

Physical Activity Analysis for Esports Athletes in Kediri City

Amelia Alfina Rachmawati¹, M. Akbar Husein Allsabab², Mokhammad Firdaus³

¹²³Universitas Nusantara PGRI Kediri, Indonesia

Article Info

Article history:

Accepted: 21 July 2026

Published: 04 Agustus 2026

Keywords:

Physical Activity,
Athlete eSports,
Sedentary Behavior.

Abstract

The predominance of prolonged sedentary behavior among eSports athletes has the potential to trigger sedentary behavior and affect their physical activity levels. This study aims to describe the physical activity profiles and sedentary behaviors of eSports athletes at ESI in Kediri City. Using a descriptive quantitative method, this study involved 25 athletes as subjects. Data were collected using the International Physical Activity Questionnaire-Short Form (IPAQ-SF) and analyzed descriptively based on percentages. The results revealed that the majority of athletes had high levels of physical activity (60%), followed by low (24%) and moderate (16%) levels. Conversely, the subjects' sedentary behavior was dominated by the moderate (48%) and high (44%) categories, while the low category accounted for only 8%. This study concludes that the high level of physical activity among ESI Kota Kediri eSports athletes has not been sufficient to eliminate their high exposure to sedentary behavior. Therefore, intervention strategies are needed to reduce sedentary duration in order to maintain the athletes' health and performance.

This is an open access article under the [Creative Commons Attribution-ShareAlike 4.0 International License](https://creativecommons.org/licenses/by-sa/4.0/)



Corresponding Author:

Amelia Alfina Rachmawati

Universitas Nusantara PGRI Kediri

Email Correspondent: alpindmangu95@gmail.com

1. INTRODUCTION

The development of digital technology over the past two decades has transformed various aspects of people's lives, including sports. One example of this development is the emergence of electronic sports, or eSports, which has now developed into a competitive sports industry with a growing number of players, spectators, and tournaments. No longer viewed solely as entertainment, eSports has become a recognized sport in various national and international competitions. This demonstrates that eSports has evolved into an activity that demands technical skills, strategy, concentration, and optimal individual performance to face increasingly fierce competition (Dhedhy Yuliawan, 2021). eSports in Indonesia continues to develop; this can be seen from the existence of various big competitions and the increasing number of esports communities that have emerged (Romario F D Purba et al., 2024).

eSports athletes are players who regularly participate in video game competitions, train both individually and in teams, and participate in competitions, *gameplay*, professional or semi-professional (Nicholson et al., 2024). Unlike conventional sports, which are dominated by physical activity, most activities in eSports are performed in a seated position for long periods. eSports athletes can spend hours practicing, analyzing matches, or participating in online and offline competitions. If this condition persists for long periods without sufficient physical activity, it can impact the health and fitness of players (Ekefj rd et al., 2024). This activity pattern leads to high levels of sedentary

behavior, which in the long term can potentially cause various health problems such as musculoskeletal disorders, an increased risk of metabolic disease, decreased physical fitness, and even sleep disturbances (Cyma-Wejchenig et al., 2024). Lack of physical activity can be a major factor in mortality, as it carries a 20% to 30% higher risk of death compared to physically active people (WHO, 2024). Therefore, although achievement in eSports is largely determined by cognitive abilities and playing skills, physical condition remains an important component that supports an athlete's overall performance.

Physical activity is one of the factors that plays a role in maintaining health and fitness. The World Health Organization recommends that adults aged 18–64 engage in at least 150–300 minutes of moderate-intensity physical activity per week or at least 75–150 minutes of vigorous-intensity physical activity per week. Furthermore, the WHO emphasizes the importance of reducing sedentary time, as prolonged sitting is known to be associated with an increased risk of non-communicable diseases and premature death (WHO, 2020). Therefore, balancing play and physical activity is a crucial aspect of an eSports athlete's life.

Several previous studies have shown that the physical activity levels of eSports athletes remain an interesting topic to study. Research conducted by Sinatra reported that East Java eSports athletes in the Mobile Legends division tended to have low levels of physical activity and spent most of their time sitting during training (Sinatra, 2022). Similar findings were also reported by Paramitha and colleagues, who stated that eSports activities are inherently low-demanding, requiring additional efforts to maintain athlete fitness (Sandey et al., 2021). Low levels of physical activity among eSports players may be related to the sedentary lifestyle common in competitive gaming communities (Başoğlu, 2025). However, different results were found by Giakoni-Ramírez and colleagues, who showed that most professional eSports athletes have moderate to high levels of physical activity (Giakoni-Ramírez et al., 2022). These differences in results indicate that the characteristics of eSports athletes' physical activity can vary depending on the training environment, level of competition, and characteristics of the respondents studied.

To date, studies on the physical activity of eSports athletes at the regional level are relatively limited, particularly for athletes under the guidance of official organizations. However, information on physical activity levels and sedentary behavior is essential as a basis for developing more comprehensive development programs. Athletes with good levels of physical activity are expected to maintain their health and fitness, thus supporting their performance during training and competitions. Conversely, high levels of sedentary behavior have the potential to hinder athletes' long-term health.

The novelty of this study lies in providing empirical evidence on the coexistence of physical activity levels and sedentary behavior among regional esports athletes under the official Esports Indonesia (ESI) organization in Kediri City. Unlike previous studies that mainly focused on professional players or national competitions, this study simultaneously evaluates both variables using the IPAQ-SF.

Based on these conditions, this study was conducted to obtain an overview of the physical activity levels of eSports athletes who are members of the ESI Kediri City. Using the IPAQ-SF questionnaire, it measures physical activity levels based on an individual's activities over the past seven days, thus providing an overview of a person's physical activity category, whether low, moderate, or high. (Manci & Günay, 2023). The research results are expected to provide scientific information regarding

the physical activity conditions of regional eSports athletes and serve as a consideration for coaches, organizational administrators, and athletes in designing a more balanced training pattern between playing and physical activities to support the health and performance of athletes in a sustainable manner.

2. METHOD

This study uses a quantitative approach with a descriptive design to describe the level of physical activity and sedentary behavior of ESI eSports athletes in Kediri City. The study was conducted in April 2026 involving athletes who actively participated in training and competition activities under the auspices of ESI Kediri City. The study population consisted of 40 ESI eSports athletes in Kediri City. The sample was selected using a purposive sampling technique based on the following criteria: (1) aged ≥ 18 years, (2) actively training and participating in competitions, (3) having been a member of ESI Kediri City for at least six months, and (4) willing to be research respondents. (5) Athletes who were willing to fill out the questionnaire from April 15, 2026, to April 26, 2026. Based on these criteria, 25 athletes were selected as research samples. Data were collected using the International Physical Activity Questionnaire–Short Form (CL Craig, 2019). This instrument consists of seven questions regarding vigorous physical activity, moderate physical activity, walking activity, and sitting duration over the past seven days. This instrument has been widely used in physical activity research and has demonstrated good reliability through test-retest testing, as well as adequate predictive, concurrent, convergent, criterion, and discriminant validity for measuring physical activity in adult populations. Data collection was conducted through an offline questionnaire using Google Forms. All responses were checked for completeness before data processing. Physical activity scores were calculated based on the IPAQ guidelines using MET-minutes/week units, namely 3.3 METs for walking activity, 4.0 METs for moderate activity, and 8.0 METs for vigorous activity. The total MET score was used to categorize physical activity levels into low, moderate, and high categories. Daily sitting duration was used to determine low, moderate, and high sedentary behavior categories according to the guidelines. (Ministry of Health, 2023). Data analysis was conducted descriptively using Microsoft Excel 2021. Data are presented in the form of mean values, standard deviations, medians, minimum values, maximum values, frequencies, and percentages to describe the distribution of physical activity levels and sedentary behavior of respondents.

Purposive sampling was employed because only athletes fulfilling predefined inclusion criteria could appropriately represent the target population. Although only 25 respondents met all criteria, this number adequately represents eligible athletes within the organization and is appropriate for a descriptive study.

3. RESULTS AND DISCUSSION

Results

The results section presents an overview of the physical activity levels and sedentary behavior of ESI eSports athletes in Kediri City based on data obtained through the International Physical Activity Questionnaire–Short Form (IPAQ-SF). The analysis includes descriptive statistics of physical activity, the distribution of physical activity categories (low, moderate, and high), and the distribution

of sedentary behavior based on the length of time respondents sit. The results of the analysis are presented to answer the research objectives regarding the physical activity profile of eSports athletes in Kediri City.

Table 1. Respondent Characteristics

Man	24
Woman	1
Total	25

Table 2. Distribution of Physical Activity Levels of ESI eSports Athletes in Kediri City

Physical Activity Categories	Criteria (MET-minutes/week)	n	%
Low	< 600	6	24
Currently	600–3000	4	16
High	> 3000	15	60
Total		25	100

Table 3. Descriptive Statistics of Physical Activity of Esports Athletes in Kediri City

Variables	Mark
Mean (MET-minutes/week)	2.387,9
Median	1.748
Standard Deviation	2.595
Minimum	99
Maximum	11.942
Range	11.843
Total	59.698,6

Table 4. Distribution of Sedentary Behavior of ESI eSports Athletes in Kediri City

Sedentary Category	Sitting Duration	n	%
Low	< 2 hours/day	2	8
Currently	2–5 hours/day	12	48
High	> 5 hours/day	11	44
Total		25	100

Table 5. Descriptive Statistics of Sedentary Behavior of ESI eSports Athletes in Kediri City

Variables	Mark
Mean (hours/day)	6,2
Median (hours/day)	5,0
Standard Deviation	5,02

Minimum (hours/day)	0,3
Maximum (hours/day)	22,0
Range (hours/days)	21,7
Total (hours/day)	157,3

The results of descriptive analysis of 25 ESI eSports athletes in Kediri City showed that the level of physical activity had an average value of 2,387.9 MET-minutes/week, a median of 1,748 MET-minutes/week, a standard deviation of 2,595 MET-minutes/week, and a minimum and maximum value of 99 and 11,942 MET-minutes/week, respectively. Based on the IPAQ-SF classification, 15 athletes (60%) were in the high physical activity category, 4 athletes (16%) in the moderate category, and 6 athletes (24%) in the low category.

Analysis of sedentary behavior showed that most respondents were in the moderate to high category. Twelve athletes (48%) had a sedentary duration of 2–5 hours per day, 11 athletes (44%) had a sedentary duration of more than 5 hours per day, and 2 athletes (8%) had a sedentary duration of less than 2 hours per day. Furthermore, the median value of sedentary behavior was 5 hours per day with a standard deviation of 5.02 hours, while the lowest and highest sedentary durations were 0.3 hours and 22 hours per day, respectively.

Discussion

The study results showed that the majority of ESI eSports athletes in Kediri City had a high level of physical activity (60%). This finding indicates that involvement in eSports is not always associated with low levels of physical activity. Although athletes' primary activities were conducted in front of a screen, most respondents continued to engage in other physical activities outside of training sessions and matches. According to the WHO (2020), adults are recommended to engage in at least 150–300 minutes of moderate-intensity physical activity per week or 75–150 minutes of vigorous-intensity physical activity per week to achieve optimal health benefits. The results of this study indicate that the majority of athletes met these recommendations.

These findings indicate that high physical activity and high sedentary behavior can coexist because structured exercise does not automatically reduce prolonged sitting. Esports athletes may complete sufficient exercise sessions but still spend many hours sitting during practice, competition, and game analysis. Therefore, interventions should combine regular exercise with strategies to interrupt prolonged sitting through active breaks and movement routines.

These findings align with research by Giakoni-Ramírez et al. (2022), which found that most professional eSports athletes have moderate to high levels of physical activity. This research suggests that modern eSports athletes are beginning to recognize the importance of physical fitness as part of improving competitive performance. Similar findings were also found by Sanz-Matesanz et al. (2023), who stated that good physical condition contributes to game performance, concentration, and decision-making abilities during matches. Therefore, physical training remains necessary even if the sport is digitally based.

The findings of this study are also supported by research (Sugito et al., 2022), which shows that individuals with high levels of physical activity tend to have better health than those with low levels of physical activity. Furthermore, research (Allsabab et al., 2023) explains that regular physical

activity plays a role in maintaining fitness, improving physiological function, and supporting a better quality of life. These results support the findings of this study, which show that physical activity remains a crucial component for eSports athletes.

Despite this, the study results showed that respondents' sedentary behavior remained relatively high. Forty-eight percent of athletes were classified as moderately sedentary, and 44% were classified as highly sedentary. This finding indicates that most respondents still spend significant time sitting during their daily activities. This is a common characteristic among eSports athletes, as much of their training, game evaluation, team communication, and matches take place on digital devices.

These results align with research by Trotter et al., 2020, which reported that eSports athletes have high daily sitting time due to long training sessions. Research by Sandey et al., 2021 also found that eSports activities are closely linked to increased sedentary behavior, as most activities are performed in a seated position with low energy expenditure. Similar findings were reported by Tholl et al., 2024, who stated that eSports athletes are a group vulnerable to sedentary behavior due to high screen exposure and prolonged playing time. According to the WHO (2020), prolonged sedentary behavior can increase the risk of various health problems, including metabolic disorders, cardiovascular disease, and decreased physical fitness. Therefore, even if someone meets the weekly physical activity recommendations, reducing sedentary time remains an important aspect of maintaining health.

The results of this study differ from those of Sinatra (2022), which reported that Mobile Legends eSports athletes in East Java tended to have low levels of physical activity. This difference is likely influenced by respondent characteristics, training patterns, the sports environment, and the variety of physical activities undertaken outside of gaming. Conversely, the results of this study indicate that most athletes remain physically active, thus categorizing themselves as having high levels of physical activity.

The study's findings also align with research by (YohanisFàot et al., 2021), which emphasizes the importance of regular physical activity in maintaining athlete health. Furthermore, (Ardiansyah et al., 2023) explain that adequate physical activity can help improve fitness and reduce the risk of health problems caused by a sedentary lifestyle. These results indicate that eSports athletes can maintain good levels of physical activity, despite still having a high tendency for sedentary behavior.

Overall, this study shows that ESI eSports athletes in Kediri City have good levels of physical activity, but still face challenges in the form of high levels of sedentary behavior. This situation indicates that eSports athlete development programs need to not only focus on playing skills and physical activity, but also reduce prolonged sitting time through active breaks, stretching, and structured physical exercise.

4. CONCLUSION

This study provides an overview of the physical activity levels and sedentary behavior of ESI eSports athletes in Kediri City aged 18 years and above. The results showed that most athletes had a high level of physical activity with an average of 2,387.9 MET-minutes/week. This finding indicates that eSports athletes are still able to meet their physical activity needs through various activities carried out outside of playing and training. On the other hand, sedentary behavior was still found in the majority of respondents, as indicated by the dominance of the moderate to high sedentary

category. This condition indicates that a good level of physical activity is not necessarily followed by a low duration of sedentary activity.

The findings of this study demonstrate that eSports athletes possess unique characteristics, namely the ability to maintain adequate levels of physical activity despite their primary activity requiring relatively long periods of sitting. Therefore, eSports athlete development should be directed not only at increasing physical activity but also at reducing excessive sedentary behavior through scheduling training sessions, providing active breaks, and adopting healthier lifestyles.

This study still has several limitations. Data were obtained through self-report instruments, thus relying heavily on respondents' ability to recall activities over the past seven days. Furthermore, the limited sample size, consisting only of athletes from the Kediri City ESI, means the results are not representative of the entire population of eSports athletes in Indonesia.

Based on these limitations, further research is recommended to involve a larger number of respondents, cover a wider area, and utilize more objective measurement instruments, such as accelerometers, pedometers, or other physical activity monitoring devices. An assessment of the factors influencing physical activity and sedentary behavior in eSports athletes is also necessary to gain a more comprehensive understanding of their lifestyle and fitness needs. The results of this study are expected to provide considerations for eSports organizations, coaches, and athletes in developing development programs that are not only oriented towards competitive performance but also support long-term health and fitness.

5. ACKNOWLEDGMENTS

The authors would like to thank the Physical Education, Health, and Recreation Study Program, Faculty of Health and Science, Universitas Nusantara PGRI Kediri for all academic support during the research. They also thank the supervising lecturers, ESI Kediri City administrators, coaches, and all ESI Kediri City athletes who participated and provided support so that this research could be carried out successfully.

6. BIBLIOGRAPHY

- Allsabab, M. A. H., Putra, R. P., & Sugito. (2023). Body mass index and physical fitness level of elementary school students. *Edu Sportivo: Indonesian Journal of Physical Education*, 4(3), 215–229. [https://doi.org/10.25299/esijope.2023.vol4\(3\).13775](https://doi.org/10.25299/esijope.2023.vol4(3).13775)
- Ardiansyah, Risnita, & Jailani, M. S. (2023). Teknik Pengumpulan Data Dan Instrumen Penelitian Ilmiah Pendidikan Pada Pendekatan Kualitatif dan Kuantitatif. *Jurnal IHSAN: Jurnal Pendidikan Islam*, 1(2), 1–9. <https://doi.org/10.61104/ihsan.v1i2.57>
- Başoğlu, B. (2025). Comparison of body mass index and physical activity levels of e-sportsmen. *Frontiers in Public Health*, 13. <https://doi.org/10.3389/fpubh.2025.1557022>
- CL Craig. (2019). *International Physical Activity Questionnaire - Short Form*. <https://share.google/9Wrg6YfF6dTus4o8Z>
- Cyma-Wejchenig, M., Maciaszek, J., Ciężka, J., & Stemplewski, R. (2024). The Level of Physical Activity, E-Game-Specific Reaction Time, and Self-Evaluated Health and Injuries' Occurrence in Non-Professional Esports Players. *Electronics*, 13(12), 2328. <https://doi.org/10.3390/electronics13122328>

- Dhedhy Yuliawan, R. A. B. (2021). *Legitimasi Esportss dalam Kecabangan Olahraga: Studi Literature Review*.
- Ekefjård, S., Piussi, R., & Hamrin Senorski, E. (2024). Physical symptoms among professional gamers within eSports, a survey study. *BMC Sports Science, Medicine and Rehabilitation*, 16(1), 18. <https://doi.org/10.1186/s13102-024-00810-y>
- Giakoni-Ramírez, F., Merellano-Navarro, E., & Duclos-Bastías, D. (2022). Professional Esports Players: Motivation and Physical Activity Levels. *International Journal of Environmental Research and Public Health*, 19(4), 2256. <https://doi.org/10.3390/ijerph19042256>
- KEMENKES. (2023). *Sedentary Behavior Vs Aktifitas Fisik*. https://Keslan.Kemkes.Go.Id/View_artikel/2663/Sedentary-Behavior-vs-Aktifitas-Fisik. https://keslan.kemkes.go.id/view_artikel/2663/sedentary-behavior-vs-aktifitas-fisik
- MANCI, E., & GÜNAY, E. (2023). Physical Activity in Turkish Esports Players: Age Differences Approach. *Spor Bilimleri Araştırmaları Dergisi*, 8(3), 763–774. <https://doi.org/10.25307/jssr.1352769>
- Nicholson, M., Thompson, C., Poulus, D., Pavey, T., Robergs, R., Kelly, V., & McNulty, C. (2024). Physical Activity and Self-Determination towards Exercise among Esports Athletes. *Sports Medicine - Open*, 10(1), 40. <https://doi.org/10.1186/s40798-024-00700-0>
- Romario F D Purba, Rafael E J Siregar, Pawan D Panjaitan, Darwin Damanik, Ade Nurul Elisyah, Ade Nurma Dani, & Rizky Sahertian. (2024). PERKEMBANGAN INDUSTRI E-SPORT DAN PENGARUHNYA TERHADAP PERTUMBUHAN EKONOMI DI PEMATANG SIANTAR. *MANAJEMEN*, 4(2), 62–69. <https://doi.org/10.51903/manajemen.v4i2.831>
- Sandey, T. P., Hasan, M. F., Ihsya, M. N. F., Anggraeni, L., & Ramadhan, M. G. (2021). *Tingkat aktivitas fisik atlet esport Indonesia di cabang piala Presiden esport 2019*. Vol. 7 No. 1.
- Sanz-Matesanz, M., Gea-García, G. M., & Martínez-Aranda, L. M. (2023). Physical and psychological factors related to player's health and performance in esports: A scoping review. *Computers in Human Behavior*, 143, 107698. <https://doi.org/10.1016/j.chb.2023.107698>
- Sinatra, F. (2022). *GANGGUAN KESEHATAN PADA ATLET E SPORT JATIM DIVISI MOBILE LEGENDS*. <https://ejournal.unesa.ac.id/index.php/jurnal-prestasi-olahraga/article/view/48520>
- Sugito, Allsabab, M. A. H., & Trio Kurniawan, B. (2022). Level of physical activity, body mass index (BMI), and sleep patterns in junior and senior high school students of Kediri city and regency. *Journal Sport Area*, 7(1), 134–147. [https://doi.org/10.25299/sportarea.2022.vol7\(1\).8188](https://doi.org/10.25299/sportarea.2022.vol7(1).8188)
- Tholl, C., Soffner, M., & Froböse, I. (2024). How strenuous is esports? Perceived physical exertion and physical state during competitive video gaming. *Frontiers in Sports and Active Living*, 6. <https://doi.org/10.3389/fspor.2024.1370485>
- Trotter, M. G., Coulter, T. J., Davis, P. A., Poulus, D. R., & Polman, R. (2020). The Association between Esports Participation, Health and Physical Activity Behaviour. *International Journal of Environmental Research and Public Health*, 17(19), 7329. <https://doi.org/10.3390/ijerph17197329>
- WHO. (2020). *WHO GUIDELINES ON PHYSICAL ACTIVITY AND SEDENTARY BEHAVIOUR*. <https://www.who.int/publications/i/item/9789240015128>
- WHO. (2024, June 26). *Aktivitas Fisik*. <https://www.who.int>. <https://www.who.int/news-room/fact-sheets/detail/physical-activity>

YohanisFàot, J., Baitul Mukarromah, S., Ilmu Keolahragaan, J., Ilmu Keolahragaan, F., Negeri Semarang, U., Kunci, K., Fisik, K., & Roda, S. (2021). PROFIL KONDISI FISIK ATLET OLAHRAGA SEPATU RODA PADA PEMUSATAN LATIHAN DAERAH JAWA TENGAH (PELATDA JATENG). In *JSSF* (Vol. 7, Number 2). <http://journal.unnes.ac.id/sju/index.php/jssf>