019 (Covid-19) has attacked all aspects of life. One of the fields affected tremendously is the field of Education (Aji, 2020: 32). What emerges from this pandemic, especially in education, is the application of learning from-home rules (Purwanto et al., 2020, p. 23). This

is based on the Circular Letter of the Minister of Education and Culture of the Republic of Indonesia No. 3 of 2020 concerning preventing Covid-19 in Education Units.

In the circular letter, all levels of education have undergone a very extraordinary change, namely from conventional learning patterns to online-based or commonly known as online (Herliandry et al., 2020). Online learning

uses the Internet network in the learning process (Isman, 2017). Online learning allows students to connect with teachers through the Google Classroom app, phone or chat, zoom, or via WhatsApp. It is an update to make learning fun. Many things hinder online learning, including slow internet, especially for students who live in remote areas, high internet costs, limited use of computers and smartphones, learning at home a lot, and teachers and students needing to keep up with the development of science and technology. It happens, and students play many games.

Teacher challenges in online learning will be straightforward to answer by teachers accustomed to using technology during the learning process. However, this challenge is quite a big obstacle among sports teachers, who rarely use technology during the learning process (Indrayana & Sadikin, 2020). They usually focus on practice and field activities during learning. Transforming learning in the field, where the entire process is doing movements and activities, into online activities is certainly not easy (Sari & Sutapa, 2020).

The impact of PJOK learning on the body mass index and physical fitness of students before and during the pandemic encouraged researchers to try to conduct pre-observation at SMPN 1 Losari located in Losari District to determine the quality of the body mass index and the level of physical fitness of students during PJOK online learning during the COVID-19 pandemic. Based on the observations of researchers, there are several problem findings, including the still not optimal intensity of students in exercising, not optimal

PJOK learning, which is in improving body mass index and physical fitness during the Covid-19 pandemic; some students experience fatigue in the eyes of PJOK tasks through online, The lack of movement of students in PE learning is due to online learning because it uses technology instead of direct physical activity, there is no student awareness of the importance of body mass index quality and physical fitness during this covid pandemic, some students play more gadgets Compared to physical activity that results in weight gain or obesity, lack of physical activity of students outside of school. In addition, based on data obtained by researchers in schools shows that students' weight increases in online learning through PJOK. In addition, on the problem based on the above observations, researchers also conducted TKJI tests and body mass index measurements to determine the impact of online learning on body mass index and physical fitness.

The data results show that the sample of 20 before online learning PJOK is as follows with details of 15 people (75%) with average body weight and five people (25%) with overweight body. However, after the pandemic, online learning PJOK is as follows: details of 10 people (50%) with average body weight, six people (30%) with body weight are overweight, and four people (20%) with body weight are obese. The data shows that students' weight has increased in online learning, physical education, sports, and health.

The lack of physical activity of students triggered the weight gain. This is in line with research by Hita et al. (2020). There is a

significant relationship between nutritional status and physical activity levels during the COVID-19 quarantine period, so an appeal is needed from the government so that people continue to maintain physical activity amid limited space for movement. The research results by (Budi et al., 2020) need special attention to increasing the Body Mass Index (BMI) owned to the Normal BMI level. Therefore, paying attention to physical activity patterns is necessary to adjust BMI to suit body conditions. The results of research by Habut et al. (2015) show that there is a relationship between physical activity and dynamic balance (maintenance of body balance when in a moving position) in students; students are tried to continuously regulate and maintain eating/consumption patterns, physical activity patterns, regulating lifestyles and other things that can make a person experience a decrease or increase in body mass index. Factors that can affect a person's BMI are age, gender, genetics, diet, and physical activity (Yusuf & Ibrahim, 2019). This study is in line with the research results proving that physical activity is one of the factors influencing BMI (Body et al.) (Habut et al., 2018; Indahsari & Mahali, 2019).

In addition to body mass index data, online learning can impact students' physical fitness. Thus it can be said that if students who have obesity, they will have difficulty moving. In addition to body mass index data, researchers also conducted physical fitness tests to determine the level of physical fitness during the Covid-19 pandemic. The results of physical fitness test data with multi fitness test can be explained that a sample of 20 with details of 2

people (10%) get a score less once, 16 people (80%) get a scoreless, and only two people (10%) get a score of enough meaning from the percentage of physical fitness. Students at SMPN 1 Losari during the pandemic through online learning were 19 students or (90%) with low physical fitness. Thus, students' body mass index and physical fitness during learning are in a low category.

The presentation illustrates that before the Covid-19 pandemic, much PJOK learning was carried out outside the classroom or offline in the field. However, after the pandemic, the implementation of PJOK learning changed to online learning, which sports teachers have yet to become accustomed to PJOK online learning. Limited space and time because it is online will also impact the quality of the body mass index and physical fitness of students.

Face-to-face learning is starting to be implemented again; this will still have an impact for the last two years during the pandemic with online learning, thus that online and offline learning will have a difference in the impact produced on the body mass index and physical fitness of students, therefore, according to researchers it is essential to study and know about the impact of online learning and offline PJOK in the body mass index and physical fitness of SMP Negeri 1 Losari agar students in the future can be evaluated to find steps to improve and improve physical fitness and also so that students have an average body mass index or do not experience obesity or obesity during the Covid 19 pandemic.

## **METHOD**

The research method is a comparative quantitative research method with a comparative nature. Comparative research is used to compare similarities or differences. So comparative research is a type of research that compares several groups against a particular variable (Arikunto, 2013). Population is the overall subject of study (Arikunto, 2013). So after understanding the expert opinion above, the population in this study is all students at SMPN 1 Losari, which amounts to 120 students. The sampling technique used by researchers using Saturated Sampling. Saturated sampling is a sampling technique when all population members are used as samples (Sugiyono, 2014). Based on the above theory, the researcher wants to take all the population to be sampled. So the sample in the study was all class VIII students with 120 people.

The research variables consist of independent variables and dependent variables, which include PJ OK learning before the pandemic and PJOK learning during the pandemic, which includes dependent variables like body mass index and physical fitness. Data collection techniques through initial pretests during the pandemic during learning by conducting physical fitness tests and body mass index, then conducting final tests after offline learning with physical fitness tests and body mass index. The body mass index research instrument uses a manual weight scale. At the same time, height is measured using a microtonal with an accuracy of 0.1 cm, as for

measuring physical fitness using the bleep test. This study used inferential statistics with the help of SPSS 25 to test the hypothesis with an independent sample t-test.

## **FINDINGS AND DISCUSSION**

### **Findings**

Based on the body mass index research data, it can be illustrated that BMI during PJOK learning before the Covid-19 pandemic male students had a mean of 20.46 and during the pandemic 20.92 while female students before the pandemic had a mean of 20.98 and during the pandemic 21.48. Male students who had an average body before the pandemic had a mean of 19.85, and during the pandemic, 19.89. In contrast, female students who had an average body before the pandemic had a mean of 20.52, and during the pandemic, 20.42. However, students were obese during the pandemic, male students had a mean of 25.42, and female students had a mean of 25.65. Male students experienced pre-obese before the pandemic with a mean of 23.65, and during the pandemic, with a mean of 23.44.

Meanwhile, female students experienced pre-obese before the pandemic with a mean of 23.67, and during the pandemic, with a mean of 24.05. This is because, during the Covid-19 pandemic, PJOK learning was carried out online, so there was a lack of physical activity or sports in students because it was online, which resulted in students' eating and movement patterns eating more, sleeping, and lack of exercise so that it had an impact on the body that was overweight. The similarity test

results of the two average final test samples  $t$ -Count value = 2.440 greater than  $t$ -Table value = 0.676 and signification value  $0.00 < 0.05$ . Thus, the hypothesis is accepted, or there are differences in the impact of PJOK learning before and during the Covid-19 pandemic on the body mass index in students at SMPN 1 Losari.

In general, weight gain is due to the body getting nutritious food intake. A person who does much physical activity will lose energy; the intake of food consumed produces energy. However, the imbalance of food intake with physical activity that is carried out causes the body to be not ideal; if food intake is more and physical activity is less likely, the body mass index will increase, and vice versa.

Lack of physical activity in daily activities is also one of the risk factors for increasing BMI values (Nurmalia, 2011, p. 10). Destructive activity patterns will disrupt energy balance, where the incoming energy is greater than the energy that comes out, so it will cause fat accumulation, and children will look fatter. Therefore, the energy imbalance that occurs can lead to overweight and obesity. Being overweight can be said to be obese; with the fat category, it can be seen physically that an obese child is more silent and difficult to move. Children who fall into the fat category must do much physical activity because, with activity, there will be burning calories (Anjali, 2008, p. 17); with burning calories in the body, the fat in the body will decrease little by little according to the routine or not someone does activities. Lack of activity will also affect bone growth, bone mass, and bone flexibility. So children

whose activity is less will have disturbances in bone growth; it can be said that bone growth is not optimal because physical activity will trigger bone growth hormone. Other bone disorders will easily fracture and bone loss due to less bone composition (Miftah, 2010: 7). Body mass index is a translation of the term Body Mass Index (BMI). BMI is a simple tool to monitor nutritional status, especially those related to deficiency and overweight (Nyoman, 2002, p. 60)

Excess weight negatively affects a person's movements. When someone has excess weight or obesity, it will undoubtedly impact a person's limited movement (Moeloek, 2008: 8). Of course, people with excess weight will find it challenging to display material skills in exercising at school.

## Discussion

The results of physical fitness research data can be illustrated that physical fitness during PJOK learning before the covid 19 pandemic male students had a mean of 36.14 and during the pandemic 33.73 while female students before the pandemic had a mean of 37.78 and during the pandemic 30.47. Male students who had less physical fitness before the pandemic had a mean of 30.52, and during the pandemic, 43.43. In comparison, female students who had less physical fitness before the pandemic had a mean of 43.43, and during the pandemic, 20.42. Male students who had less physical fitness before the pandemic had a mean of 36.75, and during the pandemic, 36.14. In comparison, female students who had less physical fitness before the pandemic had a

mean of 37.46 and during the pandemic 35.35. Male students who had moderate physical fitness before the pandemic had a mean of 42.21, and during the pandemic, 42.

In contrast, female students with moderate physical fitness before the pandemic had a mean of 23.67. The similarity test results of the two average final test samples t-Count value = 4.877 greater than  $t_{\text{Table}}$  value = 0.676 and signification value  $0.00 < 0.05$ . Thus, the hypothesis is accepted, or there are differences in the impact of PJOK learning before and during the Covid-19 pandemic on physical fitness in students at SMPN 1 Losari. Thus, researchers can conclude that there is an impact of PJOK learning before and during the COVID-19 pandemic. This is because, during the Covid-19 pandemic, PJOK learning was carried out online, so the lack of physical activity or sports in students, because it was through online, resulted in the lack of movement of students to eat, sleep and lack of exercise, which had an impact on student's physical fitness.

The above results are corroborated by several research studies that have been carried out, which state that, in essence, there is a relationship between physical activity (physical activity) and physical fitness (physical fitness). Among children and adolescents, physical activity (PA) is associated with more benefits, including lower rates of obesity, improved cardiovascular and muscular fitness, higher bone mineral density, improved psychosocial health, and academic achievement (De Bate, Gabriel, Zwald, Huberty, & Zhang, 2009)

The above quote explains the benefits of physical activity that are associated with lower rates of obesity, improved cardiovascular and muscular fitness, high bone density, improved psychosocial health, and academic achievement. Physical activity is essential for improving cardiorespiratory fitness. Several studies have demonstrated that more active children have better cardiorespiratory fitness than inactive ones (Hsieh et al., & Chang, 2014). That is, physical activity is essential to improve cardiorespiratory fitness. Several studies have shown that more active children have better cardiorespiratory fitness than inactive children. Physical activity is positively related to cardiorespiratory fitness in children and youth, and both preadolescents and adolescents can improve cardiorespiratory fitness with exercise training (WHO, 2010, p. 19). This means that physical activity is related to the cardiorespiratory fitness of children and adolescents, and adolescence can improve cardiorespiratory fitness with exercise training. In addition, research conducted by Hsieh, Chen, Huang, Chen, Li, & Chang, Yi-Ching & Robert, and Desi Ardiyani also helped strengthen the above theories. The study by Hsieh, Chen, Huang, Chen, Li, & Chang (2014) revealed a significant relationship between BMI and physical activity and cardiorespiratory endurance level. Yi-Ching & Robert (2001) say a significant and positively correlated relationship exists between physical activity and physical fitness as measured by an 8-mile running test. From some of the quotes above, it can be concluded that physical activity affects a person's physical fitness; if a person's physical

activity is high, it can be said that his physical fitness is also high.

In their book *Concepts of Physical Fitness with Laboratories*, Corbin & Lindsey (1997: 5) say: "Physical fitness is the body's ability to function efficiently and effectively. It consists of health-related physical fitness and skill-related physical fitness, which have at least eleven different components, each of which contributes to total quality of life."

The quote explains that physical fitness is the ability of the body to function efficiently and effectively. Physical fitness consists of health-related fitness and skill-related fitness, totaling 11 components, each contributing to quality of life. Fitness components include health-related components such as body composition, cardiorespiratory fitness, flexibility, muscular endurance, and strength. Components of skills are agility, balance, coordination, explosive power, reaction speed, and speed (Corbin & Lindsey, 2007: 5-8). From some quotes and research results above, it can be concluded that physical activity affects a person's physical fitness; if it is high, then his physical fitness is also high. Thus, it can be concluded that the physical activity of SMPN 1 Losari students has low physical activity, which impacts the index of body mass and low physical fitness.

Low physical fitness results due to an unbalanced healthy lifestyle. Low physical fitness data shows that there is an imbalance between intake, rest, and exercise (Irianto, 2006: 2). In addition, lifestyle is also a thing that can make physical fitness low or even very low. A sedentary lifestyle (relaxing, sitting

around) is seen when teenagers are at home. Besides that, teenagers now sit and use gadgets, resulting in silence and ultimately impacting the student's physical fitness. Based on low physical fitness in adolescents. Therefore, the role of parents, schools, and village governments should encourage (motivation) and provide facilities for adolescents to be willing and responsible for their physical fitness. Good facilities to maintain fitness are sports facilities such as bicycles, swimming, jogging, basketball, volleyball, and so on that can be provided by parents and schools. A good encouragement or motivation is to invite teenagers to regularly do sports activities carried out by parents so that adolescents can get used to exercising, which will become a routine and essential activity.

## CONCLUSION

Based on the results of the hypothesis test, it can be concluded that:

- a. There is an Impact of Physical Education, Sports, and Health Learning Before and During the Covid-19 Pandemic on the Body Mass Index in Students at SMPN 1 Losari.
- b. There is an Impact of Physical Education Learning in Sports and Health Before and During the Covid 19 Pandemic on Physical Fitness in Students at SMPN 1 Losari

## REFERENCES

- Aji, R. H. S. (2020). Dampak Covid-19 pada Pendidikan di Indonesia: Sekolah,

- Keterampilan, dan Proses Pembelajaran, SALAM: Jurnal Sosial dan Budaya Syar-i, 7(5). doi: 10.15408/sjsbs.v7i5.15314.
- Ambarita, Jenri, Jarwati, dan Dina Kurnia Restianti (2020). Pembelajaran Luring. Jawa Barat: Penerbit Adab.
- Arikunto, Suharsimi. (2013). Prosedur Penelitian. Jakarta: PT Rineka Cipta.
- Badriah, Dewi Laelatul. (2011). Fisiologi Olahraga. Bandung: Multazam.
- Badriah, Dewi Laelatul. (2012). Metodologi Penelitian Ilmu-Ilmu Kesehatan. Bandung: Multazam.
- Bilfaqih, Y. And Qomarudin, M. N. (2015). Esensi Pengembangan Pembelajaran Daring', Deepublish, 1(1), p. 131.
- Budi, D. R. et al. (2020) Indeks Masa Tubuh ( IMT ): Kajian Analisis Pada Atlet Renang Junior Usia Sekolah Dasar Indeks Masa Tubuh', Journal of Teaching Physical Education in Elementary School, 3(2), pp. 46–53
- Centers for Disease Control and Prevention. Body mass index: Considerations for practitioners. Cdc [Internet]. 2011:1-4
- Christiani, Ve. (2021). Efektivitas Pembelajaran PJOK di SMP N 3 Godean Melalui Media Daring Di Masa Pandemi Covid-19. S1 Thesis, Fakultas Ilmu Keolahragaan.
- De Bate, R. D., Gabriel, K. P., Zwald, M., Huberty, J., & Zhang, Y. 2009. Changes in Psychosocial Factors and Physical Activity Frequency Among Third to Eighth-Grade Girls Who Participated in a Developmentally Focused Youth Sport Program: A Preliminary Study. School Health, 475.
- Dewi, Wahyu Aji Fatma. (2020). Dampak COVID-19 terhadap Penerapan Pembelajaran Online di Sekolah Dasar. Jurnal Ilmu Pendidikan. Vol 2. No.1. <https://edukatif.org/index.php/edukatif/article/view/89>.
- Erlinda, E. (2017) Hubungan Status Gizi Dengan Hasil Belajar Pendidikan Jasmani Olahraga Kesehatan Siswa Sekolah Dasar 52 Kuranji Kota Padang, Sport Science, 17(2), pp. 84–91.
- Fadillah, A., & Bilda, W. (2019). Pengembangan Video Pembelajaran Matematika Berbatuan Aplikasi Sparkoll Videoscribe. Jurnal Gantang, 4(2), 177–182. <https://doi.org/10.31629/jg.v4i2.1369>
- Gugus Tugas Penanganan Covid 19. (2020). Protokol Percepatan Penanganan Pandemi Covid 19 ( Corona Virus Disease 2019) Diakses pada tanggal 26 Februari 2021 melalui <https://covid19.go.id/>.



- Habut, M. Y., Nurmawan, I. P. S. and Wiryanthini, I. A. D. (2018) Relationship of Body Mass Index and Physical Activity for Dynamic Balance', *Majalah Ilmiah Fisioterapi Indonesia*, 2, pp. 45–51.
- Hanief, Y. N., & Sugito, S. (2015). Membentuk Gerak Dasar Pada Siswa Sekolah Dasar Melalui Permainan Tradisional. *Jurnal SPORTIF : Jurnal Penelitian Pembelajaran*, 1(1), 100–113. [https://doi.org/10.29407/js\\_unpgri.v1i1.575](https://doi.org/10.29407/js_unpgri.v1i1.575).
- Harris, I. N. (2018). Model pembelajaran peer teaching dalam pembelajaran pendidikan jasmani. *Journal of Chemical Information and Modeling*, 4(9), 2. <https://ejournal.unsub.ac.id/index.php/FKIP/article/download/191/170>
- Herliandry, L. D. et al. (2020). Pembelajaran Pada Masa Pandemi Covid-19: JTP - *Jurnal Teknologi Pendidikan*, 22(1), pp. 65–70. doi: 10.21009/jtp.v22i1.15286.
- Hsieh, P.-L., Chen, M.-L., Huang, C.-M., Chen, W.-C., Li, C.-H., & Chang, L.-C. 2014. Physical Activity, Body Mass Index, and Cardiorespiratory Fitness among School Children in Taiwan: A Cross-Sectional Study. *Environmental Research and Public Health*, 7276.
- Huang, Yi-Ching & Malina M. Robert. 2011. Physical Activity and Health-Related Physical Fitness in Taiwanese Adolescents. *Journal of Physiological Anthropology and Applied Human Science*. USA: Department of Kinesiology
- Indahsari, N. K. and Mahali, M. I. (2019) Hubungan Antara Kebiasaan Aktivitas Fisik dengan Indeks Massa Tubuh pada Mahasiswa FK-UWKS Angkatan 2016 dan 2017', *Hang Tuah Medical journal*, 17(1), p. 84. doi: 10.30649/htmj.v17i1.188.
- Indrayana, B. and Sadikin, A. (2020). Tantangan dan Solusi Pembelajaran Daring Olah Raga di Masa Pandemi Covid-19 (Sports Online Learning Challenges and Solutions during the Covid-19Pandemi): *Indonesion Journal of Sport Science and Coaching*, 2(3), pp. 139–142. Available at: <https://online-journal.unja.ac.id/IJSSC/article/view/10158>.
- Irianto, Djoko Pekik. (2004). *Bugar dan Sehat Dengan Olahraga*. Yogyakarta : Andi Offset.
- Irianto, Djoko Pekik. 2006. *Pedoman Praktis Berolahraga Untuk Kebugaran Dan Kesehatan*. Yokyakarta: ANDI Ofset.
- Isman, Mhd. (2016). Pembelajaran Media dalam Jaringan (Moda Jaringan). *The Progressive and Fun Education Seminar*, 586.

- Ismaryati. (2006). Tes dan Pengukuran Olahraga. Surakarta: Sebelas Maret University Press.
- Jumadi, Anak Agung Ngurah Putra Laksana, dan I Gusti Ngurai Agung Pranata. (2020). Efektivitas Pembelajaran PJOK pada Teknik Dasar Passing Bawah Permainan Bolavoli Melalui Media Daring pada Masa Pandemi Covid-19. *Jurnal Pendidikan Kesehatan Rekreasi*, 7(2), 423-440. <https://doi.org/10.5281/zenodo.5027642>
- Kemedikbud. (2020). Surat Edaran Kemdikbud Nomor 4 Tahun 2020 Tentang Pelaksanaan Kebijakan Pendidikan Dalam Masa Darurat Penyebaran Coronavirus Disease (Covid-19). Jakarta.
- Kemdikbud. (2020). Surat Edaran Sekretaris Jenderal Kemdikbud Nomor 15 Tahun 2020 Tentang Pedoman Penyelenggaraan Belajar Dari Rumah Dalam Masa Darurat Penyebaran Corona Virus Disease (Covid-19). Jakarta.
- Lestari, Ayu Lintang (2020). Efektivitas Pembelajaran PJOK Berbasis Daring dalam Pandangan Siswa pada Masa Pandemi Covid-19. Skripsi. Surakarta: Fakultas Keolahragaan.
- Listiandi, A. D. et al. (2020) Healthy fitness zone: identification of body fat percentage, body mass index, and aerobic capacity for students', *Jurnal SPORTIF : Jurnal Penelitian Pembelajaran*, 6(3), pp. 657–673. doi [https://doi.org/10.29407/js\\_unpgri.v6i3.14936](https://doi.org/10.29407/js_unpgri.v6i3.14936).
- Lutan, Rusli. (2012). Menuju Sehat dan Bugar. Jakarta: Depdiknas
- M Fauzan Abdillah Rasyid. (2021). Pengaruh Asupan Kalsium Terhadap Indeks Masa Tubuh (IMT). *Jurnal Medika Utama*, 2(04 Juli), 1094-1097. Retrieved from <https://jurnalmedikahutama.com/index.php/JMH/article/view/226>
- Mahendra, Agus. (2007). Asas dan Falsafah Pendidikan Jasmani. Bandung: FPOK-UPI.
- Mansyur, A. R. (2020). Dampak COVID-19 Terhadap Dinamika Pembelajaran Di Indonesia: *Education and Learning Journal*, 1(2), p. 113. doi: 10.33096/eljour.v1i2.55
- Muhajir. (2007). Pendidikan Jasmani Teori dan Peraktik 1. Jakarta: Erlangga.
- Mylsidayu dan Febi Kurniawan. (2015). Ilmu Kepelatihan Dasar. Bandung. Alfabeta.
- Nanaware NL, Gavkare AM, Surdi AD. (2011). Study Of Correlation Of Body Mass Index (BMI) With Blood Pressure In School Going Children And Adolescents. *Int J Recent Trends Sci Technol*. 2011;1(1):20-6

- Narbuko, C. and Achmadi, A. (2015). Metodologi Penelitian. Bumi Aksara.
- Nurhasan. (2005). Aktivitas Kebugaran. Jakarta: Depdiknas.
- Nurhasan dan Hasanudin Cholil. (2007). Tes dan Pengukuran Keolahragaan. Bandung : FPOK-UPI.
- Pangondian, Roman A. (2019). Faktor-Faktor Yang Mempengaruhi Kesuksesan Pembelajaran Daring Dalam Revolusi Industri 4.0. Seminar Nasional Teknologi Komputer & Sains (SAINTEKS). 57
- Pamungkas, T. S., & Hariyoko. (2018). Pengaruh Metode Drill Dan Metode Barrier Hops Terhadap Hasil Belajar Shooting. Gelanggang Pendidikan Jasmani Indonesia, 2(1), 46–51. <https://doi.org/10.17977/um040v2i1p46-51>.
- Paramitha, S. T. (2018). Revitalisasi Pendidikan Jasmani untuk Anak Usia Dini melalui Penerapan Model Bermain Edukatif Berbasis Alam. JPJO, 3(1), 41–51.
- Pratiwi, E. W. (2020). Dampak Covid-19 Terhadap Kegiatan Pembelajaran Online Di Perguruan Tinggi Kristen Di Indonesia. Perspektif Ilmu Pendidikan, 34(1), 1–8. <https://doi.org/10.21009/pip.341.1>.
- Priyastama, Romie. (2017). Buku Sakti Kuasi SPSS Pengolahan Data dan Analisis Data. Yogyakarta: PT Anak Hebat Indonesia.
- Purnama, Sari (2020). Efektivitas Pembelajaran Jarak Jauh Dengan Daring Selama Pandemi COVID-19 Mata Pelajaran Pendidikan Jasmani Olahraga dan Kesehatan (PJOK). Seminar Nasional, 2020.
- Putra, R.N.Y., Ermawati., & Arni Amir. (2016). hubungan IMT dengan usia menarche. Jurnal Kesehatan Andalas, 5(3), 551–557. <http://jurnal.fk.unand.ac.id/index.php/jka>.
- Putra, G. N. K. W., Artanayasa, I. W., & Suwiwa, I. G. (2020). Pengaruh Model pembelajaran Kooperatif Tipe Numbered Head Together Berbantuan Media Gambar Terhadap Hasil Belajar Teknik Dasar Passing Bola Voli. Jurnal Ilmu Keolahragaan Undiksha, 8(3), 164–172. <https://doi.org/10.23887/jiku.v8i3.29823>.
- Rahadi, F. (2020) ‘Pembelajaran Daring Beri Tantangan Positif Guru dan SekolahRepublikaOnline’. Available at: <https://republika.co.id/berita/q8s1i9291/pembelajaran-daring-beri-tantangan-positif-guru-dan-sekolah>.

- Ramdani, Adnan. (2021). Efektivitas Pembelajaran Daring Pendidikan Jasmani Olahraga Dan Kesehatan Dimasa Pandemi Covid-19 Berdasarkan Pandangan Siswa Kelas IV dan V SD Negeri 1 Binangun. S1 thesis, Fakultas Ilmu Keolahragaan.
- Roida, Pakpahan., dan Yuni Fitriani. (2020). Analisa Pemanfaatan Teknologi Informasi dalam Pembelajaran Jarak Jauh di Tengah Pandemi Virus Corona Covid-19. Universitas Bina Sarana Informatika
- Roji. 2006. Pendidikan Jasmani Olahraga dan Kesehatan kelas VII. Jakarta: Erlangga.
- Sari, D. P. and Sutapa, P. (2020). Efektifitas Pembelajaran Jarak Jauh dengan Daring Selama Pandemi COVID-19 Mata Pelajaran Pendidikan Jasmani Olahraga dan Kesehatan (PJOK): Pediatric Critical Care Medicine, Publish Ah, pp. 19–29.
- Sobron A.N, B. R. (2019). Persepsi Siswa dalam Studi Pengaruh Daring Learning terhadap Minat Belajar IPA. Pendidikan Islam dan Multikulturalisme.
- Sugiyono. (2014). Metode Penelitian Kuantitatif Kualitatif dan R & D. ALFABETA.
- Suherman, Adang. (2009). Revitalisasi Pengajaran dalam Pendidikan Jasmani. Bandung: CV. Bintang WarliArika.
- Sukadiyanto. (2007). Majalah Olahraga. Yogyakarta: Fakultas Ilmu Keolahragaan.
- Syarifudin, Albitar S. (2020). Implementasi Pembelajaran Daring Untuk Meningkatkan Mutu Pendidikan Sebagai Dampak Diterapkannya Social Distancing. Jurnal Pendidikan Bahasa dan Sastra Indonesia. 31-33
- World Health Organization. (2010). Global Recommendations on Physical Activity for Health. Switzerland: WHO Press.
- WHO. (2020). Physical Activity Factsheet. <http://www.who.int/mediacentre/factsheets/fs385/en/>. Diakses pada 2 Juni 2021.
- Yusuf, R. N. and Ibrahim, I. (2019) Correlation Of Body Mass Index (BMI) With Cholesterol', Jurnal Kesehatan Saintika Meditory, 1, pp. 50–56.
- Education and Training Studies, 6(11), 67-74.
- Thein, J. M., & Brody, L. T. (2000). Aquatic-based rehabilitation and training for the shoulder. Journal of athletic training, 35(3), 382.
- Trisnowiyanto, B. (2015). PENJASKESREK FKIP UNS JOURNAL OF PHEDHERAL <http://jurnal.fkip.uns.ac.id>

<http://penjaskesrek.fkip.uns.ac.id>. 11(2),  
71-78.

Umaniora, S. E. R. I. H., Safelia, N., Friyani,  
R., Indonesia, P. P., & Octavia, A.  
(2012). J Urnal P Enelitian U Niversitas  
J Ambi. 14.