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REVIEW ARTICLE

Aging and physical activity

Yaşlanma ve fiziksel aktivite

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Abstract

Aging is a natural and inevitable process occurring in the anatomical and physiological functions of the organism. With the increase in the elderly population in Turkey, the rising rates of physical inactivity have become a significant public health problem. This review emphasizes the critical role of physical activity in the healthy aging process. Physical activity in older adults is examined with classification by intensity and energy expenditure; functional categorization of exercise types; structured exercise phases; use of validated assessment scales and preventive rehabilitation framework. Regular physical activity is vital for healthy aging, significantly improving physical, psychological, and cognitive health. This review highlights that exercise prevents chronic diseases, maintains independence by preserving musculoskeletal and cardiovascular functions, and reduces the risk of falls. Despite these benefits, inactivity remains high, especially in Turkey. Tailored programs incorporating endurance, strength, flexibility, and balance exercises are essential for enhancing quality of life and reducing mortality.

Keywords: Healthy aging, elderly, physical activity, preventive rehabilitation.

Özet

Yaşlanma, organizmanın anatomik ve fizyolojik fonksiyonlarında meydana gelen doğal ve kaçınılmaz bir süreçtir. Türkiye'de yaşlı nüfusun artmasıyla birlikte, fiziksel aktivite eksikliği oranlarındaki artış önemli bir halk sağlığı sorunu haline gelmiştir. Bu derleme, sağlıklı yaşlanma sürecinde fiziksel aktivitenin kritik rolünü vurgulamaktadır. Yaşlı yetişkinlerde fiziksel aktivite, yoğunluk ve enerji harcamasına göre sınıflandırma; egzersiz türlerinin fonksiyonel kategorizasyonu, yapılandırılmış egzersiz aşamaları, geçerliliği kanıtlanmış değerlendirme ölçeklerinin kullanımı ve önleyici rehabilitasyon çerçevesi ile incelenmiştir. Düzenli fiziksel aktivite, sağlıklı yaşlanma için hayati önem taşır ve fiziksel, psikolojik ve bilişsel sağlığı önemli ölçüde iyileştirir. Bu derleme, egzersizin kronik hastalıkları önlediğini, kas-iskelet ve kardiyovasküler fonksiyonları koruyarak bağımsızlığı sürdürdüğünü ve düşme riskini azalttığını vurgulamaktadır. Bu faydalara rağmen, özellikle Türkiye'de hareketsizlik oranı yüksek kalmaktadır. Dayanıklılık, güç, esneklik ve denge egzersizlerini içeren kişiye özel programlar, yaşam kalitesini artırmak ve ölüm oranını azaltmak için gereklidir.

Anahtar Kelimeler: Sağlıklı yaşlanma, yaşlılar, fiziksel aktivite, koruyucu rehabilitasyon.

INTRODUCTION

Aging is a naturally occurring physiological process that affects all organisms in the universe. Depending on the time factor, all living organisms in the universe undergo irreversible changes at the molecular, cellular, tissue, organ, and system levels. Aging is a biological process that refers to the natural and inevitable changes in an organism's anatomical and physiological functions, rather than a pathological condition. These transformations, observed in chronological progression, are an integral part of the life cycle of living organisms and also determine the limits of the organism's adaptation mechanisms. In this context, aging should be considered as a physiological process independent of the concept of disease. Reduced muscle and bone mass, an increase in body fat percentage, and declines in cardiovascular parameters like maximum heart rate, stroke volume, cardiac output, and maximum oxygen consumption, as well as respiratory function, are all consequences of aging that lead to limited physical activity and inadequate physical work capacity (1). The aging population in Turkey is steadily increasing, making it increasingly important for health policies. The elderly population is expected to reach 25.6% in 2080. Therefore, it is seen that the elderly population will show a significant increase in Turkey's demographic structure in the long term, and the importance of healthy aging is

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evident (2). Epidemiological studies show that physical activity levels are generally low among adults, and rates of inactivity increase with age. For example, a study covering the period 2014–2023 showed no significant improvement in physical activity levels among adults; the inactivity rate increased from 37.3% to 39.9%, and this rate was found to be even higher in older age groups (3). The importance of physical activity among elderly individuals has also been emphasized at the national level; the literature indicates that elderly individuals' physical activity levels are low, and the need to promote even simple activities such as walking and indoor exercise is highlighted (4). Furthermore, another study conducted with individuals aged 65–74 reported that 64.9% of the elderly participants were physically inactive; indicating that a large portion of the elderly group does not engage in sufficient physical activity (5). As the population ages in Turkey, it is clear that physical activity levels decrease significantly with age and remain low, especially among older individuals. The aim of this review is to emphasise the importance of physical activity in the healthy ageing process, to examine types of exercise and assessment methods, and to highlight the role of preventive rehabilitation in maintaining independence.

Physical Activity

Physical activity is considered a key factor supporting healthy aging process in older adults. Physical activity, defined as any bodily movement that involves the contraction of skeletal muscles and the expenditure of energy, plays a critical role in maintaining and improving functional capacity in older adults. For older adults, regular physical activity has multifaceted positive effects on both physical fitness and overall health. These effects include maintaining musculoskeletal function, supporting cardiovascular health, preserving metabolic balance, enhancing psychosocial well-being, and sustaining cognitive function (6). One of the most important benefits of physical activity in older adults is its contribution to maintaining their independence (1). Maintaining the motor skills necessary for performing activities of daily living is one of the factors that improves an individual's quality of life. In addition, physical activity helps prevent chronic diseases. In particular, health problems such as cardiovascular diseases, diabetes, osteoporosis, and obesity can be prevented, or their progression can be slowed down with regular exercise programs (7). In addition, regular exercise helps maintain energy balance and preserve healthy body composition. In conclusion, physical activity is an integral part of the healthy aging process for older adults. Promoting regular exercise habits is crucial for extending lifespan and improving quality of life. Therefore, it is necessary to promote physical activity among older adults and to develop programs tailored to their individual needs (8).

Physical Activity Intensity

Low-intensity Physical Activity

This includes daily activities that require minimal effort, during which ventilation and heart rate are slightly above resting levels. These activities contribute to overall physical health by increasing energy expenditure and, because they do not require intense exertion, they offer an ideal option for older individuals and those with low fitness levels. In this context, low-intensity physical activity helps protect the musculoskeletal system, maintain flexibility and mobility, support the circulatory system, and balance metabolic processes. In addition, it can positively affect psychological well-being by reducing stress levels (9).

Example Activities: Activities such as leisurely walking, light housework, gardening, low-intensity yoga, and stretching are considered low-intensity physical activities. These activities can be easily integrated into individuals' daily routines, and their positive effects on health can be observed over the long term. Regular practice of low-intensity physical activity significantly contributes to maintaining physical fitness, improving quality of life, and preserving independence throughout the aging process (8). Therefore, identifying and promoting types of activity appropriate to an individual's physical capacity and health status is of great importance (10).

Moderate Physical Activity

Moderate physical activity encompasses movements that require moderate effort, causing a significant increase in an individual's ventilation and heart rate, and putting the muscles under strain. These types of activities have positive effects on the cardiovascular system, while playing an important role in increasing musculoskeletal endurance and improving metabolic processes. One key

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characteristic of moderate physical activity is that the individual can talk during the activity but cannot perform activities such as singing. This situation can be used as a practical indicator for determining the intensity level of the activity (11). These types of exercises contribute to the development of aerobic capacity and increase physical endurance, which can have positive long-term effects on health.

Example Activities: Activities such as brisk walking, slow jogging, dancing, jumping rope, swimming, playing table tennis, and slow-paced cycling are considered moderate-intensity physical activities (12). When practiced regularly, these activities improve quality of life by increasing muscle strength and flexibility, as well as supporting cardiovascular health. Regular, moderate physical activity helps individuals perform activities of daily living more easily and contributes to maintaining functional independence during aging. Therefore, it is important to encourage and design activities in ways appropriate to the individual's physical capacity (10).

High-Intensity Physical Activity

High-intensity physical activity refers to activities that significantly increase ventilation rate and heart rate, involve intense muscle exertion, and require considerable physical effort. These activities significantly impact the cardiovascular system, supporting the development of aerobic capacity and playing a critical role in increasing muscle strength and endurance. The ability of an individual to speak only a few words without becoming breathless during high-intensity exercise is considered an important indicator of the intensity of these activities. Physical activity at this level allows for a significant increase in metabolic rate, enabling the respiratory and circulatory systems to operate at maximum capacity, while providing long-term positive effects on fat burning and physical performance (13).

Example Activities: Activities such as brisk running, team sports like basketball, football, volleyball, handball, and tennis, as well as step aerobics classes and fast-paced dancing, are classified as high-intensity physical activities. These types of activities contribute to increased physical endurance and improved overall health by engaging individuals' musculoskeletal and cardiovascular systems at high intensity (14). Regular engagement in high-intensity physical activity helps improve overall health by increasing aerobic capacity. However, it is important that these activities are determined according to individual physical capacity and are performed safely. In this context, programs conducted with professional guidance help individuals to derive maximum benefit and minimize potential health risks (10).

Types of Exercise

Endurance (Aerobic) Exercises

Endurance exercises encompass physical activities that increase the body's oxygen utilization capacity, thereby improving the efficiency of the cardiovascular and respiratory systems. These exercises improve physical endurance by promoting the coordinated work of large muscle groups and supporting aerobic energy production mechanisms. Performing endurance-building activities for a specific duration, intensity, and frequency is critical for achieving optimal benefits. Aerobic exercises strengthen the circulatory system by raising heart rate to a moderate level, while contributing to more efficient metabolic processes. Regular, long-term application improves individuals' overall health by preserving musculoskeletal function. It also has positive effects on psychological well-being and helps manage stress (15).

Example Activities: Activities that do not involve excessive strain, such as regular, rhythmic walking, cycling, prolonged swimming, gardening or fieldwork, and playing tennis, are considered endurance exercises. These activities strengthen an individual's aerobic capacity and improve physical performance by providing sustained muscle work (10).

Strength Exercises

Strength training encompasses physical activities that increase the capacity of specific muscle groups to resist resistance and maximize muscle contraction. These exercises help prevent bone loss by contributing to muscle strengthening, increased endurance, and the preservation of bone mineral density. Strength training plays an important role in improving an individual's physical functions and enabling them to perform daily living activities more efficiently. By strengthening the musculoskeletal system, it contributes to maintaining

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posture, supporting joint health, and improving metabolic processes (16). Especially during the aging process, preserving muscle mass plays a critical role in maintaining physical independence.

Example Activities: Activities such as lifting weights, climbing stairs, carrying a backpack, performing push-ups to strengthen arm muscles, performing sit-ups for abdominal muscles, and strength training with various weights are considered strength training exercises. These types of exercises improve physical performance and overall health by strengthening muscles against resistance (10).

Flexibility Exercises

Flexibility is an important physical capacity that enables the preservation and improvement of joint range of motion. This ability enables muscles and connective tissues to function optimally, contributing to smoother, more fluid body movements. Maintaining flexibility is particularly important for older adults, as it enables them to continue daily activities, increases mobility, and improves overall quality of life. Regularly performed flexibility exercises support musculoskeletal health by reducing joint stiffness, helping to improve posture, and increasing muscle elasticity. It also helps individuals maintain their independence by preventing mobility limitations that can arise with age. When performing these exercises, it is important to select movements that accommodate joint range of motion to reduce the risk of injury (17).

Example Activities: Disciplines such as yoga, Pilates, and tai chi are effective exercises that increase flexibility. Additionally, flexibility exercises can be performed separately for each joint. For example, activities such as stretching for the shoulder joint, mobilization exercises for the hip joint, or controlled opening and closing movements for the knee joint help maintain joint health (10).

Balance Exercises

Balance is the capacity of an individual to stand, move, and perform various physical activities safely without the risk of falling. Maintaining and improving balance in older adults is crucial for preventing falls and enhancing independent mobility. Balance exercises improve musculoskeletal coordination by supporting posture control and help the body adapt to movement mechanisms. Regular practice of balance exercises strengthens an individual's proprioceptive sense, increasing body stability in response to environmental stimuli. It also improves muscle strength and reflex responses, minimizing the risk of falls. Balance exercises help older individuals perform daily living activities more safely and comfortably, while also playing an effective role in maintaining their physical independence (18).

Example Activities: Disciplines involving controlled movements, such as standing on one leg, changing direction during slow-paced walks, working on a balance beam, yoga, and Tai Chi, are considered within the scope of balance exercises. These activities improve postural stability and enhance muscle coordination, thereby strengthening an individual's mobility (10).

Components of Exercise: Warm-up, Loading, and Cool-down

Exercise is a systematic process comprising specific stages aimed at improving physical performance and promoting physiological adaptation. The three basic components of this process are warm-up, loading, and cool-down phases. Each phase is based on specific principles to enhance exercise effectiveness and minimize the risk of injury (19).

Warm- up: Warm-up, the initial stage of exercise, encompasses mental and physical activities designed to prepare the muscles, joints, respiratory and circulatory systems for physical activity. The warm-up process increases muscle elasticity, preventing sudden strain, and facilitates the cardiovascular system's adaptation to activity. The warm-up phase should begin with stretching and flexibility exercises, followed by endurance activities that increase heart rate in a controlled manner. This process should ideally last 5–10 minutes (20).

Loading: The loading phase, a key component of exercise, is implemented to ensure that muscle strength, cardiovascular endurance, and the musculoskeletal system reach their maximum performance levels. During this phase, there is a significant acceleration of respiratory and circulatory function, and the muscles

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function optimally to support the process of physical adaptation process. Exercise intensity should be determined according to the individual's fitness level and exercise goals (21).

Cool-down: The final stage of exercise involves movements that allow the respiratory and circulatory systems, which have accelerated during the exertion phase, to return to normal levels in a controlled manner. This process aims to reduce muscle fatigue and accelerate recovery by helping to remove lactic acid that accumulates in the muscles. The cool-down phase should be supplemented with 5-10 minutes of stretching exercises (22).

Muscle Strengthening Exercises: Isometric, Isotonic, and Isokinetic Exercises

Muscle strengthening exercises are methods that enable the muscle structure to be strengthened through different mechanisms. These exercises are classified according to how the muscles respond to resistance. Depending on the type of muscle contraction and range of motion, isometric, isotonic, and isokinetic exercises have different functional characteristics.

Isokinetic exercises are a specialized form of resistance training in which muscles contract at a constant angular velocity, and the applied force varies. These exercises are an effective method for developing muscle strength, enabling maximal muscle contraction at a constant rate throughout the entire range of motion. Isotonic exercises are commonly used in rehabilitation processes and performance enhancement programs (Table 1). Isotonic exercises can be performed with two basic types of contractions: concentric and eccentric contractions (23).

Concentric Contraction: During concentric muscle contraction, muscle fibers shorten, bringing the two ends of the muscle closer together. This type of contraction represents the active production of force by the muscle in response to resistance. For example, muscle shortening to generate force during weightlifting exercises is an example of concentric muscle contraction (23).

Eccentric Contraction: During eccentric muscle contraction, the muscle fibers lengthen and the two ends of the muscle move away from each other. This phenomenon typically occurs when a muscle encounters resistance and applies force in a controlled manner. Eccentric contraction allows muscles to generate force without losing control, playing a crucial role in increasing muscle endurance. For example, muscle lengthening during lowering of the load is an example of eccentric muscle contraction (23).

Assessment of Physical Activity Level Using the MET Concept

The metabolic equivalent of task (MET) is used to assess the metabolic demands of physical activity. It is a standard unit of measurement used to calculate the amount of oxygen an individual expends during a specific activity (24). MET allows comparison of energy expenditure across different levels of physical activity with resting levels, based on the amount of oxygen and energy the body consumes at rest. As the intensity of physical activity increases, the body's metabolic demands increase proportionally. The MET value is directly related to the intensity of the individual's activity and expresses energy expenditure in multiples compared to resting levels (12). In this context, physical activities are evaluated in three main categories:

Table 1. Muscle strengthening exercises (23)

Isometric Exercises	Isotonic Exercises	Isokinetic Exercises
During isometric muscle contraction, muscle length remains constant while muscle tension increases. This type of exercise does not involve joint movement, but rather strengthens the muscle against a specific resistance. Isometric exercises are particularly preferred in conditions that limit joint range of motion or during rehabilitation.	During isotonic exercises, the muscle contracts by applying a specific force, but muscle tension remains unchanged. During this process, muscle fibers can lengthen or shorten, resulting in detectable joint movement. Isotonic exercises are important for developing muscle strength and improving the functional range of motion.	In isokinetic exercises, the muscle contraction rate remains constant while the applied force varies. Isokinetic strengthening is considered an effective method for achieving dynamic muscle strengthening. During exercise, joint movement occurs at a specific rate while maximal muscle contraction is achieved at every angle.

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Low Intensity Activities (0-3 MET): These are activities that require low energy expenditure on the body; they include activities such as sleeping, watching television, light housework, writing, desk work, and low-intensity walking (25).

Moderate Intensity Activities (3-6 MET): Activities that cause a significant increase in heart rate and require greater muscular effort include physical activities such as stationary cycling, home exercises, gymnastics, walking at a normal pace, and cycling (25).

High-intensity activities (>6 METs): Activities that involve intense muscle contractions and significantly increase oxygen consumption and energy expenditure include racewalking, stair climbing, jogging, running, weightlifting, carrying objects, tennis, swimming, and jump rope (22).

The Effects of Physical Activity on Health

Health is defined as a state of complete physical, biological, psychosocial, and environmental well-being (26). Scientific research has shown that physical activity improves health-related quality of life. Regular exercise not only improves physical fitness but also plays a significant role in preventing chronic diseases and maintaining overall health. Regular physical activity supports healthy aging by reducing mortality and morbidity rates in older adults. Aerobic and resistance exercises have positive effects on the musculoskeletal system, improve cardiovascular function, and help maintain metabolic balance. One of the most important benefits of physical activity is its effect on weight control and reducing the risk of obesity (27). Regular exercise helps maintain the body's energy balance, preventing weight gain and ensuring a more efficient metabolism. Furthermore, studies have shown that the risk of developing diseases such as colon and breast cancer is lower in physically active individuals compared to those with low levels of physical activity. Physical activity might reduce the breast cancer risk through several biological mechanisms, including the impact of physical activity on adiposity, sex hormones, insulin resistance, adipokines, and inflammatory markers (28).

Scales for Assessing Physical Activity

Assessing physical activity at an individual level is important for determining health status and functional capacity. Various scales have been developed for this purpose, allowing for a scientific assessment of an individual's physical fitness, independence, and relationship with daily activities. Some of the physical activity assessment scales are:

Global Physical Activity Questionnaire (GPAQ)." A scale that assesses an individual's functional capacity and activity level. It is a WHO-recommended tool for physical activity surveillance (29).

Functional Independence Scale: This scale, which assesses the ability to perform activities of daily living, helps determine an individual's motor functions and level of independence (30).

International Physical Activity Questionnaire (IPAQ) – Short Form: A commonly used scale for assessing physical activity levels. It assesses the intensity and duration of effort expended during daily activities to determine an individual's overall physical activity level (31).

Physical Activity Assessment Scale for Older Adults (Appendix C) – PASE: This scale, specifically developed to measure physical activity levels in older adults, assesses mobility, exercise habits, and independent living skills. These scales provide effective tools for determining an individual's physical activity level and for obtaining scientific data to inform the development of healthy lifestyle recommendations. The use of assessment scales helps create appropriate exercise programs while maintaining the individual's physical fitness (32).

Planning Physical Activity According to Individual Characteristics

Planning physical activity in a manner that aligns with an individual's health status and functional capacity is crucial for achieving optimal benefits. Individuals are classified into groups based on their physical condition and lifestyle, and the recommended types and durations of exercise vary accordingly.

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Active individuals who walk and work daily: Individuals in this group are physically active, engaging in regular walking and carrying out their daily tasks without interruption. The primary goal for these individuals is to maintain their current activity level and increase overall endurance. It is recommended to get at least 150 minutes of moderate-intensity physical activity or 75 minutes of high-intensity physical activity per week (33).

Individuals with Low Activity Levels and Sedentary Lifestyles: This group includes individuals who are experiencing muscle weakness or have weight problems. Regular physical activity can help restore lost functions and prevent various health problems. To improve balance and reduce the risk of falls, it is recommended to engage in physical activity at least three days a week (34).

Individuals with Reduced Physical and Functional Capacity Due to Chronic Diseases: For elderly individuals in this group, low levels of physical activity are recommended rather than a sedentary lifestyle. Exercises should be spread throughout the day, and warm-up and cool-down periods should be lengthy. The intensity, duration, and type of physical activity should be planned based on the patient's individual characteristics and the course of the disease. Regular exercise is an important factor in preventing chronic diseases and improving quality of life (7).

Physical Activity in Hypertensive Patients: In patients with hypertension, aerobic exercises that work large muscle groups should be preferred. Resistance exercises should be performed twice a week, beginning with moderate-intensity activities and gradually increasing exercise intensity (35).

Individuals with Chronic Respiratory Diseases: Physical activity programs should be carefully designed for this population. Exercise intensity should be increased gradually, with walking being the preferred aerobic exercise. In addition, exercises that strengthen respiratory muscles and movements targeting lower extremity muscles should be included in the program (10).

Physical Activity and Preventive Rehabilitation

Preventive rehabilitation encompasses multifaceted goals, including disease prevention, early treatment of disease-causing risk factors, slowing disease progression, increasing healthy life expectancy, improving quality of life, and minimizing the effects of permanent health problems problems (36). Preventive rehabilitation approaches are categorized into three main groups based on the prevention and management of chronic diseases: primary, secondary, and tertiary prevention.

Primary Protection: It includes strategies aimed at preventing risk factors that cause diseases. In this context, preventive measures include adopting healthy lifestyle habits, engaging in regular physical activity, and maintaining healthy eating practices (36).

Secondary Protection: It aims to control the progression of diseases by encompassing early diagnosis and intervention processes. Regular health checkups, screening tests, and preventive treatment approaches applied to individuals at risk are considered within the scope of secondary prevention (36).

Tertiary Protection: Rehabilitation encompasses processes aimed at preventing complications that may arise after an illness occurs, administering necessary medical treatments, and improving patients' quality of life. Specific exercise programs for chronic diseases, regularization of physical activity, and multidisciplinary approaches that support disease management are included within the scope of tertiary prevention (37).

Preventive rehabilitation approaches are of great importance in preventing chronic diseases, controlling symptoms, slowing disease progression, and supporting treatment processes. These approaches aim to preserve the individual's physical and functional capacity, improve quality of life, and minimize the negative effects of diseases (38). Physical activity plays a critical role in preventive rehabilitation and is important for the prevention and treatment of chronic diseases and for improving disease-related quality of life. Regular exercise programs improve an individual's physical and psychosocial health, increasing their capacity for independent living and contributing to the maintenance of overall health (7).

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The Effects of Physical Activity on Aging

Physical activity is a vital factor in improving quality of life, promoting healthy aging, and slowing down the aging process. In daily life, any movement that engages the body's muscles and causes energy expenditure is defined as physical activity. Regular physical activity contributes positively to the aging process by improving both physical and psychosocial health. The main positive effects of physical activity on the aging process are as follows:

Effects on Psychological and Cognitive Health:

- It helps reduce symptoms of depression.
- It contributes to the preservation of cognitive functions.
- A significant improvement in sleep quality is observed (7).

Effects on the Musculoskeletal System:

- It increases physical mobility by supporting the development of muscle functions.
- It reduces the risk of osteoporosis by increasing bone mineral density.
- It minimizes the risk of hip fracture by preventing falls (39).

Metabolic and Cardiovascular Effects:

- It supports healthy weight management by preventing excessive weight gain.
- It improves cardiovascular performance and increases respiratory capacity.
- It protects cardiovascular health by reducing the risk of heart disease and stroke.
- It contributes to the improvement of high blood pressure (hypertension).
- It helps to maintain metabolic balance by lowering cholesterol levels (40).

Effects on Chronic Diseases and Cancer:

- It increases insulin sensitivity, thereby reducing the risk of type 2 diabetes mellitus.
- It reduces the risk of certain types of cancer, particularly colon, breast, uterine, and lung cancers (28).

CONCLUSION

Regular physical activity is a fundamental pillar of healthy aging, offering a powerful defense against the physiological declines and chronic diseases associated with the later stages of life. By integrating consistent exercise into their daily routines, older adults can significantly improve their physical, psychological, and cognitive well-being, ultimately reducing both morbidity and mortality rates. The multifaceted benefits of exercise include musculoskeletal and functional health; cardiovascular and metabolic protection; psychosocial well-being. To achieve optimal results and minimize injury, exercise programs must be tailored to an individual's specific health status and physical capacity. This includes a structured approach utilizing warm-up, loading, and cool-down phases, as well as the use of validated scales. Finally, a comprehensive preventive rehabilitation framework is essential. By prioritizing active lifestyles and evidence-based interventions, healthcare systems can support the growing elderly population in Turkey and beyond, ensuring that increased longevity is matched by sustained quality of life. In conclusion, regular and conscious engagement in physical activity supports healthy aging, is a powerful tool for combating chronic diseases, and significantly reduces morbidity and mortality rates.

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