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What is the relationship between socioeconomics and physical activity? Literature review
¿Cuál es la relación entre socioeconomía y actividad física? Revisión bibliográfica

*I Made Dwi Sastra Wargama, *Tandiyo Rahayu, *Bambang Priyono, *Siti Baitul Mukarromah, *Harry Pramono, *Heny Setyawati, **Syamsudin, ***Didi Suryadi

*Universitas Negeri Semarang (Indonesia), **Universitas Musamus Merauke (Indonesia), ***Universitas Negeri Yogyakarta (Indonesia)

Abstract. The relationship between socioeconomic status (SES) and physical activity (PA) has become an increasingly prominent area of research. However, research specifically exploring this relationship, especially in developing countries, is limited. This literature review seeks to identify and analyze the socioeconomic factors that influence participation in physical activity. A comprehensive search was conducted using the ScienceDirect and PubMed databases, adhering to PRISMA guidelines to ensure data reliability and accuracy. The search strategy involved the use of keyword combinations such as: ("socioeconomics OR socioeconomic status" AND "physical activity OR sport activity" AND "sport AND social inequality"). The initial search yielded 3,786 publications, which were narrowed down to 10 articles after applying exclusion criteria. The review revealed that individuals with higher SES typically have better access to sports facilities and are more likely to engage in organized physical activities. Conversely, those from lower SES backgrounds face barriers such as financial constraints, limited access to facilities, and less free time. Additionally, the COVID-19 pandemic has exacerbated the socioeconomic divide in sports participation, particularly in developing countries. In conclusion, addressing disparities in physical activity participation requires a multidimensional approach, including public policy interventions, improved access to sports facilities, and community education. This review underscores the need for a more inclusive strategy to promote physical activity and ensure equitable health benefits across all socioeconomic groups.
Keywords: socioeconomic status, physical activity, sport, social inequality

Resumen. La relación entre el estatus socioeconómico (SES) y la actividad física (AF) se ha convertido en un área de investigación cada vez más prominente. Sin embargo, la investigación que explora específicamente esta relación, especialmente en los países en desarrollo, es limitada. Esta revisión bibliográfica pretende identificar y analizar los factores socioeconómicos que influyen en la participación en la actividad física. Se realizó una búsqueda exhaustiva en las bases de datos ScienceDirect y PubMed, siguiendo las directrices PRISMA para garantizar la fiabilidad y exactitud de los datos. La estrategia de búsqueda implicó el uso de combinaciones de palabras clave como: ("socioeconomía O estatus socioeconómico" Y "actividad física O actividad deportiva" Y "deporte Y desigualdad social"). La búsqueda inicial arrojó 3.786 publicaciones, que se redujeron a 10 artículos tras aplicar criterios de exclusión. La revisión reveló que las personas con un nivel socioeconómico más alto suelen tener mejor acceso a instalaciones deportivas y es más probable que participen en actividades físicas organizadas. Por el contrario, las personas con un nivel socioeconómico más bajo se enfrentan a barreras como las limitaciones económicas, el acceso limitado a las instalaciones y la falta de tiempo libre. Además, la pandemia de COVID-19 ha exacerbado la brecha socioeconómica en la participación deportiva, especialmente en los países en desarrollo. En conclusión, para abordar las disparidades en la participación en la actividad física se requiere un enfoque multidimensional, que incluya intervenciones en las políticas públicas, un mejor acceso a las instalaciones deportivas y la educación de la comunidad. Esta revisión subraya la necesidad de una estrategia más inclusiva para promover la actividad física y garantizar beneficios equitativos para la salud en todos los grupos socioeconómicos.
Palabras clave: estatus socioeconómico, actividad física, deporte, desigualdad social

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I Made Dwi Sastra Wargama
sastra@students.unnes.ac.id

Introduction

Physical activity (PA) offers numerous health benefits for children and adolescents, yet the majority of young people remain physically inactive (Aznar et al., 2024; Mashud et al., 2024; Purba et al., 2024). Regular PA reduces mortality rates and lowers the risk of non-communicable diseases (Lee et al., 2012; Samitz et al., 2011). However, despite these benefits, a significant portion of the population remains inactive (Hallal et al., 2012), making the promotion of physical activity a critical public health priority. This issue is particularly pressing among children and adolescents, where inactivity is well-documented as a public health challenge (Musić Milanović et al., 2021). Insufficient physical activity increases the risk of developing various non-communicable diseases such as heart disease, diabetes, and cancer (Lona et al., 2021; Suryadi, Komaini, Suganda, Rubiyatno, et al., 2024; Suryadi, Nasrulloh, Haryanto, et al., 2024; Suryadi, Susanto, Faridah, Wahidi, et al., 2024). Additionally, evidence continues to grow on the positive impact of physical activity on both physical and mental health (Kemel et al., 2022). Numerous studies highlight that PA enhances emotional and cognitive function, reduces symptoms of depression and anxiety (Borland et al., 2022), and promotes overall well-being in children and adolescents (Lema-Gómez et al., 2021).

Despite widespread recognition of PA's benefits, many young people fail to meet the recommended activity levels. The World Health Organization (WHO) advises children aged 5-17 years to engage in at least 60 minutes of moderate to vigorous physical activity (MVPA) daily (WHO, 2020). Yet, over 80% of students aged 11-17 globally do not meet these guidelines, particularly in high-income countries in the

Asia-Pacific region (Guthold et al., 2020). Technological advances and lifestyle changes, such as increased screen time and more convenient transportation, have further contributed to reduced physical activity among youth (Liu et al., 2016). Therefore, focusing on modifiable factors that influence PA, particularly in high-risk groups, is crucial (Tandon et al., 2012). Addressing this health issue requires a better understanding of the determinants of physical activity in children and adolescents to develop effective interventions.

Participation in physical activity among young people is shaped by various personal, environmental, social, and psychological factors (Chen et al., 2024). Among these, socioeconomic influences are critical for guiding policies that address health inequities (Musić Milanović et al., 2021). Social and economic factors, in addition to health considerations, play a major role in determining PA levels (Ke et al., 2022). Increasingly, research has shown the significant impact of socioeconomic status (SES) on PA, demonstrating how an individual's social and economic conditions can shape their engagement in physical activity.

Socioeconomic status (SES), defined as "the relative position of families or individuals within a hierarchical social structure, based on their access to or control over wealth, prestige, and power" (Calixto & Anaya, 2014), influences various aspects of life, including health. Two key theoretical models explore how SES affects human development and health outcomes throughout life. One of these is the social causality theory, which argues that health risks and poor health behaviors are more prevalent in lower social classes, thereby highlighting the role of SES in health disparities (Pampel et al., 2010). Differences in SES affect access to resources, influencing individuals' ability to engage in healthy behaviors such as physical activity (Manstead, 2018).

SES, typically measured by education, income, and employment, is a crucial determinant of access to sports and physical activity opportunities (Musić Milanović et al., 2021). People with higher SES tend to have more leisure time, access to better sports facilities, and greater health awareness, which contribute to higher levels of PA participation (Rawal et al., 2020; Rubiyatno et al., 2023). In contrast, those with lower SES face barriers such as time constraints, limited access to facilities, and less knowledge about the benefits of PA. Even in developed countries, the potential of physical activity to improve the health of low-SES populations is often underutilized (Rawal et al., 2020).

From a sports perspective, SES influences not only individual participation but also access to broader public resources, such as physical education programs and safe public spaces for exercise. Parental SES can impact children's activity levels, although findings are inconsistent (Heradstveit et al., 2020). Socioeconomic inequalities can also lead to disparities in exercise participation, ultimately affecting population health (Ke et al., 2022). Understanding the link between SES and PA is crucial for developing effective policies that promote active lifestyles across all socioeconomic groups.

A nuanced understanding of the interaction between positive and deficit frameworks is needed to address the research gap on PA among low-SES populations (Rawal et al., 2020). Physical activity during adolescence has been shown to improve both short- and long-term health, as well as academic and professional performance (Heradstveit et al., 2020). This study aims to identify and analyze the socioeconomic factors influencing physical activity participation through a literature review. By exploring the complexity of these factors, this research seeks to pinpoint key areas for intervention and policy development that promote equitable access to physical activity. This approach considers not only the linear effects of SES but also the interactions between education, income, employment, and access to sports resources, offering a comprehensive perspective on how different components of SES collectively influence physical activity participation.

Materials and Methods

Search Strategy

The literature search for this study was conducted using two primary databases: ScienceDirect and PubMed. ScienceDirect was selected for its broad coverage of scientific literature, particularly in the areas of science, engineering, and health. PubMed was chosen as it is a widely recognized indexing system frequently used by researchers worldwide to access biomedical and health science literature (Suryadi, Nasrulloh, Yanti, et al., 2024; Suryadi, Okilanda, Nofrizal, Anggara Suganda, et al., 2024).

The search strategy involved using the following keyword combinations: ("socioeconomic OR socioeconomic status" AND "physical activity OR sport activity OR sport" AND "social inequality"). These keywords were selected to capture relevant publications addressing the relationship between socioeconomic status and physical activity. The search followed the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines (Mohamed Shaffril et al., 2019), which prioritize transparency and comprehensiveness in systematic reviews (Moher et al., 2009).

Exclusion Criteria

The following exclusion criteria were applied: (1) Articles not published in Scopus or Web of Science indexed journals, (2) Articles in languages other than English, (3) Articles published before 2020 or after 2024, and (4) Articles that did not explicitly discuss the relationship between socioeconomic factors and physical activity.

Procedure

The initial search yielded 3,786 publications: 1,456 from ScienceDirect and 2,330 from PubMed. After applying the

exclusion criteria, the final number of relevant articles was reduced to 10, with many excluded due to their lack of specific focus on the relationship between socioeconomic status and physical activity. The remaining articles were extracted and analyzed using Mendeley software to remove duplicates. A detailed overview of the article selection and filtering process is presented in Figure 1.

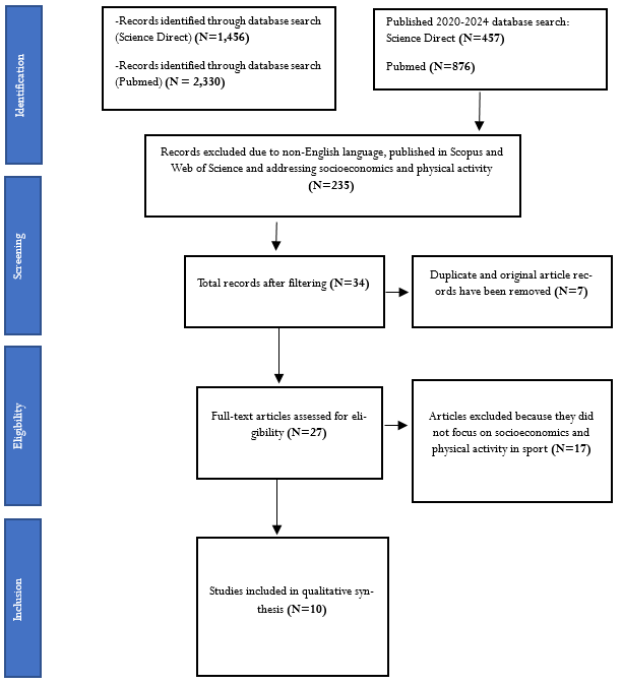

Figure 1. PRISMA Research Flow Diagram

Results

This study reviewed studies related to socioeconomic status, physical activity and quality of life. Therefore, only research articles that examined socioeconomic status and physical activity were reviewed. Based on the review, the articles were divided into four categories, namely (i) Author and Year, (ii) Journal Name, (iii) Research Objective, and (iv) Research Results. This study aims to make a meaningful contribution to the existing literature on the relationship between socioeconomic factors and physical activity, by providing new insights that can guide the development of more effective policies and interventions in the future. Findings were based on a review of 10 articles, which are summarized in Table 1.

Table 1.
Results of the review of articles that match the research theme

Author and Year	Journal Name	Research Objectives	Research Results
(Heradstveit et al., 2020)	BMC Public Health	to examine the overall level of low physical activity/exercise participation and its association with parental socioeconomic status (SES) and adolescent school programs in a population-based study of older adolescents	Parental employment status was largely unrelated to being physically inactive/not participating in sports. Adolescents in the vocational study had a small but significantly increased risk of being physically inactive and not participating in sports compared to individuals in the general study.
(Ke et al., 2022)	Frontiers in Psychology	to investigate the relationship between socioeconomic status (SES) and physical activity (PA) among Chinese children and adolescents.	Higher socioeconomic status was positively associated with higher levels of physical activity among children and adolescents, especially using FAS and maternal education level as measures of SES. The relationship between SES and PA varied by gender and grade group, and the effect of SES also differed on weekdays and weekends. This study found socioeconomic disparities in PA among Chinese children and adolescents, and demonstrated the importance of targeting children and adolescents with low SES intervention priorities.
(Huikari et al., 2021)	Economics & Human Biology	to provide a detailed empirical investigation into socioeconomic status (SES) indicators as determinants of leisure-time physical activity	The findings showed that proxies for individual motivational factors and childhood physical activity, such as average grades and grades achieved in physical education when leaving primary education, were highly correlated with leisure-time physical activity in midlife among men, but not among women. Our results are in line with behavioral economic reasoning that social and environmental comparisons influence behavior.
(Lona et al., 2021)	International journal of environmental research and public health	The current study examined prospective associations between parental household income, education level, migration background, and physical activity (PA) behavior with pulse wave velocity (PWV) development in prepubertal children.	Results showed no significant associations between household income, education level, and parental migration background with children's PWV after four years. However, high levels of maternal PA were associated with lower childhood PWV at follow-up (mean (95% CI) 4.6 (4.54-4.66) m/s) compared to children of mothers with low PA behavior (mean (95% CI) 4.7 (4.64-4.77) m/s).
(Bardid et al., 2022)	Journal of Exercise	to identify secular trends and socio-economic	Although favorable policies have been in place for a decade, physical

	Science & Fitness	inequalities, and to assess the physical activity and health of children and adolescents before COVID-19	activity and health of children and young people have not improved, and marked socio-economic disparities persist in Scotland. There is a clear need for greater monitoring of physical activity and health, as well as improved policy implementation and evaluation, especially as many of the indicators and associated disparities may have worsened following the COVID-19 pandemic.
(Kyan & Takakura, 2022)	Public Health	to explore socio-economic inequalities in physical activity (PA) by domains of daily life, such as work, transportation, leisure, and sedentary life, among Japanese adults during the COVID-19 pandemic	We detected absolute and relative inequalities for household income across all PA domains, except for work-related PA. The higher the income of participants, the longer they engaged in transportation-related and recreational PA and sedentary behavior. Our study revealed significant socio-economic disparities in each PA domain, particularly in leisure PA. These results suggest a widening gap due to the COVID-19 pandemic.
(Griffiths et al., 2022)	Sport, Education and Society	to provide this insight to understand the habits and behaviors of university students in sports and physical activity while gaining an understanding of the barriers to student participation	The main barriers preventing both groups from participating in sport and physical activity included time (mainly due to academic commitments), cost and lack of confidence, alongside some university-specific factors. A greater number of commuter students were in the lower socioeconomic group (SEG) which also affected behaviors related to participation in sport and physical activity. In addition, the study found that students who did not participate in sport and physical activity before university were also less likely to participate after they started university, and this was an important factor regardless of SEG.
(Barnett et al., 2023)	Cities	This study examined the relationship between objectively assessed physical features of the surrounding environment and physical and mental aspects of health-related quality of life (HRQoL) as measured by the SF-36, and the role of physical activity and sedentary behavior in this relationship.	This study suggests that neighborhood SES may partially benefit HRQoL by helping to promote an active lifestyle. Neighborhood attributes that determine walkability may benefit HRQoL by providing opportunities for walking and resistance exercise and, through this, help reduce leisure-time sitting.
(Castan et al., 2024)	Archives of Physical Medicine and Rehabilitation	(1) To assess the prevalence and severity of socio-ecological barriers to leisure-time physical activity (LTPA) in a sample of adults with spinal cord injury (SCI); (2) to examine the association of these barriers with sociodemographic characteristics and functional independence (FI); and (3) to explore which levels of socio-ecological barriers may be associated with LTPA.	A high prevalence of barriers to LTPA was found. Seven of these barriers (2 intrapersonal, 3 organizational, and 2 community) were present in >60% of participants. Intrapersonal and organizational barriers had higher effects in participants with lower FI and women. Interpersonal barriers were higher for older participants and those with lower FI, while community barriers were higher for unemployed participants. Lastly, intrapersonal and interpersonal barriers were negatively associated with LTPA, and FI was revealed as a moderator of the intrapersonal barriers-LTPA relationship.
(Aznar et al., 2024)	Plos One	to evaluate whether neighborhood walkability and/or socioeconomic status (SES) can influence walking, outdoor play and exercise practices in a representative sample of Spanish children and adolescents.	Youth from more walkable areas reported more minutes of walking per day compared to those living in less walkable neighborhoods (51.4 vs 48.8 minutes, respectively). The lowest average minutes spent playing outdoors was found among participants from low SES neighborhoods and neighborhoods with low walking access. Neighborhood SES influenced participation in team sports over the weekend, as this participation was higher in high SES neighborhoods.

Description: socioeconomic status (SES), physical activity (PA), leisure-time physical activity (LTPA), spinal cord injury (SCI), health-related quality of life (HRQoL), socioeconomic group (SEG), pulse wave velocity (PWV), and functional independence (FI)

Discussion

This review examined various studies on the relationship between socioeconomic status (SES) and physical activity (PA). While extensive research exists on this topic globally (Aznar et al., 2024), there is limited focus on developing countries, highlighting a significant gap in the literature over recent decades. The findings of this review align with previous studies, confirming that SES plays a critical role in influencing PA among children and adolescents (Lampinen et al., 2017). Key indicators such as parental education and perceived family wealth consistently show a positive impact on the PA levels of young people. Promoting walkable environments appears to be a practical strategy for encouraging PA, irrespective of SES (Aznar et al., 2024).

Several studies suggest that disparities in recreational PA can be attributed to educational gaps (Castan et al., 2024; Griffiths et al., 2022; Kyan & Takakura, 2022). Therefore, incorporating behavioral economic considerations is crucial when designing policies to enhance PA participation (Huikari et al., 2021). Additionally, research shows that increased parental PA positively influences children's vascular health, which should be factored into future primary prevention strategies for cardiovascular health in children (Lona et al., 2021). Socioeconomic inequalities have long been associated with health disparities and unhealthy behaviors (Marmot et al., 2012). Those from lower SES backgrounds face a higher risk of premature death from cardiovascular and other causes compared to those from higher SES groups (Kivimäki et al., 2020).

This review categorized research findings into four thematic groups:

PA and Parental SES

Research explored the link between PA levels and parental SES, examining its influence on adolescents' physical activity and participation in school sports programs (Heradstveit et al., 2020). One study found no strong correlation between parental employment status and physical inactivity, but adolescents in vocational studies were at a slightly higher risk of inactivity compared to their peers in general studies. Another study focused on the relationship between parental household income, education, migration background, and PA, revealing that maternal PA was significantly associated with better vascular health in children (Lona et al., 2021).

SES and PA in Youth

The second group addressed socioeconomic status (SES) and physical activity (PA) among children and adolescents (Bardid et al., 2022; Ke et al., 2022). This group of studies analyzed how SES affects PA in children and adolescents. These studies examined how SES affects PA levels among adolescents. One study by Ke et al., (2022) found that, although supportive policies have been implemented, significant socioeconomic disparities in PA participation remain. Furthermore, another study developed by Bardid et al., (2022) investigated the impact of neighborhood walkability and SES on outdoor activities, which revealed that children in more walkable areas walked more each day, while those from high SES neighborhoods were more likely to participate in team sports.

SES and Quality of Life

The third group addressed socioeconomic status (SES) as a determinant of physical and mental activity of quality of life and leisure time (Barnett et al., 2023; Castan et al., 2024; Huikari et al., 2021). Studies in this group focused on how SES influences PA and mental health in leisure time. One study showed that SES indicators such as educational performance were strongly correlated with leisure-time PA in men but not women (Huikari et al., 2021). Another study highlighted the role of neighborhood SES in enhancing health-related quality of life (HRQoL) through active lifestyles (Barnett et al., 2023). A third study identified significant barriers to leisure-time PA among adults with spinal cord injuries, with the majority facing personal, organizational, and community challenges (Castan et al., 2024).

SES Inequalities and PA Barriers

The fourth group discussed socioeconomic inequalities in physical activity while gaining an understanding of barriers to physical activity (Griffiths et al., 2022; Kyan & Takakura, 2022). Research in this group explored socioeconomic inequalities in PA across various life domains, including work, transportation, and leisure activities. A study conducted during the COVID-19 pandemic found that higher-income participants engaged more in transportation- and leisure-related PA, further exacerbating socio-economic disparities (Kyan & Takakura, 2022). Another study explored the barriers faced by university students in participating in sports and PA, with time constraints, costs, and lack of confidence being the primary obstacles (Griffiths et al., 2022).

Research by Kyan & Takakura, (2022) suggests that recreational PA is influenced by educational inequalities, and increasing parental PA has beneficial effects on children's cardiovascular health. While lower socioeconomic groups tend to be less active than higher SES groups, the student population shows mixed results (Griffiths et al., 2022;Lona et al., 2021). A Japanese study also found a trend of increasing inactivity across various PA domains (Matsushita et al., 2015), further underscoring the need for targeted interventions.

Conclusion

This review highlights that socioeconomic status (SES) significantly influences an individual's participation in physical activity (PA), including sports. Research consistently shows that individuals with higher SES have better access to sports facilities, more knowledge about the health benefits of PA, and more free time to engage in such activities. Conversely, those with lower SES often encounter barriers such as financial constraints, lack of accessible facilities, and limited time. Supportive environments, like walkable neighborhoods, have been shown to increase PA participation across SES levels, making neighborhood-based interventions an effective strategy for reducing disparities. Educational disparities also impact recreational PA, with parental education and family awareness playing a crucial role in promoting PA from an early age. The COVID-19 pandemic has further widened socioeconomic gaps in PA participation, particularly in developing countries, where reduced access to sports facilities and increased financial strain have led to declining activity levels among lower SES groups. Parental, especially maternal, involvement in PA significantly benefits children's physical health and development, underscoring the need for family-centered health interventions.

Additionally, socioeconomic inequalities are evident in access to organized sports and recreational facilities, with high-SES neighborhoods typically offering more resources and programs. To reduce these disparities, a multidimensional approach is required, incorporating public policy, better access to sports facilities, community education, and neighborhood-based strategies. By taking these steps, PA promotion can become more inclusive, reaching individuals across all socioeconomic backgrounds. Future research should expand the scope by including additional keywords and databases such as ERIC and EBSCO (SPORTDiscus and Psychology & Behavioral Sciences Collection). There is also a need for further global studies using literature reviews or mapping studies (bibliometric and scientometric), as well as research on the practical application of PA and its health impacts.

References

Aznar, S., Jimenez-Zazo, F., Romero-Blanco, C., Gómez, S. F., Homs, C., Wärnberg, J., Medrano, M., Gusi, N., Gonzalez-Gross, M., Marín-Cascales, E., González-Valeiro, M. Á., Serra-Majem, L., Terrados, N., Tur, J. A., Segu, M., Lassale, C., Colom-Fernández, A., Labayen, I., Sánchez-Gómez, J., … Molina-García, J. (2024). Walkability and socio-economic status in relation to walking, playing and sports practice in a representative Spanish sample of youth: The PASOS study. *PLOS ONE*, *19*(3), e0296816. https://doi.org/10.1371/journal.pone.0296816

Bardid, F., Tomaz, S. A., Johnstone, A., Robertson, J., Craig, L. C. A., & Reilly, J. J. (2022). Results from Scotland's 2021 report card on physical activity and health for children and youth: Grades, secular trends, and socio-economic inequalities. *Journal of Exercise Science & Fitness*, *20*(4), 317–322. https://doi.org/https://doi.org/10.1016/j.jesf.2022.07.002

Barnett, A., Shaw, J. E., Martino, E., Knibbs, L. D., Poudel, G., Owen, N., & Cerin, E. (2023). Associations of neighbourhood environmental attributes and socio-economic status with health-related quality of life in urban mid-aged and older adults: Mediation by physical activity and sedentary behaviour. *Cities*, *142*, 104538. https://doi.org/https://doi.org/10.1016/j.cities.2023.104538

Borland, R. L., Cameron, L. A., Tonge, B. J., & Gray, K. M. (2022). Effects of physical activity on behaviour and emotional problems, mental health and psychosocial well-being in children and adolescents with intellectual disability: A systematic review. *Journal of Applied Research in Intellectual Disabilities*, *35*, 399–420. https://doi.org/10.1111/jar.12961

Calixto, O. J., & Anaya, J. M. (2014). Socioeconomic status. The relationship with health and autoimmune diseases. In *Autoimmunity Reviews*. https://doi.org/10.1016/j.autrev.2013.12.002

Castan, A., Úbeda-Colomer, J., Chamarro, A., Vidal, J., Benito-Penalva, J., & Sauri, J. (2024). Socio-ecological Barriers to Leisure Time Physical Activity in Spanish Wheelchair Users With Spinal Cord Injury: Associations With Sociodemographic Characteristics and Functional Independence. *Archives of Physical Medicine and Rehabilitation*, *105*(7), 1239–1246. https://doi.org/https://doi.org/10.1016/j.apmr.2024.02.719

Chen, J., Bai, Y., & Ni, W. (2024). Reasons and promotion strategies of physical activity constraints in obese/overweight children and adolescents. *Sports Medicine and Health Science*, *6*(1), 25–36. https://doi.org/https://doi.org/10.1016/j.smhs.2023.10.004

Griffiths, K., Moore, R., & Brunton, J. (2022). Sport and physical activity habits, behaviours and barriers to participation in university students: an exploration by socio-economic group. *Sport, Education and Society*, *27*(3), 332–346. https://doi.org/10.1080/13573322.2020.1837766

Guthold, R., Stevens, G. A., Riley, L. M., & Bull, P. F. C. (2020). Global trends in insufficient physical activity among adolescents: a pooled analysis of 298 population-based surveys with 1·6 million participants. *The Lancet Child & Adolescent Health*, *4*(1), p23-35. https://doi.org/10.1016/S2352-4642(19)30323-2

Hallal, P. C., Andersen, L. B., Bull, F. C., Guthold, R., Haskell, W., Ekelund, U., Alkandari, J. R., Bauman, A. E., Blair, S. N., Brownson, R. C., Craig, C. L., Goenka, S., Heath, G. W., Inoue, S., Kahlmeier, S., Katzmarzyk, P. T., Kohl, H. W., Lambert, E. V., Lee, I. M., … Wells, J. C. (2012). Global physical activity levels: Surveillance progress, pitfalls, and prospects. *The Lancet*, *380*(9838), 247–57. https://doi.org/10.1016/S0140-6736(12)60646-1

Heradstveit, O., Heradstveit, O., Haugland, S., Hysing, M., Hysing, M., Stormark, K. M., Stormark, K. M., Sivertsen, B., Bøe, T., & Bøe, T. (2020). Physical inactivity, non-participation in sports and socioeconomic status: A large population-based study among Norwegian adolescents. *BMC Public Health*, *20*(1), 1–9. https://doi.org/10.1186/s12889-020-09141-2

Huikari, S., Junttila, H., Ala-Mursula, L., Jämsä, T., Korpelainen, R., Miettunen, J., Svento, R., & Korhonen, M. (2021). Leisure-time physical activity is associated with socio-economic status beyond income – Cross-sectional survey of the Northern Finland Birth Cohort 1966 study. *Economics & Human Biology*, *41*, 100969. https://doi.org/https://doi.org/10.1016/j.ehb.2020.100969

Ke, Y., Shi, L., Peng, L., Chen, S., Hong, J., & Liu, Y. (2022). Associations between socioeconomic status and physical activity: A cross-sectional analysis of Chinese children and adolescents. *Frontiers in Psychology*, *13*(904506), 1–12. https://doi.org/10.3389/fpsyg.2022.904506

Kemel, P. N., Porter, J. E., & Coombs, N. (2022). Improving youth physical, mental and social health through physical activity: A Systematic literature review. In *Health Promotion Journal of Australia*. https://doi.org/10.1002/hpja.553

Kivimäki, M., Batty, G. D., Pentti, J., Shipley, M. J., Sipilä, P. N., Nyberg, S. T., Suominen, S. B., Oksanen, T., Stenholm, S., Virtanen, M., Marmot, M. G., Singh-Manoux, A., Brunner, E. J., Lindbohm, J. V., Ferrie, J.

E., & Vahtera, J. (2020). Association between socioeconomic status and the development of mental and physical health conditions in adulthood: a multi-cohort study. *The Lancet Public Health*. https://doi.org/10.1016/S2468-2667(19)30248-8

Kyan, A., & Takakura, M. (2022). Socio-economic inequalities in physical activity among Japanese adults during the COVID-19 pandemic. *Public Health*, *207*, 7–13. https://doi.org/https://doi.org/10.1016/j.puhe.2022.03.006

Lampinen, E. K., Eloranta, A. M., Haapala, E. A., Lindi, V., Väistö, J., Lintu, N., Karjalainen, P., Kukkonen-Harjula, K., Laaksonen, D., & Lakka, T. A. (2017). Physical activity, sedentary behaviour, and socioeconomic status among Finnish girls and boys aged 6–8 years. *European Journal of Sport Science*. https://doi.org/10.1080/17461391.2017.1294619

Lee, I. M., Shiroma, E. J., Lobelo, F., Puska, P., Blair, S. N., Katzmarzyk, P. T., Alkandari, J. R., Andersen, L. B., Bauman, A. E., Brownson, R. C., Bull, F. C., Craig, C. L., Ekelund, U., Goenka, S., Guthold, R., Hallal, P. C., Haskell, W. L., Heath, G. W., Inoue, S., … Wells, J. C. (2012). Effect of physical inactivity on major non-communicable diseases worldwide: An analysis of burden of disease and life expectancy. *The Lancet*, *380*(9838), 219–29. https://doi.org/10.1016/S0140-6736(12)61031-9

Lema-Gómez, L., Arango-Paternina, C. M., Eusse-López, C., Petro, J., Petro-Petro, J., López-Sánchez, M., Watts-Fernández, W., & Perea-Velásquez, F. (2021). Family aspects, physical fitness, and physical activity associated with mental-health indicators in adolescents. *BMC Public Health*, *21*(1), 2324. https://doi.org/10.1186/s12889-021-12403-2

Liu, Y., Tang, Y., Cao, Z. B., Chen, P. J., Zhang, J. L., Zhu, Z., Zhuang, J., Yang, Y., & Hu, Y. Y. (2016). Results from Shanghai's (China) 2016 report card on physical activity for children and youth. *Journal of Physical Activity and Health*, *13*, S124–S128. https://doi.org/10.1123/jpah.2016-0362

Lona, G., Hauser, C., Bade, S., Köchli, S., Infanger, D., Endes, K., Faude, O., & Hanssen, H. (2021). Association of Parental Socioeconomic Status and Physical Activity with Development of Arterial Stiffness in Prepubertal Children. *International Journal of Environmental Research and Public Health*, *18*(15). https://doi.org/10.3390/ijerph18158227

Manstead, A. S. R. (2018). The psychology of social class: How socioeconomic status impacts thought, feelings, and behaviour. *British Journal of Social Psychology*. https://doi.org/10.1111/bjso.12251

Marmot, M., Allen, J., Bell, R., Bloomer, E., & Goldblatt, P. (2012). WHO European review of social determinants of health and the health divide. In *The Lancet*. https://doi.org/10.1016/S0140-6736(12)61228-8

Mashud, M., Arifin, S., Warni, H., Samodra, Y. T. J., Yosika, G. F., Basuki, S., Suryadi, D., & Suyudi, I. (2024). Physical Fitness: Effects of active lifestyle internalization through physical literacy awarenes based project. *Retos*, *51*, 1299–1308. https://doi.org/10.47197/retos.v51.101662

Matsushita, M., Harada, K., & Arao, T. (2015). Socioeconomic position and work, travel, and recreation-related physical activity in Japanese adults: A cross-sectional study Health behavior, health promotion and society. *BMC Public Health*. https://doi.org/10.1186/s12889-015-2226-z

Mohamed Shaffril, H. A., Samah, A. A., Samsuddin, S. F., & Ali, Z. (2019). Mirror-mirror on the wall, what climate change adaptation strategies are practiced by the Asian's fishermen of all? In *Journal of Cleaner Production* (pp. 232, 104–117). https://doi.org/10.1016/j.jclepro.2019.05.262

Moher, D., Liberati, A., Tetzlaff, J., & Altman, D. G. (2009). Preferred reporting items for systematic reviews and meta-analyses: the PRISMA statement. *Journal of Clinical Epidemiology*, *62*(10), 1006–1012. https://doi.org/10.1016/j.jclinepi.2009.06.005

Musić Milanović, S., Buoncristiano, M., Križan, H., Rathmes, G., Williams, J., Hyska, J., Duleva, V., Zamrazilová, H., Hejgaard, T., Jørgensen, M. B., Salanave, B., Shengelia, L., Kelleher, C. C., Spinelli, A., Nardone, P., Abdrakhmanova, S., Usupova, Z., Pudule, I., Petrauskiene, A., … Breda, J. (2021). Socioeconomic disparities in physical activity, sedentary behavior and sleep patterns among 6- to 9-year-old children from 24 countries in the WHO European region. *Obesity Reviews*, *22*, e13209. https://doi.org/10.1111/obr.13209

Organization, W. H. (2020). *WHO Guidelines on Physical Activity and Sedentary Behaviour*. Geneva: World Health Organization.

Pampel, F. C., Krueger, P. M., & Denney, J. T. (2010). Socioeconomic Disparities in Health Behaviors. *Annual Review of Sociology*, *36*, 349–370. https://doi.org/10.1146/annurev.soc.012809.102529

Purba, P. H., Rahayu, T., Kusuma, D. W. Y., Handayani, O. W. K., Suganda, M. A., Suryadi, D., & Manullang, J. G. (2024). Development of a Test Instrument for Physical Assessment in Junior Karate Practitioners: A Study Targeting 16-17-Year-Old Individuals. *International Journal of Human Movement and Sports Sciences*, *12*(2), 277–287. https://doi.org/10.13189/saj.2024.120202

Rawal, L. B., Smith, B. J., Quach, H., & Renzaho, A. M. N. (2020). Physical Activity among Adults with Low Socioeconomic Status Living in Industrialized Countries:

A Meta-Ethnographic Approach to Understanding Socioecological Complexities. *Journal of Environmental and Public Health*, *2020*, 4283027. https://doi.org/10.1155/2020/4283027

Rubiyatno, Perdana, R. P., Fallo, I. S., Arifin, Z., Nusri, A., Suryadi, D., Suganda, M. A., & Fauziah, E. (2023). Analysis of differences in physical fitness levels of extracurricular futsal students: Survey studies on urban and rural environments. *Pedagogy of Physical Culture and Sports*, *27*(3), 208–214. https://doi.org/10.15561/26649837.2023.0304

Samitz, G., Egger, M., & Zwahlen, M. (2011). Domains of physical activity and all-cause mortality: Systematic review and dose-response meta-analysis of cohort studies. *International Journal of Epidemiology*, *40*(5), 1382–400. https://doi.org/10.1093/ije/dyr112

Suryadi, D., Komaini, A., Suganda, M. A., Rubiyatno, R., Faridah, E., Fauzan, L. A., Fauziah, E., Putra, M. E., & Ayubi, N. (2024). Sports Health in Older Age: Prevalence and Risk Factors - Systematic Review. *Retos*, *53*, 390–399. https://doi.org/10.47197/retos.v53.102654

Suryadi, D., Nasrulloh, A., Haryanto, J., Samodra, Y. T. J., Wati, I. D. P., Suganda, M. A., Nugroho, S., Dafun Jr, P. B., Kushartanti, B. M. W., & Fauziah, E. (2024). What are physical exercise interventions in older age? Literature review for physical and cognitive function. *Pedagogy of Physical Culture and Sports*, *28*(3 SE-Articles), 201–212. https://sportpedagogy.org.ua/index.php/ppcs/article/view/2657

Suryadi, D., Nasrulloh, A., Yanti, N., Ramli, R., Fauzan, L. A., Kushartanti, B. W., Sumaryanti, S., Suhartini, B., Budayati, E. S., Arovah, N. I., Mashud, M., Suganda, M. A., Sumaryanto, S., Sutapa, P., Abdullah, N. M. bin, & Fauziah, E. (2024). Stimulation of motor skills through game models in early childhood and elementary school students: systematic review in Indonesia. *Retos*, *51*, 1255–1261. https://doi.org/10.47197/retos.v51.101743

Suryadi, D., Okilanda, A., Nofrizal, D., Anggara Suganda, M., Tulyakul, S., Ahmed, M., Hussain, I., Nasrulloh, A., Juni Samodra, Y. T., Puspita Wati, I. D., & Herdiyana Bastian, R. (2024). How does cooperative learning work with students? Literature review in physical education. *Retos*, *55*, 527–535. https://doi.org/10.47197/retos.v55.105256

Suryadi, D., Susanto, N., Faridah, E., Wahidi, R., Samodra, Y. T. J., Nasrulloh, A., Suganda, M. A., Wati, I. D. P., Sinulingga, A., Arovah, N. I., & Dewantara, J. (2024). Exercise for health in old age: Comprehensive review examining the benefits and efficacy of interven-tions. *Retos*, *55*(SE-Revisiones teóricas, sistemáticas y/o metaanálisis), 88–98. https://doi.org/10.47197/retos.v55.103771

Tandon, P. S., Zhou, C., Sallis, J. F., Cain, K. L., Frank, L. D., & Saelens, B. E. (2012). Home environment relationships with children's physical activity, sedentary time, and screen time by socioeconomic status. *International Journal of Behavioral Nutrition and Physical Activity*, *9*, 88–97. https://doi.org/10.1186/1479-5868-9-88

Datos de los/as autores/as y traductor/a:

I Made Dwi Sastra Wargama	sastra@students.unnes.ac.id	Autor/a
Tandiyo Rahayu	tandiyorahayu@mail.unnes.ac.id	Autor/a
Bambang Priyono	bambangpriyono@mail.unnes.ac.id	Autor/a
Siti Baitul Mukarromah	sitibaitul@mail.unnes.ac.id	Autor/a
Harry Pramono	hpr4mono@mail.unnes.ac.id	Autor/a
Heny Setyawati	henysetyawati@mail.unnes.ac.id	Autor/a
Syamsudin Syamsudin	syamsudin@unmus.ac.id	Autor/a
Didi Suryadi	didisuryadi.2023@student.uny.ac.id	Autor/a
Rezza Dewintha	atapoltekkes@gmail.com	Traductor/a