

Original Research Article

# The impact of physical activity on the quality of life and level of self-satisfaction among seniors

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## Abstract

**Background:** Older adults face increasing challenges in maintaining their physical and mental well-being; physical activity plays a key role in enhancing quality of life and overall satisfaction, particularly in the post-pandemic context. The objective was to evaluate the impact of combining individualized aerobic training in accordance with WHO guidelines and supervised group training sessions on depressive symptoms, satisfaction, and quality of life in individuals aged  $\geq 60$  years. **Methods:** Sixty older adults were assessed before and after the intervention. The Beck Depression Inventory and the Physical Activity Questionnaire were administered at baseline and post-intervention. The intervention included individualized aerobic exercise plans and four supervised group training sessions. Paired t-tests were used to evaluate changes, with significance set at  $p < 0.05$ . **Results:** The average Beck Depression Inventory score decreased from  $9.56 \pm 7.30$  to  $7.63 \pm 6.40$  ( $p < 0.001$ ). The number of seniors frequently experiencing feelings of guilt dropped from 56 to 28 ( $p = 0.03$ ), and low life satisfaction decreased from 55 to 27 ( $p = 0.04$ ). The proportion of individuals without depressive symptoms increased, while cases of moderate depression declined. **Conclusions:** The combination of aerobic and group training significantly reduces depressive symptoms and enhances life satisfaction among older adults. Implementing such programs in preventive strategies may positively impact the quality of life in the elderly population.

**Keywords:** physical activity, psychophysical health, satisfaction

## Introduction

The ageing of the population is one of the greatest challenges of modern society, and with it the need to find effective methods to improve the quality of life of this social group is growing. In the context of dynamic demographic changes, studying the impact of physical activity on the quality of life and level of self-satisfaction in older people is of particular importance. Regular physical activity, perceived as a natural way to improve health, not only supports physical health, but also has a positive effect on the mental health and emotional state of older people.

Although the benefits of regular physical activity for physical and mental health are well known to the majority of the population, a relatively large number of people still do not engage in any type of regular physical activity, which results in a significant number of people leading a sedentary lifestyle [1]. Regular physical activity is a key element in maintaining an individual's physical and mental health. Grudniewicz and Herbert

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emphasize that including physical activity in a daily routine is not only beneficial, but also necessary for maintaining balance in a person's life, and add that physical activity is a need of every person, ensuring proper physical, intellectual, emotional and social development of a person [2].

According to the World Health Organization, the concept of a healthy lifestyle is a balance between all areas of human health: physical, mental and social [3]. A healthy lifestyle includes a number of habits and choices that promote overall physical, mental and social well-being, and also plays a key role in maintaining health and preventing many diseases. In his publication, Velasco emphasizes that it is important to shape the habit of a healthy lifestyle from an early age, because health behaviors during adolescence have a major impact on current and future health [4]. Friedman also says that developing the habit of physical activity early in life helps avoid many health problems in the future, and health habits developed early and practised throughout life influence longevity, the ability to survive into old age and the health with which a person experiences older adulthood [5].

A healthy lifestyle can also be beneficial for mental health. Therefore, defining a healthy lifestyle that promotes psychological well-being and reduces mental problems is useful in preventing mental disorders [6]. Many lifestyle factors play an important role in positively modifying medical and mental illnesses and their associated morbidity and mortality [7]. It is a process that requires ongoing commitment and informed decision-making on a daily basis. Modifiable lifestyle factors, including smoking, physical activity, alcohol consumption, body weight and diet, affect both overall life expectancy and the incidence of chronic diseases. Studies have shown that smoking, inactivity, poor diet quality and alcohol abuse are responsible for as much as 60% of premature deaths [8]. Small changes introduced gradually can lead to significant improvements in overall health, which is why it is so important to make informed choices that promote long-term well-being. Living a healthy lifestyle is associated with a longer life expectancy free from serious chronic diseases [9].

## Material and Methods

### *Study design*

This study employed a single-arm pretest–posttest design to evaluate the impact of an aerobic exercise intervention on depressive symptoms and physical activity levels in seniors aged  $\geq 60$  years. Sixty participants were recruited via convenience sampling at the University Athletics Center of the University of Rzeszów and assessed at two time points: baseline and immediately post-intervention. Informed consent was obtained from all subjects involved in the study. The intervention comprised individualized aerobic exercise plans tailored to WHO guidelines for older adults, supplemented by four supervised group training sessions conducted in April 2024. Primary outcomes—depressive symptom severity and physical activity level—were measured using the Beck Depression Inventory and the Physical Activity Questionnaire, respectively. Ethical approval was obtained from the Regional Medical Chamber Bioethics Committee (Resolution No. 31/2003/B, 24 April 2023), and the study conformed to the principles of the Declaration of Helsinki.

### *Participants*

Research was conducted on a group of people 60 + related to the impact of physical activity on psychophysical health, with particular emphasis on its importance in the lives of seniors. The study was conducted twice using a survey technique, which is a test - Beck Depression Scale. This is a test for self-assessment of well-being, and this scale is one of the most commonly used diagnostic tools to assess the severity of depressive symptoms in adults. The questionnaire was distributed to sixty respondents twice at the beginning and end of the project, during research conducted at the University Athletics Center of

the University of Rzeszów as part of the Grant "Intergenerational dimension of physical fitness after the COVID-19 pandemic" in April 2024. During this research, in addition to the survey, which is the Depression Scale, the respondents also received the Physical Activity Questionnaire to assess their level of physical activity. Participants also received aerobic training plans in accordance with WHO guidelines for their age group to perform independently. Four sample joint group trainings were organized, which took place at the University Athletics Center of the University of Rzeszów.

*Statistical analysis*

Descriptive statistics were computed for all continuous variables, including the arithmetic mean, median, standard deviation, minimum and maximum values, and range. Differences between the first and second examinations for continuous outcomes were assessed using the paired Student's *t*-test. A two-tailed *p*-value < 0.05 was considered statistically significant. All analyses were performed in Statistica version 13.3 (StatSoft, Kraków, Poland).

**Results**

Analysis of the study results indicates that over 50 people, i.e. the vast majority of study participants, did not show symptoms of depression, both in the first and second study (Table 1). There are some differences in the mild and moderate depression categories between the studies, which may suggest changes in the level of quality of life and self-satisfaction, which may be the result of various factors, including the appropriate level of physical activity.

**Table 1.** Interpretation of the Depression Scale for the first and second examinations

<b>Results' interpretation of the Depression Scale</b>	I examination (number of people)	II examination (number of people)
0-11 points no depression	51	52
12-19 points mild depression	4	6
20-25 points moderate depression	5	2
26-63 points severe depression	0	0

The numerical data in the table (Table 2) show that the respondents engaged in vigorous physical activity on average 0.56 days per week, which means that most of them very rarely engaged in vigorous physical activity. The median is 0.5 days, which indicates that half of the respondents engaged in such activities for less than half a day per week. The range of results (from 0 to 2 days) and the low standard deviation (0.63) suggest that high-intensity physical activity was undertaken very rarely in the study group. The average time spent on vigorous physical activity was 20.31 minutes per week. The median of 0.00 minutes indicates that half of the seniors studied did not engage in vigorous physical activity at all. The range of results (from 0 to 90 minutes) and the high standard deviation (27.60) suggest that there were large differences between seniors in terms of the time spent on vigorous physical activity.

**Table 2.** Characteristics of intense physical activities

Intensive physical activity	N	Mean	Median	Min	Max	Range	Standard deviation
Days	60	0.56	0.5	0	2	2	0.63
Time	60	20.31	0	0	90	90	27.6

Taking into account the data in the table (Table 3), we can see that moderate physical activity was also undertaken by the respondents relatively rarely. The results show that seniors engaged in moderate physical activity on average 1.69 days per week. The median of 1.00 days indicates that half of the respondents engaged in moderate physical activity for at least 1 day per week. On the other hand, the analysis of the time devoted to moderate physical activity shows that the average time was 39.38 minutes per week. The median of 45 minutes indicates that half of the seniors engaged in moderate physical activity for at least 45 minutes per week. The range of results (from 0 to 90 minutes) and the standard deviation (31.88) suggest that there were significant differences between seniors in terms of the time devoted to activity.

**Table 3.** Characteristics of moderate physical activities.

Moderate physical activity	N	Mean	Median	Min	Max	Range	Standard deviation
Days	60	1.69	1	0	4	4	1.45
Time	60	39.38	45	0	90	90	31.88

The largest differences were observed in the question about guilt towards oneself and others and in the question about self-satisfaction (Table 4). In the first study, 56 people answered that they felt guilty or often had remorse. In the study ending the project, this number decreased to 28 people. The observation of a significant change in the result ( $p = 0.03$ ) in the question about the feeling of guilt in seniors between the studies suggests that the decrease in the results may indicate an improvement in their well-being. A significant difference also occurred in another question, where during the first study 55 people expressed dissatisfaction with themselves, while in the second study this number decreased to 27 people. As in the case of the previous question, a significant decrease in the number of respondents and a significant difference in the results ( $p = 0.04$ ) indicate significant changes in the level of self-satisfaction in seniors between the studies.

**Table 4.** Comparison of the results of the Beck Depression Inventory Questions on Guilt and Self-satisfaction between the two studies

Beck Depression Scale	I examination (number of people)	II examination (number of people)	P
Question 5	56	28	0.03
Question 7	55	27	0.04

Analyzing the data in the table (Table 5), it can be seen that a higher mean score was recorded in the case of the first survey (9.59>7.63), i.e. before the participants started regular physical activity. The highest value of the points obtained also fell in favor of the first survey (23.00). In turn, a lower standard deviation was recorded in the second survey (6.40<7.30), which may suggest that the physical activity undertaken caused a decrease in the variability of the participants' results. It is also worth noting that the difference between the means was at a level of 1.94 and showed the occurrence of a statistically significant relationship ( $p=0.00$ ).

**Table 5.** Numerical characteristics of the sum of points obtained.

Total points	Numerical characteristics of the sum of points obtained								
	N	Mean	Median	Min	Max	Range	Standard deviation	d	p
I examination	60	9.56	9.00	0.00	23.00	23.00	7.30		
II examination	60	7.63	6.50	0.00	21.00	21.00	6.40	1.94	0.00

### Discussion

Physical activity is an essential element of a healthy lifestyle, which determines a person's physical fitness, which undoubtedly determines high quality of life and well-being. Regular physical exercise is crucial in the prevention of diseases related to cognitive function disorders and helps maintain the so-called mental well-being [10]. Studies indicate that elderly people are much more susceptible to a decrease in the quality of life and loss of a positive state of mind. Old age means increasing health problems and an irreversible deterioration of physical functions [11].

Physical activity of every elderly person should be a natural, normal part of everyday life [12]. Analysis of the results of our own research indicates significant observations regarding physical activity among the examined people before the introduction of training programs and participation in group training. As mentioned earlier, according to the recommendations of the World Health Organization (WHO) from 2020, elderly people should perform at least 150-300 minutes of moderate-intensity aerobic physical activity or at least 75-150 minutes of high-intensity aerobic physical activity [13]. The World Health Organization also recommends that this activity be performed for at least three to five days a week.

Our own research shows that only a small group of respondents adjusted their activity to the recommendations regarding time and intensity, which suggests existing challenges in promoting a healthy lifestyle and physical activity among this population. The analysis of the research results shows that among all participants, the average time devoted to moderate physical effort was less than 40 minutes per day, and the number of days on which it was undertaken was 3 days, which, as Czarnecki D. states, may suggest limited motivation or access to physical activity, but also result from the lack of awareness of the health benefits associated with physical activity [14].

Among all participants, the average daily time spent on vigorous physical activity was 20 minutes. The data indicate that moderate physical activity was more common among seniors than vigorous physical activity, although still rarely practiced. Compared with vigorous activity, a larger proportion of seniors in the study regularly engaged in moderate exercise, suggesting that moderate activity may be more acceptable and feasible for this age group.

Based on the conducted research, it can be stated that such a type of motivation for the elderly to consciously undertake physical activity can be group trainings proposed as part of the conducted project, which were very positively received and willingly attended by this social group, and what is important, they have a multidimensional impact on the physical and mental health of the elderly. In many cases, seniors also undertake physical activity to be able to spend time with others. In these meetings, they see a deep meaning of life and the essence of society. The regular exercises they undertake improve both mental fitness and help to reintegrate into social life [15]. Spending free time together actively improves well-being, strengthens social relationships, increases motivation, reduces the fear of ridicule and promotes making new friends. All these factors make group trainings a valuable element in strategies for promoting health among seniors. Czarnecki points out that active people, compared to inactive people, enjoy better well-being, and are less likely to experience mental or physical ailments, such as low mood or headaches [16].

Apart from the physical and physiological aspects, regular physical activity plays an important psychological role, significantly improving well-being, self-esteem, comfort and independence, and thus the quality of life, self-esteem, usefulness, acceptance of age and appearance [12]. Lack or deficiency of physical activity is a significant risk factor that may contribute to poor well-being and low mood. According to Podstawski, physical activity is one of the factors that strongly determine human psychophysical health and although its increased level slightly extends the genetically programmed time of our life, it improves its quality [17].

Analysis of data from the conducted studies shows that significant differences between the first and second studies were observed in the answers to the question about self-esteem in comparison to other people. A statistically significant difference ( $p = 0.04$ ) indicates significant changes in the level of self-satisfaction of seniors between the studies. Improvement in self-satisfaction may be the effect of regular physical activity, which often leads to improved well-being and increased self-confidence. As Wilk points out in his publication, physical activity of seniors makes them not ashamed of their bodies, they are attractive to themselves and others, they are brave and show that it is possible to age with pride and dignity [12].

One of the most significant results of the study was the observation of a significant change in the answers to the question about the feeling of guilt towards oneself and others. In the first study, as many as 56 people answered that they often had pangs of conscience. In the final study, this number decreased to 28 people. A significant decrease in the number of respondents feeling guilty, also confirmed by a statistically significant difference ( $p = 0.03$ ), suggests that regular physical activity may contribute to the improvement of emotional well-being in seniors. Improvement in the reduction of the feeling of guilt may be related to the general improvement of mental health and the positive impact of exercise on self-esteem and the perception of one's own achievements. The available literature indicates that there is a growing body of evidence indicating that physical activity can effectively prevent poor well-being and alleviate its symptoms, positively affecting the overall mental and emotional condition [18].

As indicated by the results of scientific studies, physical activity causes positive changes in the state of mental health and the ability to cope with depression [16]. Comparison of the results of two samples of our own studies suggests that the level of depression was lower in the second study. This may indicate a positive effect of physical activity on reducing the symptoms of poor well-being in seniors. Differences in mean results (9.56 in study I and 7.63 in study II) and medians (9.00 in study I and 6.50 in study II) may therefore suggest that physical activity contributes to improving mood and general self-satisfaction among seniors.

The lower results obtained in the Depression Scale at the end of the project may indicate the effectiveness of physical exercise interventions in improving the mental health

of seniors. Depression, considered one of the important diseases of civilization, can be generally described as an emotional state characterized by feelings of sadness, depression, lack of motivation and decreased activity [10]. Epidemiological studies show that people who regularly engage in physical activity in their lives are less susceptible to depression. Available literature also indicates that there is evidence indicating that skeletal muscle activity may affect the "detoxification" of the body, which protects the brain from the development of mental illnesses and disorders [16].

The results of the analyses of the conducted studies indicate interesting changes in the level of depression, quality of life and self-satisfaction in seniors under the influence of physical activity. The vast majority of the study participants did not show symptoms of depression, both in the first and second examination. These results suggest a generally good state of mental health among the examined seniors. The studies observed some differences in the category of mild and moderate depression between the first and second examination, which may suggest that an appropriate level of physical activity may be one of the key factors influencing these changes. However, the varied results indicate the need for further research, which would aim to more thoroughly understand individual responses to physical activity and identify additional factors influencing the mental health of seniors.

### Conclusions

1. Physical activity significantly influenced the level of self-satisfaction in seniors. The mean sum of points obtained in the tests after the physical activity program was lower (7.63) compared to the results before the program (9.59), which indicates an improvement in self-satisfaction after the introduction of regular exercise.

2. Regular physical activity contributed to the improvement of the quality of life of seniors, which is visible in the results of the study at the end of the project. A statistically significant difference between the mean results (1.94,  $p=0.00$ ) indicates that after the introduction of the physical activity program, participants experienced a significant improvement in their quality of life.

3. The results of the first survey, conducted after the COVID-19 pandemic but before the physical activity program began, show that the level of self-satisfaction of seniors was lower compared to the period after the physical activity program. This suggests that the pandemic had a negative impact on the level of self-satisfaction of seniors, and the introduction of regular physical activity helped to improve it.

4. Regular physical activity is a modifiable factor that has a positive impact on the level of self-satisfaction and quality of life of seniors, including reducing the symptoms of depression.

### *Practical implications*

As teachers and health educators, we recommend introducing programs that encourage seniors to engage in physical activity. Research results clearly show that the more active an elderly person is, the more satisfied they are with life, which is why older people should also be educated about the positive impact of physical activity on physical and mental health. Local governments should take care of seniors and give them the opportunity to engage in safe physical activity under the supervision of a professional.

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## References

1. De Mello MT, Lemos V de A, Antunes HKM, et al. Relationship between physical activity and depression and anxiety symptoms: A population study. *Journal of Affective Disorders*. 2013;149:241–6. doi:10.1016/j.jad.2013.01.035.
2. Grudniewicz N, Karaś K, Herbert J. Aktywność fizyczna osób starszych w czasach pandemii Covid-19. Wybrane badania. *Nauki o Kulturze Fizycznej*. 2023;1:81–92. doi:10.15584/978-83-8277-057-5.7.
3. Eckstrom E, Neukam S, Kalin L, Wright J. Physical Activity and Healthy Aging. *Clinics in Geriatric Medicine*. 2020;36(4):671–83. doi:10.1016/j.cger.2020.06.009.
4. Velasco V, Gragnano A, Ghelfi M, et al. Health lifestyles during adolescence: clustering of health behaviours and social determinants in Italian adolescents. *Journal of Public Health*. 2023;45:218–28. doi:10.1093/pubmed/fdab371.
5. Friedman SM. Lifestyle (Medicine) and Healthy Aging. *Clinics in Geriatric Medicine*. 2020;36:645–53. doi:10.1016/j.cger.2020.06.007.
6. Velten J, Bieda A, Scholten S, et al. Lifestyle choices and mental health: a longitudinal survey with German and Chinese students. *BMC Public Health*. 2018;18:1–13. doi:10.1186/s12889-018-5526-2.
7. Zaman R, Hankir A, Jemni M. Lifestyle factors and mental health. *Psychiatria Danubina*. 2019;31:217–20.
8. Li Y, Schoufour J, Wang DD, et al. Healthy lifestyle and life expectancy free of cancer, cardiovascular disease, and type 2 diabetes: prospective cohort study. *British Medical Journal*. 2020;368:l6669. doi:10.1136/bmj.l6669.
9. Li Y, Pan A, Wang DD, et al. Impact of Healthy Lifestyle Factors on Life Expectancies in the US Population. *Circulation*. 2018;138:345–55. doi:10.1161/circulationaha.117.032047.
10. Gieroba B. Effect of physical activity on mental health and cognitive functions. *Medycyna Ogólna i Nauki o Zdrowiu*. 2019;25:153–61. doi:10.26444/monz/112259.
11. Prusik K, Zaporozhanov V, Prusik K, et al. Rekreacyjne uprawianie Nordic walking a jakość życia osób w wieku 60–70 lat. 2010;115–7.
12. Wilk I. Rola aktywności fizycznej, jej rodzaje i formy u osób w starszym wieku. 2021;26–30.
13. World Health Organization. WHO Guidelines on physical activity and sedentary behaviour. 2016.
14. Czarnecki D, Skalski DW, Tsyhanovska N, et al. Aktywność fizyczna kobiet po 65 roku życia. *Physical Culture and Sport. Science and Perspectives*. 2023;3:145–50. doi:10.31891/pcs.2023.3.19.

15. Mitkiewicz B. Poszukiwanie form aktywności i aktywizacji seniorów. *Zeszyty Naukowe Katolickiego Uniwersytetu Lubelskiego Jana Pawła II.* 2022;65:117–27. doi:10.31743/znkul.13823.
16. Czarnecki D, Skalski D, Akademia Wychowania Fizycznego i Sportu im. Jędrzeja Śniadeckiego w Gdańsku, et al. Aktywność fizyczna jako ważny element terapii w depresji. 2023;5.
17. Podstawski R, Omelan A. Deficyty ruchowe osób starszych – znaczenie aktywności fizycznej w ich zapobieganiu. *Hygeia Public Health.* 2015;50:572–80.
18. Mazurek J, Szczygieł J, Błaskowska A, et al. Aktualne zalecenia dotyczące aktywności ruchowej osób w podeszłym wieku. *Gerontologia Polska.* 2014;2:70–5.