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Article

The effect of exercise on quality of life, fatigue, and pain management in older women: A cross-sectional study in Greece

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Abstract: Background: Frequently, the contribution of exercise to the elderly and the associated benefits of such activities are discussed. **Aim:** This paper deals with the contribution of exercise to the levels of quality of life, fatigue, and pain management. **Method:** Then, quantitative and cross-sectional research is carried out to investigate the contribution of physical exercise to the levels of quality of life, fatigue, and pain management in women over 60 years of age. For the data collection, the questionnaire used consisted of the Missoula—VITAS Quality of Life Index (MVQOLI), the Pain Assessment Questionnaire (PSeQ), and the Fatigue Assessment Scale (FAS). **Results:** From the statistical analysis made between exercise and quality of life, fatigue, and pain management of the women over 60 who participated in the research, it follows that women undergoing exercise show a better quality of life and less fatigue, while no statistically significant difference was detected in terms of pain management. **Conclusion:** It seems that exercise affects positively quality of life and fatigue. Potential implications must be addressed in order to organize more exercise programs, particularly for older people.

Keywords: exercise; quality of life; fatigue; pain management; women; elderly

1. Introduction

There has been a lot of interest in quality of life (QOL) recently. Despite the lack of consensus regarding its definition, it can be understood as satisfaction or happiness with life in view of the domains that the individual considers important [1]. Regarding health-related quality of life (HRQOL), it is considered a health indicator that assesses the general physical condition, functional capacity, household activities, social interactions, cognitive function, and emotional state of the individual in relation to the situation of his health [1]. HRQOL measurement instruments can facilitate clinical decision-making, assess the quality of care, assess the health service needs of a population, and understand the causes and consequences of health problems [1]. The impact of illnesses on physical health, and work performance, and their effects on intimate and personal life increase the therapeutic context.

Thus, improvements in quality of life become as important as clinical laboratory responses to interventions, broadening the spectrum of therapeutic outcomes. In 1990, the World Health Organization emphasized that the ultimate goal of palliative care is to achieve the best quality of life for patients and their families. Schipper et al. [2] have suggested that quality of life is the most appropriate outcome measure in hospice care because it focuses on what is happening to the patient, measuring the effect of physiological change rather than simply the fact of physiological change.

Although there is no recognized gold standard for measuring quality of life [3], in recent decades, two classes of complementary measures of health status have emerged to fill this information gap—objective measures of functional health status and subjective measures of health and well-being [4]. Various quality-of-life measurement tools have been designed, but most may not be ideal for use in palliative care patients, whose quality-of-life assessment should focus on areas for which palliative care is most effective, such as psychosocial and mental problems [5]. Also, fatigue is a common symptom reported by many older people. Fatigue is associated with poor health-related quality of life (HRQoL) and is an important predictor of survival in individuals. Fatigue significantly affects the quality of life and especially the elderly suffer from low levels of physical activity and reduced functional capacity while suffering from general muscle weakness resulting in a general feeling of fatigue [6].

An important dimension that undeniably affects the quality of life of individuals, especially the elderly, is pain, which these individuals are very likely to experience. It is known that the presence of chronic pain greatly affects the quality of life and can play an important role in the co-morbidity of anxiety and depression. Pain, according to the Subcommittee of taxonomy of the IASP (international association for the Study of the Pain), is defined as an unpleasant aesthetic and emotional experience associated with already existing or potential tissue damage or described as such [7]. Leisure activities, especially so-called structured or serious ones such as arts and crafts, volunteering, sports, hobbies, attending cultural events, and reading, are important predictors of both hedonic and hedonic well-being [8]. These activities provide individuals with opportunities to engage in autonomously selected tasks, consistent with the individual's interests and self-defined goals, and to experience positive emotions, capacity building, and knowledge, as well as social inclusion and connection. Regarding physical activity, in addition to providing health benefits, it promotes the psychosocial well-being of citizens in late life [9]. Studies investigating the effects of physical exercise programs aimed at older adults have highlighted their positive effect on adaptation to aging through the promotion of physical health, self-determination, and social connectedness [10]. In a study by Theofilou [11] concerning the evaluation of quality of life (QoL) in Greek patients with heart failure (CHF) and the role of health cognitions before and after participation in an exercised rehabilitation program, the results indicated that before the participation of CHF patients in the rehabilitation program, internal cognitions affected negatively their QoL and specifically their evaluation of overall QoL/health. On the other hand, after the end of the program, CHF patients' personal control regarding their condition of health affected positively their status of mental health as well as QoL. In another study by Kallivoka et al. [12] regarding fatigue and quality of life after the Pulmonary Rehabilitation Program, the results showed decreased levels of fatigue after the completion of the program compared to pre-intervention. Moreover, although QoL did not seem to change after the intervention, however, the dimension "Transcendent" seemed to be increased for the majority of the participants.

Despite the fact that a great number of studies have been performed to investigate the effectiveness of exercise in people's lives, this number is restricted

concerning the impact on quality of life, fatigue, and pain management. Moreover, the findings of the existing research are controversial. The purpose of this work is to investigate the contribution of exercise to the levels of quality of life, fatigue, and pain management in women over 60 years old.

2. Method

2.1. Research design

The purpose of this work is to investigate the contribution of exercise to the levels of quality of life, fatigue, and pain management in women over 60 years old. It was chosen in the present research to study the effect of exercise only on women since the research that has been done in Greece is particularly limited, while in the area where the present research was focused, no research has been carried out on a female sample. The research questions that are expected to be answered through the research are the following:

- How is the level of quality of life, the level of fatigue, and the level of pain management of women over 60 characterized?
- Is there a relationship between exercise and quality of life, fatigue, and pain management in women over 60?

A quantitative cross-sectional approach was used for data collection. The basis of quantitative research is to obtain data that can be accurately measured and statistical analysis is used to evaluate the results [13]. Approaches based on quantitative data do not emphasize qualitative depictions of the situation. Instead, they focus on empirical observations. Unlike qualitative models, these computational models offer an advantage in that they are able to validate hypotheses, examine emergent phenomena, and make predictions [14]. The nature of quantitative research is such that it yields numerical data, which can either confirm or refute a given theory. Even if the study is based on a smaller sample size, researchers can use quantitative data to make predictions about larger populations and groups. Typically, the methods used in quantitative research involve a number of statistical tests and instruments. Emphasizing basic group designs for research and evaluation, analytical methods for exploring relationships between categorical and continuous measures, and statistical analysis procedures for group design data [15], quantitative research methods are particularly effective. The research variables were four and related to the existence of physical activity and the total score of each questionnaire used. More specifically, the independent research variable was exercise and the dependent research variables were MVQOLI, PSEQ, and FAS. However, the MVQOLI questionnaire included five subdimension variables (symptoms, functioning, interpersonal relationships, well-being, spirituality), and the FAS questionnaire two subdimension variables (physical fatigue, mental fatigue). Comparisons were made between the above variables through which the research questions posed were answered.

2.2. Participants

The study population was women over 60 years of age who were approached through the method of random "convenience" sampling. The specific method was chosen due to the fact that it offers the researcher the opportunity to approach a large part of the population, which is close to him/her and therefore has the possibility of easy access [16]. A total of 60 people from the area participated in the Prefecture of Imathia. As an entry and exclusion criterion in the research, the age limit of the participants was strictly set, as well as that the participants had to reside in the Prefecture of Imathia. Moreover, the participants had to speak in Greek and present a good level of perceived ability and cooperation.

2.3. Psychometric tools

It was decided that the data collection tool would be the questionnaire. The questionnaire used in the research consists of the following parts:

- Demographic Characteristics Questionnaire. The demographic characteristics questionnaire included six questions that were intended to explore the demographics of the female participants such as age, place of residence, education level, marital status, exercise, and frequency of exercise.
- Missoula Quality of Life Index—VITAS (MVQOLI). The Missoula Quality of Life Index—VITAS (MVQOLI) was created in response to the need for a quality-of-life measure that assesses the individual experience of people nearing the end of life (EOL), by Byock and Merriman [5]. The MVQOLI is an assessment instrument that collects patient-reported information about the quality of life during an advanced illness. Maintaining optimal quality of life is a key goal of palliative and nursing care, and information collected through the MVQOLI assists healthcare professionals in identifying and addressing patient concerns that affect quality of life. The MVQOLI has been used in many different healthcare settings, including hospice, hospital, home health, long-term care (including assisted living), outpatient palliative care, disease management, and consular programs [5]. The MVQOLI asks patients about 5 dimensions or domains of quality of life: symptoms, functioning, interpersonal relationships, well-being, and spirituality. The instrument is specifically designed to assess patients' personal experience of each of these dimensions, so the MVQOLI items are constructed in highly subjective language and no scores appear in the version of the tool that patients see. The tool seeks to describe the qualitative and subjective experience of quality of life in a way that can be quickly interpreted by professional caregivers [1]. The statistical tests performed by Theofilouand and Zyga [7] concern the measurement of internal validity, repeatability, agreement of responses (test-retest reliability), as well as convergent validity. Their analysis showed that the five dimensions have good variability. The internal validity of the questionnaire was satisfactory, with an overall Cronbach's alpha value of 0.74. In this research, the overall Cronbach's alpha value is 0.614, which is considered moderately satisfactory. The answers to each question are given on a five-point scale (Likert) so that the lowest score indicates the least desirable situation and vice versa. The questions are general,

meaning that the MVQOLI provides information about the dimensions that decrease or increase the patient's quality of life. This questionnaire also includes a QoL (global quality of life) level question, which is used to assess the convergent validity of the MVQOLI. There are two versions of the MVQOLI questionnaire: 15 questions and 25 questions. The tool was originally designed with 25 questions. But it was noticed that it was too long for some patients and it was impossible for them to complete it. Using data from the original reliable and valid study, a version of 15 questions was constructed, which was used in the present work [1,17].

- The Pain Self-Efficacy Questionnaire. In its original form, the PSeQ consisted of 10 questions. Created in 1980 by Michael Nicholas. It can be applied to all clinical pain conditions. It covers a wide range of functions, including housework, socializing, work, and non-drug pain management. It takes two minutes to complete. This specific questionnaire investigates and evaluates the patient's ability to perform usual activities and to have a normal personal, family, and social life despite the presence of chronic pain in their individual medical history. It consists of 10 questions, which examine the effectiveness of chronic pain management by the patient himself, even without the administration of analgesic treatment [18]. To construct the corresponding score, the patients' answers to the 10 questions are added up. The coding of the responses is as follows: 0 = not at all sure (n), 1 = a little sure (n), 2 = not so sure (n), 3 = don't know/don't answer, 4 = quite sure (n), 5 = very sure (n) and 6 = absolutely sure (n). Therefore, the score ranges from 0–60, with a high score indicating greater effectiveness in pain management. In the research of Van der Maas et al. [19] internal consistency was found to be excellent and test-retest reliability adequate (Cronbach's $\alpha = 0.92$). In the present research, the overall Cronbach's alpha value is 0.965, which is considered extremely satisfactory.
- The Fatigue Rating Scale. The Fatigue Assessment Scale (FAS) is a tool that collects information related to perceived fatigue. The original form of the FAS was developed in 2003 by Michielsen et al. [20] and consists of 10 questions. It only takes two minutes to complete. Patient responses to 10 questions are summed to construct the score. The coding of the responses is as follows.1 = never, 2 = sometimes, 3 = regularly, 4 = often, 5 = always. Therefore, the score ranges from 10–50. Five questions relate to physical fatigue and the other five to mental fatigue. Patients are categorized as "not fatigued" if the FAS score is below 22, "fatigued" if the FAS score is greater than or equal to 22, and "extremely fatigued" if the FAS score is greater than or equal to 35. In Zyga's et al. research [6], the internal consistency was found to be excellent (Cronbach's $\alpha = 0.825$), while in the present research the overall Cronbach's alpha value is 0.697 which is considered marginally satisfactory.

2.4. Procedure

The survey was conducted in April 2023. The sample ultimately consisted of 60 women and the survey took no more than 10 min to complete. At the same time, instructions were given on how to complete the questionnaire at the beginning, while the same order of filling in the questionnaires was followed for all individuals. Participants in this study were given an information letter explaining the purpose, design, and benefits of the research. The letter emphasized that all ethical factors, including the Code of Ethics, were taken into account to ensure the confidentiality of the research and the anonymity of the participants. Written informed consent has been taken from the participants. The researcher was available to answer any questions and obtain informed consent from the participants, providing their contact information (email and phone). In addition, participants were informed that they could withdraw from the study if they did not feel comfortable with the procedures. The study did not withhold any information from the participants and all details were disclosed from the beginning. Finally, the completed questionnaires were stored securely on the researcher's personal computer, protected by strong security codes, and destroyed after the statistical analysis was completed. Helsinki Declaration has been followed for involving human subjects in the study.

2.5. Statistical analysis

The analysis of the research data was done with the help of the statistical package SPSS (Statistical Package for the Social Sciences). Tables with frequencies, relative frequencies, and cumulative frequencies were used to present the results. The reliability of the questionnaire as a whole was measured with the Cronbach alpha index (a) and it was found $\alpha = 0.830 > 0.7$, which shows quite high reliability.

3. Results

Sixty women over the age of 60 took part in the research, most of whom were between 60–69 years old with a percentage of 75%, followed by those who were over 70 years old with 25% (**Table 1**). The majority of participants lived in a city with a percentage of 78.3%, followed by those who lived in a village with a percentage of 21.7%. Regarding the level of education, most women were high school graduates with a rate of 28.3%, followed by high school graduates at 25%. Regarding their marital status, most women were married with a rate of 58.3% (**Table 1**).

Table 1. Sociodemographic characteristics.

	Frequency	Percentage	Valid percentage	Cumulative percentage
Age				
60–69 years	45	75.0	75.0	75.0
70 years and over	15	25.0	25.0	100.0
Total	60	100.0	100.0	
Residence				
Village	13	21.7	21.7	21.7

Table 1. (*Continued*).

	Frequency	Percentage	Valid percentage	Cumulative percentage
Residence				
Town	47	78.3	78.3	100.0
Total	60	100.0	100.0	
Education				
No training completed	9	15.0	15.0	15.0
Primary school graduate	11	18.3	18.3	33.3
High school graduate	17	28.3	28.3	61.7
High school graduate	15	25.0	25.0	86.7
University graduate	8	13.3	13.3	100.0
Total	60	100.0	100.0	
Marital status				
Single	3	5.0	5.0	5.0
Married	35	58.3	58.3	63.3
Divorced	12	20.0	20.0	83.3
Widow	10	16.7	16.7	100.0
Total	60	100.0	100.0	

Thirty women who exercised and 30 women who had no exercise took part in the research (**Table 2**).

Table 2. Exercise.

	Frequency	Percentage	Valid percentage	Cumulative percentage
Yes	30	50.0	50.0	50.0
No	30	50.0	50.0	100.0
Total	60	100.0	100.0	

Regarding the frequency of exercise of the women who exercised more, they claimed that it was 1–2 times or 3–4 times a week with the same percentage of 40% (**Table 3**).

Table 3. Frequency of exercise.

	Frequency	Percentage	Valid percentage	Cumulative percentage
1–2 times	12	20.0	40.0	40.0
3–4 times	12	20.0	40.0	80.0
Over 4 times	6	10.0	20.0	100.0
Total	30	50.0	100.0	
They did not reply	30	50.0		
Total	60	100.0		

3.1. Missoula quality of life index—VITAS (MVQOLI)

The next part of the research investigated the level of quality of life of the women participants. Initially, the women were asked how they would rate their

overall quality of life, with the majority rating it as good or very good with a rate of 63.3%, followed by 36.7% who rated it as average. On the contrary, there was also 10% who characterized their quality of life as poor or very poor (**Table 4**).

Table 4. How would you rate your overall quality of life?

	Frequency	Percentage	Valid percentage	Cumulative percentage
Very poor	3	5.0	5.0	5.0
Poor	3	5.0	5.0	10.0
Moderate	22	36.7	36.7	46.7
Good	18	30.0	30.0	76.7
Very good	14	23.3	23.3	100.0
Total	60	100.0	100.0	

Mean values and standard deviations for each question of the Missoula Quality of Life—VITAS questionnaire (MVQOLI) used are then presented (**Table 5**). Negative values (-) were presented in all the dimensions of the MVQOLI (symptoms, functionality, interpersonal relationships, wellness, and spirituality).

Table 5. MVQOLI dimensions.

	N	Minimum	Maximum	Mean value	Standard deviation
Symptoms					
(A) 1. I feel sick all the time	60	−1.00	2.00	0.6333	1.07304
(S) 2. I am satisfied with my current symptom control	60	−4.00	4.00	0.6333	2.70572
(I) 3. Physical discomfort hinders any opportunity for fun	60	1.00	5.00	2.7333	1.53895
Functionality					
(A) 4. I am no longer able to do many of the things I love to do	60	−2.00	2.00	0.2167	1.32884
(S) 5. I accept the fact that I can't do many of the things I used to do	59	−4.00	4.00	1.2542	3.03197
(I) 6. My life satisfaction depends on being active and being able to take care of myself	60	2.00	5.00	4.2000	0.87914
Interpersonal relationships					
(A) 7. Lately, I have been able to share important things with those close to me	60	−2.00	2.00	0.8167	0.98276
(S) 8. I currently spend as much time as I want with family and friends	60	−4.00	4.00	0.8333	2.66278
(I) 9. It is important for me to have close personal relationships	60	3.00	5.00	4.2500	0.70410
Wellness					
(A) 10. My affairs are not settled. I am concerned that many things remain unresolved	60	−2.00	2.00	0.2333	1.43050
(S) 11. I am more satisfied with myself now than I was before my illness	60	−4.00	4.00	−1.1500	2.76678
(I) 12. It's important for me to be good with myself	60	3.00	5.00	4.5667	0.59280
Spirituality					
(A) 13. I feel that my life has more meaning now than it had in the past	60	−2.00	2.00	−0.2333	1.54445
(S) 14. Life has lost all value to me. Everyday life is a burden	60	−4.00	4.00	2.5000	2.43213
(I) 15. It's important for me to feel that my life has meaning	60	3.00	5.00	4.5333	0.59565
Valid N (listwise)	59				

Then, the mean values and standard deviations for each dimension of the Missoula Quality of Life—VITAS questionnaire (MVQOLI) used, as well as the

total score of the questionnaire, are presented. As it turns out, the dimensions of symptoms, functionality, interpersonal relationships, and spirituality have a positive sign, while the well-being dimension has a negative sign. Overall, the average value of the quality of life of the women in the research is 17.1525 (± 4.42525), which shows satisfactory levels of quality of life for the women in the research (**Table 6**).

Table 6. Mean values and standard deviations of MVQOLI dimensions and total score.

	N	Minimum	Maximum	Average	Standard deviation
Symptoms	60	−16.00	30.00	2.1833	9.45909
Functionality	59	−30.00	30.00	5.7458	14.69881
Interpersonal relationships	60	−30.00	30.00	7.8333	15.73312
Wellness	60	−30.00	30.00	−4.2500	14.36524
Spirituality	60	−30.00	30.00	10.9167	15.81063
Overall score	59	2.40	25.60	17.1525	4.42525
Valid N (listwise)	59				

3.2. Pain Self-Efficacy Questionnaire

The next part of the research investigated the level of pain management self-efficacy of the female participants. The mean values and standard deviations for each question of the Pain Self-Efficacy Questionnaire (PSEQ) used are then presented. As it turns out, women show high mean values in almost all the individual pain management questions, except for one that states that they can gradually become more active, despite the pain they feel, with most keeping a below-average positive attitude to this question (**Table 7**).

Table7. Average values and standard deviations of the Pain Self-Efficacy Questionnaire.

	N	Minimum	Maximum	Mean value	Standard deviation
I can rejoice, despite the pain I feel	60	1.00	6.00	4.4000	1.56444
I can do most household chores (e.g., ironing, washing dishes, etc.), despite the pain I feel	60	1.00	6.00	4.2000	1.47062
I can keep in touch with my friends or family often, as I used to do, despite the pain I feel	60	1.00	6.00	4.7333	1.59306
Can I cope with my pain in most situations	60	1.00	6.00	3.8333	1.31699
I can do some form of work, despite the pain I feel (“work” includes household chores, paid or unpaid work)	60	1.00	6.00	4.2333	1.33234
I can still do many of the activities I enjoy, such as my hobbies or leisure activities, despite the pain I feel	60	1.00	6.00	3.6000	1.50929
I can cope with my pain without medication	60	0.00	6.00	3.4833	1.68233
I can still achieve most of my goals in life, despite the pain I feel	60	1.00	6.00	3.5333	1.12697
I can have a normal lifestyle despite the pain I feel	60	1.00	6.00	3.9500	1.32031
I can gradually become more active; despite the pain I feel	60	0.00	6.00	2.9500	1.44298
Valid N (listwise)	60				

Regarding the total score of the questionnaire, its average value is 38.9167 (±12.59310), which shows that women manage their pain to an above-above-average effective degree (**Table 8**).

Table 8. Total score Pain Self-Efficacy Questionnaire.

	N	Minimum	Maximum	Mean value	Standard deviation
PSEQ	60	9.00	60.00	38.9167	12.59310
Valid N (listwise)	60				

3.3. Fatigue Rating Scale

The final part of the survey investigated the fatigue level of the female participants. Mean values and standard deviations for each question of the Fatigue Assessment Scale (FAS) used are then presented. As it turns out, women don't seem to show fatigue symptoms as often (**Table 9**).

Table 9. Average values and standard deviations of the questions of the Fatigue Assessment Scale.

	N	Minimum	Maximum	Mean value	Standard deviation
Physical fatigue					
I am bothered by fatigue	60	2.00	5.00	2.9500	1.06445
I get tired very easily	60	1.00	5.00	3.1500	1.19071
I don't do a lot of chores during the day	60	1.00	4.00	2.4167	0.78744
I have enough energy for daily activities	60	1.00	5.00	2.9667	1.31441
Physically, I feel exhausted	60	2.00	5.00	2.6667	1.08404
Mental fatigue					
I'm having a hard time getting started doing things	60	1.00	5.00	2.6500	1.32544
I find it difficult to think clearly	60	1,00	5.00	2.4667	1.14191
I am not in the mood to do any activity	60	1.00	5.00	2.6500	1.08651
Mentally, I feel exhausted	60	1.00	5.00	2.6000	1.09235
When I do an activity, I can concentrate quite well	60	2.00	5.00	3.4667	0.98233
Valid N (listwise)	60				

Regarding the total score of the questionnaire, its mean value is 27.9833 (±5.78277), which shows that women are categorized between "tired" and "extremely tired" based on the Fatigue Rating Scale used (**Table 10**).

Table 10. Overall Fatigue Assessment Scale score and fatigue dimensions.

	N	Minimum	Maximum	Mean value	Standard deviation
FAS	60	22.00	42.00	27.9833	5.78277
Physical fatigue	60	11.00	20.00	14.1500	2.39933
Mental fatigue	60	10.00	22.00	13.8333	3.76499
Valid N (listwise)	60				

3.4. Effect of exercise

Then, a check was made to see if there is a relationship between exercise and quality of life, fatigue, and pain management of the women over 60 who participated in the research. From the non-parametric test carried out (Mann-Whitney) between the variables a statistically significant difference ($p < 0.05$) was found between exercise and quality of life and fatigue, while no statistically significant difference was found ($p > 0.05$) between exercise and pain management. More specifically, it appears that women with exercise have a better quality of life and less fatigue than women without exercise. There is also a statistically significant difference in the individual dimensions of fatigue, physical and mental, with women with exercise showing less physical and mental fatigue than women without exercise (**Table 11**).

Table 11. Association between exercise and quality of life, fatigue and pain management.

	Exercise	**N**	**Mean value**	**Standard deviation**	**Sig. (2-tailed)**
MVQOLI	Yes	29	19.0034	3.59955	0.001
	No	30	15.3633	4.46299	
PSEQ	Yes	30	42.3333	9.85877	0.111
	No	30	35.5000	14.18778	
FAS	Yes	30	25.2333	2.43088	0.001
	No	30	30.7333	6.81749	
Physical fatigue	Yes	30	13.2333	1.33089	0.009
	No	30	15.0667	2.86397	
Mental fatigue	Yes	30	12.0000	1.53128	0.004
	No	30	15.6667	4.42043	

4. Discussion

The purpose of this work was to investigate the contribution of exercise to the levels of quality of life, fatigue, and pain management in women over 60 years old. More specifically, an attempt was made to investigate the level of quality of life of women over 60 years old, their level of fatigue and pain management as well as to investigate whether there is a relationship between exercise and quality of life fatigue and pain management of women over 60 years old. 60 women over the age of 60 took part in the research, most of whom were between 60–69 years of age mainly lived in a city, were high school or high school graduates, and basically married. Thirty women who exercised and 30 women who had no physical activity took part in the research. Regarding the frequency of exercise of the women who exercised more, they claimed that it was 1–2 times or 3–4 times a week. According to the results of the survey, the women characterized their overall quality of life as good or very good. From the Missoula Quality of Life—VITAS (MVQOLI) questionnaire that was used, the dimensions of symptoms, functionality, interpersonal relationships, and spirituality have a positive sign, while the well-being dimension has a negative sign. Overall, the average value of the quality of life of the women in the survey shows satisfactory levels of quality of life for women. Regarding the pain management of the female participants, according to the results of the PSEQ

questionnaire used, the women show high average values in almost all individual pain management questions, while its average value is 38.9167 (±12.59310) which shows that women manage their pain more than moderately effectively. Finally, regarding the level of fatigue of the participating women according to the results of the questionnaire (FAS) that was used, the women seem not to show frequent symptoms of fatigue. The mean value of the questionnaire is 27.9833 (±5.78277) indicating that women are categorized between "tired" and "extremely tired" based on the Fatigue Rating Scale used.

From the correlations made between exercise and quality of life, fatigue, and pain management of the women over 60 who participated in the research, it follows that women with exercise show a better quality of life and less fatigue, while no statistically significant difference was found in terms of pain management. According to Andruszkiewicz and Basinska [21], the aging process can bring about disabilities that cause significant pain and discomfort, leading to a decrease in daily functioning and social interaction. In fact, approximately 80%–85% of people over the age of 60 have at least one chronic illness, contributing to their physical decline. Older people face a variety of challenges that can significantly affect their quality of life, ranging from changes in their health status to adapting to new limitations and identifying new roles and support systems [22]. Fatigue is a core symptom experienced by 40%–74% of older people living with a chronic disease [23]. Fatigue is one of the most common symptoms reported in older people, with 77% of patients over the age of 70 reporting fatigue [24]. On the other hand, fatigue can be one of the early signs of aging and a self-reported indicator of frailty [25]. The impact of pain on a person is wide-ranging and is particularly important in the elderly. Pain can lead to functional impairment, sleep disturbance, reduced socialization, depression, reduced mobility, and reduced or delayed recovery. According to the research of Patel et al. [26] showed a 70%–80% reduction in the ability of older people to perform daily activities for people with pain compared to people without pain, as well as reduced walking speed, weaker grip strength, and reduced self-reported physical ability. Older adults, especially those with frailty, may have reduced functional reserves meaning that pain-related impairments may have a more profound impact on mobility, cognition, and independence [27]. Although some declines with age are inevitable, substantial evidence shows that physically active older people maintain healthy physical function longer than their sedentary peers [28]. In this way, physical activity has been recognized as a priority area in general health promotion as well as a specific health goal. As highlighted by Rodriguez-Laso et al. [29] in older adults, regular physical activity is important for increasing or maintaining aspects of physical function, which allows for more comprehensive functional tasks to be performed, such as muscle strength and power, balance, flexibility, endurance or mobility, and consequently for maintaining independent living. Finally, Spirduso and Cronin [30] emphasize that health-related quality of life consists not only of a domain of physical or cognitive function, but also of psychological well-being and, in general, that measures of physical activity in the elderly are related to feelings of well-being [31].

The limitations identified during the conduct of the work mainly concern limitations related to the quantitative research carried out and have to do with issues

of understanding by the participants of the questionnaire. However, an attempt was made to address this problem with the existence of clarifying instructions in the introduction of the questionnaire. Also, there was a limitation of the sample of participants and the time of conducting the research as it is a post-graduate work with specific delivery dates.

5. Conclusion

The conclusions of the study concern exclusively the women who participated in the research and their views on the contribution of exercise to the levels of quality of life, fatigue and pain management. As a proposal for future research, it is proposed to conduct research that will explore the opinions of a larger sample of women, nationwide, in order to create comparative results between regions. Also, the findings of this thesis could be used to conduct research that explores the opinions of other than women and the opinions of older men and form a basis for further study and research.

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