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TAU ALPHA
MONTERREY - MEXICO

The life- space mobility as an expression of the mode of interdependence of functionality in older adults

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Introduction

- Mobility is a complex function that reflects several areas of activity.
 - the most important skill needed to maintain an independent life, personal autonomy and low use of care services
(Owsley, et al., 2006; Parker, Baker & Allman, 2007)
 - Limitations in mobility precede dependence
(Baker, Bodner & Allman, 2006).
- “life- space mobility” concept
 - Extent of mobility of individuals from inside their home to locations beyond their community or geographical area of residence (Parker et al., 2002).



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Introduction

□ Reasoning:

- A behavior of the physiological mode can have an effect or act as a stimulus for one or all the other modes (Roy & Andrews, 1999; p.114).
- The interdependence needs are satisfied through social interaction at an individual level and with the support systems.

□ When functionality is considered as the behavior of older adults:

- Social relations that older adults engage in are determined by the structure or spaces in which they live and move.
- It is in these spaces that individuals have the opportunity to interact with others and with their social environment.



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Functionality as behavior

Stimuli



Physiological
mode

- Muscular strength

Self concept
mode

- Perceived muscle strength

Interdependence
mode

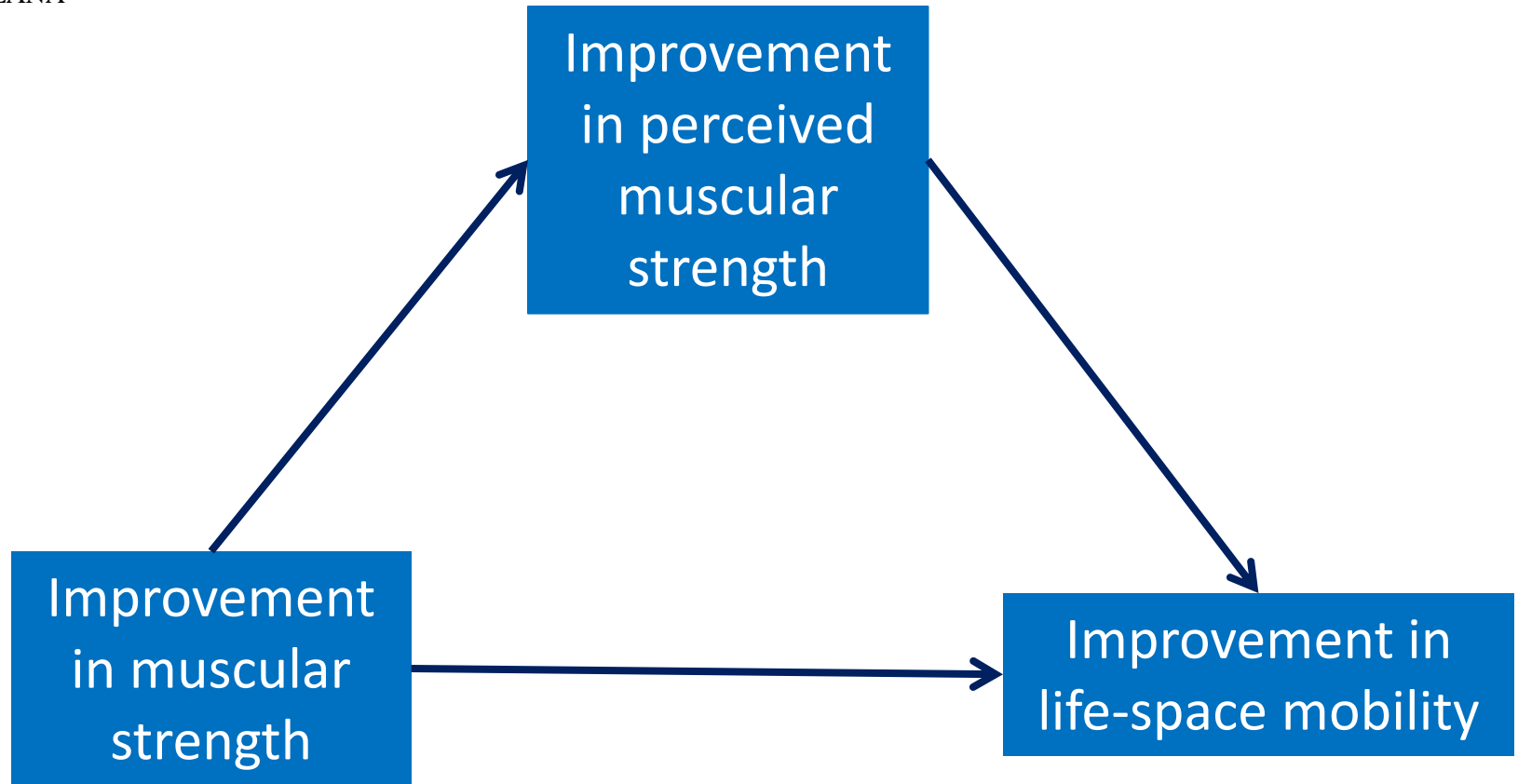
- Life-space mobility





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Proposed mediation model





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Methods

Participants

- ❑ 41 older adults who live in the Monterrey, NL, Mexico, metropolitan area and were recruited at gerontological clubs.
 - The average age was 71.8 years (SD = 8.1);
 - 90.95 Women
 - Physically inactive (less than 9.4 points in the physical activity questionnaire for older adults), with no cardiovascular, orthopedic or neuromuscular diseases and were not taking medications that could interfere with their safety. T
 - Those with medical contraindications to engage in exercise were excluded.

Intervention

- ❑ 12-week exercise program to increase muscular strength using Thera-band[®] elastic bands.
 - focused primarily on the lower extremities; it had three 1-hour sessions per week at a moderate intensity.
- ❑ A session consisted of four series of six isotonic strength exercises with 10 to 15 repetitions at 40% to 60% 1RM (weeks 3 to 12).
- ❑ There was one week of practice prior to the program
- ❑ Following the guidelines from the American College of Sports Medicine (Fletcher et al., 2001; Kraemer et al., 2002; Mazzeo et al., 1998; Pollock et al., 2000).



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Measurements and instruments

□ Four different moments

- Muscular strength : $1RM = F \times X_{rm}$
- The Muscular Strength Scale from the physical self-description questionnaire (Marsh et al., 1994).
 - The alpha achieved in this study was .80.
- The Life- Space Mobility questionnaire, the Life – Space Questionnaire: A measure of the Extent of Mobility in Older Adults (Stalvey, Owsley, Sloane & Ball, 1999).
 - The instrument authors report .80 of reliability in the test-retest tests (Parker et al., 2002).



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Results

Initial comparison of the groups

Variable	Mean	S.D.	Minimum Value	Maximum Value
Muscular Strength				
Intervention Group	43.1	37.5	0.0	135.0
Squatting	19.0	9.3	6.8	46.4
LL Bending	19.0	9.7	5.4	45.2
RL Bending	27.2	27.4	3.15	103.2
LL Pressure	23.6	23.4	2.8	103.2
RL Pressure	34.2	46.3	4.5	173.7
LL Extension	33.9	45.8	2.0	172.5
RL Extension				
Control Group (n=19)				
Squatting	20.6	25.2	0.5	85.8
LL Bending	17.07	8.1	6.8	40.2
RL Bending	16.2	6.1	8.0	27.1
LL Pressure	17.8	18.4	3.1	87.4
RL Pressure	15.7	14.5	2.8	69.3
LL Extension	20.0	39.5	2.4	173.7
RL Extension	22.2	44.1	1.2	172.5
Perceived Muscular Strength				
Intervention Group	72.5	15.6	31.2	96.8
Control Group	75.3	10.8	46.8	87.5
Life-Space Mobility				
Intervention Group (n=22)	58.5	16.1	11.1	77.7
Control Group (n=19)	64.9	16.2	11.1	77.7

*Without significant differences between the groups



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Effect of the muscular strength on perceived muscular strength and life- space mobility; mediating effect of the perceived muscular strength

Effect of the Change in Muscular Strength on the Change of Perceived Muscular Strength

<i>Coefficients</i>	<i>B</i>	<i>EE</i>	β	<i>t</i>	<i>p Value</i>
Constant	-3.40	3.43		-.099	.921
Muscular Strength	.191	.052	.508	3.68	.001

$F_{(1,20)} = 13.58; p < .001; R^2 = .239$



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Effect of the muscular strength on perceived muscular strength and life- space mobility; mediating effect of the perceived muscular strength

Effect of the Change in Muscular Strength on the Change in Life- Space Mobility

Coefficients	<i>B</i>	<i>EE</i>	β	<i>t</i>	<i>P Value</i>
Constant	1.91	3.06		.624	.536
Muscular Strength	.13	.046	.411	2.81	.008

$F_{(1,20)} = 7.94; p < .001; R^2 = .148$



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Effect of the muscular strength on perceived muscular strength and life-space mobility; mediating effect of the perceived muscular strength

Paso 1

Improvement
in the muscle
strength

$\beta = .130; p = .008; R^2 = 14.8$

Improvement in
the life-space
mobility

Paso 2

Improvement
in the muscle
strength

$\beta = .191; p = .001$

Improvement in
the perceived
muscle strength

$\beta = .443; p = .001$

$\beta = .046; ns$

Improvement in
the life-space
mobility

$F_{(2,19)} = 11.33; p < .001; R^2 = .341$



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Discussion

- ❑ The intervention had an effect on the physical mode represented by the muscular strength of older adults.
 - The magnitude of the effect achieved in each one of the exercised areas was large although different for each one of them.
- ❑ Variations may be explained by the intensity reached in carrying out the routine.
 - Previous studies report a maximum allowed intensity of 80% of the 1RM, while in this study the maximum reached was 60% of the 1RM.
- ❑ Physiological integrity (Roy & Andrews, 1999; p. 102).
 - One limitation of this study was that we did not take into account aspects that could affect the necessary physiological integrity in older adults in order to boost the effects of exercise



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Discussion

- ❑ It was proven that by strengthening the physiological mode, the self-concept mode and interdependence mode were also stimulated.
- ❑ The mediating role of the perceived muscular strength between the muscular strength and the life- space mobility shows the regulating and innovating activity of the systems that show the holistic nature of human adaptative systems (Roy, 1999).
- ❑ The concept of life- space mobility proved that it can be considered as a manifestation of the interdependence mode in the functionality of older adults.



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Conclusions

- ❑ The life- space mobility is considered as a manifestation of the interdependence role.
 - In turn, it is interrelated with other modes, such as the physiological mode and the self-concept mode.
 - The self-concept mode acts as mediator between the physiological mode and the interdependence mode.

- ❑ Considering these three manifestations in the functionality of older adults and the way in which they operate, will enable us to advance in understanding this group's functionality and use them to promote methods of intervention that, based on the theory, will aim to preserve it.