



# Mental health and social integration in active older adults according to the type of sport practiced

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## ABSTRACT

**Background:** The practice of general gymnastics, aquatic activities, dance, yoga or pilates, bring benefits to the physical and mental health of people over 65 years of age. However, the benefits of the practice of these activities on the mental health of the older adults have not been studied in depth; without establishing differences by gender.

**Aim:** The aim of this work is to study whether the emotional state and social integration of older people differ according to the type of sport. The CUBRECAVI scale was used to assess mental health and social integration in 358 people over 61 years of age ( $M = 69.66$ ,  $SD = 4.64$ ).

**Results:** The results showed that older adults people who do general gymnastics are more socially integrated ( $F = 4.842$ ,  $p = .003$ ) than those who do dance activities; while those who prefer aquatic activities report better mental health ( $F = 3.6$ ,  $p = .002$ ), than those who do general gymnastics ( $p = .001$ ) or dance activities ( $p = .029$ ).

**Conclusion:** The type of sporting activity performed by the older adults is associated with some aspects of their quality of life.

## 1. Introduction

The study of health and aging to prevent diseases is a priority in contemporary research. In this context, both the [European Commission \(2019\)](#) and the [World Health Organization \(2018\)](#) emphasize the need to implement strategies that prevent diseases and enhance the physical and psychological well-being of older adults. Physical exercise, whether on land or in water, is among the most extensively discussed topics in aging research due to its well-documented positive effects on the physical and mental health of this population ([Moreira et al., 2020](#); [Powell et al., 2018](#); [Rebello-Marques et al., 2018](#)).

Specifically, land-based physical exercise has been shown to improve flexibility, autonomy, functionality, and cognitive capacity in older adults ([Blasco-Lafarga et al., 2020](#); [Mazini et al., 2017](#); [Sanchís-Soler et al., 2021](#)). Over the past decade, numerous physical exercise programs have been developed to address these needs ([ACSM, 2013](#); [Blasco-Lafarga et al., 2016](#); [Izquierdo, 2019](#)). Furthermore, studies such as

those by [Uusi-Rasi et al. \(2020\)](#) highlight that the regular practice of non-competitive general gymnastics, the focus of this study, reduces the risk of falls in older adults. Additionally, [Stenner et al. \(2020\)](#) suggest that general gymnastics contributes to successful aging and fosters positive social relationships.

Similarly, activities such as Pilates, yoga, or dance can contribute to the physical and mental well-being of older adults. On one hand, yoga and Pilates are disciplines that improve both physical and mental health, although with different approaches. Yoga combines postures, breathing, and meditation to promote balance between the body and mind, with benefits such as stress reduction, improved flexibility, and strength. Pilates, which focuses on strengthening the core and posture, is effective for the rehabilitation and prevention of musculoskeletal pain. Both practices have been shown to be effective in stress reduction and the improvement of overall well-being, according to various scientific studies ([Cramer et al., 2018](#); [Field, 2011](#); [Sorosky et al., 2008](#)).

On the other hand, dance is a physical activity involving rhythmic

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and coordinated movements, offering benefits to cardiovascular health, mobility, balance, and cognitive function (Clifford et al., 2023). Furthermore, dance promotes social interaction and enhances emotional well-being, alleviating symptoms of depression and anxiety (Karkou et al., 2019; Santos et al., 2020).

Kim et al. (2020) suggest that incorporating water-based activities, either as a primary or complementary exercise, can be beneficial for healthy older adults and for those with metabolic, musculoskeletal, or cognitive challenges. For instance, Graça et al. (2020) reported improvements in upper limb functionality, postural control, and balance following aquatic training. Similarly, Beyranvand et al. (2018) observed enhanced balance and postural control in older men after an eight-week aquatic exercise program. Devereux et al. (2005) found comparable improvements in balance among women aged 50 to 65 with osteoporosis after a 10-week water immersion program. Henwood et al. (2017), Henwood et al. (2015), and Wong et al. (2011) also documented significant benefits, such as increased grip strength, coordination, and improved body composition, even in adults with moderate-to-severe dementia.

The psychological benefits of aquatic exercise are equally notable. Neville et al. (2014) reported a reduction in symptoms associated with dementia and an improvement in well-being in participants with moderate-to-severe dementia after a 12-week aquatic exercise intervention. Similarly, Serrano-Huete et al. (2018) observed improvements in the perception of emotional well-being, encompassing both physical and emotional aspects, after a 20-week aquatic training program involving 98 older adults.

Previous studies have highlighted the physical and mental health benefits of activities such as dance for older adults. Dance, in particular, has been shown to improve mood and reduce anxiety (Podoslki et al., 2023; Prudente et al., 2024; Salihi et al., 2021). Additionally, some research suggests that dance enhances cognitive functions (Meng et al., 2020). Moreover, because dance is often practiced in group settings, it provides older adults with opportunities to strengthen social connections and relationships (Prudente et al., 2024; Wu et al., 2023). However, due to the variability across studies, further research is necessary to confirm these findings (Prudente et al., 2024). Similarly, both Yoga and Pilates have been found to improve body awareness, flexibility, strength, and balance (Casonatto & Yamacita, 2019; Martens, 2022). Like dance, participating in these activities in group settings fosters a sense of community, social support, and enhances individuals' subjective perception of their health (Lim & Hyun, 2021).

Mental health is also closely tied to social relationships, which are, in turn, influenced by physical activity (Park et al., 2020; Schrempft et al., 2019). Group-based sports activities, in particular, offer greater psychological benefits compared to individual sports (Puciato et al., 2017). Tsuji et al. (2020) and Kanamori et al. (2016) found that individuals engaging in group activities reported better subjective health outcomes than those participating in individual sports. Nevertheless, despite the physical and functional benefits of land and water-based activities for older adults (Kim et al., 2020; Reichert et al., 2018), few studies have specifically compared their effects on mental health and social integration. Furthermore, little attention has been given to evaluating the differences in mental and social outcomes across various group-based sports that enhance cardiovascular capacity, coordination, balance, and strength (Bull et al., 2020). Among the activities offered to the older people and that also allow the improvement of these capacities, can be found, among others, general gymnastics, aquatics activities, dance, yoga or Pilates. Therefore, the aim of this work is to study whether the emotional state and social integration of the elderly differ according to the type of sport that is practiced. Specifically, the following aspects are to be determined:

a) Identify the differences in the health (objective health and mental health) of the older adults taking into account the type of sport that is performed.

b) Identify the differences in the social integration of the older adults depending on the type of sport they practice.

## 2. Material & methods

### 2.1. Participants

A total of 358 physically active older adults from Spain participated in this study. The mean age of the participants was 69.66 years (SD = 4.64). Of the sample, 64 % were women (n = 229), and 36 % were men (n = 129). Regarding the level of physical activity performed by the participants, 12 % were at a low level, 40.5 % at a moderate level, and 47.5 % at a high level. Participants were recruited from various sports and recreational programs targeting older adults. Other sociodemographic characteristics are shown in Table 1.

The following inclusion criteria were established: (1) being over 60 years old; (2) regular engagement in physical activity for at least one year, with a minimum frequency of once per week (3) exclusion criteria included individuals who did not engage in any form of physical activity during the specified period.

All participants signed a consent to participate. The study was conducted according to the guidelines of the Declaration of Helsinki and approved by the Institutional Review Board (or Ethics Committee) of Miguel Hernández University (protocol code 200115191342).

### 2.2. Sports of participants

The participants engaged in four main types of physical activities: general gymnastics (54.7 %), yoga/Pilates (16.2 %), dance activities (15.1 %), and aquatic activities (14 %). The activities offered by the centers were scheduled on the same day and at the same time, requiring participants to choose between the available options. As a result, it was not possible to attend two activities at the same time. Regarding gymnastic activities, these were performed on group sessions, characterized by stage work with musical accompaniment and movements, among others, of flexion, extension and swing to improve agility and coordination. In relation to aquatic activities, these involved sessions of physical work with activities such as walking, opening and extending arms and raising knees in the aquatic environment. All activities were led by qualified instructors and were performed in group settings. Sessions lasted between 45 and 60 min and were carried out three times per week at a moderate intensity level, as determined by the instructors. The duration of the activity program was 12 months.

### 2.3. Procedure

This study utilized a cross-sectional design, with data collected during a single time period. Participants were recruited from two main settings: sports and social centers, and outdoor spaces where regular sports practice occurred. On the one hand, the managers of 38 centers were contacted, of which 18 agreed to collaborate. The research team explained the study objectives to attendees interested in participating. Upon receiving an explanation of the study objectives, attendees interested in participating provided informed consent. Subsequently, they were given a questionnaire designed to collect sociodemographic data and to verify their eligibility according to the inclusion and exclusion criteria. On the other hand, in the external sports practice areas, people who met the inclusion requirements were contacted, and the study and its objectives were explained to them. Those who agreed to participate were given an envelope with the questionnaire and informed consent that they had to return completed at a later appointment set at that time.

### 2.4. Instruments

For the sociodemographic data collection, an ad hoc questionnaire was developed that also considered the type of sport practiced in which

**Table 1**  
Other sociodemographic characteristics of the participants.

	Married	Widowed	Single	Divorced	
Marital status	67.6 %	16.8 %	9.1 %	6.5 %	
	Non-smokers	Between 1 and 5 cigarettes/day	Between 6 and 20 cigarettes/day	More than 20 cigarettes/day	Only on special occasions
Tobacco consumption	91.8 %	1.7 %	4.5 %	1.4 %	0.6 %
	Never drank alcohol	Once a week	Every day	On special occasions	
Alcohol consumption	51.9 %	20.7 %	21.8 %	5.6 %	
	No physical ailments			No psychological ailments	
Illnesses	72.6 %			88 %	

they had to specify the type of sport practiced (gymnastics, dance, water activities, yoga, Pilates, or not practiced). In addition, to find out the level of physical activity in the last week, the participants were asked to answer the self-administered IPAQ questionnaire. The Physical Activity Questionnaire (WHO, 2012) evaluates three categories of exercise based on intensity: low, moderate, and high. Individuals classified as having high activity levels engage in at least one hour of additional mild-intensity activity or 30 min of high-intensity activity per day beyond their baseline activity. Those with moderate activity levels perform at least 30 min of additional mild-intensity activity on most days, while individuals with low activity levels do not meet the criteria for moderate or high activity. A shorter version of the questionnaire asks participants to answer seven items about physical activities they performed in the past week. Sample questions include: “How much total time did you spend in vigorous physical activity on one of those days?” and “How much total time did you spend in moderate physical activity on one of those days?” The questionnaire has a reliability coefficient of 0.65 ( $r_s = 0.76$ ; 95 % CI: 0.73–0.77) and has been recently applied in studies involving older adults (Loginov et al., 2018; Oh et al., 2020).

For the assessment of mental health and integration, the CUBRECAVI quality of life questionnaire was used. This instrument has demonstrated a high level of internal consistency, with Cronbach's alpha values ranging between 0.70 and 0.92 (Fernández-Ballesteros & Zamarrón, 2007). The CUBRECAVI questionnaire is a self-administered tool designed to evaluate key components of quality of life in individuals, based on the multidimensional concept of health and quality of life proposed by the World Health Organization (WHO). The questionnaire takes approximately 20 min to complete and is highly recommended for measuring quality of life in older adults (Fernández-Ballesteros, 2007). The questionnaire consists of 21 subscales, and while all are relevant, this study specifically focused on two subscales: health and social integration. Participants were asked to evaluate their level of social integration using a Likert-type scale, with items such as “I usually meet to talk with friends or neighbors” and “frequency of relationships” where 0 indicates “not at all” and 3 indicates “a lot.” For mental health, items such as “Do you feel depressed, sad, nervous, distressed?” were rated on a scale from “never” to “frequently.”

## 2.5. Statistical analysis

Descriptive statistics, including means, standard deviations, and frequencies, were calculated to summarize the sociodemographic characteristics and the distribution of the variables. The normality of the data was verified, and tests of homogeneity of variances (Levene's test) were conducted to ensure the assumption of equal variances across

groups. To examine the relationships between the variables under study, the point-biserial correlation coefficient has been applied.

To perform the analysis of the differences between the participants according to the sport they practice, univariate (ANOVAs) and multivariate analyses of variance (MANOVAs). The effect size has been estimated using  $\eta^2$  in the ANOVAs and MANOVAs. The established significance value is  $<0.05$ . The data analyses were completed with the SPSS statistical package, version 23.0 (IBM corp., Armonk, NY, USA).

## 3. Results

The types of sports practiced by the participants were as follows: 54.7 % engaged in gymnastics (Age:  $M = 69.26$ ,  $SD = 4.50$ ), 16.2 % practiced yoga/pilates (Age:  $M = 71.09$ ,  $SD = 5.85$ ), 15.1 % participated in dance activities (Age:  $M = 70.26$ ,  $SD = 4.77$ ) and 14 % engaged in aquatic activities (Age:  $M = 68.96$ ,  $SD = 3.86$ ).

### 3.1. Health

Continuing with Table 2, it indicates that the correlations between the types of sport and health dimensions vary. While some activities (such as gymnastics) show weak and positive correlations with both objective and mental health, other activities (such as aquatic activities) show negative correlations, particularly in mental health.

Continuing with Table 3, the results show that in terms of objective health, participants who practice dance, yoga/pilates, and aquatic activities have slightly higher average scores than those who practice gymnastics, indicating that they perceive their objective health somewhat more positively.

In terms of mental health, participants in aquatic activities appear to have the most positive perception of their mental health, followed by those who practice yoga/pilates, with dance and gymnastics showing lower average scores.

**Table 2**  
Pearson correlations (point-biserial correlation) between health status dimensions and the sport practiced.

	Gymnastics (gymnastics/ others)	Dance (dance/ others)	Aquatic (aquatic/ others)	Yoga/pilates (yoga-pilates/ others)
Objective health	0.117*	−0.070	−0.039	−0.053
Mental health	0.130*	0.022	−0.200**	−0.009

Note: \* $p < .05$ ; \*\* $p < .01$ .

**Table 3**

Means and standard deviations of the scores on the health status subscales according to the sport practiced.

	Gymnastics		Dance		Aquatic		Yoga/pilates	
	M	SD	M	SD	M	SD	M	SD
Objective health	3.44	0.39	3.55	0.29	3.52	0.39	3.53	0.34
Mental health	3.10	0.65	3.14	0.67	3.50	0.55	3.19	0.67

SD standard deviation.

Objective health (the frequency of common physical aches and pains in older adults) and mental health (the frequency of common psychological issues in older adults) were assessed to evaluate the participants' overall health status. Higher scores on the scales indicated better health. To study whether there were health status based on the type of sports activity practiced, a multivariate analysis was conducted, with the type of activity as the independent variable and the physical and mental health subscales as the dependent variables. The results of the MANOVA were statistically significant ( $F(6, 708) = 3.614, p = .002, \eta^2 = 0.030$ ). The group means for the subscales are shown in Table 4. In the ANOVAs assessing health status based on the type of sports activity performed, significant differences were observed in the mental health subscale, with higher mean scores for participants engaging in water activities compared to those practicing gymnastics ( $p = .001$ ) or dance activities ( $p = .029$ ) (Table 5).

### 3.2. Social integration

The analysis conducted using the social integration scale, showed that the scores varied according to the type of sport practiced by the participants ( $F(3, 111,761) = 4.842, p = .003, \eta^2 = 0.045$ ) (Table 6). Specifically, significant differences were found between participants who engaged in gymnastics and those who participated in dance activities, with mean scores of 3.39 and 3.17, respectively ( $p = .008$ ). These findings indicate that individuals practicing gymnastics are more socially integrated than those engaging in dance activities.

## 4. Discussion

The primary objective of this study was to examine the differences in mental health and social integration among older adults based on the type of exercise they engage in. The results suggest that older adults who participated in aquatic activities exhibited better mental health, whereas those whose primary activity was gymnastics reported greater social integration.

These findings align with the body of literature that underscores the positive impact of physical exercise on both physical and mental health (Warburton & Bredin, 2017). Specifically, previous research by Rebelo-Marques et al. (2018) and De Souza et al. (2018) has observed that physical activity plays a relevant role in preventing the development of age-related diseases and complications. Further studies have integrated various forms of exercise aimed at disease prevention and improving the quality of life in older adults (Blasco-Lafarga et al., 2020; Cordes et al., 2019; Nasr et al., 2019). Despite the strong evidence supporting the general benefits of physical activity, it remains unclear which specific type or combination of exercises provides the greatest benefits, particularly for mental health.

**Table 4**

Continuation ANOVAs for the dimensions of state of health according to the sport practiced.

	F	Gl effect	Gl error	p	$\eta^2$
Objective health	1.684	3	354	0.170	0.014
Mental health	5.231	3	354	0.002*	0.042

\* $p < .025$ .

The results of the present study, though in a descriptive manner, highlight the effect of various forms of exercise on the mental health of older adults.

In particular, our results indicate that individuals who participate in aquatic activities achieve better outcomes on mental health assessments. This aligns with findings from Silva et al. (2018), who observed improvements in quality of life in older adults engaging in structured aquatic activities compared to those participating in unstructured land-based physical activities, such as gymnastics or dance. Silva et al. (2019) further reported reductions in anxiety and depression among older individuals practicing aquatic exercise. While land-based training tends to yield more significant physical improvements, well-structured aquatic programs also offer substantial physical and mental health benefits, even for older adults with pre-existing health conditions (Perkins et al., 2020; Ruangthai et al., 2020; Silva et al., 2018; Yoo, 2020).

Additionally, research by Oliver (2021) emphasizes the health and wellness benefits of water-related activities, promoting the concept of "blue therapy" and its positive effects on physical and mental well-being. Similarly, Satariano (2019) notes the therapeutic value of water-related environments, such as coastal areas, in enhancing health. In line with this, Dempsey et al. (2018) reported lower rates of depression among older adults exposed to aquatic environments in the Irish Longitudinal Study of Aging (TILDA). In contrast, the study found that older adults practicing gymnastics demonstrated higher levels of social integration. This finding is consistent with the work of Tsuji et al. (2020), who observed psychological improvements in individuals practicing group sports compared to those engaging in individual sports. Similarly, Kanamori et al. (2016) found that group sports were associated with better subjective health outcomes than individual sports.

Overall, the results suggest that individuals who engage in aquatic activities exhibit better mental health, whereas social integration is more evident among those who practice gymnastics. Although our results are purely descriptive, these findings are consistent with the conclusions drawn by Tsuji et al. (2020). However, further studies with larger sample sizes, longitudinal designs, and a broader range of sports are needed to confirm and expand upon these results. While shedding light on the effects of different sports disciplines on older adults is valuable, it is important to acknowledge two key limitations of this study: the analysis was restricted to only four modalities—general gymnastics, dance, aquatic activities, and yoga/Pilates—and the study design was cross-sectional. Expanding the range of activities and conducting follow-ups on the effects in the short, medium, and long term could provide a more comprehensive understanding of the potential benefits of various forms of exercise in this population.

On the other hand, the fact that some participants answered the questionnaire at home may imply a lack of control. This fact is a limitation of the study, which must be taken into account in future improvement and control procedures. From their results it can be inferred, however, that mental health, compared to the rest of the sports modalities, improves with the practice of aquatic activities. Likewise, and as possible practical implications, consideration should be given to the fact that this study highlights the need to take care of the mental health and social integration of the elderly through the practice of water activities and gymnastics. As a future line of research, it would be interesting to explore a broader range of sports and psychological variables, examining training sessions over a longer duration through longitudinal studies. Additionally, investigating differences between individual and group sports, as well as including a sample of sedentary older adults or those with diagnosed mental health conditions, would provide further insights into the relationship between exercise and well-being in older populations.

## 5. Conclusions

The results of this research show that older adults who practiced gymnastics achieved better results in the social integration dimension.



**Table 5**  
Pearson correlations (point-biserial correlation) between social integration and the sport practiced.

	Gymnastics (gymnastics/others)	Dance (dance/others)	Aquatic (aquatic/others)	Yoga/pilates (yoga-pilates/others)
Social integration	−0.188**	0.166**	0.076	0.021

Note: \*p < .05; \*\*p < .01.

**Table 6**  
Means, standard deviations and ANOVA of a factor of the scores of the participants in the scale of social integration (CUBRECAVI) according to the sport they practice.

	Gymnastics	Dance	Aquatic	Yoga/Pilates	F	P	η <sup>2</sup>
	M (SD)	M (SD)	M (SD)	M (SD)			
Social integration	3.39 (0.35)	3.17 (0.45)	3.25 (0.40)	3.31 (0.42)	4.842	0.003*	0.045

\*p < .05 n = number of participants; M = average; SD = standard deviation F = F statistic; p = p-value; η2 = size of the eta squared effect.

Similarly, mental health outcomes differ depending on the activity performed, with higher levels observed in those who participate in aquatic activities. The reduction of joint overload, the increase in blood flow or the relaxing capacity of water could be one of the causes of these results. Overall, the type of physical activity practiced by older adults plays a significant role in their mental health and social integration. These insights underscore the importance of considering specific exercise modalities when designing preventive or health-promoting interventions for this population.

**CRedit authorship contribution statement**

**Gema Sanchís-Soler:** Writing – review & editing, Writing – original draft, Visualization, Validation, Conceptualization. **Sergio Sebastián-Amat:** Writing – review & editing, Writing – original draft, Visualization, Conceptualization. **María Antonia Parra-Rizo:** Writing – review & editing, Writing – original draft, Visualization, Validation, Supervision, Software, Resources, Project administration, Methodology, Investigation, Funding acquisition, Formal analysis, Data curation, Conceptualization.

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**Data availability**

Data will be made available on request.

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