

Weight Management and Various Other Benefits of Physical Activity in Human Life

Sandhya J. Kadam 

ABSTRACT

Obesity is a major health problem for all age groups. Various preventive and treatment modalities are available for weight management. Along with losing weight, a healthy heart and a fit body are the central concepts of overall well-being. Among all obesity prevention and management modalities, physical activity has various other benefits that can help strengthen the idea of a healthy life. Physical activity promotes muscle mass, boosts metabolism, and burns calories even when resting. Age-wise daily physical activity recommendations are available. However, a large number of people are unaware of these recommendations. Several reasons may limit a person's ability to perform physical activity. Diet is the main component of weight loss in managing overweight and obesity, which can be combined with physical activity to lose, maintain, and prevent regain of weight after weight loss. A combination of aerobic, resistance, and strength training exercises can be the key components of weight management. Physical activity can be difficult for patients with other co-morbidities, severely obese, and elderly patients. Finding ways to deal with co-morbidities and performing physical activities daily may help patients deal with weight loss and achieve overall fitness, as well as a healthy heart. In conclusion, this article highlights the recommendations for physical activity for a healthy life and provides guidelines to overcome the barriers and help patients in the best possible ways.

Keywords: Aerobic and resistance exercise, Borg scale, obesity, physical activity.

Submitted: January 21, 2025

Published: April 25, 2025

 10.24018/ejsport.2025.4.2.223

MD, Family HealthCare Network, USA.

*Corresponding Author:
e-mail: hellosandhya7@gmail.com

1. INTRODUCTION

A sedentary lifestyle affects the health of all age groups. Lack of education and knowledge about physical activity is worsening everyone's sedentary lifestyle, including children. Preferring screen time over activities is decreasing overall 24-hour energy expenditure. The concept of age-wise daily recommended activities has been forgotten, and people are becoming increasingly sedentary. This sedentary lifestyle not only increases obesity and weight gain, but it is also affecting every organ in the body. Any amount and duration of physical activity can help with weight management, bone and metabolic health, and improving the fitness level of the (Tranchita *et al.*, 2023).

The presence of physical barriers, lack of motivation, lack of accessibility, and lack of self-esteem may cause obstacles in performing physical activities. Helping patients overcome all these barriers and motivating them to integrate technology may help make physical activity an important part of daily routine for everyone (Schuch & Vancampfort, 2021). This article provides an overview of the physical activity component of weight management.

2. PHYSICAL ACTIVITY RECOMMENDATIONS

The American Academy of Pediatrics (AAP) recommends the amount of age-wise daily physical activity for children. According to the AAP, infants should have approximately half an hour of activity spread throughout the day. It is advisable to focus on interactive floor play, including tummy time, to



promote motor development. Toddlers should engage in one eighty minutes of active play, including outdoor activities such as walking and free play. Children more than six years of age should aim for sixty minutes of moderate to vigorous activity incorporating activities that build muscle and bone strength. Parents should be counseled about choosing activities that are suitable for a child's age and developmental level. Exposing children to different types of physical activity to target various muscle groups may help all body muscles and keep children engaged and excited about physical activities (McWilliams *et al.*, 2009).

For adults, the 2007 physical activity guidelines still apply, and there are "The New Physical Activity Guidelines for Americans-2018". A sedentary lifestyle is associated with multiple chronic conditions. Therefore, it is recommended that any type and duration of physical activity be added throughout the day. According to the 2018 guidelines, all activities count toward health and fitness, especially cancer, brain health, and fall-related injuries (Stamatakis *et al.*, 2019).

There are specific American College of Sports Medicine recommendations for maintaining a healthy weight, losing weight, and preventing weight gain after loss. As per the American College of Sports Medicine, healthy adults should perform moderate-intensity physical activity for at least 30 minutes 5 days per week, 30 min can be accumulated in 10–15 minutes bouts for a healthy life. If the person is ready to perform vigorous-intensity physical activity, they are recommended to do 20 min or more, 3 days per week, and is advised to add resistance exercise as 1 set of 8–12 repetitions, 8–10 exercises. To help with weight loss, moderate-intensity physical activity of 150 to 250 minutes per week is recommended and clinically significant weight loss can be achieved with more than 250 minutes per week of physical activity as per the guidelines. Duration of physical activity has to be increased to 200–300 minutes per week, that is, five 40- to 60-minute bouts per week, to prevent regain after weight loss (Kanaley *et al.*, 2022).

3. WEIGHT LOSS WITH PHYSICAL ACTIVITY

It was found that people lose very little weight with only physical activity due to various reasons. A person may take sixty minutes to lose six hundred calories and regain all those calories in just five minutes by eating calorie-dense food. People may also get tired after physical activity and may sleep or rest, burning less total calories in 24 hours. After physical activity, people may change their mindset with the false impression that they have done physical activity and can now eat more (Swift *et al.*, 2018).

Prevention of weight gain over time and prevention of regain after weight loss requires consideration of multiple factors such as exercise, 24-hour total energy expenditure, calorie intake, and factors affecting eating habits, cravings, hunger, and satiety. As per the available data, it was found that much weight loss does not occur with exercise. It was studied that aerobic exercise can cause zero to two kilograms of weight loss, resistance training only does not help to lose weight, and aerobic plus resistance training can help with weight loss only with extremely high volumes of aerobic training (Berge *et al.*, 2021).

However, data from the National Weight Control Registry is very encouraging. As per the registry data, more than ninety percent of weight maintainers exercise regularly as one hour per day of walking, and more than sixty percent of people who have regained weight do not exercise regularly. Despite not achieving much weight loss with physical activity alone, physical activity is recommended for various other benefits (Thomas *et al.*, 2014).

4. OTHER BENEFITS OF PHYSICAL ACTIVITY

Regular physical activity can bring positive changes at the cellular level. It improves vascular endothelial function. It is found that there is a positive relationship between physical activity and mitochondria, leading to increased mitochondrial quantity and improved function through biogenesis. Physical activity helps cells to become more efficient at producing energy, which can enhance endurance and overall physical performance. With this approach of physical activity, patients can be obese but can still be fit and healthy. Fitness achieved through physical activity protects each weight category and is independent of body weight against all-cause mortality (Smith *et al.*, 2023).

Waist circumference is correlated with vascular fat, which predicts cardiovascular mortality. Physical activity helps to decrease waist circumference even with very little weight loss. Aerobic activity can specifically target and decrease visceral fat, which is associated with increased cardiovascular health risks (Armstrong *et al.*, 2022).

Physical activity can improve self-esteem, mood, and overall well-being, which can further support healthy lifestyle choices, including dietary habits and appetite regulation. Physical activity can also

TABLE I: SUMMARY OF BENEFITS OF PHYSICAL ACTIVITY

Category	Benefits
Physical health	• Reduced heart disease risk • Strengthening of muscles, bones, and joints, reducing injury risk • Improved coordination, balance, flexibility
Mental health	• Decreased stress, anxiety, depression • Improved self-esteem, emotional well-being • Improved sleep quality • Enhancement of memory and cognition
Longer life	• Reduced all-cause mortality risk • Delayed onset of age-related osteoporosis and dementia
Social factors	• Improve communication skills, teamwork • Social engagement
Immunity	• Reduced inflammation • Resistance to infections
Physical performance	• Improved energy and stamina • Reduced fatigue level

Note: Sources: (Smith *et al.*, 2023; Armstrong *et al.*, 2022; Yu *et al.*, 2020).

improve bone health and heart health by lowering blood sugar and blood pressure, lowering high lipid profile, and enhancing cognitive function and better sleep, in addition to weight control. Physical activity decreases inflammation, risk of falling, fall-related injuries, sarcopenic obesity, and cancer mortality. Please refer to Table I for the summary of the benefits of physical activity (Smith *et al.*, 2023; Armstrong *et al.*, 2022; Yu *et al.*, 2020).

5. DIFFERENT TYPES OF PHYSICAL ACTIVITY FOR WEIGHT MANAGEMENT

Aerobic exercise, which involves cardio that elevates the heart rate and burns significant calories, such as running, swimming, cycling, brisk walking, and weights, helps build muscle mass and improve metabolism. Another component is High-Interval Training (HIIT), which involves intense exercise and recovery periods. HIIT can be effective for burning calories in a shorter time. Physical activity causes net calorie to burn and increases metabolism. Daily exercise can increase resting metabolic rate and burn calories even during no active exercise (Martin-Smith *et al.*, 2020).

Important considerations regarding intensity and duration of physical activity are consideration of seeking professional advice to find the appropriate exercise type and intensity based on individual health and fitness level. Intensity is important. Higher-intensity exercise generally burns more calories per minute. If a person can perform daily high-intensity exercise, he can burn more calories. But instead of doing high-intensity exercise just once or twice a week, performing regular physical activity at least five days a week is more effective, even if it is just moderate intensity. The Borg scale is used to determine the intensity of physical activity (Arney *et al.*, 2019).

6. HOW PHYSICAL ACTIVITY CAN BE MADE MORE EFFECTIVE

Patients need motivation to perform daily physical activity and continue to perform consistently. This can be achieved by encouraging patients to connect physical activity to a habit they do every day, such as brushing their teeth, bathing, etc. If the patient can perform physical activity with something enjoyable, such as listening to music, it may help to improve consistency. After a few days of consistent physical activity, the patient may start feeling the gains, which will help reinforce the habit. Professionals can recommend a safe and individualized plan after taking history, physical exam, and finding the readiness and fitness level of the patient. Always emphasize that any type and amount of physical activity is better than no movement, which can help the patient feel encouraged (Samdal *et al.*, 2017).

While recommending physical activity for children, elderly patients, and patients with obesity, special considerations must be kept in mind. In patients with obesity, it is recommended to start slowly and progress gradually as tolerated. Start with low-impact simple exercises and gradually increase in duration and intensity. Psychological barriers, lack of accessibility due to environmental factors, and potential for injury are other factors that need to be addressed during initial visits while making the physical activity plan (Oppert *et al.*, 2021).

Physical activity alone may not lead to significant weight loss, particularly compared to dietary modifications. So, it is important to advise combining physical activity with healthy dietary habits. If

professionals see the patient for a physical activity plan for weight loss, the conversation regarding changing dietary habits along with physical activity becomes paramount (Kanaley *et al.*, 2022).

Physical activity plans for children need to promote entire family involvement, encourage parents to become active role models, and provide support to children for physical activity. Community-based interventions and collaborating with schools and local organizations to ensure accessible and safe physical activity options can be very impactful (Kliziene *et al.*, 2021).

In patients with obesity, weight creates a load on joints, especially the lower limb joints, causing joint pain. Addressing joint pains before starting physical activity may help to continue it for a longer duration. During exercise, muscular physical activity energy has to be released as heat by sweating. Patients with obesity may find it difficult, so measures to deal with sweating and hydration status must be considered. Some patients with obesity may feel self-conscious or embarrassed about exercising in public, hindering their participation. Providing counseling and referral to support groups to address body image concerns and build self-esteem can be very useful (Messier *et al.*, 2022).

To make the physical activity plan more effective, it is recommended to use motivational interviewing techniques. Advise the patient to develop a SMART goal that is simple, measurable, attainable, realistic, practical, and timed. Offer problem-solving and avoid an all-or-nothing strategy (Cole *et al.*, 2023).

Typical respiratory changes occurring in patients with obesity may make it harder for them to exercise. These changes must be considered when providing an individualized plan to patients with obesity. It was found in one study that patients with obesity were not able to sustain exercise as breaths per minute were higher in obesity starting dyspnea earlier. The drive to breathe was reduced during exercise, and the lactate threshold was reached at lower exercise intensities. Despite all the differences, O₂ saturation remained constant in obese and lean with exercise, possibly due to optimization of ventilation and perfusion ratio (Christopher *et al.*, 2015).

In another study, catecholamine responses during exercise were found to be blunted in obesity compared with lean. CHO Oxidation was lower in obesity. Insulin (anti-lipolytic) was higher in patients, suggesting insulin resistance. However, aerobic and resistance exercise could overcome the blunted catecholamine response and insulin resistance in obesity, independent of weight loss. One pound of weight loss is known to reduce a fourfold load over the knees (Zouhal *et al.*, 2013).

In children with special needs, physical activity can help mitigate the secondary health issues associated with disability while also promoting positive mental and social development. Physical activity can help them with better coordination, improvement in daily activities, and overall independence. Collaboration of speech, occupational, and physical therapists, physical educators, and healthcare providers can help to provide individualized plans to children with special needs (Kanda *et al.*, 2021).

Water-based activities such as swimming are great options for many children with disabilities due to their buoyancy and reduced impact on joints. Adapted dance programs can focus on movement patterns and coordination while promoting enjoyment. Yoga and stretching can improve flexibility and body awareness. Wheelchair basketball, bocchia, and sitting volleyball are sports modified for children with physical limitations. For optimal weight management, physical activity should be combined with a healthy dietary plan of nutrient-dense foods with special attention to portion size and mindful eating (Kanda *et al.*, 2021).

7. MEASURE OUTCOMES FREQUENTLY TO CONTINUE MOTIVATION

Even if there is no weight loss with physical activity, the patient can be motivated by measuring other parameters such as improved endurance, strength, energy level, better feeling of wellness, reduced overall aches and pains, and improved sound sleep. Biomarkers such as waist circumferences, blood glucose, blood pressure, lipids, and resting HR should be measured during each visit, and improvements in all these measures can be shown to the patients to motivate them (Sun *et al.*, 2023).

8. USE OF APPS AND DEVICES TO PROMOTE PHYSICAL ACTIVITIES

Apps and devices offer counting of physical activities, send reminders, and encourage motivation automatically. Any type and duration of activity get counted by Apps and devices to provide appreciation to the individual. It was found that people underreport their food intake and overreport their activity. Using Apps and devices can help to overcome this subjectivity. All devices and apps are usually more accurate at step counts than estimating energy expenditure. Pedometers and Accelerometers are more accurate than phones and wearable devices. They can still be used to maintain consistency and help with objective assessment of physical activity (Oba *et al.*, 2023).

9. ROLE OF WALKING STEPS IN PHYSICAL ACTIVITY

The study found that the more the person sits, the lower the survival. However, getting up and walking can alter gene expression. Therefore, patients who cannot perform moderate to vigorous activity should be encouraged to walk the steps per day. A person usually walks around 4000 steps per day related to daily activities, which is considered low for adults. Instead, walking 8,000 steps per day was associated with a 51% lower risk, and taking 12,000 steps per day was associated with a 65% lower risk for all-cause mortality compared with taking 4,000 steps. It was also studied that there was no association between step intensity (steps per minute) and risk of death after accounting for the total number of steps taken per day. A total number of steps walked at any intensity were found to impact all-cause mortality (Saint-Maurice *et al.*, 2020).

10. CONCLUSION

In all cases of weight management, only physical activity does not help if calories consumed exceed calories burned. However, the concept of becoming healthy and fit even without weight loss in patients with obesity is possible as physical activity offers various bone, metabolic, mental, social, and fitness benefits independent of weight loss. To achieve weight loss, maintain weight, and prevent the regain of weight, physical activity has to be combined with healthy dietary habits and calorie restriction. Individualized SMART goals and integration of new technology, Apps, and devices can help continue consistent and motivated physical activity plans. Education and training of health care staff may be needed to convey the importance of physical activity to their patients in the most effective manner.

CONFLICT OF INTEREST

The author declares that there is no conflict of interest.

REFERENCES

- Armstrong, A., Jungbluth Rodriguez, K., Sabag, A., Yorgi, M., Helen, M. P., Shelley, E. K., & Nathan, A. J. (2022). Effect of aerobic exercise on waist circumference in adults with overweight or obesity: A systematic review and meta-analysis. *Obesity Reviews*, 23(8), e13446. <https://doi.org/10.1111/obr.13446>.
- Arney, B. E., Glover, R., Fusco, A., Cortis, C., de Koning, J. J., Van Erp, T., Jaime, S., Mikat, R. P., Porcari, J. P., & Foster, C. (2019). Comparison of RPE (Rating of Perceived Exertion) Scales for Session RPE. *International Journal of Sports Physiology and Performance*, 14(7), 994–996. <https://doi.org/10.1123/ijspp.2018-0637>.
- Berge, J., Hjelmestaeth, J., Hertel, J. K., Gjevestad, E., Småstuen, M. C., Johnson, L. K., Martins, C., Andersen, E., Helgerud, J., & Storen, Ø. (2021). Effect of aerobic exercise intensity on energy expenditure and weight loss in severe obesity—A randomized controlled trial. *Obesity A Research Journal (Silver Spring)*, 29(2), 359–369. <https://doi.org/10.1002/oby.23078>.
- Christopher, L. K., Kosai, N. R., Reynu, R., Levin, K. B., Taher, M. M., Sutton, P. A., Sukor, N., & Das, S. (2015). Effect of exercise on pulmonary function tests in obese Malaysian patients. *La Clinica Terapeutica*, 166(3), 105–109. <https://doi.org/10.7417/CT.2015.1838>.
- Cole, S. A., Sannidhi, D., Jadotte, Y. T., & Rozanski, A. (2023). Using motivational interviewing and brief action planning for adopting and maintaining positive health behaviors. *Progress in Cardiovascular Diseases*, 77, 86–94. <https://doi.org/10.1016/j.pcad.2023.02.003>.
- Kanaley, J. A., Colberg, S. R., Corcoran, M. H., Malin, S. K., Rodriguez, N. R., Crespo, C. J., Kirwan, J. P., & Zierath, J. R. (2022). Exercise/Physical activity in individuals with type 2 diabetes: A consensus statement from the American college of sports medicine. *Medicine & Science In Sports & Exercise*, 54(2), 353–368. <https://doi.org/10.1249/MSS.0000000000002800>.
- Kanda, D., Walker, A., Siekirk, N., & Colquitt, G. (2021). The relationship between physical activity and school success among children with and without special health care needs. *Journal of School Health*, 91(5), 393–400. <https://doi.org/10.1111/josh.13012>.
- Kliziene, I., Cizauskas, G., Sipaviciene, S., Aleksandraviciene, R., & Zaicenkoviene, K. (2021). Effects of a physical education program on physical activity and emotional well-being among primary school children. *International Journal of Environmental Research and Public Health*, 18(14), 7536. <https://doi.org/10.3390/ijerph18147536>.
- Martin-Smith, R., Cox, A., Buchan, D. S., Baker, J. S., Grace, F., & Sculthorpe, N. (2020). High Intensity Interval Training (HIIT) Improves Cardiorespiratory Fitness (CRF) in healthy, overweight and obese adolescents: A systematic review and meta-analysis of controlled studies. *International Journal of Environmental Research and Public Health*, 17(8), 2955. <https://doi.org/10.3390/ijerph17082955>.
- McWilliams, C., Ball, S., Benjamin Neelon, S. E., Hales, D., Vaughn, A., & Ward, D. S. (2009). Best-practice guidelines for physical activity at child care. *Pediatrics*, 124(6), 1650–1659. <https://doi.org/10.1542/peds.2009-0952>.
- Messier, S. P., Beavers, D. P., Queen, K., Mihalko, S. L., Miller, G. D., Losina, E., Katz, J. N., Loeser, R. F., DeVita, P., Hunter, D. J., Newman, J. J., Quandt, S. A., Lyles, M. F., Jordan, J. M., & Callahan, L. F. (2022). Effect of Diet and exercise on knee pain in patients with osteoarthritis and overweight or obesity: A randomized clinical trial. *The Journal of the American Medical Association*, 328(22), 2242–2251. <https://doi.org/10.1001/jama.2022.21893>.
- Oba, T., Takano, K., Katahira, K., & Kimura, K. (2023). Use patterns of smartphone apps and wearable devices supporting physical activity and exercise: Large-scale cross-sectional survey. *JMIR Mhealth and Uhealth*, 11, e49148. <https://doi.org/10.2196/49148>.
- Oppert, J. M., Bellicha, A., van Baak, M. A., Battista, F., Beaulieu, K., Blundell, J. E., Carraça, E. V., Encantado, J., Ermolao, A., Pramono, A., Farpour-Lambert, N., Woodward, E., Dicker, D., & Busetto, L. (2021). Exercise training in the management of overweight and obesity in adults: Synthesis of the evidence and recommendations from the European association for

- the study of obesity physical activity working group. *Obesity Reviews*, 22 Suppl 4(Suppl 4), e13273. <https://doi.org/10.1111/obr.13273>.
- Saint-Maurice, P. F., Troiano, R. P., Bassett, D. R., Jr, Graubard, B. I., Carlson, S. A., Shiroma, E. J., Fulton, J. E., & Matthews, C. E. (2020). Association of daily step count and step intensity with mortality among US adults. *The Journal of the American Medical Association*, 323(12), 1151–1160. <https://doi.org/10.1001/jama.2020.1382>.
- Samdal, G. B., Eide, G. E., Barth, T., Williams, G., & Meland, E. (2017). Effective behaviour change techniques for physical activity and healthy eating in overweight and obese adults; systematic review and meta-regression analyses. *International Journal of Behavioral Nutrition and Physical Activity*, 14(1), 42. <https://doi.org/10.1186/s12966-017-0494-y>.
- Schuch, F. B., & Vancampfort, D. (2021). Physical activity, exercise, and mental disorders: It is time to move on. *Trends in Psychiatry and Psychotherapy*, 43(3), 177–184. <https://doi.org/10.47626/2237-6089-2021-0237>.
- Smith, J. A. B., Murach, K. A., Dyar, K. A., & Zierath, J. R. (2023). Exercise metabolism and adaptation in skeletal muscle. *Nature Review Molecular Cell Biology*, 24(9), 607–632. <https://doi.org/10.1038/s41580-023-00606-x>.
- Stamatakis, E., Straker, L., Hamer, M., & Gebel, K. (2019). The 2018 physical activity guidelines for Americans: What's new? Implications for clinicians and the public. *Journal of Orthopedic & Sports Physical Therapy*, 49(7), 487–490. <https://doi.org/10.2519/jospt.2019.0609>.
- Sun, J., Li, Y., Zhao, M., Yu, X., Zhang, C., Magnussen, C. G., & Xi, B. (2023). Association of the heart association's new life's essential 8 with all-cause and cardiovascular disease-specific mortality: Prospective cohort study. *BMC Medicine*, 21(1), 116. <https://doi.org/10.1186/s12916-023-02824-8>.
- Swift, D. L., McGee, J. E., Earnest, C. P., Carlisle, E., Nygard, M., & Johannsen, N. M. (2018). The effects of exercise and physical activity on weight loss and maintenance. *Progress in Cardiovascular Diseases*, 61(2), 206–213. <https://doi.org/10.1016/j.pcad.2018.07.014>.
- Thomas, J. G., Bond, D. S., Phelan, S., Hill, J. O., & Wing, R. R. (2014). Weight-loss maintenance for 10 years in the national weight control registry. *American Journal of Preventive Medicine*, 46(1), 17–23. <https://doi.org/10.1016/j.amepre.2013.08.019>.
- Tranchita, E., Cafiero, G., Giordano, U., Guzzo, I., Labbadia, R., Palermi, S., Cerulli, C., Candusso, M., Spada, M., Ravà, L., Gentili, F., Drago, F., & Turchetta, A. (2023). Preliminary evaluation of sedentary lifestyle in Italian children after solid transplant: What role could physical activity play in health? It is time to move. *International Journal of Environmental Research and Public Health*, 20(2), 990. <https://doi.org/10.3390/ijerph20020990>.
- Yu, H. J., Li, F., Hu, Y. F., Li, C. -F., Yuan, S., Song, Y., Zheng, M., Gong, J., & He, Q. -Q. (2020). Improving the metabolic and mental health of children with obesity: A school-based nutrition education and physical activity intervention in Wuhan, China. *Nutrients*, 12(1), 194. <https://doi.org/10.3390/nu12010194>.
- Zouhal, H., Lemoine-Morel, S., Mathieu, M. E., Casazza, G. A., & Jabbour, G. (2013). Catecholamines and obesity: Effects of exercise and training. *Sports Medicine*, 43(7), 591–600. <https://doi.org/10.1007/s40279-013-0039-8>.