The Effect of Combined Physical Activity and Cognitive Training on Quality of Life in Older Adults

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Abstract

Background: Quality of life (QoL) is an individual's perception of their position in life within the context of their culture, values, goals, expectations, and concerns.

Aim: This study aimed to evaluate the effect of combined physical activity and cognitive training on quality of life in older adults.

Design: A quasi-experimental design was utilized.

Setting: The study was conducted in Shobera El Nakhla, a randomly selected rural area in Sharkia Governorate, Egypt.

Sample: The sample consisted of 100 older adults, and a multistage random sampling technique was employed.

Tools: Data were collected using four tools: Structured interview questionnaire, the Community Healthy Activities Model Program for Seniors (CHAMPS), the Cognitive and Leisure Activity Scale (CLAS), and the WHO Quality of Life-BREF (WHOQOL-BREF).

Results: The findings revealed statistically significant improvements among participants following the intervention. Physical activity increased from 10% to 52%, cognitive engagement improved from 16% to 62%, and quality of life enhanced from 9% to 58%. Additionally, a highly significant positive correlation ($p < 0.01$) was observed between physical activity, cognitive training, and quality of life both before and after the intervention.

Conclusion: The combined physical activity and cognitive training intervention was effective in enhancing quality of life among older adults**.**

Recommendations: The combined intervention should be applied continuously in the current study setting and expanded to similar environments to assess its long-term sustainability and to support evidence-based aging care.

Keywords : Physical Activity, Cognitive Training, Quality of Life, Older Adult

Introduction

The ageing of the population is a worldwide phenomenon **(United Nations Department of Economic and Social Affairs, 2020)**. Healthy ageing is described as "the process of establishing and maintaining functional ability that allows for well-being in old age." **(Matsuyama et al., 2022).** The number of people aged 60 and up reached one billion in 2019. By 2030, this number will have risen to 1.4 billion, and by 2050, it will have risen to 2.1 billion. This rise is occurring at an unprecedented rate, and it is expected to intensify in the next decades, particularly in developing countries **(WHO, 2022).**

Quality of life (QoL) is broadly defined by the World Health Organization (WHO) as an individual's perception of their position in life within the context of their culture, values, goals, expectations, and concerns. It is a multidimensional concept encompassing physical health, psychological state, level of independence, social relationships, personal beliefs, and environmental factors that collectively influence well-being **(Teno et al., 2024; Marafioti et al., 2024).**

Non-pharmacological interventions have increasingly gained attention as effective and safe alternatives to pharmacological treatments, which often carry unwanted side effects. Among these approaches, combined physical and cognitive therapies have shown promising results for enhancing executive function and overall cognitive health in older adults. The integration of cognitive tasks within physical exercise programs—such as walking, stretching, and resistance training—alongside cognitive stimulation activities like memory exercises, attention training, and digital cognitive technologies, optimizes benefits for both physical and cognitive domains. This dual-task intervention is thought to produce synergistic effects by promoting neuroplasticity and improving cerebral blood flow, two key mechanisms supporting cognitive maintenance in aging populations. These combined interventions have demonstrated positive outcomes not only in cognitive function but also in mobility, balance, and strength, which are critical for reducing fall risk and enhancing daily functional abilities in older adults **(Muñoz-Perete et al., 2025).**

Physical activity (PA) is essential for health promotion and disease prevention, contributing to physiological well-being and enhancing quality of life across all age groups **(Conger et al., 2024).** It is defined as any bodily movement produced by skeletal muscles that requires energy expenditure, including activities performed during work, play, housework, travel, and recreation **(Longhini et al., 2024).** For older adults, physical activity offers a wide range of benefits in preventing and managing common conditions and diseases associated with aging. Well-known benefits include improvements in cardiovascular health, hypertension control, and weight management, while additional positive effects extend to daily functioning, sleep quality, cognitive health, and even cancer survival **(Sullivan, 2024).** Moreover, regular physical activity has been shown to counteract many of the adverse effects of aging, making exercise a vital component of healthy aging for older adults **(Indrakumar & Silva, 2024).**

Cognitive training is defined as a treatment that focuses on the guided practice of tasks targeting specific cognitive domains **(Yang et al., 2024).** A substantial body of scientific literature has established that such training can enhance a wide range of cognitive functions, including working memory, inhibition, cognitive flexibility, selective attention, processing speed, and overall quality of life **(Saez-Gutierrez et al., 2024).** Additional improvements have been

observed in reaction time, reasoning, learning capacity, interference control, and verbal fluency among older adults **(Yu & Woo, 2021).**

Gerontological nurses play a vital role in addressing the complex and unique healthcare needs of the aging population. As the population ages, healthcare systems face increasing demands, and these nurses are essential in providing specialized care tailored to older adults. They implement evidence-based practices that focus not only on managing existing health conditions but also on promoting health and protection, preventing disease, and supporting recovery and rehabilitation. In addition to direct patient care, gerontological nurses collaborate with families and other healthcare professionals to develop comprehensive care plans that enhance the quality of life and functional independence of older adults **(Ferretti-Rebustini et al., 2021).**

Method

Study Design

A quasi-experimental research design with a pre-test–post-test intervention was employed to achieve the aim of the study

Setting:

This study was conducted in **Shobera El Nakhla**, a rural area randomly selected from Sharkia Governorate. Shobera El Nakhla is a large village located in the Belbeis district and comprises 20 smaller sub-villages. It has an elderly population of approximately 1,696 and is situated about 24.5 kilometers from Zagazig City. Multigenerational households are the predominant family structure among the residents. Agriculture serves as the primary source of income. The village includes approximately 7,875 houses and is served by five schools, and several pharmacies. Additionally, it has one hospital and a kidney dialysis unit.

Sample

The initial sample consisted of 110 older adults, including 10 participants for the pilot study. After excluding the pilot participants, the final study sample comprised 100 older adults from the aforementioned setting who met the following inclusion criteria: Aged between 60 and 75 years, of either gender, able to read and write, free from any uncontrolled chronic diseases or conditions affecting executive function, and willing and able to cooperate and provide informed consent to participate in the study.

Sampling technique

A multistage random sampling technique was employed to select participants for the study. In the first stage, Sharkia Governorate—comprising 17 districts—was considered, and one district, Belbeis, was selected using simple random sampling. In the second stage, one village, Shobra El Nakhla, was randomly chosen from the 50 villages within the Belbeis district. In the third stage, the selected village was divided into 20 clusters, each containing approximately 85 older adults. Four clusters were then randomly selected, and all older adults within these clusters who met the inclusion criteria were invited to participate in the study until the required sample size of 100 participants was reached.

Sample size calculation

The sample size was calculated using the Epi Info software with a 95% confidence level, a 5% margin of error, and 80% power. It was assumed that 71.2% of older adults had low physical activity based on a sample of 1,696 elderly individuals in the community **(Farrag et al., 2019).**

Anticipating a minimum improvement of 10% following the intervention program, the required sample size was determined to be 100 older adults.

Tool of data collection

Four tools were used to collect the study data.

Tool I: Structured Interview Questionnaire

It was developed by the researchers to collect relevant data from older adults. The questionnaire consisted of two main parts, each designed to capture different aspects of the participants' background and lifestyle.

- **Part 1: Demographic Characteristics of the Older Adults**

This section included ten closed-ended questions aimed at gathering key demographic information. The variables covered were age, gender, marital status, educational level, current occupation, crowding index, monthly income, source of income, and living arrangements (Questions 1–10).

- **Part 2: Health History and Daily Habits of the Older Adults**

This section focused on the participants' health status and lifestyle behaviors. It included questions on the presence of chronic illnesses (e.g., hypertension, diabetes mellitus, respiratory conditions), current medication use, and the number of medications taken regularly. Additionally, it assessed lifestyle habits such as smoking and caffeine consumption (Questions 11–14).

Tool II: The Community Healthy Activities Model Program for Seniors (CHAMPS):

The CHAMPS questionnaire is a self-report tool designed to assess the weekly frequency and duration of various lifestyle physical activities that are meaningful and appropriate for older adults. Originally developed as a 40-item scale, it was adapted by **Hekler et al. (2012)**. In the present study, the researcher modified the questionnaire to include 27 items by omitting activities deemed unsuitable for the study sample. The adapted version includes activities of varying intensities, ranging from light to vigorous, such as walking, running, bicycling, aerobics, yoga/tai chi, gardening, and housework. **Each item was scored** using a binary response format, with “Yes” assigned 1 point and “No” assigned 0, resulting in a maximum total score of 27. The overall score was then converted into a percentage and used to categorize participants into three levels of physical activity: **Good** (>75%, 21–27 points), **Fair** (50–75%, 14–20 points), and **Poor (**<50%, 0–13 points).

Tool III: Cognitive and Leisure Activity Scale (CLAS):

The Cognitive and Leisure Activity Scale (CLAS), adapted by **Galvin et al. (2021)**, is designed to assess the frequency of cognitively stimulating and leisure activities among older adults to evaluate their potential impact on cognitive health and well-being. Originally composed of **16 statements**, the CLAS was modified in the current study to include **8 domains**: Memory Activities, Problem Solving, Learning, Social Engagement, Reading, Creative Activities, Physical Activity, and Use of Technology. **The tool employs a 3-point Likert scale** to measure activity frequency, with scores assigned as "Often" = 2, "Sometimes" = 1, and "Never" = 0, yielding a maximum total score of 16. This score is then converted into a percentage to classify cognitive activity levels into three categories: **Good** (≥75%, 12–16 points), **Fair** (50% to <75%, 8–11 points), and **Poor** (<50%, 0–7 points)

Tool IV: The WHO Quality of Life-BREF (WHOQOL-BREF)

The aim of the WHO Quality of Life-BREF (WHOQOL-BREF) in older adults is to assess their perceived quality of life across key domains that influence overall well-being. Adopted by **the World Health Organization (1998),** the WHOQOL-BREF is a 26-item questionnaire that includes two general items on overall quality of life and satisfaction with health, while the remaining 24 items are distributed across four specific domains, physical health (7 items), psychological health (6 items), social relations (3 items), and environment (8 items) Each item is rated on a 5-point Likert scale ranging from 1 ("Not at all") to 5 ("Extremely"). The domain scores are summed, multiplied by 4 to align with the WHOQOL-100 format, and then transformed to a 0–100 scale. The total possible score is 130, with results categorized into three levels of quality of life: **Good** (>75%, 98–130 points), **Fair** (50–75%, 65–97 points), and **Poor** (<50%, 26–64 points).

Statistical analysis

Statistical analysis was conducted using Microsoft Excel and SPSS version 25. Descriptive statistics were used to present the data: frequencies and percentages for categorical variables, and means ($\bar{X}$) with standard deviations (SD) for quantitative variables. The Chi-square test (χ^2) was used to compare qualitative variables, and the Wilcoxon test was applied for comparing quantitative variables. Pearson's correlation coefficient (r) was used to examine the relationships between studied variables, while a linear regression model was employed to analyze the impact of community healthy activities, cognitive and leisure activities, and executive skills on the quality of life of older adults. The reliability of the study tools was assessed using Cronbach's alpha. Statistical significance was considered at P-value ≥ 0.05 (not significant), P-value < 0.05 (significant), and P-value < 0.01 (highly significant).

Results

Table (1) shows that 44.0% of the older adults were aged between 65 and <70 years, with a mean age of 67.64 ± 5.13 years. Additionally, 52.0% were male, and 71.0% were married. Regarding education, 39.0% had completed secondary education. Moreover 64.0% of the participants were not working. In terms of the crowding index, 60.0% had a score between 1 and 2. Furthermore, 51.0% of older adults reported having insufficient income, and for 59.0%, the primary source of income was a pension. Finally, 71.0% of the older adults lived with their spouse.

Table (2): shows that, there was a significant improvement in Physical Activity for older adults with a highly statistically significant difference at (P= < 0.01). As evidence, 10.0% of the studied older adults had good community healthy activities at pre intervention phase changed to 52.0% after interventions.

Table (3): shows that, there was a marked improvement in cognitive and leisure activity post interventions with a highly statistically significant difference at (P= < 0.01). As evidence, 16.0% of the studied older adults had good cognitive and leisure activity at pre intervention phase changed to 62.0% after.

Table (4) shows that, there was a marked improvement in all quality-of-life domains at post interventions with a highly statistically significant difference at (P= < 0.01). As evidence, (6.0%, 9.0% and 6.0%, respectively) and of the older adults had a good level of psychological, social and environmental health which changed to (58.0%, 56.0% and 60.0%, respectively) after interventions.

Figure (1) illustrated that, 9% of the older adults had good quality of life which changed to 58.0% at post intervention.

Table (5) demonstrates strong and highly significant correlations ($p < 0.01$) among total physical activity, cognitive training, executive functions, and quality of life scores before and after the intervention. At the post-intervention stage, total physical activity showed a very strong correlation with cognitive training ($r = 0.817$), and quality of life ($r = 0.933$). Similarly, cognitive training exhibited strong associations with quality of life ($r = 0.923$). The high correlation between executive functions and quality of life ($r = 0.817$).

Discussion

Objective 1: Identify Physical Activity patterns in Older Adults Pre- and Post- Intervention

The findings of the current study revealed that prior to the intervention, the majority of older adults exhibited low levels of physical activity. Several factors may explain this result. ***First,*** age-related physiological changes—including declines in strength, endurance, and balance—make physical activity more challenging for older adults. Second, multiple demographic factors influence activity levels, such as gender, education, and marital status. ***Notably,*** physical activity tends to be lower among individuals with limited educational backgrounds. ***Furthermore,*** social determinants play a critical role: older adults with active spouses or strong social support systems are more likely to remain physically active. Access to appropriate facilities, motivation, self-efficacy, and self- regulation skills (e.g., goal-setting and activity tracking) also substantially affect participation. ***Additionally,*** central barriers such as chronic pain, fear of falling, and poor awareness about the benefits of physical activity were commonly reported. These findings aligned with a study by ***Farrag et al. (2019)*** in ***Mansoura, Egypt,*** which found that three-quarters of older adults had low physical activity levels. Similarly, research by ***Shi et al. (2025)*** *in* ***Southern China*** reported that older adults had insufficient physical activity.

After the implementation of the intervention, the study showed ***a statistically significant improvement in the physical activity scores among participants.*** This improvement can be attributed to the content and delivery of the intervention, which emphasized the importance of physical activity for healthy aging, encouraged open communication about health conditions, and promoted access to reliable health information. The intervention empowered participants to take initiative in improving their physical activity habits. These findings were in line with previous international research. ***Chen et al. (2025)*** *in* ***China*** found that more than half of older adults met physical activity recommendations post-intervention. Similarly, ***Kim et al. (2024)*** in ***Korea, Ho et al. (2024)*** in ***Taiwan,*** and ***Alley et al.*** **(2024)** in **Australia** demonstrated that structured interventions significantly improved physical activity levels among older adults. ***Li et al. (2023)*** further showed that physical activity promotion remained effective even after 24 months of follow-up in a Chinese population.

Objective 2: Describe Cognitive Training methods for Older Adults in Older Adults Pre- and Post- Intervention

The present study revealed that prior to the intervention, ***older adults demonstrated a poor level of engagement in cognitive training.*** Several factors may account for this finding. ***Firstly,*** individual variability in response to cognitive training (CT) can be influenced by aspects such as fluid intelligence, baseline mental status, verbal ability, and adherence to CT strategies. ***Secondly,*** older adults residing in rural areas often face unique challenges, including limited access to healthcare resources, reduced social interactions that could stimulate cognitive

functioning, lower income levels, and suboptimal health behaviors. These barriers are compounded by limited awareness regarding the benefits and importance of cognitive training. In line with these findings, a study conducted in ***the United States*** by ***Steinberg et al. (2023)*** reported that rural older adults performed worse across all baseline cognitive measures—including memory, reasoning, and processing speed—compared to their urban counterparts ($p < 0.01$).

Following the implementation of the intervention, the study recorded a ***statistically significant improvement in cognitive training practices among participants.*** This improvement can be attributed to several factors: increased educational awareness about the value of cognitive stimulation, the provision of diverse and engaging cognitive activities (e.g., reading, writing, puzzles, yoga, and learning new skills), and effective monitoring and encouragement during the intervention sessions. Daily application of cognitive exercises further reinforced these practices. These outcomes are consistent with a study by ***Kunrit et al. (2025)*** in ***Pathum Thani Province, Thailand,*** which showed that a 6-week game-based brain training program led to improvements in executive and overall cognitive function, with benefits sustained during a 3-month follow-up. Similarly, ***Tsiakiri*** **et** ***al. (2025)*** in ***Greece*** supported the use of CT as a non-pharmacological strategy to enhance cognitive resilience in aging populations. Additional international studies echo these findings: ***Paggetti et al. (2025)*** in ***Italy*** reported improvements in global cognitive function through both individual and group CT programs; ***Sung et al. (2023) in Taiwan*** found that multi-domain CT enhanced executive functions ($p = 0.001$), working memory ($p = 0.016$), and selective attention ($p = 0.026$); and ***Moradi et al. (2024) in Iran*** observed that cognitive stimulation interventions significantly enhanced memory ($p = 0.047$), reduced distractibility ($p = 0.035$), and improved information processing speed.

Objective 3: Examine the quality of life among older adults before and after the intervention.

The present study aimed to examine the quality of life (QoL) among older adults before and after a structured intervention. Prior to the intervention, findings revealed that a significant proportion of older adults experienced a poor level of QoL. This aligned with the understanding that QoL among the elderly is strongly influenced by multiple dimensions—namely physical health, psychological well- being, social interaction, and environmental factors. As individuals age, the natural decline in health and functional capacity, coupled with increased dependence, often leads to a diminished QoL. Several factors contribute to this decline. Aging is frequently associated with chronic illnesses, reduced mobility, sensory impairments, social withdrawal, and financial dependency, all of which negatively impact well-being. ***Mariani et al. (2025),*** in a study conducted in ***Sidakarya Village,*** similarly found that half of the older adults assessed had poor QoL, reinforcing the global nature of this issue.

After the intervention, however, ***two-thirds of the participants demonstrated an improved and good level of QoL.*** This significant improvement can be attributed to the multifaceted nature of the intervention, which emphasized physical activity, social engagement, and healthy lifestyle habits. According to the World Health Organization (WHO), older adults should engage in regular moderate-to-vigorous physical activity combined with strength training to enhance health outcomes and overall QoL. Interventions promoting such behaviors can counteract physical and cognitive decline, stimulate neuroplasticity, and support psychosocial well-being.Lifestyle modification—including better nutrition, increased physical activity, social connection, and reduced stress—has been shown to play a pivotal role in successful aging and enhanced QoL. ***Fiorilli et al. (2022)*** in ***Italy and Setiawan et al. (2025)*** in ***Surakarta City*** found similar improvements in QoL following physical exercise interventions. These studies echo the

current findings and emphasize the importance of active engagement and environmental enrichment in maintaining or improving QoL in older adults.

In exploring the socio-economic determinants of QoL, this study found a ***highly statistically significant relationship between income and QoL.*** Financial resources affect older adults' access to healthcare, nutrition, safe housing, and social participation, all of which are critical to well-being. Older individuals with lower income are often more vulnerable to isolation, limited healthcare, and lack of basic services, which collectively reduce QoL across all domains—physical, psychological, social, and environmental. These findings aligned with ***Samadarshi et al. (2021)*** *in* ***Nepal,*** who reported that older adults with sufficient income were nearly four times more likely to have higher QoL. Similarly, ***Gobbens and Remmen (2019)*** *in the* ***Netherlands*** found a significant positive association between higher monthly income and improved QoL.

Another notable finding of the study was ***the statistically significant association between educational level and quality of life.*** Education is recognized as a critical determinant of health and longevity. It enhances intellectual functioning, facilitates better health literacy, and empowers individuals to engage actively with their environment. Educated older adults are generally more aware of chronic disease management, health promotion behaviors, and community resources, all of which contribute to better physical, mental, and social health.

Moreover, education often correlates with better job opportunities, higher income, and improved living standards—all contributing to higher QoL. Education also enhances autonomy, decision-making abilities, and meaningful social interactions, thereby enriching the psychological and social domains of life. Conversely, illiteracy is often associated with poverty and limited access to health services, which can negatively affect QoL. These findings are consistent with research by ***Purba et al. (2021)*** in ***Indonesia,*** who demonstrated a positive link between educational attainment and QoL in older adults. Similarly***, Moudi et al. (2020),*** in a case–control study in ***Iran,*** found that older adults with primary education or diplomas had significantly higher QoL scores than their illiterate counterparts.

Objective 4: Evaluate the effect of the combined intervention on quality of life in older adults.

In relation to ***quality of life,*** the study also identified ***a statistically significant positive correlation with combined physical and cognitive training.*** The multi-dimensional nature of QoL—which encompasses physical, mental, emotional, and social well-being—makes it particularly responsive to interventions that target both body and mind. ***Mind–body exercises****,* a central component of the intervention, are especially suited to older adults as they combine aerobic and resistance movements with controlled breathing and mental focus. This type of exercise enhances emotional regulation, helping to alleviate ***stress, depression, and loneliness***—common psychological challenges in older populations due to retirement, loss of loved ones, and reduced social roles. Another crucial aspect is the ***multi-tiered mechanism*** by which these interventions influence QoL. Physical improvements such as increased strength and mobility contribute to greater independence and reduce fear of falling, while mental stimulation supports cognitive resilience. Simultaneously, emotional well-being is bolstered through increased ***social interaction***, enhanced self-esteem, and improved perceived social support—all of which are linked to a better QoL perception.

Support for these outcomes can be seen in international literature. ***Cintoli et al. (2021) in Italy*** observed significant QoL improvement after seven months of combined training. Similar results were found by ***Sok et al. (2021) in Korea, Trombini-Souza et al. (2022), and***

Nascimento et al. (2022) in Brazil. Moreover, mind–body approaches such as Tai Chi were shown by ***Yang et al. (2024) in China and Shakir (2024)*** in ***Pakistan*** to significantly enhance QoL, even during long-term follow-up periods.

Limitations of the Study

There is one limitation in this study that could be addressed in future studies. The limitation is that our sample was only rural older adults, so the study results are only generalizable in older population in rural settings.

Conclusion

Based on the findings of the present study and the tested research hypotheses, the results strongly support the effect of combined physical activity and cognitive training on quality of life in older adults. Before the intervention, participants exhibited low levels of physical activity, cognitive functioning, and quality of life. Following the intervention, significant improvements were observed across all measured domains. Furthermore, the positive correlations among physical activity, cognitive training, and quality of life underscore the synergistic impact of an integrated intervention approach in promoting healthy aging.

Recommendations

Based on the results of this study, the combined intervention should be applied continuously in the current study setting and expanded to similar environments to assess its long-term sustainability and to support evidence-based aging care. **Also,** further research should explore the underlying neurological mechanisms associated with cognitive and physical improvements to better understand how the intervention influences brain function and structure.

Declaration of Conflicting Interests

The Author(s) declare(s) that there is no conflict of interest.

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Table (1): Frequency Distribution of the Older Adults According to Their Demographic Characteristics (n=100).

Demographic *Characteristics*	No.	%
Age (years)		
60-<65	24	24.0
65-<70	**44**	**44.0**
70-75	32	32.0
Mean ± SD	**67.64±5.13**	
Gender		
Male	**52**	**52.0**
Female	48	48.0
Marital status		
Married	**71**	**71.0**

Divorced	4	4.0
Widowed	25	25.0
Educational level		
Read and write	29	29.0
Basic education	19	19.0
Secondary education	39	39.0
University education	13	13.0
Current occupation		
Working	36	36.0
Not working	**64**	**64.0**
Crowding index		
<1	37	37.0
1-2	**60**	**60.0**
>2	3	3.0
Monthly income		
Sufficient	40	40.0
Insufficient	**51**	**51.0**
Sufficient and spared	9	9.0
Source of income		
Pension	**59**	**59.0**
Family	32	32.0
Still working	5	5.0
Property income	4	4.0
Living Condition		
Alone	12	12.0
Spouse	**71**	**71.0**
Sons	14	14.0
Relatives	3	3.0

Table (2): Total scores of the Physical Activity Questionnaire for older adults – pre- and post-intervention (n=100).

Total scores of CHAMPS Physical Activity	Pre intervention		Post intervention		X^2	P-value
	No.	%	No.	%		
Good	10	10.0	52	52.0	48.87	0.000**
Fair	33	33.0	30	30.0		
Poor	57	57.0	18	18.0		
Mean SD	**7.87±7.38**		**16.96±6.16**		**Z=4.030**	**0.000****

X^2: Chi Square Test Z= Wilcoxon test. (**) highly Statistically significant at p <0.01.

Table (3): Total older adults' cognitive and leisure activity at pre and post interventions (n=100).

Levels of total cognitive and leisure activity	Pre intervention		Post intervention		X^2	P-value
	No.	%	No.	%		
Good	**16**	**16.0**	**62**	**62.0**	51.38	0.000**
Fair	32	32.0	25	25.0		
Poor	52	52.0	13	13.0		
Mean SD	**6.07± 3.69**		**11.96±3.25**		**Z=8.61**	**0.000****

$X^{2:}$ Chi Square Test. Z= Wilcoxon test. **(**)** highly Statistically significant at p <0.01.

Table 4: Comparison of Older Adults' Quality of Life Scores Pre- and Post-Intervention (n = 100)

Domains	Pre intervention						Post intervention						X^2	P-value
	Good		Fair		Poor		Good		Fair		Poor			
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%		
1.Physical health	3	3.0	25	25.0	72	72.0	42	42.0	31	31.0	27	27.0	54.89	0.000**
2.Psychological health	6	6.0	33	33.0	61	61.0	58	58.0	25	25.0	17	17.0	68.17	0.000**
3.Social health	9	9.0	21	21.0	70	70.0	56	56.0	24	24.0	20	20.0	61.96	0.000**
4.Environmental health	6	6.0	16	16.0	78	78.0	60	60.0	26	26.0	14	14.0	91.08	0.000**

$X^{2:}$ Chi Square Test. **Z**= Wilcoxon test. **(**)** highly Statistically significant at p <0.01.

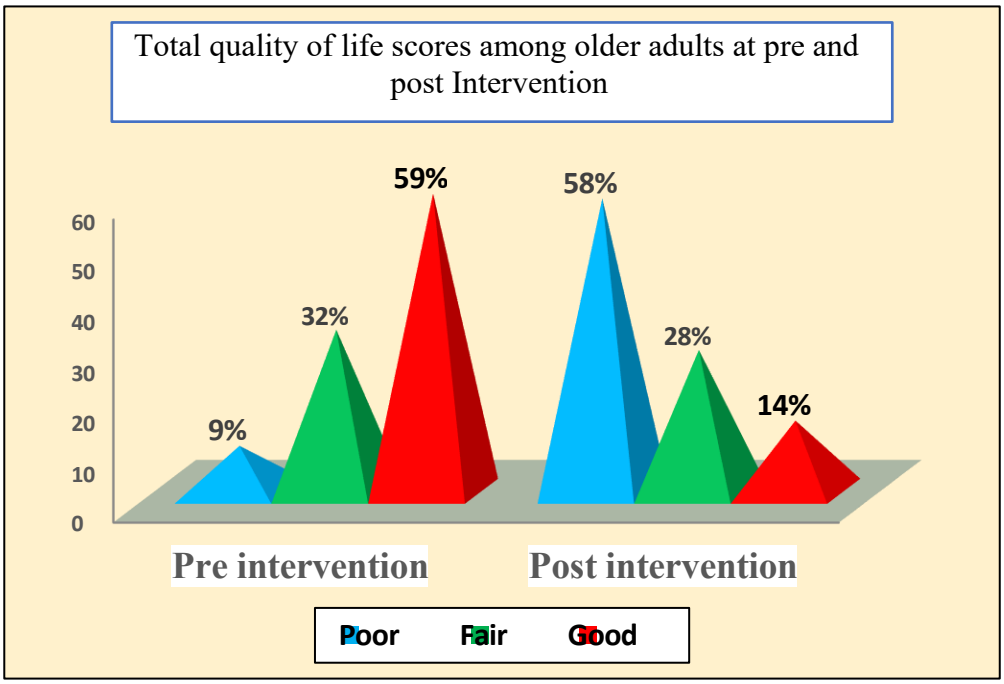

Figure (1): Total Quality of Life Scores Among Older Adults at Pre and Post Intervention (n=100).

Table (5): Correlation Between Total Physical Activity, Cognitive Training, and Quality of Life Among Older Adults at Pre- and Post-Intervention (n=100):

Variables		Total physical activity score		Total cognitive training score	
		Pre	Post	Pre	Post
Total quality of life score	r	0.868	0.933	0.781	0.923
	p	0.000**	0.000**	0.000**	0.000**

R= correlation coefficient test. P= p-value ****highly significant at p ‹ 0.01.**

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