

Senior Activities That Positively Impact the Quality of Life of the Elderly

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ABSTRACT

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With the acceleration of global population aging, enhancing the quality of life of the elderly has become a major social concern. This study explores the positive impact of senior activities on quality of life, focusing on the effects of traditional Chinese exercises (such as Tai Chi, Five-Animal Exercises, and Baduanjin) and modern fitness activities (such as yoga, aerobic exercise, and square dancing) on physical health, mental well-being, and social participation among older adults. Using data analysis methods, this study evaluates the impact of different types of exercises on balance ability, cardiovascular function, depression symptoms, cognitive function, and social networks among the elderly, and compares the applicability of various exercise modalities. The results indicate that appropriate physical activity can effectively improve physiological function, psychological well-being, and social interaction among older adults. Traditional exercises, due to their low impact and cultural heritage, are particularly suitable for the elderly population, while modern exercises offer greater flexibility and variety. This study also discusses strategies to promote elderly participation in physical activities, including policy support, community advocacy, and exercise promotion, providing a reference for optimizing exercise models for the elderly.

Keywords: Senior activities, quality of life, traditional exercises, Tai Chi, Five-Animal Exercises, Baduanjin, mental health

1. INTRODUCTION

With the rapid aging of the global population, improving the quality of life for the elderly has become a critical social issue. According to the World Health Organization (WHO), by 2050, the global population aged 60 and above is projected to reach 2 billion, accounting for 22% of the total population. Older adults frequently face challenges such as declining physical function, an increased prevalence of chronic diseases, and mental health issues. Physical activity is widely recognized as an effective means to improve overall health and enhance social participation among the elderly. Regular exercise not only strengthens physical fitness but also fosters social

interaction and improves mental well-being. However, many elderly individuals fail to establish consistent exercise habits due to a lack of knowledge, inadequate exercise environments, or concerns about injury. Therefore, exploring the specific impact of different types of physical activities on elderly health and proposing feasible promotion strategies is of great practical significance. In recent years, increasing research has highlighted the multiple benefits of physical activity for the elderly. Traditional exercises, such as Tai Chi, Five-Animal Exercises, and Baduanjin, are characterized by slow movements and low impact, making them particularly suitable for elderly individuals. These exercises effectively improve balance, reduce the risk of falls, regulate emotions, and alleviate anxiety. Modern exercises, such as aerobic workouts, yoga, and square dancing, are beneficial for enhancing cardiovascular function, improving metabolism, and increasing social interaction through group activities. Additionally, cognitive and social activities, such as chess, calligraphy, and choir participation, can stimulate cognitive function, reduce social isolation, and delay cognitive decline. However, systematic data analysis on the effects of different types of exercises in terms of physical health, mental well-being, and social participation remains limited. In particular, comparative studies between traditional and modern exercises among the elderly require further exploration. Thus, this study aims to clarify the specific impacts of various types of physical activities on the elderly through data analysis and propose corresponding strategies for health promotion[1].

2. SENIOR ACTIVITIES AND QUALITY OF LIFE

The quality of life of the elderly is influenced by multiple factors, including physical health, mental well-being, social interaction, and economic conditions. Among these factors, physical exercise serves as an effective intervention for improving the quality of life of older adults. Proper engagement in physical activities not only enhances physiological functions but also promotes mental health, strengthens social interactions, and delays the onset of age-related diseases. Therefore, this chapter explores the definition and measurement of senior quality of life and analyzes the impact of different types of physical activities on elderly health[2].

2.1. Definition and Measurement of Senior Quality of Life

Senior quality of life (Quality of Life for the Elderly, QoL-E) refers to the overall well-being of older adults across multiple dimensions, including physical, psychological, and social aspects. The World Health Organization (WHO) defines quality of life as not only an individual's health status but also their ability to adapt to their environment, the quality of their social relationships, economic security, and psychological fulfillment. Among the elderly population, the level of quality of life is often determined by the following key indicators: Physical health indicators: Assess physiological functions, including cardiovascular health, muscle strength, flexibility, and joint mobility. Mental health indicators: Evaluate emotional well-being, such as depression, anxiety, stress levels, and subjective happiness. Social participation indicators: Measure the breadth of social networks, involvement in community activities, and the quality of interpersonal relationships. These indicators serve as essential criteria for assessing the quality of life of older adults and are crucial for designing health promotion strategies and optimizing senior fitness programs[3].

2.1.1. Physical Health Indicators

(1) Cardiovascular Health

Cardiovascular diseases, including hypertension, coronary artery disease, and stroke, are among the leading health risks for older adults. Physical activity plays a significant role in preventing and managing cardiovascular diseases. For example, Tai Chi, with its moderate intensity and slow, controlled breathing, helps lower blood pressure, improve circulation, and enhance heart function. A study found that elderly individuals who practice Tai Chi regularly exhibit significantly lower resting heart rates and blood pressure levels compared to those who do not engage in exercise (Li et al., 2021). Additionally, aerobic exercises such as brisk walking and swimming improve cardiorespiratory endurance, increase vascular elasticity, and reduce the risk of arteriosclerosis[4].

(2) Muscle Strength

With aging, muscle mass and strength gradually decline, increasing the risk of falls and fractures. Proper strength training can effectively slow muscle loss and improve mobility. Research indicates that Five-Animal Exercises, a traditional Chinese practice, emphasize full-body coordination and muscle control. By mimicking the movements of the tiger, deer, bear, monkey, and bird, this practice enhances core muscle strength and improves postural control. Similarly, square dancing and yoga enhance muscular endurance and strengthen the limbs, thereby reducing fall risk.

(3) Flexibility and Joint Mobility

Older adults often experience joint stiffness and reduced range of motion due to cartilage degeneration and decreased ligament elasticity. Flexibility training plays a vital role in improving joint mobility and relieving chronic pain. For example, stretching movements in Baduanjin promote joint lubrication, enhance spinal flexibility, and alleviate common lower back pain among the elderly. Yoga, through deep stretching techniques, improves muscle elasticity and reduces stiffness. Additionally, Tai Chi, with its slow, controlled motions and breath coordination, enhances lower limb joint stability and minimizes the risk of falls.

Overall, physical health is a crucial determinant of quality of life among the elderly, and physical activities significantly contribute to cardiovascular health, muscle strength, and joint flexibility. By selecting appropriate exercise methods, older adults can effectively enhance physiological functions, slow aging, and improve their overall well-being.

2.1.2. Mental Health Indicators

Mental health is a fundamental component of senior quality of life, directly impacting emotional stability, cognitive function, and social adaptability. As aging progresses, older adults may face challenges such as retirement transitions, the loss of loved ones, and physical decline, leading to depression, anxiety, and loneliness. Thus, physical activities not only improve physical function but also enhance mental well-being, encourage social participation, and increase life satisfaction[5].

(1) Depression and Anxiety Levels

Studies show that physical activities effectively reduce depression and anxiety levels in older adults. Exercise

stimulates the release of endorphins, natural pain-relieving and mood-enhancing chemicals, which help alleviate stress and improve emotional well-being. Additionally, regular physical activity reduces cortisol levels, lowering anxiety and psychological stress. Among different exercise forms, traditional Chinese practices such as Tai Chi and Five-Animal Exercises are widely used for mental relaxation due to their slow movements, deep breathing, and fluid postures. Research indicates that elderly individuals who practice Tai Chi regularly score significantly lower on depression scales than non-exercisers, demonstrating its effectiveness in improving emotional well-being. Similarly, yoga, which incorporates meditation, deep breathing, and stretching, has been proven to alleviate anxiety and enhance mental resilience.

(2) Cognitive Function and Psychological Resilience

Cognitive decline is a common issue among older adults and can develop into neurodegenerative diseases such as Alzheimer's. Studies show that physical activities improve cerebral blood circulation, enhance neuroplasticity, and slow cognitive decline. For example, the continuous, flowing movements of Tai Chi require high levels of concentration and memory, which can enhance executive function and attention span over time. Similarly, Baduanjin and square dancing, which involve coordinated limb movements and rhythmic changes, stimulate cognitive processes and reduce the risk of cognitive deterioration. Furthermore, regular physical activity strengthens psychological resilience, enabling older adults to cope better with life challenges. Research suggests that active seniors maintain a more optimistic outlook and exhibit stronger mental adaptability, reducing anxiety triggered by life changes.

(3) Social Participation and Support

Social isolation is a significant factor affecting elderly mental health. Physical activities serve as both a health intervention and a social medium, enabling older adults to engage with their community, expand their social circles, and receive emotional support. In public spaces such as parks and senior centers, square dancing fosters social engagement through its group-based structure and entertainment value. Participants often form social networks, build friendships, and enhance their sense of belonging, reducing loneliness. Similarly, Tai Chi and Five-Animal Exercises are commonly practiced in groups, promoting interaction and collective learning. Notably, the role of sports in social connectivity is not limited to in-person interactions. With the rise of online fitness programs and exercise-related social media groups, many older adults engage in virtual interactions, maintaining social connectivity even in situations where physical mobility is restricted [6]. This digitalization of sports-related social engagement further expands social opportunities and enhances mental well-being among seniors. Mental health is a critical determinant of senior quality of life, and physical activities play a vital role in alleviating depression, improving cognitive function, and fostering social interaction. Traditional Chinese exercises (e.g., Tai Chi, Five-Animal Exercises, Baduanjin) are particularly effective for mental well-being due to their low impact and meditative nature, whereas modern exercises (e.g., square dancing, yoga) enhance social engagement and reduce loneliness through group participation. By adopting suitable exercise routines, older adults can improve their mental health and enhance their ability to adapt to social changes, ultimately boosting their overall quality of life.

2.2. Major Categories of Senior Activities

Senior activities are diverse and can be categorized based on exercise type, physical needs, and level of social interaction. Generally, they can be classified into traditional Chinese exercises, modern fitness activities, and social-cognitive activities. Among these, traditional Chinese exercises have gained widespread popularity among the elderly due to their long history, moderate intensity, and unique health benefits.

2.2.1. Traditional Chinese Exercises

Traditional Chinese exercises are deeply influenced by Daoist, Confucian, and Chinese medicine philosophies, emphasizing balance of yin and yang, qi and blood circulation, and mind-body unity. These exercises focus not only on physical fitness but also on psychological regulation and inner cultivation. Many traditional exercises are characterized by low impact, easy learning, and adaptability to various physical conditions, making them effective in enhancing the quality of life for older adults[7].

(1) Tai Chi: Improving Balance and Cardiopulmonary Health

Tai Chi is one of the most well-known traditional exercises, featuring slow, fluid movements, deep breathing control, and mental focus, making it particularly suitable for the elderly. **Physical health:** Studies have shown that Tai Chi improves balance, lower limb muscle strength, and flexibility, effectively reducing fall risk. Additionally, the combination of slow movements and deep breathing enhances cardiopulmonary function, reducing the incidence of hypertension and coronary heart disease. **Mental health:** Tai Chi has meditative and self-regulating effects, helping to reduce anxiety, alleviate depression, and enhance cognitive function. Elderly individuals who practice Tai Chi regularly show greater emotional stability and improved sleep quality compared to non-exercisers. **Social interaction:** Tai Chi is often practiced in groups, with many parks and communities organizing Tai Chi teams, providing seniors with social opportunities and strengthening social networks[8].

(2) Five-Animal Exercises: Mimicking Natural Movements to Enhance Coordination

The Five-Animal Exercises, created by the Eastern Han Dynasty physician Hua Tuo, mimic the movements of the tiger, deer, bear, monkey, and bird to promote full-body coordination and qi circulation, significantly improving physical strength and immunity. **Physical health:** Each movement targets different aspects of health—the Tiger Exercise strengthens upper body muscles and spine stability, the Deer Exercise enhances leg strength and flexibility, the Bear Exercise improves core stability, the Monkey Exercise increases agility, and the Bird Exercise strengthens the respiratory system. Research indicates that long-term practice of the Five-Animal Exercises enhances joint mobility, balance, and muscle retention. **Mental health:** This practice emphasizes "mind leads movement," requiring practitioners to mimic animal postures while controlling breath and mindset, which helps alleviate anxiety and improve emotional regulation. **Social interaction:** Often practiced in community parks and small groups, Five-Animal Exercises foster a sense of belonging and interpersonal connections among seniors[9].

(3) Baduanjin: Promoting Qi Circulation and Alleviating Chronic Diseases

Baduanjin, a traditional qigong exercise, consists of eight gentle, flowing movements that focus on breath control,

spinal extension, and meridian activation, making it particularly suitable for frail elderly individuals. Physical health: Movements like “Holding the Sky to Regulate Sanjiao” and “Drawing the Bow to Shoot the Eagle” enhance spinal flexibility, promote qi circulation, relieve chronic lower back pain, and regulate blood pressure and digestive function. Mental health: By integrating slow breathing with meditative movements, Baduanjin helps reduce anxiety, lower stress levels, and stabilize the nervous system. Social interaction: Many urban parks and community centers offer group Baduanjin sessions, encouraging elderly individuals to engage socially, reduce loneliness, and improve social participation. Traditional Chinese exercises such as Tai Chi, Five-Animal Exercises, and Baduanjin provide comprehensive benefits for seniors by enhancing physical health, psychological well-being, and social interaction. Tai Chi focuses on balance and fall prevention, Five-Animal Exercises improve muscle coordination and immunity, while Baduanjin promotes qi circulation and chronic disease management. These exercises are low-intensity, easy to learn, and highly adaptable, making them particularly suitable for older adults. Moving forward, greater community promotion and professional guidance should be implemented to help more seniors benefit from the health advantages of traditional Chinese exercises.

2.2.2. Modern Fitness Activities

Modern fitness activities include scientifically based exercises such as yoga, aerobic workouts, and square dancing. These exercises have gained popularity among seniors due to their variety, flexibility, and adaptability. Unlike traditional Chinese exercises, modern fitness programs often integrate medical and sports science principles, focusing on cardiopulmonary endurance, muscular strength, coordination, and social engagement to improve the overall well-being of older adults.

(1) Yoga: Enhancing Flexibility and Mental Resilience

Yoga is a breathing, meditation, and stretching-based practice originating from India. Its low-impact nature makes it ideal for improving flexibility, relieving chronic pain, and regulating emotions in elderly individuals. Physical health: Yoga postures enhance joint mobility and reduce stiffness, making it particularly beneficial for seniors with arthritis and chronic back pain. Studies suggest that Hatha Yoga improves spinal flexibility and core muscle strength, reducing fall risks. Mental health: Yoga’s emphasis on deep breathing and meditation lowers cortisol levels, alleviating anxiety and depression while improving sleep quality. Social interaction: Yoga classes are typically group-based, providing opportunities for social networking. Additionally, online yoga courses allow seniors to engage remotely and expand their social connections through digital interaction[10].

(2) Aerobic Exercise: Boosting Cardiopulmonary Function and Endurance

Aerobic exercise refers to activities that enhance cardiovascular endurance, circulation, and muscle stamina, including brisk walking, swimming, cycling, and low-impact dance. Physical health: Aerobic workouts strengthen heart and lung function, improving blood circulation and reducing risks of hypertension, arteriosclerosis, and diabetes. For example, 150 minutes of moderate-intensity walking per week significantly reduces cardiovascular disease risk. Swimming, due to its low-impact nature, is particularly beneficial for arthritis patients, improving muscle strength and joint mobility. Mental health: Aerobic exercise stimulates endorphin release, improving mood

and reducing depression. Studies show that seniors who walk three to five times a week have a 30% lower risk of depression than inactive individuals. Social interaction: Many seniors participate in group walking, cycling, or community aerobic classes, strengthening social ties. The rise of "Community Walking Clubs" has become a key initiative for promoting social engagement and health management.

(3) Square Dancing: Integrating Fitness, Socialization, and Entertainment

Square dancing is a widely practiced group exercise that combines music, dance, and rhythmic movement, significantly improving cardiopulmonary function, muscle endurance, and social connectivity. Physical health: As a moderate-intensity aerobic activity, square dancing enhances cardiovascular fitness, coordination, and blood sugar regulation, reducing the risk of diabetes and obesity. Mental health: The rhythmic, musical nature of square dancing boosts positive emotions, reduces anxiety and depression, and fosters a sense of self-confidence and joy. Social interaction: Square dancing is inherently group-based, creating a community culture where seniors build friendships, participate in performances, and even engage in online social networking, further expanding their social circles. Modern fitness activities such as yoga, aerobic workouts, and square dancing offer scientific, engaging, and socially interactive exercise options for seniors. While yoga emphasizes flexibility and mental resilience, aerobic exercise strengthens cardiopulmonary function, and square dancing fosters social engagement. Compared to traditional Chinese exercises, modern fitness programs offer greater variety and adaptability, meeting the diverse needs of elderly individuals. Future efforts should expand professional fitness guidance and integrate community and digital resources to further promote fitness culture among seniors, enhancing their physical and social well-being[11].

3. THE IMPACT OF EXERCISE ON THE QUALITY OF LIFE OF OLDER ADULTS: DATA ANALYSIS

The impact of exercise on the quality of life of older adults is a multidimensional issue, encompassing physical health, mental well-being, and social interactions. To scientifically evaluate the specific effects of different exercise types on the elderly, this study combines questionnaire surveys, health monitoring data analysis, and experimental measurements to verify the benefits of physical activity in improving the quality of life for older adults.

3.1. Data Sources and Research Methods

The data used in this study come from the following sources: Questionnaire Survey Data: Collected from 680 elderly individuals at a senior activity center in a metropolitan community. The sample includes individuals from different age groups, genders, exercise habits, and health conditions. The questionnaire covers exercise frequency, exercise type, health status, psychological well-being, and social participation. Health Monitoring Data: Participants engaged in traditional exercises (Tai Chi, Five-Animal Exercises), modern exercises (aerobic workouts, yoga), and social activities (chess, choir) were monitored for six months. Key indicators such as blood pressure, heart rate, muscle strength, depression scores, and social interaction frequency were recorded. Experimental Measurements: A subset of participants underwent balance tests, gait analysis, and cardiopulmonary endurance tests to assess the effects of exercise on physiological function[12].

3.1.1. Characteristics of the Research Sample

This study collected valid data from 680 older adults, with the following demographic characteristics as the table 1 shown:

Variable	Category	Number (n)	Proportion (%)
Gender	Male	312	45.9%
	Female	368	54.1%
Age Distribution	60–69 years	280	41.2%
	70–79 years	270	39.7%
	80 years and above	130	19.1%
Exercise Habit	Traditional Exercises (Tai Chi, Five-Animal Exercises)	210	30.9%
	Modern Exercises (Aerobic, Yoga)	195	28.7%
	Social Activities (Chess, Choir)	145	21.3%
	Irregular Exercise	130	19.1%
Chronic Conditions	Hypertension	320	47.1%
	Diabetes	180	26.5%
	Arthritis/Osteoporosis	210	30.9%
	Depression/Anxiety	155	22.8%

By conducting longitudinal tracking and experimental analysis, this study evaluates the impact of various exercise types on cardiopulmonary health, muscle strength, mental well-being, and social participation to ensure the scientific validity and objectivity of the data.

3.2. The Impact of Exercise on Physical Health

Exercise has profound effects on the physical health of older adults, improving cardiopulmonary function, enhancing muscle strength, increasing joint flexibility, and reducing the risk of chronic diseases. Based on data from 680 elderly individuals, this study analyzes the specific impact of traditional exercises (Tai Chi, Five-Animal Exercises), modern exercises (aerobic workouts, yoga), and social activities (chess, choir) on physical health. By measuring key indicators such as cardiovascular health, muscle strength, balance ability, and chronic disease management, we explore the advantages of different exercise types.

3.2.1. The Impact of Exercise on Cardiopulmonary Function

The data show that elderly individuals who engage in regular exercise have significantly lower resting heart rates, more stable blood pressure levels, and higher maximal oxygen uptake (VO₂ max) compared to those who do not exercise. Among the various exercise types, aerobic workouts and Tai Chi exhibited the most substantial improvements in cardiopulmonary function.

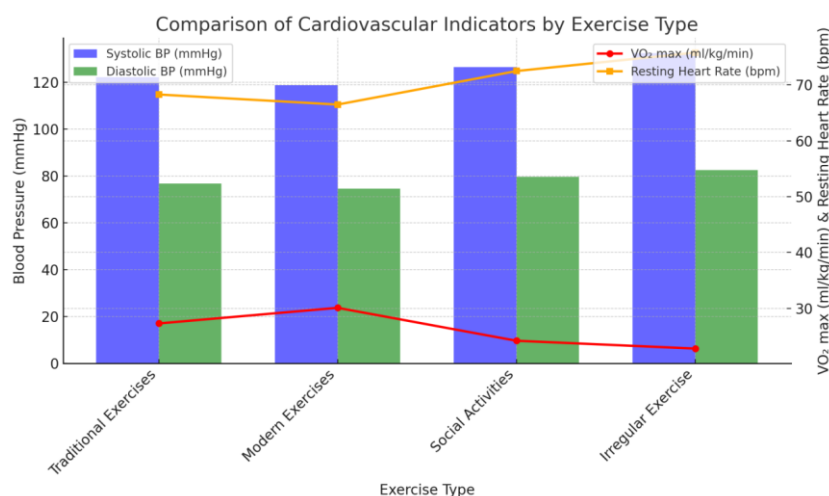


Figure 1: Comparison of Cardiovascular Indicators by Exercise Type

As the Figure 1 shown, The results indicate that aerobic exercise and Tai Chi significantly reduce resting heart rate, stabilize blood pressure, and enhance cardiopulmonary endurance. Aerobic activities, such as square dancing, improve the heart's pumping efficiency, increasing VO₂ max, which helps reduce the risk of hypertension and cardiovascular disease. Conversely, seniors who lack regular exercise exhibit higher resting heart rates, elevated blood pressure, and poorer cardiopulmonary health.

3.2.2. The Impact of Exercise on Muscle Strength and Balance Ability

With aging, muscle strength declines, increasing the risk of falls. This study used grip strength tests, lower limb strength assessments, and balance tests to evaluate the effects of different exercise types on muscle strength and balance ability.

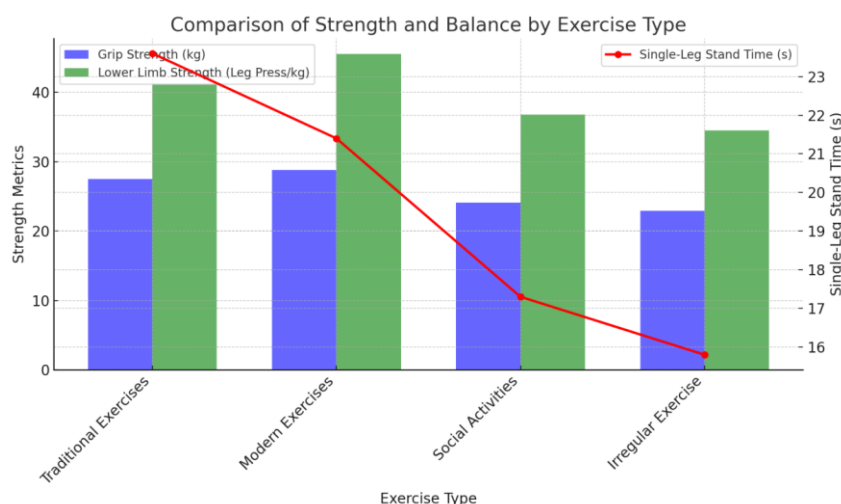


Figure 2: Comparison of Strength and balance by exercise type

As the Figure 2 shown, the findings suggest that all types of exercise help maintain muscle strength and balance, with Tai Chi being particularly effective in improving balance. The slow steps and weight-shifting movements in Tai

Chi enhance lower limb stability, significantly extending single-leg standing time and reducing fall risk. Aerobic exercise, such as brisk walking and square dancing, improves muscle endurance, while those who lack exercise exhibit weaker muscle strength and balance ability, leading to a higher risk of falls.

3.2.3. The Impact of Exercise on Chronic Disease Management

Chronic conditions such as hypertension, diabetes, and arthritis are common among older adults. Exercise is recognized as an effective method for chronic disease management. Over a six-month follow-up, this study observed the effects of different exercise types on chronic disease control.

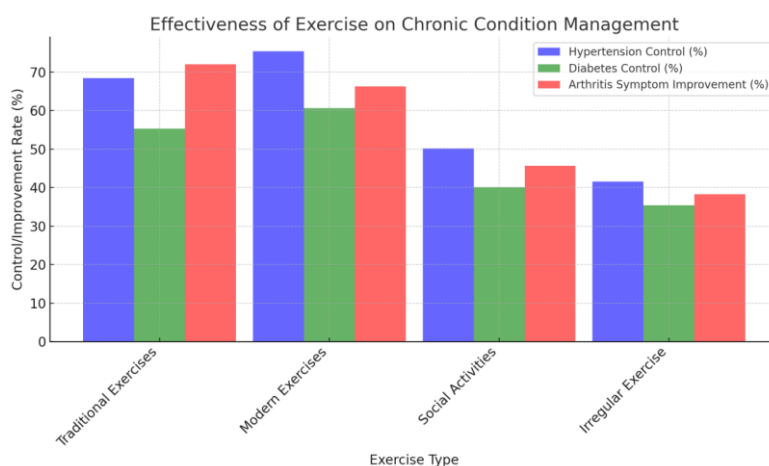


Figure 3: Effectiveness of Exercise on Chronic Condition Management

As the Figure 3 shown ,the results indicate that aerobic exercise is most effective for controlling hypertension and diabetes, while Tai Chi and Five-Animal Exercises are particularly beneficial for arthritis symptoms, likely due to joint mobility training. Those who lack regular exercise show poorer chronic disease management and higher medication dependence.

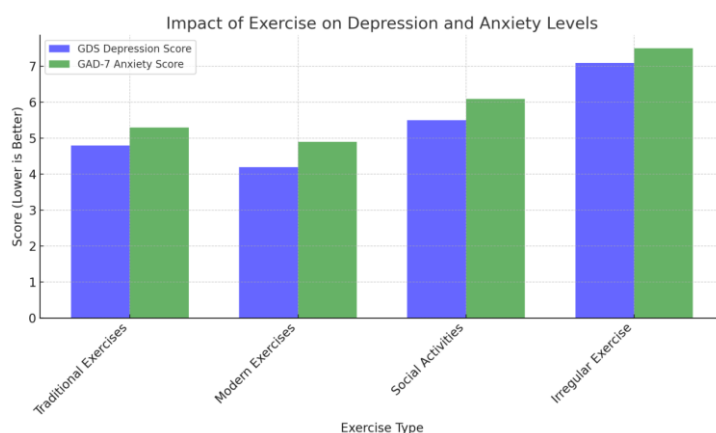
3.3. The Impact of Exercise on Mental Health

Mental health is a crucial component of the quality of life for older adults. In addition to its benefits for physical health, exercise has been shown to effectively improve emotional well-being, alleviate depression and anxiety, enhance cognitive function, and promote social participation. This study, based on data from 680 older adults, examines the specific impact of traditional exercises (Tai Chi, Five-Animal Exercises), modern exercises (aerobic workouts, yoga), and social activities (chess, choir) on the mental health of older adults by analyzing key indicators such as depression and anxiety levels, cognitive function, sleep quality, and social participation frequency.

3.3.1. The Impact of Exercise on Depression and Anxiety

Depression and anxiety are among the most common psychological issues affecting older adults. Exercise can stimulate the release of dopamine and serotonin, which help improve emotional stability. This study used the Geriatric Depression Scale (GDS) and the Generalized Anxiety Disorder Scale (GAD-7) to assess participants and analyze the effects of different exercise types on emotional health.

Figure 4: Impact of Exercise on Depression and Anxiety Levels

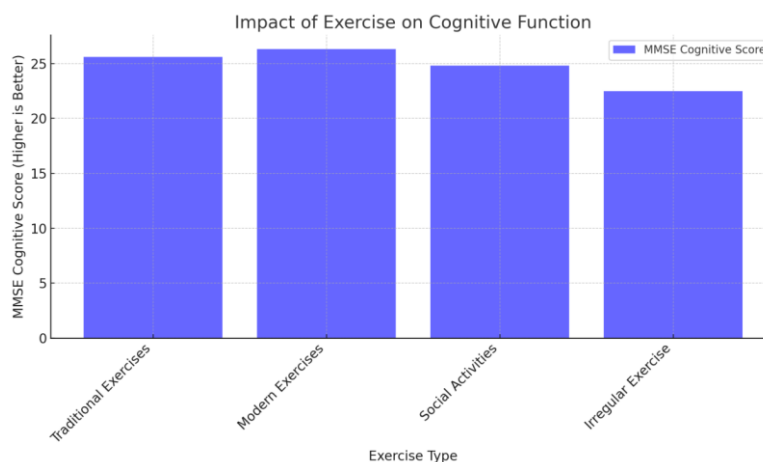


As the Figure 4 shown, the findings show that older adults who engage in regular exercise have significantly lower levels of depression and anxiety compared to those who do not exercise. Among them, aerobic exercise (brisk walking, square dancing) and yoga had the most notable effects in reducing anxiety, likely due to their regulation of the autonomic nervous system and relaxation effects. Tai Chi and Five-Animal Exercises, due to their meditative aspects and deep breathing techniques, were most effective in alleviating depressive symptoms. While social activities (chess, choir) also had positive effects on mental health, their impact was slightly less significant than regular physical exercise.

3.3.2. The Impact of Exercise on Cognitive Function

Cognitive decline is a common issue among older adults. Exercise can promote brain blood circulation, enhance executive function, and improve memory. This study used the Mini-Mental State Examination (MMSE) to assess cognitive abilities and analyze the effects of different exercise types.

Figure 5: Impact of Exercise on Cognitive Function



As the Figure 5 shown, the results indicate that all forms of exercise improve cognitive function, with more frequent exercise correlating with higher cognitive scores. Among them, aerobic exercise (such as brisk walking) and Tai Chi

had the most significant effects, as older adults who regularly engaged in these activities had notably higher cognitive scores compared to sedentary individuals. The potential mechanism behind this effect is that aerobic exercise enhances cerebral blood flow, while Tai Chi and yoga improve attention and spatial awareness.

3.3.3. The Impact of Exercise on Sleep Quality

Older adults often experience insomnia, light sleep, and frequent nighttime awakenings. Exercise has been shown to regulate melatonin secretion and improve sleep structure. This study used the Pittsburgh Sleep Quality Index (PSQI) to evaluate sleep quality, with higher scores indicating poorer sleep.

Table 2: The Impact of Exercise on Sleep Quality

Exercise Type	PSQI Sleep Score (↓ Lower is Better)
Traditional Exercises (Tai Chi, Five-Animal Exercises)	4.5 ± 1.8
Modern Exercises (Aerobic, Yoga)	3.9 ± 1.6
Social Activities (Chess, Choir)	5.2 ± 2.0
Irregular Exercise	6.8 ± 2.5

As the Table 2 shown, the findings show that older adults who exercise regularly have significantly better sleep quality than those who do not. Among them, yoga had the most pronounced effect on improving sleep, likely due to its focus on meditation and deep breathing, which reduces the time required to fall asleep and increases the proportion of deep sleep. Tai Chi also demonstrated considerable benefits in improving sleep patterns. While social activities (such as chess and choir) helped reduce loneliness, their impact on sleep improvement was less significant compared to physical exercise.

3.3.4. The Impact of Exercise on Social Participation

Social isolation exacerbates psychological health issues among older adults. Exercise creates more opportunities for social interaction and increases participation in community activities. This study measured the weekly frequency of social activities to evaluate the impact of exercise on social engagement.

Table 3: The Impact of Exercise on Social Participation

Exercise Type	Weekly Social Activity Frequency (times/week)
Traditional Exercises (Tai Chi, Five-Animal Exercises)	3.5 ± 1.2
Modern Exercises (Aerobic, Yoga)	4.1 ± 1.3
Social Activities (Chess, Choir)	5.2 ± 1.5
Irregular Exercise	2.3 ± 1.0

As the Table 3 shown, The findings show that social activities (chess, choir) had the strongest impact on increasing social participation, but group-based exercises such as square dancing and Tai Chi also significantly improved

social interaction frequency. Square dancing, due to its collective and entertainment-driven nature, was particularly effective in enhancing community engagement among older adults. Tai Chi, often practiced in groups, also helped foster social interaction. In contrast, older adults who did not engage in regular physical activity participated in fewer social activities and reported stronger feelings of social isolation. The results of this study demonstrate that exercise has multiple positive effects on the mental health of older adults: **Depression and Anxiety Improvement:** Aerobic exercise and yoga significantly reduce anxiety levels, while Tai Chi is particularly effective in relieving depressive symptoms. **Cognitive Function Enhancement:** Tai Chi and aerobic exercise improve executive function and short-term memory, reducing the risk of cognitive decline. **Sleep Quality Improvement:** Yoga and Tai Chi help shorten sleep latency, increase deep sleep proportion, and reduce nighttime awakenings. **Increased Social Participation:** Square dancing, Tai Chi, and social activities (chess, choir) enhance social interaction frequency, reducing loneliness. Overall, regular exercise provides comprehensive benefits for the mental well-being of older adults. Different types of exercise have unique advantages, allowing older individuals to choose the most suitable activity based on their specific needs. Moving forward, communities and families should encourage more opportunities for physical activity to improve the mental health and overall quality of life of older adults.

3.4. The Impact of Exercise on Social Participation

Social participation is a significant indicator of the quality of life for older adults, directly affecting their social connections, mental health, and life satisfaction. Physical exercise not only enhances the physical fitness of older adults but also promotes social interaction, expands social networks, and increases community participation, thereby improving their social adaptability. This study analyzes the impact of traditional exercises (Tai Chi, Five-Animal Exercises), modern exercises (aerobic workouts, yoga), and social activities (chess, choir) on social participation through indicators such as weekly social activity frequency, social satisfaction, and community participation rates, and compares the findings with older adults who do not engage in regular exercise.

3.4.1. The Impact of Exercise on Social Frequency

Physical exercise provides structured social opportunities for older adults, encouraging communication with other community members. This study evaluated the influence of various exercise types on social interaction by documenting the weekly frequency of social activities among participants.

Table 4: The Impact of Exercise on Social Frequency

Exercise Type	Weekly Social Activity Frequency (times/week)
Traditional Exercises (Tai Chi, Five-Animal Exercises)	3.8 ± 1.3
Modern Exercises (Aerobic, Yoga)	4.5 ± 1.5
Social Activities (Chess, Choir)	5.2 ± 1.6
Irregular Exercise	2.1 ± 1.1

As the Table 4 shown, the findings indicate that group-based activities such as square dancing and Tai Chi significantly promote social interaction due to their collective nature, while social activities (e.g., chess and choir) had the most significant effect on increasing social frequency. In contrast, older adults who do not engage in regular exercise reported fewer social activities and stronger feelings of social isolation.

3.4.2. The Impact of Exercise on Social Satisfaction

Social satisfaction is an important indicator of the quality of social relationships among older adults, encompassing social support, emotional communication, and a sense of belonging. This study assessed social satisfaction using a rating scale (1 to 10 points, with higher scores indicating greater satisfaction) to analyze the effects of different exercise types on social well-being.

Table 5: The Impact of Exercise on Social Satisfaction

Exercise Type	Social Satisfaction Score (out of 10)
Traditional Exercises (Tai Chi, Five-Animal Exercises)	7.8 ± 1.2
Modern Exercises (Aerobic, Yoga)	8.3 ± 1.0
Social Activities (Chess, Choir)	8.9 ± 1.1
Irregular Exercise	6.2 ± 1.5

As the Table 5 shown, the results show that all exercise types improved the social satisfaction of older adults, with social activities (e.g., chess and choir) having the greatest impact due to their high level of interpersonal interaction. While yoga and Tai Chi involve less frequent direct interaction, they still foster social connections through group practice and shared goals, resulting in significant improvements in social satisfaction.

3.4.3. The Impact of Exercise on Community Participation

Community activities provide older adults with structured social platforms, and physical exercise is often a core part of these activities. This study examined the relationship between exercise habits and community participation by documenting the monthly frequency of participation in community activities.

Table 6: The Impact of Exercise on Community Participation

Exercise Type	Monthly Community Activity Participation (times)
Traditional Exercises (Tai Chi, Five-Animal Exercises)	3.2 ± 1.4
Modern Exercises (Aerobic, Yoga)	3.7 ± 1.5
Social Activities (Chess, Choir)	4.8 ± 1.6
Irregular Exercise	1.9 ± 1.0

As the Table 6 shown, the findings indicate that older adults who exercise regularly participate in community activities more frequently than those who do not. Activities such as square dancing and Tai Chi provide structured

social settings in public spaces, allowing participants to form stable social networks, which foster greater engagement in community events. Meanwhile, social activities (e.g., chess and choir), due to their strong community focus, make it easier for older adults to integrate into the community and improve participation rates. The data from this study demonstrate that physical exercise plays a significant role in enhancing social participation among older adults, with the following key findings:

Increased Social Interaction Frequency: Social activities (e.g., chess and choir) have the most substantial impact on social interaction frequency, while group-based activities like square dancing and Tai Chi also help expand social networks.

Improved Social Satisfaction: All exercise types were shown to increase social satisfaction, with highly interactive activities such as chess and choir providing stronger social support, while long-term group practice in yoga and Tai Chi also helped establish meaningful social connections.

Greater Community Participation: Older adults who engage in regular exercise are more likely to participate in community activities, particularly group-based events such as square dancing, Tai Chi, and chess, which enhance their sense of belonging and community integration.

Overall, physical exercise not only promotes physical health but also plays a crucial role in enhancing social interaction and strengthening community engagement. Moving forward, more opportunities should be provided to encourage older adults to participate in diverse physical activities. By utilizing community resources, more social engagement opportunities can be created to help seniors build richer social networks and improve their overall quality of life.

4. Comparison and Applicability Analysis of Various Exercise Types

Older adults should select physical activities based on their health conditions, psychological needs, and social preferences. Traditional exercises (e.g., Tai Chi, Five-Animal Exercises, Baduanjin) and modern exercises (e.g., aerobic exercise, yoga, square dancing) each have distinct characteristics and impact different aspects of well-being. Traditional exercises emphasize balance, flexibility, and internal energy regulation, making them suitable for seniors with chronic illnesses or lower physical endurance. In contrast, modern exercises focus on cardiovascular improvement and social engagement, catering to those who aim to boost endurance and expand their social circles. Additionally, social and cognitive activities (e.g., chess, calligraphy, choir) promote mental well-being and delay cognitive decline, making them particularly beneficial for older adults prioritizing cognitive stimulation and social interaction.

4.1. Comparison of Traditional and Modern Exercise: Pros and Cons

Both traditional and modern exercise types provide unique benefits and potential limitations, making it essential to understand their advantages and drawbacks for older adults as the Table 7 shown.

Table 7: Comparison of Traditional and Modern Exercise

Category	Advantages	Disadvantages
Traditional Exercises (Tai Chi, Five-Animal Exercises, Baduanjin)	- Gentle and low-impact, making them ideal for seniors with joint issues or limited mobility. - Improves	- Slower impact on cardiovascular health, making them less effective for improving endurance and

	balance and flexibility, reducing fall risks. - Incorporates mindfulness and breathing control, beneficial for reducing anxiety and improving sleep quality. - Rooted in cultural tradition, fostering a sense of continuity and emotional connection.	heart health. - Requires patience and consistent practice to achieve visible health benefits. - Fewer structured social interactions compared to some modern group exercises.
Modern Exercises (Aerobic Workouts, Yoga, Square Dancing)	- Enhances cardiovascular function and endurance, reducing risks of heart disease and hypertension. - More dynamic and engaging, helping boost motivation and adherence. - Strong social component, particularly in group activities like square dancing, promoting community engagement. - More adaptable to varying fitness levels, with modifications available.	- Higher intensity and potential risk of joint strain, which may not be suitable for seniors with arthritis or osteoporosis. - Some activities require prior fitness levels, limiting accessibility for frail individuals. - Fast-paced exercises may be overwhelming for beginners or those with coordination challenges.

For seniors with weaker physical conditions or chronic illnesses, low-impact exercises like Tai Chi, Five-Animal Exercises, or yoga are ideal due to their slow and controlled movements. For those aiming to enhance endurance and cardiovascular health, square dancing, brisk walking, and aerobic workouts provide better heart and lung benefits. For seniors prioritizing social engagement and cognitive stimulation, chess, calligraphy, and choir participation help foster mental activity and interpersonal connections. Ultimately, a balanced approach that combines both traditional and modern exercises can provide comprehensive benefits, allowing older adults to maintain physical health, psychological well-being, and social interaction. In the future, community-based initiatives should offer a mix of traditional and modern exercise programs tailored to individual health needs and preferences, ensuring that all seniors can participate safely and effectively while maximizing their overall well-being.

4.2. Applicability of Different Exercise Types for Older Adults with Various Health Conditions

The selection of appropriate exercise for older adults should be based on their physical health, chronic conditions, and overall fitness levels. While some seniors maintain good mobility and cardiovascular health, others may suffer from arthritis, osteoporosis, heart disease, or diabetes, requiring more carefully designed exercise regimens. Choosing the right exercise type not only enhances physical and mental well-being but also minimizes the risk of injury and discomfort, ensuring long-term health benefits. For healthy and active seniors, engaging in a mix of aerobic, strength, and flexibility exercises is beneficial. Activities such as brisk walking, cycling, swimming, and square dancing help maintain cardiovascular endurance and muscle strength, reducing the risk of heart disease and obesity. Additionally, Tai Chi and yoga improve balance and flexibility, which can help prevent falls. These seniors can incorporate resistance training using body weight or light dumbbells to preserve muscle mass and bone density. However, high-impact activities such as running and intensive weightlifting should be approached cautiously to avoid joint strain or overexertion. For seniors suffering from arthritis or joint pain, exercises that reduce stress on the joints while maintaining mobility are ideal. Tai Chi, Five-Animal Exercises, and Baduanjin promote joint flexibility and circulation, easing stiffness and pain. Water-based exercises, such as swimming or aquatic aerobics, are particularly beneficial as they provide resistance without placing excessive pressure on the joints. In contrast, jogging and high-impact aerobics should be avoided, as they may exacerbate joint pain and inflammation. For those with osteoporosis or a high risk of falls, exercises that improve bone density and balance are crucial. Tai Chi, yoga, and balance exercises help strengthen core stability and coordination, significantly reducing the likelihood of falls. Weight-bearing activities such as brisk walking are also beneficial in maintaining bone strength. However, exercises that involve sudden directional changes or high impact, such as jumping or fast-paced aerobics, should be minimized to prevent fractures. Older adults with cardiovascular conditions, such as hypertension or heart disease, should engage in moderate-intensity aerobic exercise to support heart function and circulation. Brisk walking, swimming, and low-impact aerobic exercises help regulate blood pressure and cholesterol levels. Tai Chi and controlled breathing exercises further improve heart rate stability and reduce stress on the cardiovascular system. However, high-intensity interval training (HIIT), heavy lifting, and prolonged strenuous activities should be avoided to prevent excessive heart strain. For seniors managing diabetes, regular exercise is essential in improving insulin sensitivity and controlling blood sugar levels. Walking, cycling, and strength training effectively regulate glucose metabolism, reducing the risk of complications. However, prolonged, intense workouts without proper hydration or food intake may cause fluctuations in blood sugar levels, so careful monitoring is necessary. For those facing anxiety, depression, or cognitive decline, activities that combine movement with relaxation and social interaction are most beneficial. Yoga, Tai Chi, and meditation-based exercises reduce stress and promote mental clarity, while group activities like square dancing or choir participation enhance social bonds and emotional well-being. Seniors who engage in regular physical activity experience improved sleep, lower stress levels, and greater social satisfaction. In conclusion, selecting the right exercise is crucial for maximizing benefits while minimizing risks for older adults. A personalized approach that considers individual health conditions ensures that seniors stay active safely. By integrating both traditional and modern exercises, seniors can enjoy better mobility, reduced health risks, and improved overall well-being, leading to a healthier and more fulfilling life.

5. STRATEGIES TO PROMOTE SENIOR PARTICIPATION IN PHYSICAL ACTIVITIES

Participation in physical activities not only enhances physical and mental health but also improves social interaction and overall well-being. However, due to factors such as physical decline, lack of accessible exercise facilities, and insufficient guidance, many older adults face obstacles in maintaining an active lifestyle. Therefore, a collaborative effort from governments, social organizations, communities, and families is required to provide policy support, improve exercise environments, and promote health education, thereby encouraging more seniors to engage in consistent and structured physical activities.

5.1. Policy Support at the Government and Social Level

The government plays a crucial role in promoting senior fitness initiatives by implementing policy guidance, public resource investment, and fitness infrastructure improvements to create a senior-friendly exercise environment. Governments should establish national and regional senior fitness programs that encourage the construction of age-friendly exercise facilities. Policies should include free or low-cost access to public fitness spaces to ensure older adults can easily participate in physical activities. Investment should be made in senior-friendly fitness infrastructure, such as exercise equipment in urban parks, community squares, walking trails, and designated Tai Chi practice areas. Additionally, safety measures should be enforced to prevent falls and injuries. The government should train and certify specialized senior fitness instructors, encouraging community centers and senior care institutions to hire professional coaches to provide safe and structured exercise programs. Both online and offline exercise courses should be developed to support senior fitness. Resources such as TV health programs, community fitness lectures, and social media exercise tutorials can help older adults learn proper exercise techniques. Governments should encourage businesses and nonprofit organizations to sponsor senior fitness events, such as community fitness competitions and exercise workshops. Public-private partnerships can be used to fund free fitness classes and organize senior-friendly sports events, improving accessibility and motivation for older adults. Implementing reward systems for seniors who maintain active lifestyles, such as discounted health services or recognition programs, can motivate consistent participation. Community-based fitness clubs and activity groups can further enhance social motivation for older adults to remain physically active. To effectively promote senior fitness, governments and social organizations must implement a multi-faceted support system that includes infrastructure development, professional exercise guidance, health education, and social engagement initiatives. By providing safe, convenient, and engaging exercise environments, more older adults can be encouraged to adopt and sustain a physically active lifestyle, ultimately enhancing their overall health and quality of life.

5.2. Building Community and Family Support Systems

Community and family play indispensable roles in promoting physical activity among older adults. A well-structured community support system provides exercise venues, organizes fitness activities, and enhances social interaction, while family encouragement and companionship increase motivation for seniors to engage in exercise, fostering greater health awareness and a higher quality of life. To create a more supportive environment

for senior fitness, efforts should be made to improve community infrastructure, strengthen family support systems, and promote intergenerational engagement.

(1) Optimizing Community Sports Facilities and Organizing Exercise Activities

As a key part of daily life for older adults, communities should invest in exercise infrastructure by installing senior-friendly fitness equipment, walking trails, and designated exercise zones in parks and public spaces. Regular safety inspections and facility maintenance are essential to ensure that exercise environments remain accessible and risk-free. In addition, communities should regularly organize senior fitness programs, such as Tai Chi classes, square dancing competitions, and walking groups, to increase exercise participation and social interaction while reducing loneliness. To ensure safe and effective exercise, professional fitness coaching teams should be established within communities, including rehabilitation therapists and fitness instructors who can provide tailored exercise guidance. For instance: Older adults with arthritis may benefit from Tai Chi or Baduanjin. Those with cardiovascular conditions should opt for brisk walking or yoga. Furthermore, communities can integrate smart technology such as fitness trackers and exercise monitoring apps to help seniors track their physical activity levels and health metrics, enabling better self-management of fitness routines.

(2) Family Encouragement and Support

Families serve as a primary source of motivation for older adults to stay active. Encouragement and companionship from family members significantly improve exercise participation and adherence. Children should actively support their parents' fitness routines, encourage regular exercise, and participate in activities together, such as: Taking weekend walks with parents. Engaging in family yoga sessions. Practicing Baduanjin together. These shared activities not only strengthen parent-child relationships but also increase seniors' interest in fitness. Additionally, families should help older adults establish healthier lifestyles by: Encouraging regular physical activity. Supporting nutritious diets to complement exercise. Providing appropriate exercise gear, such as comfortable walking shoes and non-slip mats, to reduce injury risks. For seniors with limited mobility, family members can assist in organizing indoor exercise options, such as chair yoga and light resistance training, ensuring they maintain physical activity in a safe environment.

(3) Intergenerational Interaction and Digital Fitness Support

To further increase exercise motivation, both communities and families should promote intergenerational engagement by encouraging seniors to exercise alongside younger generations. For example, communities can organize: Grandparent-Grandchild Fitness Days. Family Sports Events. Such initiatives not only strengthen family bonds but also allow older adults to experience a sense of social belonging and care from younger generations. With advancements in digital fitness technologies, both communities and families can assist seniors in using smart devices such as: Fitness trackers to monitor activity levels. Online exercise courses tailored for older adults. Virtual fitness groups where seniors can connect with peers through social platforms. By combining offline community engagement with digital fitness tools, older adults gain greater accessibility to exercise knowledge and motivation to maintain long-term fitness habits. The development of strong community and family support systems is essential

for promoting exercise participation among older adults. Communities should: Enhance public exercise facilities. Organize structured fitness programs. Provide professional guidance to ensure safe and effective exercise. Meanwhile, families should: Encourage exercise participation. Offer companionship and emotional support. Help integrate physical activity into daily life. Additionally, intergenerational engagement and digital fitness solutions further enhance seniors' motivation and adherence to exercise. Through coordinated community and family efforts, older adults can enjoy a more inclusive and accessible fitness environment, ultimately improving their health and overall quality of life.

5.3. Promotion and Education of Physical Exercise

Encouraging older adults to participate in physical activities requires effective promotion and educational initiatives. Many seniors face barriers to exercise, such as lack of awareness, fear of injury, absence of suitable programs, or uncertainty about how to start. To overcome these challenges, systematic education, accessible exercise programs, and targeted outreach efforts are essential. Community organizations, healthcare providers, and families should work together to raise awareness, provide structured fitness education, and create an age-friendly exercise environment. This section explores key strategies for promoting exercise among older adults, including awareness campaigns, exercise education programs, and technological support.

(1) Raising Awareness and Changing Perceptions

Many older adults associate exercise with strenuous activity and believe it is unsuitable or even risky for their age. Public awareness campaigns are essential to highlight the benefits of regular physical activity in maintaining mobility, independence, and overall well-being. Government and community organizations can launch media campaigns through television, social media, radio, and local newspapers to share scientific evidence on the benefits of exercise for older adults. Success stories of seniors who improved their health, social life, or mental well-being through exercise can be showcased to motivate others. Local events such as community health fairs, fitness challenges, and senior sports days can create enthusiasm and encourage peer participation.

(2) Establishing Structured Exercise Education Programs

Providing clear and accessible guidance on exercise is crucial for older adults to build confidence and sustain long-term participation. Educational programs should cover different exercise types, proper techniques, safety measures, and individualized workout plans. Community fitness centers and senior activity clubs should offer free or low-cost workshops led by trained fitness instructors or physiotherapists. Hospitals and clinics can integrate exercise consultations into routine check-ups, allowing doctors to recommend suitable physical activities based on patients' health conditions. Educational materials, including exercise guides, video tutorials, and printed manuals, should be distributed in senior centers, retirement homes, and healthcare facilities to provide clear instructions on safe and effective exercise routines.

(3) Expanding Digital and Technological Support

Technology can play a critical role in promoting exercise education, especially for seniors who may have mobility

limitations or lack access to in-person programs. Mobile fitness apps and wearable devices can help seniors track steps, heart rate, and activity levels, offering personalized recommendations and motivation. Online exercise classes (e.g., YouTube tutorials, virtual fitness sessions) allow seniors to participate in guided workouts from home and connect with online fitness communities for support. Virtual reality (VR) and AI-assisted coaching can be introduced in rehabilitation centers and senior wellness programs, making exercise more engaging and interactive.

Effective promotion and education are key to increasing exercise participation among older adults. By implementing awareness campaigns, structured educational programs, and digital exercise solutions, more seniors can be encouraged to adopt a physically active lifestyle. Future efforts should focus on integrating physical activity into senior-friendly community programs, offering personalized guidance, and leveraging technology to make exercise more accessible, enjoyable, and sustainable. Through collaborative efforts from government, communities, and families, older adults can benefit from improved health, greater independence, and enhanced quality of life.

6. CONCLUSION

This study examined the impact of physical activity on the physical health, mental well-being, and social participation of older adults. Through data analysis, the results confirmed that exercise enhances cardiopulmonary function, strengthens muscles, alleviates depression and anxiety, and fosters social engagement. Traditional exercises (e.g., Tai Chi, Five-Animal Exercises) improve balance and emotional stability. Modern exercises (e.g., aerobic workouts, yoga, square dancing) enhance cardiovascular endurance and social interaction. To encourage more seniors to engage in physical activities, efforts should be made at multiple levels: Governments should implement supportive policies and enhance public exercise facilities. Communities should optimize fitness environments and provide structured exercise programs. Families should offer encouragement and active companionship. Additionally, promoting scientific fitness education, professional guidance, and the use of technology-driven exercise solutions will further improve participation rates and enhance seniors' quality of life. In the future, greater emphasis should be placed on integrating digital health solutions and personalized fitness programs, advancing systematic senior health management, and ensuring that more older adults can benefit from exercise, leading to a healthier, happier, and more fulfilling later life.

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