P-6

Community Health Centers and Hospital Collaboration in Developing Exercise Programs for Frailty

Jae Sik Seo[1] , Dong Ho Yoo[1], Minhyeok Choi[2], Taeho Yoon[2], Jong-Hwan Park[3], Tae Sung Park[4], Myung Jun Shin[5]

[1] Department of Rehabilitation Medicine, Biomedical Research Institute, Pusan National University Hospital
[2] Department of Preventive & Occupational and Environmental Medicine, Pusan National University, School of Medicine
[3] Biomedical Research Institute Health Convergence Medicine Laboratory, Pusan National University Hospital
[4] Department of Convergence Medical Institute of Technology, Biomedical Research Institute, Pusan National University Hospital
[5] Department of Rehabilitation Medicine, Biomedical Research Institute, Pusan National University Hospital, Pusan National University School of Medicine

Introduction

Korea's aging population is rapidly growing, leading to increased medical expenses. This study aims to establish governance among regional hospitals, community health care centers, and local government to collaboratively design and implement programs. Specifically, the initiative focuses on leveraging the community health care center as the leading entity, with support and contributions from the other institutions. The goal is to assess and enhance the physical functions of the elderly, prioritizing healthy aging that focuses on body functions rather than the prevalence of diseases.

Participants and Methods

The pilot project was conducted in three local communities, A, B, and C, with a total of 50 initial participants. Due to dropouts—3 from A and 4 from C—the final number of participants for post-assessment was 43. The 6-week program offered weekly one time training session, supplemented by voluntary exercises throughout the week. An exercise prescription specialist led the group through a diverse range of activities, including physical exercises. We assessed several health metrics before and after the program, including Skeletal Muscle Index (SMI), handgrip strength, sit-to-stand test, SARC-F, thigh circumference, blood pressure, Geriatric Depression Scale, and UCLA Loneliness Scale 3. To classify sarcopenia, we followed the guidelines of the Korean Working Group on Sarcopenia, 2023. (Figure 1)

Results

Variables measured before and after the project are illustrated in Table 1. The residents who participated in the intervention program provided by the center showed significant effects in decreased SARC-F 0.9 ± 1.96, increased thigh circumference 2.0 ± 3.66, reduced depression and loneliness scale when comparing pre- and post-intervention. Upon further regional analysis, residents in A exhibited improvements in sarcopenia, SMI scores, hand grip strength, sit-to-stand performance, SARC-F scores, thigh circumference, as well as reductions in depression and loneliness. However in B, improvements similar to those in A were observed in sarcopenia and SMI scores, hand grip strength, sit-to-stand performance, and thigh circumference did not exhibit significant. (Table 2)

Figure 1. Algorithm for sarcopenia evaluation

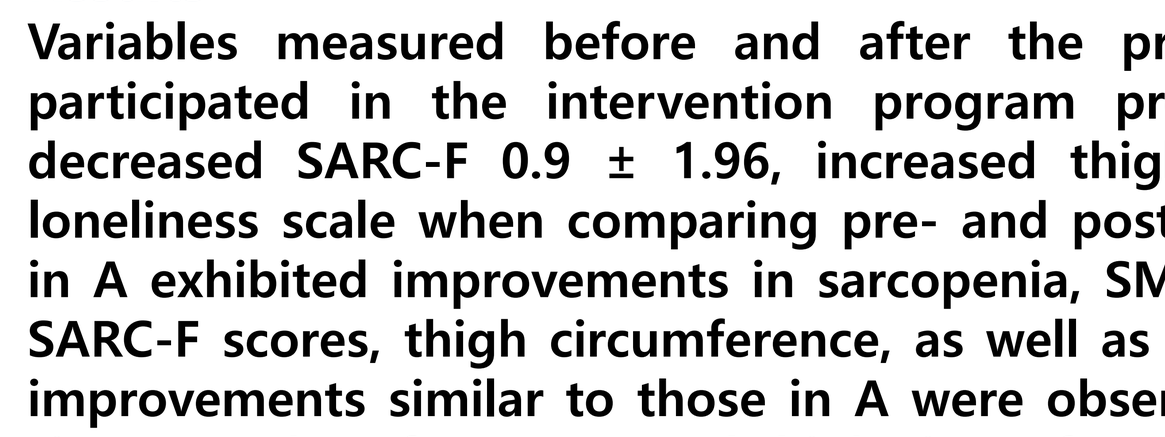

Table 1. Comparison of Pre and Post Exercise Programs

Factor	Pre (n=43)	Post (n=43)	Pre-Post	t	*p* value
SMI (kg/cm²)	7.2±0.90	7.1±0.84	-0.01±0.70	-0.112	.911
Hand grip strength (kg)	20.6±5.50	21.0±6.76	0.45±6.55	0.451	.654
Sit to stand (sec)	10.7±3.60	10.4±3.75	-0.27±3.91	-0.444	.659
Thigh circumference (cm)	32.1±2.64	34.1±3.63	2.0±3.66	3.592	.001
SARC-F	2.4±2.25	1.4±1.79	-0.9±1.96	-3.272	.002
Geriatric Depression scale	6.7±4.30	4.6±4.01	-2.16±3.80	-3.728	.001
UCLA Loneliness Scale 3	4.3±1.70	4.0±1.50	-0.37±1.20	-2.041	.048

Data are presented as mean difference (95% CI).
* p-value within group changes < 0.05

Table 2. Comparison of Pre and Post Exercise Programs across regions

Factor		A region		B region		C region	
		Pre (n=17)	Post (n=14)	Pre (n= 17)	Post (n=17)	Pre (n=16)	Post (n=12)
Sarcopenia	Normal	10 (58.8)	10 (71.4)	13 (76.5)	14 (82.4)	15 (93.8)	10 (83.3)
	Functional sarcopenia	2 (11.8)	1 (7.1)	4 (23.5)	3 (17.6)	0	2 (16.7)
	Sarcopenia	5 (29.4)	3 (21.4)	0	0	1 (6.3)	0
SMI (kg/cm²)	Normal	6 (35.3)	10 (71.4)	17 (100.0)	17 (100.0)	15 (93.8)	12 (100)
	Abnormal	11 (64.7)	4 (28.6)	0	0	1	0
Hand grip strength (kg)	Normal	5 (29.4)	9 (64.3)	12 (70.6)	9 (52.9)	10 (62.5)	9 (75.0)
	Abnormal	12 (70.7)	5 (35.7)	5 (29.4)	8 (47.1)	6 (37.5)	3 (25.0)
Sit to stand (sec)	Normal	11 (64.7)	12 (85.7)	11 (64.7)	14 (82.4)	12 (75.0)	6 (50.0)
	Abnormal	6 (35.3)	2 (14.3)	6 (35.3)	3 (17.6)	4 (25.0)	6 (50.0)
Thigh circumference (cm)	Normal	8 (47.1)	9 (64.3)	3 (17.6)	8 (47.1)	6 (37.5)	10 (83.3)
	Abnormal	9 (52.9)	5 (35.7)	14 (82.4)	9 (52.9)	10 (62.5)	2 (16.7)
SARC-F	Normal	9 (52.9)	10 (71.4)	6 (35.3)	12 (70.6)	9 (56.3)	11 (91.7)
	Abnormal	8 (47.1)	4 (28.6)	11 (64.7)	5 (29.4)	7 (43.8)	1 (8.3)
Geriatric Depression Scale	Normal	3 (17.6)	9 (64.3)	7 (41.2)	8 (47.1)	8 (50.0)	7 (58.3)
	Mild	8 (47.1)	4 (28.6)	6 (35.3)	5 (29.4)	2 (12.5)	3 (25.0)
	Moderate	5 (29.4)	1 (7.1)	4 (23.5)	4 (23.5)	6 (37.5)	2 (16.7)
UCLA Loneliness Scale 3	Normal	15 (88.2)	13 (92.9)	11 (64.7)	13 (76.5)	12 (75.0)	10 (83.3)
	Abnormal	2 (11.8)	1 (7.1)	6 (35.3)	4 (23.5)	4 (25.0)	2 (16.7)

* Abnormal cut off
SMI, male < 7.0kg or female <5.7kg ; Hand grip strength, male < 28kg or female < 18kg, Sit to stand, >11sec, Thigh circumference, male < 34cm or female <33cm, SARC-F, >3
* Geriatric Depression Scale, 0~4 : normal, 5~9 : mild, 10~15 : moderate
* UCLA Loneliness Scale 3, 3~5 : normal, 6~0 : abnormal

Conclusion

The measurements of limb muscle mass, grip strength, and chair stand tests—key indicators for diagnosing sarcopenia—did not exhibit improvements, indicating that the 6-week duration may be insufficient to elicit enhancements in muscle strength. It suggests a need to increase both the intensity and the duration of the exercise regimen. Furthermore, the program showed potential in ameliorating feelings of loneliness and depression among the elderly. The variations in outcomes across regions are likely due to differences in the scale and resources of community, as well as the characteristics of the visitors. Instead of a one-size-fits-all program, it's necessary to develop customized programs tailored to each region, following a clear understanding of the project's purpose.