

## Application of a Healthy Lifestyle Through Sports Science Knowledge to Correct Bad Habits After the COVID-19 Outbreak: Systematic Review

### Aplicación de un estilo de vida saludable a través del conocimiento de las ciencias del deporte para corregir malos hábitos tras el brote de COVID-19: revisión sistemática

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**Abstract.** The purpose of this study was to provide in-depth information about the application of a healthy lifestyle through sports science knowledge to correct bad habits after the COVID-19 outbreak through a Systematic Review. This type of research involves the systematic review method. This study was conducted using a comprehensive strategy of using article searches of databases of research journals. The databases used included Scopus, Web of Science, and PubMed. This research was conducted with a comprehensive strategy using article searches in databases of research journals. The databases used were Scopus, Web of Science, and PubMed. Journals were selected through inclusion criteria, namely international journals published in the last seven years until 2022, journals on health and sports. Furthermore, the exclusion criteria in this study were national journals and non-reputable journals. The keywords used in the search are health, sports, motor skills, motivation to exercise and COVID-19. A total of 2590 articles from the Web of Science, Pubmed, Scopus, and Embase databases were identified. A further 11 articles that met all inclusion requirements or at least some of them were selected for this systematic review. For standard operationalization, this study follows the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA). The results of this study show that the application of a healthy lifestyle can be implemented by increasing knowledge of sports science and its benefits. According to this review article, exercise and physical activity are beneficial for improving physical fitness and reducing the percentage of fat, maintaining heart health, improving bone mineral density, increasing motor and locomotor skills, as well as mental health and the role of nutrition is also important to note in living a healthy lifestyle. Increasing knowledge has the potential to correct bad habits after the COVID-19 Outbreak.

**Keywords:** Health, sports science, motor skills, healthy lifestyle, COVID-19

**Resumen.** El propósito de este estudio fue brindar información detallada sobre la aplicación de un estilo de vida saludable a través del conocimiento de las ciencias del deporte para corregir los malos hábitos después del brote de COVID-19 a través de una Revisión Sistemática. Este tipo de investigación involucra el método de revisión sistemática. Este estudio se realizó utilizando una estrategia integral de búsqueda de artículos en bases de datos de revistas de investigación. Las bases de datos utilizadas incluyeron Scopus, Web of Science y PubMed. Esta investigación se realizó con una estrategia integral utilizando búsquedas de artículos en bases de datos de revistas de investigación. Las bases de datos utilizadas fueron Scopus, Web of Science y PubMed. Las revistas fueron seleccionadas a través de criterios de inclusión, a saber, revistas internacionales publicadas en los últimos siete años hasta 2022, revistas sobre salud y deportes. Además, los criterios de exclusión en este estudio fueron revistas nacionales y revistas sin reputación. Las palabras clave utilizadas en la búsqueda son salud, deporte, motricidad, motivación para hacer ejercicio y COVID-19. Se identificaron un total de 2590 artículos de las bases de datos Web of Science, Pubmed, Scopus y Embase. Otros 11 artículos que cumplieron con todos los requisitos de inclusión o al menos algunos de ellos fueron seleccionados para esta revisión sistemática. Para la operatividad estándar, este estudio sigue los elementos de informe preferidos para revisiones sistemáticas y metanálisis (PRISMA). Los resultados de este estudio muestran que la aplicación de un estilo de vida saludable puede implementarse aumentando el conocimiento de las ciencias del deporte y sus beneficios. Según este artículo de revisión, el ejercicio y la actividad física son beneficiosos para mejorar la condición física y reducir el porcentaje de grasa, mantener la salud del corazón, mejorar la densidad mineral ósea, aumentar las habilidades motoras y locomotoras, así como la salud mental y también es importante tener en cuenta el papel de la nutrición para llevar un estilo de vida saludable. Aumentar el conocimiento tiene el potencial de corregir los malos hábitos después del brote de COVID-19.

**Palabras clave:** Salud, ciencias del deporte, motricidad, estilo de vida saludable, COVID-19

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## Introduction

Regular exercise is very important for health and fitness (Rueggsegger and Booth, 2018; Ayubi et al., 2022; Kusnanik et al., 2022). Someone who is active in sports has a lower risk of disease than those who are not active in sports (Fuller and Thyfault, 2021). In addition to physical benefits, exercise has been recognized as having great benefits for mental health (Campos et al., 2019).

In this regard, previous studies have reported that leisure time is the most common time to exercise (Agafonov et al., 2020). Sport is one type of activity that is carried out

in organized leisure time and is usually played in a team or individually (Agafonov et al., 2020; Południak et al., 2021). The current problem is that sports lessons at school are only done once a week, and the density of other subjects causes regular exercise to be neglected. However, in childhood and adolescence, exercise is very important for physical health, mental health, and motor skills (Grasdalsmoen et al., 2020; Komaini et al., 2022). In addition, the problem of the COVID-19 outbreak that has hit in recent years has changed one's habits in the learning process at schools and universities (Nurhasanah et al., 2022). In addition, even though the COVID-19 outbreak that has hit in recent years

has been conducive, this still has an impact on a person's habits in the learning process at schools and universities, screen time habits and other habits of not living a healthy lifestyle (Ayubi and Komaini, 2021).

Alternative solutions need to be found to overcome these problems, and health is very important not only among adults but also for children and adolescents who are of school age (Pantaleon, 2019). Previous studies reported that the COVID-19 pandemic had an impact on children's motor skills, in this case, due to lack of physical activity at home, increased sleeping habits, and increased eating habits (Ayubi and Komaini, 2021). If this is allowed to continue, of course it will become a bad habit that will impact health.

This problem provides an opportunity for us to provide in-depth information about the application of a healthy lifestyle through sports science knowledge to correct bad habits after the COVID-19 outbreak through a Systematic Review.

### Material & methods

This study used the systematic review method. This research was conducted with a comprehensive strategy using article searches in databases of research journals. The databases used were Scopus, Web of Science, and PubMed. Journals were selected through inclusion criteria, namely

international journals published in the last seven years until 2022, journals on health and sports. Furthermore, the exclusion criteria in this study were national journals and non-reputable journals. The keywords used in the search are health, sports, motor skills, motivation to exercise and COVID-19. A total of 2590 articles from the Web of Science, Pubmed, Scopus, and Embase databases were identified. A further 11 articles that met all inclusion requirements or at least some of them were selected for this systematic review. For standard operationalization, this study follows the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA).

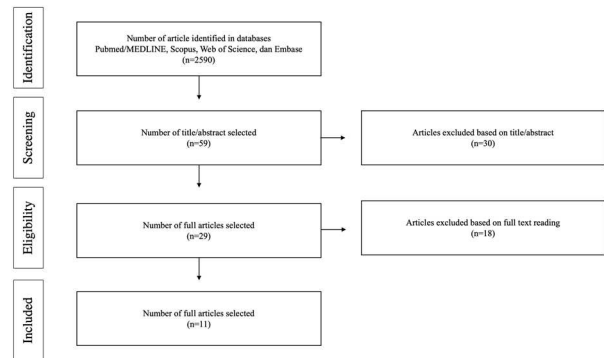


Figure 1. PRISMA flowchart of the article selection process

### Results

Table 1. Review of application of the health model through sports science knowledge to correct bad habits after the COVID-19 outbreak

Author	Sample Characteristics	Study Design	Protocol	Results
(Singh et al., 2022)	28 people with an average age of 19 years an average height of 172 cm and an average height of 64 kg participated in the study. Subjects were divided into three groups, namely the group running outdoors and the group running using a treadmill.	Experimental	Treadmill, physical fitness, body fat percentage	Running outdoors or using a treadmill can improve physical fitness and reduce fat percentage.
(Brellenthin et al., 2019)	A total of 406 men and women aged 35–70 years were divided into several groups, namely control and treatment groups. The intensity of the exercise given was 50–80% of the maximum ability, and it was carried out three times a week for 1 year. These people had at least three risk factors (overweight, inactivity, and elevated blood pressure) for obtaining the most cardiovascular benefit from the study.	Experimental	Aerobic exercise, heart health	Aerobic exercise helps generate clinical strategies to prevent heart disease.
(Adamo et al., 2016)	A total of 84 children who were 3–5 years old were divided into two groups, namely a control group and an intervention group. The intervention was carried out for 6 months.	Experimental	Preschooler activity trial, physical activity, locomotor skills	The physical activity-based intervention group showed an increase in locomotor skills compared to the control group.
(Laukkanen et al., 2015)	A total of 91 children who were 4–7 years old were divided into two groups, namely a control group and an intervention group. The intervention group received family-based physical activity counseling, while the control group did not receive counseling. This research was conducted for 12 months.	Randomized controlled trial	Family based physical activity counseling, motor competence	Family-based physical activity counseling improves motor coordination
(Herbert et al., 2020)	A total of 185 male and female students who were 22–23 years old who had symptoms of depression were given an intervention for 6 weeks.	Experimental	Aerobic exercise, mental health	Short-term aerobic exercise with low to moderate intensity carried out for 6 weeks on a regular basis has a positive effect on preventing perceived depression, thus, aerobic exercise is very good for mental health.
(Hoffmann et al., 2022)	A total of 11,235 children and adolescents who were 9–13 years old in the United States participated in this study. To assess participation in organized sports, children and youth were categorized into one of four groups: 1) participation in team	Cross-sectional	Sports, mental health	Participation in sports teams supports the mental health of children and adolescents.

	sports, 2) participation in individuals, 3) participation in sports and individuals, and 4) participation in non-sports			
(Lee, 2021)	A total of 27 studies met the inclusion criteria, and children and adolescents who were overweight or obese participated in aerobic exercise.	Systematic Review	Aerobic exercise, obesity	Aerobic exercise is effective for reducing body fat, reducing inflammatory biomarkers such as TNF- $\alpha$ , IL-6, and CRP, and reducing blood biomarkers such as cholesterol and triglycerides.
(Hamaguchi <i>et al.</i> , 2017)	15 postmenopausal women with an average age of 60 participated in the study. Subjects were divided into two groups, namely the training group and the control group. The training was carried out for 6 weeks.	Experimental	Low repetition and low load weight training, bone mineral density, muscle strength	Low repetition and low load weight training can increase the mineral density of the hip bones, and the strength of the knee extensors in postmenopausal women.
(Omar <i>et al.</i> , 2021)	60 participants of both sexes with an average age of 52 years participated in the study. Subjects were divided into two groups, namely the swimming training group and the control group. The exercises were carried out for a duration of two hours, three times/week, and were carried out for 16 weeks.	Experimental	Long-term swimming training, a nonpharmacological health approach to managing type 2 diabetes, hyperlipidemia, hypertension and obesity	Swimming exercises carried out for 16 weeks can be a therapeutic program to manage type 2 diabetes, hyperlipidemia, hypertension and reduce obesity.
(Carey, Doyle and Lucey, 2023)	405 people aged at least 18 years completed a sports nutrition survey. 295 are active in sports competitions and 110 are active in structured physical activities.	Cross-sectional	Sports and nutrition	The role of nutrition that can be obtained from healthy food and supplementation is a top priority for accelerating post-exercise recovery for athletes or individuals who are active in sports.
(Leyton-Román, de la Vega and Jiménez-Castuera, 2020)	179 people consisting of 90 men and 89 women aged between 18 – 65 years who are actively doing regular physical activity participated in the study.	Cross-sectional	Exercise motivation	Basic psychological needs of competence must be nurtured to increase motivation to exercise as an effort to maintain a healthy lifestyle.

## Discussion

This study reviews in depth the Application of a Healthy Lifestyle Through Sports Science Knowledge to Improve Bad Habits After the COVID-19 Outbreak. The number of articles that met the inclusion criteria was 11 articles. Overall, exercise has a positive effect on health. Research (Singh *et al.*, 2022) reports that running outdoors or using a treadmill can improve physical fitness and reduce fat percentage. In this study running sports that are done outdoors or on a treadmill can be included in a healthy living program. In addition, aerobic exercises such as gymnastics can also be applied to prevent disease. research (Brellenthin *et al.*, 2019) reports that aerobic exercise can prevent heart disease. In this study, the exercise dose involved intensity ranged from 50% to 80% of maximal capacity, and exercise was carried out regularly three times per week. In addition to aerobic exercise, anaerobic exercise can be applied to improve a healthy lifestyle. research (Hamaguchi *et al.*, 2017) reported that low-repetition and low-load exercises can increase pelvic bone mineral density, and knee extensor strength in postmenopausal women.

In addition to physical health, exercise has a positive effect on motor and locomotor skills. Research by (Adamo *et al.*, 2016) reports that regular physical exercise for 6 months can improve movement skills. This is reinforced by research (Laukkanen *et al.*, 2015) which reports that physical activity carried out regularly for 12 months can improve children's motor skills. Motor skills are very important for children, especially when they can be trained and improved during the growth years. Furthermore, regular exercise can maintain mental health. Research (Herbert *et al.*, 2020) reports that short-term aerobic exercise done regularly for 6 weeks can prevent depression and is very good for mental health. Reinforced by research (Leyton-Román, de la Vega and Jiménez-Castuera, 2020) reports that basic psychological needs for competence must be nurtured to increase motivation to

exercise as an effort to maintain a healthy lifestyle. Research (Hoffmann *et al.*, 2022) reports that team sports support mental health in children and adolescents compared to individual sports. In team sports, they can interact with friends and work together to achieve victory in sports. Their motivation can increase when they are in a team.

Furthermore, exercise can prevent a person from obesity. A literature study (Lee, 2021) reports that exercise such as aerobics can reduce body fat, and exercise can reduce inflammatory biomarkers, such as TNF- $\alpha$ , IL-6, and CRP, and can reduce blood biomarkers, such as cholesterol and triglycerides. This was further strengthened by research (Omar *et al.*, 2021) which reported that swimming exercises carried out for 16 weeks could be a therapeutic program for managing type 2 diabetes, hyperlipidemia, hypertension and reducing obesity.

To accelerate post-exercise recovery, the role of nutrition is needed. Several macro-nutrients such as protein, carbohydrates and good fats as well as supporting supplementation must be considered in carrying out a healthy lifestyle. Research (Carey, Doyle and Lucey, 2023) reports that the role of nutrition that can be obtained from healthy food and supplementation is a top priority for accelerating post-exercise recovery for athletes or individuals who are active in sports.

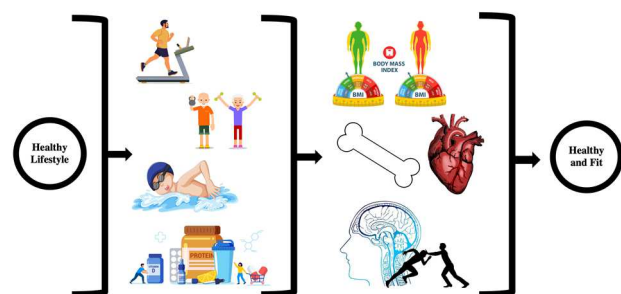


Figure 2. Application of a Healthy Lifestyle Through Sports Science Knowledge

Thus, the application of a healthy lifestyle can be implemented by increasing knowledge of sports science and its benefits. According to this review article, exercise and physical activity are beneficial for improving physical fitness and reducing the percentage of fat, maintaining heart health, improving bone mineral density, increasing motor and locomotor skills, as well as mental health and the role of nutrition is also important to note in living a healthy lifestyle.

### Conclusion

It can be concluded that the application of a healthy lifestyle can be implemented by increasing knowledge of sports science. Exercise and physical activity are beneficial for increasing physical fitness and reducing fat percentage, maintaining heart health, increasing bone mineral density, improving motor and locomotor abilities, as well as mental health and the role of nutrition is also important to pay attention to in living a healthy lifestyle. Increasing knowledge has the potential to correct bad habits after the COVID-19 Outbreak.

### Conflicts of interest

The author has no conflict of interest.

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