Efficacy of the Project Healthy Bones Program in an Elderly Community

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"The research reported on this poster was supported by Francis E. Parker Memorial Home, Inc. Grant program. The investigators retained full independence in the conduct of this research."

Background

Osteoporosis is a disease characterized by low bone mineral density. Proper nutrition, exercise, and fall prevention strategies can minimize osteoporotic fractures.

Project Healthy Bones (PHB) is a 24-week exercise and education program supported by the New Jersey Department of Human Services, Division of Aging Services. It is a peer-led course designed for older adults with or at risk for osteoporosis. Over 2000 elderly New Jersey residents have participated in the program.

The exercises in PHB focus on posture, balance, strength, and flexibility. The education sessions are interactive and focus on osteoporosis, nutrition, and fall prevention. This program currently runs in a community setting.

Objectives

To evaluate:

1. the benefits of PHB in an elderly community

2. the implementation of PHB in an assisted living setting

Methods

- Inclusion Criteria: Members of the Francis E. Parker Memorial Home's assisted living, adult day care, and community programs with a medical clearance and a Mini Mental Status Exam (MMSE) score greater than 20 were included.
- Survey Tool Questions: Patient demographics, medical history, apathy evaluation scale, fear of falling survey, nutrition log, osteoporosis/nutrition/fall prevention quizzes, exercise and attendance log, and PHB evaluation surveys were collected.
- Geriatric Fitness Assessments: The function reach, occiput to wall, timed up and go, four step square, thirty second chair stand, tandem stand, single leg stand tests were done at baseline, midpoint, and at the end of the program.
- Each class included 60 minutes of exercise and 30 minutes of education.
- Educational demonstrations, notes of encouragement, rewards, samples of nutritious food, prizes, and reminders were used to promote participation.
- Statistical analysis: The data for each subject were organized on an Excel spreadsheet. Baseline and post study data were analyzed using paired t- tests and regressions of change scores within the R statistical environment.
- Three Parker Home staff members were trained to continue the program.

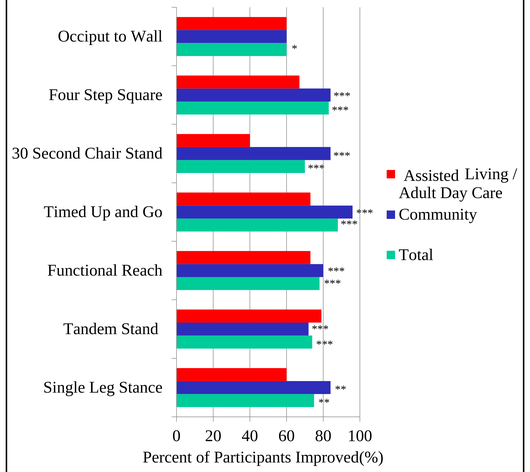
Results

Table 1. Demographics

	Participants		
	Total	**Community**	**Assisted Living**
	N=42	N=25	N=17
Female (%)	78.6	92.0	58.8
Caucasian (%)	88.1	92.0	76.5
Age (years)	80.6±9.0	76.4±8.5	86.6±5.7
MMSE Score	28.1±2.4	29.0±1.3	26.9±3.0
Apathy Score[a]	25.0±4.4[b]	24.6±4.0	26.7±4.9[c]
Medications/participant[d]	5.3±3.8	4.3±3.4	6.8±4.1
Health Status scale[d,e]	1.7±0.8	1.5±0.8	2.0±0.7
Participants with a DXA	22	19	3
Osteopenia/Osteoporosis[f]	84.2%	81.3%	100.0%
Classes/participant	21.0±3.2	21.4±3.0	20.3±3.5

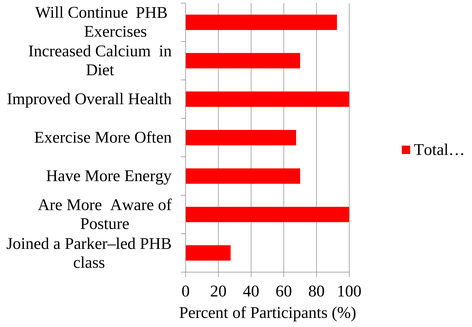
[a] Higher score = More apathy, 28 is the norm, [b] N=33, [a] N=8, [d] Values are self reported, [e] 0=Excellent, 1=Very Good, 3=Good, 4=Fair, 5=Poor, [f] Includes only participants with a DXA scan.

Figure 1. Geriatric Fitness Assessments Results



P values comparing before and after means*** p< 0.001, ** p < 0.01, *p < 0.05

Figure 2. Post Survey Results



All values are self reported; As of September 2014, two Parker-led classes have been held with a limited class size of ten participants.

Table 2. Pre/Post Questionnaire Results

Survey	Baseline	Final
Quizzes improved 17%***	70	87
Fear of falling scale (1-10) improved 15%*	5.0±2.4	4.3±2.7
Mean calcium greater than goal (mg)[a]	2078±360	1282±680
Mean Calcium less than goal (mg)	777±167	1007±340
Arm Weights (lbs)[b, ***]	0	3.0±1.3
Leg Weights (lbs)[b, ***]	0	2.9±1.2

[a] goal 1200 mg calcium per day. Improved by reducing calcium supplements and enhancing diet.
[b] maximum weight allowed is 5lb for arms and 10lb for legs in 24 weeks. ***p< 0.001, **p < 0.01, *p < 0.05

Discussion

- Forty of the 53 participants (6 men; 34 women, average age 80.3+9.1) completed the program with an average attendance rate of 88%. Two dropped out after midpoint tests due to health problems and eleven dropped after a few classes.
- Knowledge (bone health, fall prevention, nutrition), diet, fear of falling, strength, posture, flexibility, balance, and overall function improved. This may prevent or slow down the progression of their osteoporosis. The participants may also have a lower risk of falls and fractures by improving their balance through this program.
- Participants did not improve on variations of the single leg stance (eyes closed and balance pad). Thus, it may be beneficial to incorporate additional exercises aimed at increasing balance on uneven surfaces and in the dark.
- Twelve week data were significant in the assisted living/day care group but not 24 weeks. Community members may have manifested greater improvement because they were able to use heavier weights.
- Extra precautions were exercised to maintain safety in the assisted living and adult day care members.
- Assisted living members needed extra encouragement and class reminders.
- Improvement was significantly greater in subjects with a lower age on the chair stand and with a lower number of medications for the single leg stand with eyes closed. MMSE was associated with improvement.**
- The Parker Home was successful in implementing a staff run PHB class for the community members. This program is offered for 10 weeks rather than 24 weeks because of the long waiting list. Participants suggested half hour classes twice a week rather than the standard one-hour classes once a week.

Conclusion

- PHB is beneficial and well received in an elderly community.
- Frail members should be encouraged to join programs such as PHB in order to maintain physical health. Modifications to improve compliance would be beneficial in the assisted living setting.

References

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Poster Created: March 17, 2015