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UNIVERSIDADE LUSÓFONA
I Faculdade de Educação Física e Desporto

AQUA LEUVEN

"Impact of a Hydrotherapy Structured Program on Balance, Risk of Falls, Fear of Falling and Health Related Quality of Life in Older Adults, during 12 weeks"

16 April 2015

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GRUPO DE INTERESSE EM HIDROTERAPIA
FISIOTERAPIA/MEIO AQUÁTICO

Portugal


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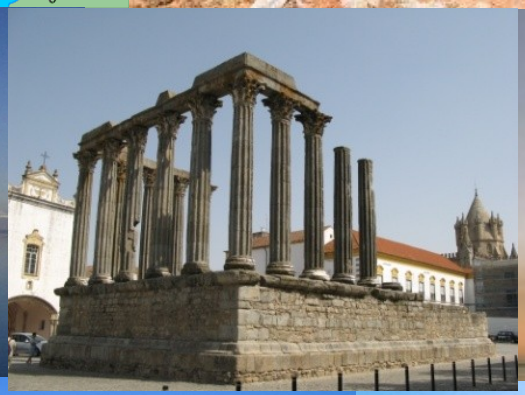
Pastéis de Belém

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Introduction

Older Adults

Growth of the Elderly Population → World phenomenon[1]

% of the elderly population in Portugal → 16% in 2001 → 19% in 2011 [2]

[1] OMS (2010)

[2] INE (2012)

Introduction

Balance

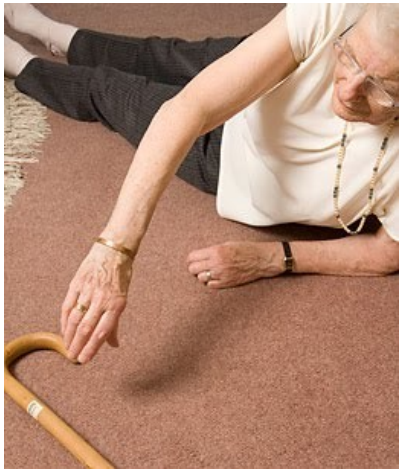
- With increasing age, the balance decreases, verifying a more marked decline from age 60 [1]

[1] Perracini e Ramos (2002)

Introduction

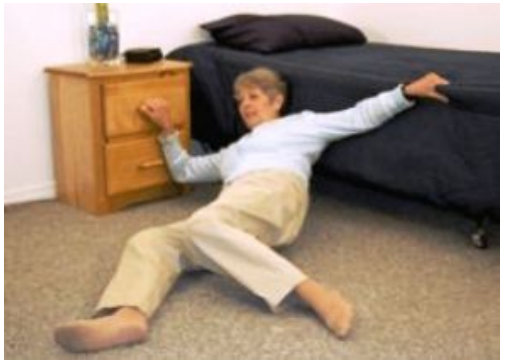
Falls

– main causes of morbidity in the Older Adults



occur as a result of balance postural loss[1]

40 to 60% of people over age 65 have experienced at least one fall [2]



[1] Perracini e Ramos (2002)

[2] Cristina et al (2003)

Introduction

The fall triggers serious physical, psychological and social consequences, such as greater dependence for the performance of ADL[1]

Need to carry out prevention programs to ensure the elderly greater independence and greater functional capacity [2]

[1] Fabrício et al (2004)

[2] Perracini e Ramos (2002)

Introduction

Changes in Balance + Fear of Falling = ↓ Self confidence

↓ Self confidence → ↓ daily physical activity, ↓ involvement of ADLs → Social isolation and increased dependence of others [1]

[1] Carter et al (2001)

[2] Koltyn (2001)

Physical Activity → associate → Improvements in Health Related Quality of Life in Older Adults[2]

Introduction

Hydrotherapy

demonstrated

Beneficial effects on health of the elderly population relatively to balance and risk of falls[1]

however

Few studies have been conducted to verify these effects in the elderly compared to the balance, risk of falls, fear of falling and health related quality of life as well as fully described intervention programs[2]

justifying

Importance of this study

[1] Geytenbeek, 2002; Devereux et al, 2005; Vivas et al, 2011; Arnold and Faulkner, 2010; Resende, Rassi & Viana, 2008; Hosseini et al, 2011; Alikhajeh et al, 2012.

[2] Booth, 2004

The study…

Objective of the Study

Evaluate the impact of a Hydrotherapy structured program during 12 weeks, on balance, risk of falls, fear of falling and health related quality of life in older adults over 60 years in the Lavradio and Barreiro Swimming Pools

Study Hypothesis

A 12-week Hydrotherapy structured program promotes significant improvements:

- in balance, risk of falls, fear of falling and quality of life among older adults, compared to the control group [1]
- in men compared to women in balance, risk of falls, fear of falling and quality of life [2]

[1] Devereux, Robertson e Briffa (2005)

[2] Niino, Kozakai e Eto (2003)

Method

Study Design

- Quasi-experimental pre/post study with a control group

Participants

- N = 187 participants (female = 128; male = 68)
  - Intervention Group = 142 participants (M = 69,73 years ; SD = 5,61)
  - Control Group = 45 participants (M = 69,60 years; SD = 6,26)

Method

Instruments

- Demographic questionnaire
- Berg Balance Scale
- Timed Up & Go Test
- Falls Efficacy Scale (FES)
- SF-12v2® Health Survey
- International Physical Activity Questionnaire (IPAQ)
- Body Composition Monitor BF500© - Digital Scale
- Tape measure

} BMI

Method

Inclusion criteria

- subjects aged over 60 years
- Independent walking
- Independence in ADLs
- absence of medical contraindication to exercise
- 80% participation in the treatment[1]

Exclusion criteria

- urinary or fecal incontinence, renal insufficiency, open wounds, contagious skin diseases, infectious diseases, catheters, vascular thrombi, cardiac insufficiency, uncontrolled arterial pressure, dyspnea upon minimal effort, use of psychotropic drugs (benzodiazepines)
- participation in any other physical activity or physical therapy program[1]

[1] Resende, Rassi e Viana (2008)

Method

Intervention

Intervention Group

Hydrotherapy structured program for 12 weeks, 2 times a week, 40 minutes each session

Control Group

without any physical activity

Intervention[1]

Method

- Warm up phase (5 minutes)

  1 - Walking around the pool at progressive speed but maintaining a comfortable speed on the last of the five laps

- Fundamental phase (30 minutes)

  2 - Walking in a circle with changes in direction

  3 - Walking with changes in direction

  4 - Walking forward with forward hip flexion (kicking)

  5 - Walking with hip and knee flexion and trunk rotation

  6 – Walking with knee flexion and hip extension, with the heel touching the hand behind the back

  7 - Walking with waistline dissociation

  8 - Lateral walking with member abduction and adduction

  9 - Sitting/lifting with weight transfer

  10 - Walking with one foot in front of another

  11 - Unipodal support with weight transfer

  12 - Bilateral shoulder horizontal abduction and adduction

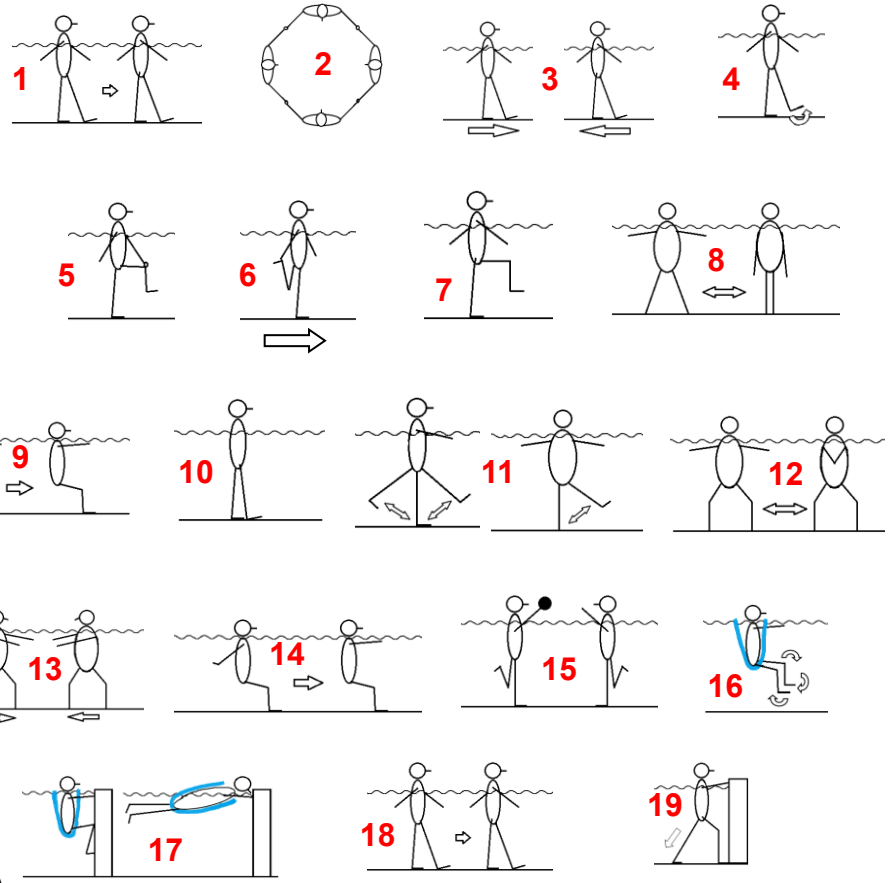
  13 - Trunk rotation pushing water with the upper extremities

  14 - Bilateral shoulder flexion/extension

  15 - Release the ball standing on one foot

  16 - Riding the noodle

  17 - The Snail



- Cool down and stretching phase (5 minutes)

  18 - Walking around the pool at regressive speed. Participants were told to stop at the end of the fifth lap

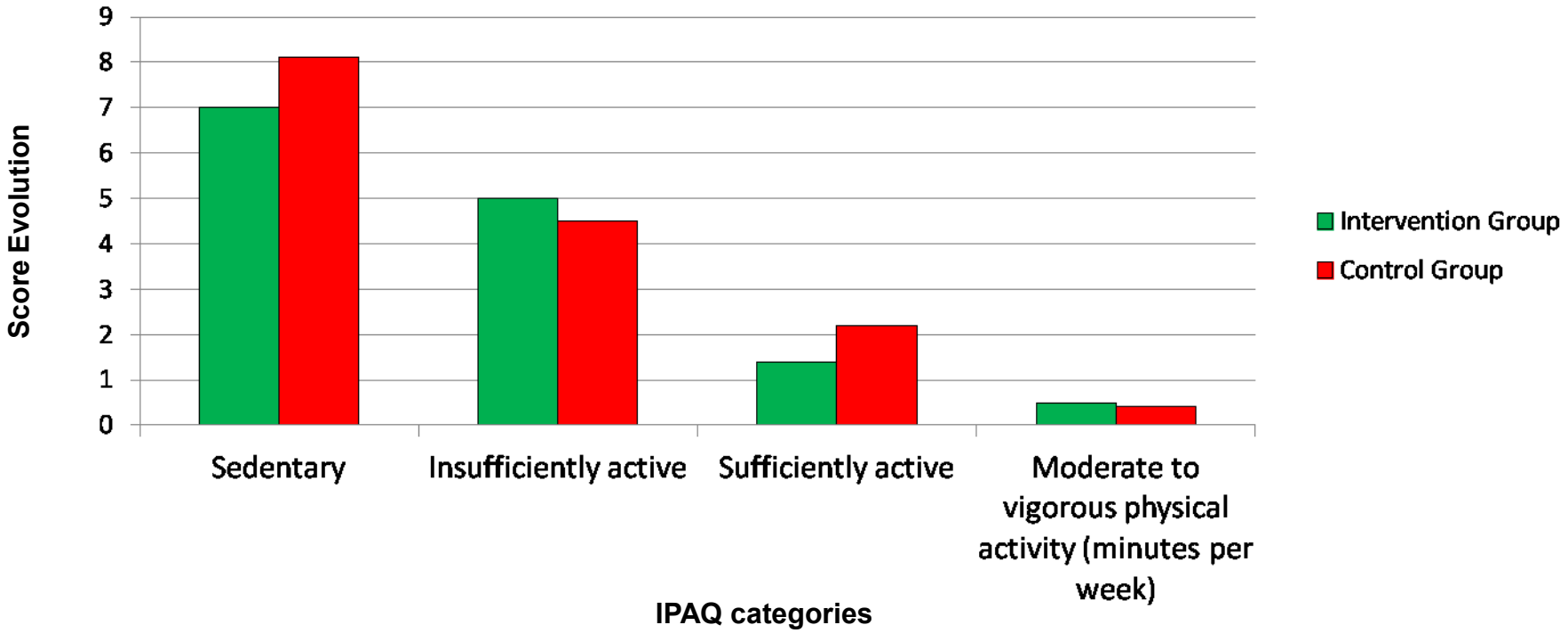
  19 - Stretching exercises of the quadriceps muscle, ischiotibial, shoulders, triceps, chest and neck (30 seconds each)

[1] Resende, Rassi e Viana (2008); Lund et al (2008); Hale, Waters e Herbison (2012); Avelar et al (2010); Devereux, Robertson e Briffa (2005); Noh et al (2008); Alikhajeh, Hosseini e Moghaddam (2012); Arnold e Faulkner, (2010); Douris et al (2003); Hosseini et al (2011); Arnold et al (2008).

Results

There were no differences in the physical activity level between the 2 groups at baseline

The average attendance in the program was high (90,04%)



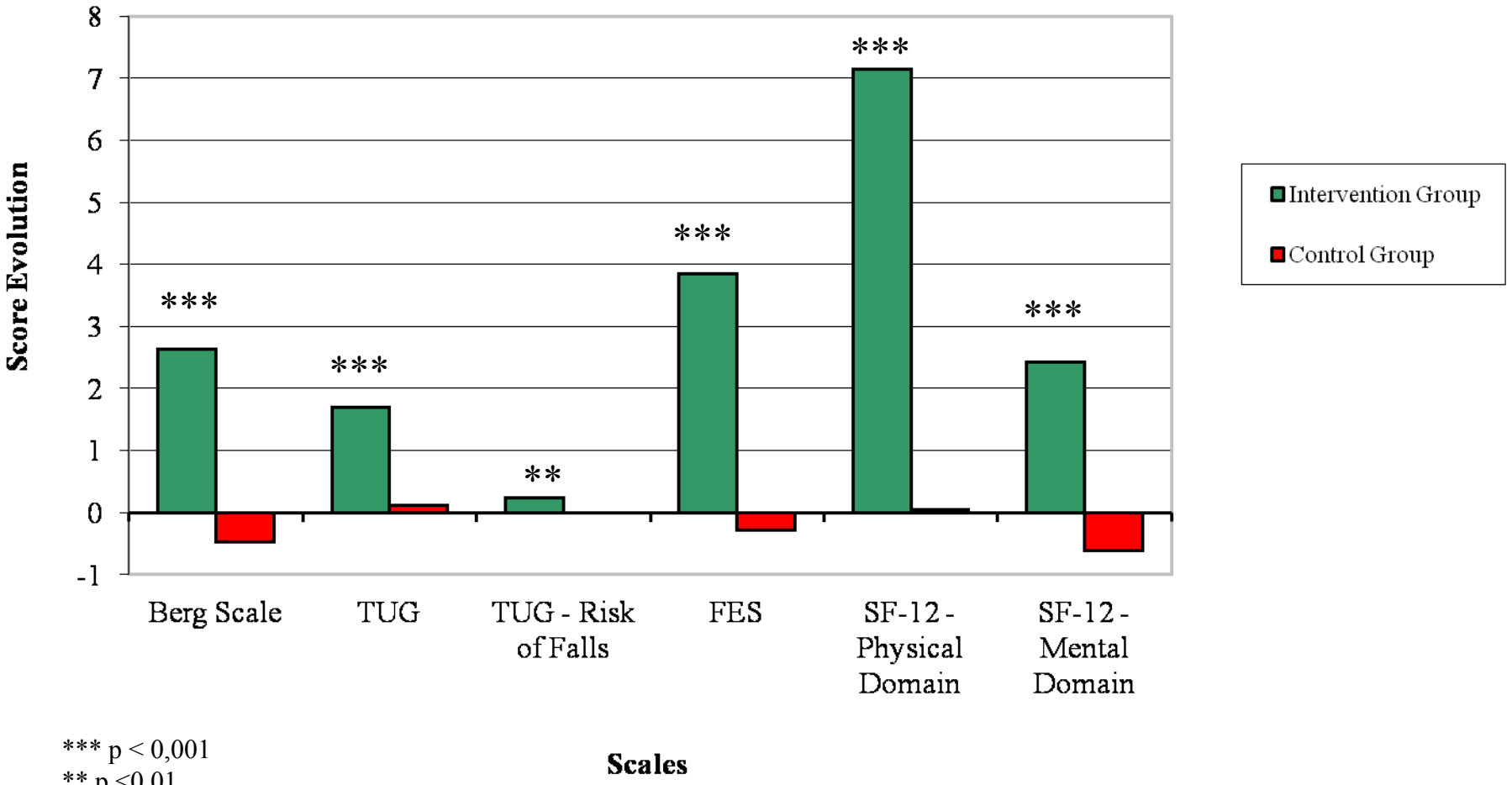
Results

Table - 2x2 Factorial ANOVA in function of the study groups

2x2 Factorial ANOVA		Baseline		Follow-up twelve weeks		F	
		M	SD	M	SD	time	time x group
Berg Balance Scale	IG	45,37	6,23	48,01	5,44	37,90***	77,27***
	CG	45,67	6,29	45,20	5,98		
Timed Up & Go Test	IG	19,05	2,41	17,36	2,12	105,46***	80,74***
	CG	19,15	2,33	19,04	2,70		
Timed Up & Go Test Risk of Falls	IG	2,34	0,46	2,11	0,32	10,43**	10,43**
	CG	2,33	0,48	2,33	0,48		
FES	IG	57,48	14,62	61,32	14,57	69,58***	94,07***
	CG	56,42	13,88	56,13	12,75		
SF-12 Physical category	IG	33,81	6,83	40,96	8,64	91,08***	88,41***
	CG	34,06	7,88	34,11	7,59		
SF-12 Mental category	IG	42,00	8,74	44,42	9,58	5,60*	15,61***
	CG	40,70	7,20	40,09	7,38		

*** $p < 0,001$
** $p < 0,01$
* $p < 0,05$

Results



*** p < 0,001
** p <0,01

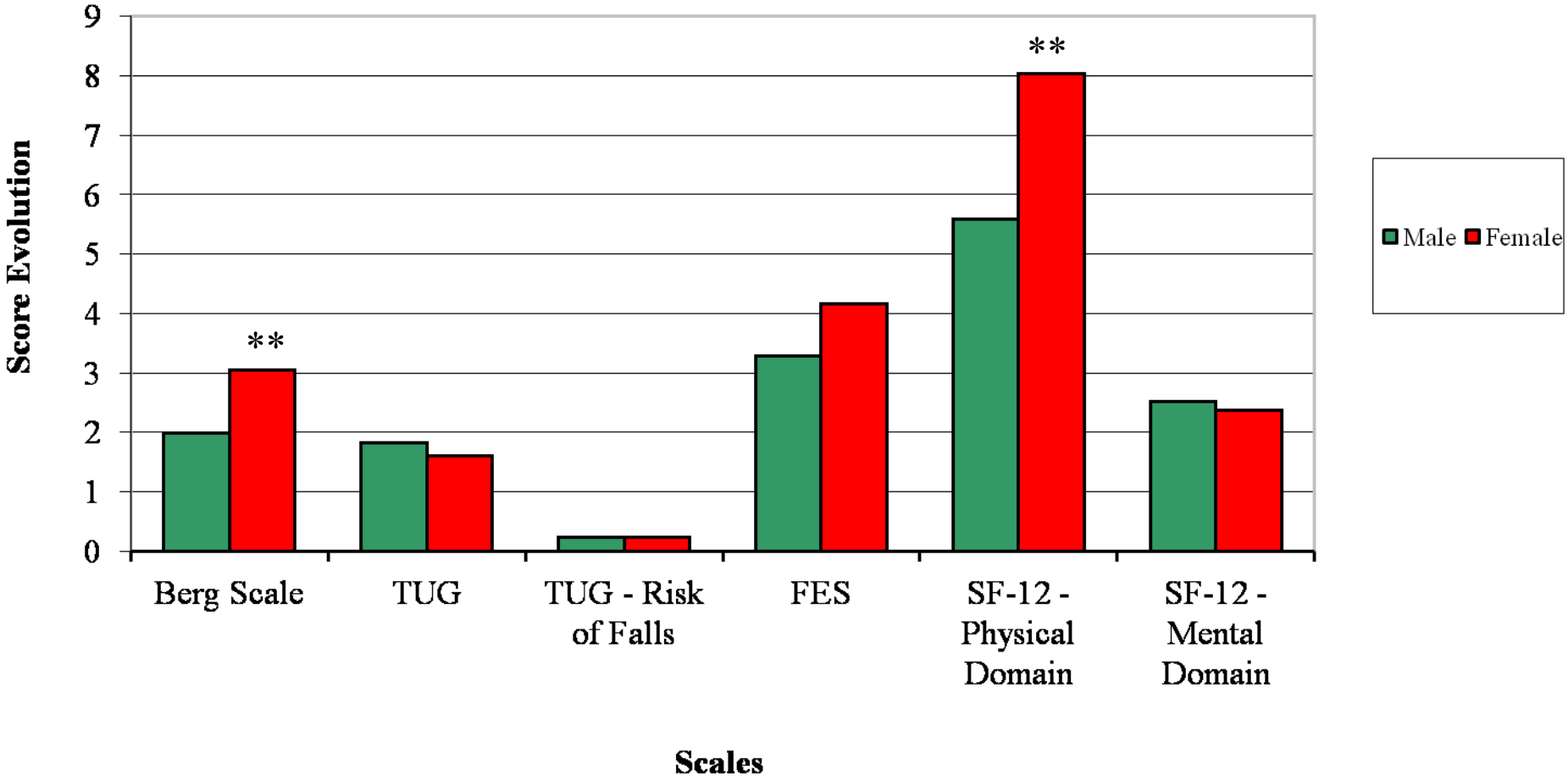
Results

Table – 2x2 Factorial ANOVA in function of gender (only for the intervention group)

2x2 Factorial ANOVA		Baseline		Follow-up twelve weeks		F	
		M	SD	M	SD	time	time x gender
Berg Balance Scale	Male	46,12	5,66	48,10	5,44	201,44***	8,88**
	Female	44,93	6,52	47,97	5,47		
Timed Up & Go Test	Male	19,15	2,47	17,32	2,29	591,12***	$2,77^{ns}$
	Female	18,99	2,38	17,39	2,02		
Timed Up & Go Test - Risk of Falls	Male	2,31	0,47	2,08	0,27	38,20***	$0,01^{ns}$
	Female	2,36	0,48	2,13	0,34		
FES	Male	58,94	15,53	62,23	15,40	257,10***	$3,49^{ns}$
	Female	56,63	14,09	60,79	14,13		
SF-12 Physical category	Male	35,51	7,11	41,10	8,26	286,28***	9,31**
	Female	32,83	6,50	40,87	8,89		
SF-12 Mental category	Male	44,53	8,74	47,04	8,25	32,07***	$0,03^{ns}$
	Female	40,54	8,45	42,91	10,00		

*** $p < 0,001$
** $p < 0,01$
ns - not significant

Results



** p <0,01

Discussion/ Conclusion

Hydrotherapy
Intervention Group
versus
Control Group

↑ Balance

Devereux et al, 2005; Vivas et al, 2011; Arnold and Faulkner, 2010; Resende, Rassi & Viana, 2008; Hosseini et al, 2011; Alikhajeh et al, 2012

↓ Risk of falls

Booth, 2004; Douris et al, 2003

↓ Fear of falling

Booth, 2004; Douris et al, 2003; Devereux et al, 2005

↑ Health related quality of life

Perracini & Ramos, 2002; Gregg et al, 2000

Discussion / Conclusion

Hypothesis: male participants had an initial higher scores than female in Berg Balance Scale and SF-12 Physical Domain, thus women were more likely to have a greater range of changes than men

?

↑ Balance

Niino, Kozakai and Eto, 2003

Hydrotherapy
Male Gender
Versus
Female Gender

↑ Health related quality of life (physical domain)

Niino, Kozakai and Eto, 2003

Discussion / Conclusion

This program should be easy to replicate, since each exercise and its frequency, intensity and duration were described [1]

12 week program

2 times per week

There is evidence that this duration and frequency shows significant improvements in endurance, balance and functional performance as well as a decrease in the rate of falls [1] [2]

[1] Resende, Rassi e Viana (2008)

[2] Devereux et al (2005); Vivas et al (2011);; Hosseini et al (2011); Alikajeh et al (2012)

Future Studies…

- Comparison of land versus water-based exercise, with a control group and objective measures and adherence.

- Longer-term follow-up is needed to determine the effect on incidence of falls.

- Compare older men and women in an Aquatic Exercise program in order to draw more specific conclusions about the risk of falls related to gender and which characteristics affect it.

Conclusion

This Hydrotherapy program promoted increases in balance and a reduction in the risk of falls among older adults in a community/real setting, as well as lower levels of fear of falling and better levels of HRQOL.

Hydrotherapy appears to be a viable physical therapeutic resource, with translational value, to be recommended for preventing falls among older people.

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Thank You!