

Adding Life to Longevity Dividend Years : The Fit & Strong! Experience



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Goals of Presentation:

1. Review 'active life expectancy'
2. Review Fit & Strong! (design, components)
3. Describe evidence-base supporting QoL impact; reduction of disability
4. Describe latest developments- new diet version and CMS evaluation.

Fit and Strong!



Active Life Expectancy

- Aging of America an incredible success story in terms of longevity increases *but*
- Increased number of years in and of itself not sufficient
- What matters (in terms of older adults themselves, caregivers and the U.S. budget) is:
 - Will people survive *and be functional* before death OR
 - Will they *experience prolonged periods of disability* prior to death??? e.g., can we compress the period of morbidity by increasing *active* life expectancy vs. life expectancy alone (Fries, 1989)?

Why We Developed Fit and Strong!

- Earlier prospective, longitudinal study of 600 older adults in Chicago (GeriMAC)
- Supported by NIAMS, NU MAC
- Found:
 - Arthritis is the number one cause of disability
 - *Lower extremity joint impairment*, in particular, is a *risk factor for future disability* (Dunlop, Hughes et al., 1998) – classification tree analysis
 - Is exercise the answer???



Osteoarthritis (OA) and Exercise

- Literature: People with OA have decreased *aerobic functioning* and *decreased muscle strength* compared to age-matched controls (Minor et al., 1989; Semble et al., 1990).
- Decreased activity due to pain leads to sedentary behavior: aerobic de-conditioning, muscle erosion, further joint stiffening.
- Indicates exercise interventions must encompass
 - flexibility,
 - aerobic conditioning, and
 - strength training



To Maintain Activity Over Time, Adherence Literature Suggests:

- Include education component geared to increasing self-efficacy
- **Self Efficacy:**
 - Confidence that you can perform a task
 - Belief that if you perform it, you will achieve a *personally meaningful* outcome
(Bandura, 1977, 1982)



Fit & Strong!

Lifestyle Change = Exercise + Education

- Can't just tell people to exercise and teach them how
- Need to review what exercise means to them in context of their lives
 - prior experience
 - concerns about safety
 - facilitators and barriers
 - problem solving



Fit & Strong! Program Components

- **Multiple component** physical activity / behavior-change program for older adults with lower-extremity pain and stiffness
- 8-weeks
- 3 sessions per week, 90 minutes per session
 - First 60 minutes = physical activity
 - Last 30 minutes = group discussion / problem solving
- Participant Adherence Contracts



Bandura 1989, 2001

- Include education component
- Theory-based behavior change
 - Social Cognitive Theory
 - Self Efficacy:
 - Confidence that you can perform a task
 - Belief that if you perform it, you will achieve a *personally meaningful* outcome (Bandura, 1977, 1982)

Social Cognitive Theory



Evidence Base: Completed Research

- Efficacy Trial: Tested safety and efficacy
- Effectiveness Trial: Tested effectiveness and maintenance
- Dissemination Study: Tested implementation and dissemination across heterogeneous group of settings and geographic regions



Fit & Strong! Efficacy Trial

Randomized Controlled Trial assessed impact on:

- Lower extremity disability, pain and stiffness (WOMAC)
- 6-minute distance walk (surrogate for aerobic capacity)
- Sit-stand test (lower-extremity muscle strength)
- Self efficacy for exercise, exercise adherence, and arthritis management
- Exercise participation at 2, 6 and 12 months



Significant Outcomes Favoring Treatment Group (N=215)

2 Months	6 Months	12 months
Adherence	Adherence	Adherence
SE for Exercise	SE for Exercise	SE for Exercise
	Time Adherence Efficacy	Time Adherence Efficacy
	SE for Arthritis Pain Management (borderline)	
WOMAC Stiffness	WOMAC Stiffness	WOMAC Stiffness (borderline)
	WOMAC Pain	
	Geri-AIMS Pain	Geri-AIMS Pain (borderline)



Fit & Strong!

Efficacy Study Effect Sizes

	Treatment Group		
	2 months	6 months	12 months
Self Efficacy			
Exercise	0.78	0.80	0.91
Time Adherence		0.76	0.71
Pain Management		0.65	
Geri-AIMS			
Pain		0.25	0.19
WOMAC			
Pain		-0.47	
Stiffness	-0.33	-0.35	-0.21
Adherence			
Total Exercise Minutes	0.86	0.71	0.67



Fit & Strong! Effectiveness Trial

- 2003-2008, funded by NIA to test different ways of reinforcing maintenance of PA after Fit and Strong! ends
- Added 536 older adult participants
- Replicated in 7 Chicago Department on Aging Senior Centers
- Outcomes assessed at baseline, 2, 6, 12, and **18** months



Effectiveness Trial Significant Effects: Physical Activity Maintenance (N = 486)

2 Months	6 Months	12 months	18 months
Caloric Expenditure (all)	Caloric Expenditure (all)	Caloric Expenditure (all)	
Caloric Expenditure (moderate)			
Frequency of PA (all)	Frequency of PA (all)	Frequency of PA (all)	Frequency of PA (all)
Frequency of PA (moderate)	Frequency of PA (moderate)	Frequency of PA (moderate)	Frequency of PA (moderate)



Other Significant Outcomes (N=486)

2 Months	6 Months	12 months	18 months
LE Stiffness	LE Stiffness	LE Stiffness	
LE Pain		LE Pain	LE Pain
LE Physical Function	LE Physical Function	LE Physical Function	
LE strength	LE strength		LE strength
Mobility	Mobility	Mobility	Mobility
Depression		Depression	
Anxiety	Anxiety	Anxiety	Anxiety
Depression/Anxiety	Depression/Anxiety	Depression/Anxiety	Depression/Anxiety



Implications

- Impaired LE strength is risk factor for falls
- Impaired LE mobility is risk factor for falls *and for mortality* (Studenski et al., 2010)
- Walking speed diminishes with age; F&S *reverses this trend* in group at high risk for future disability *and benefit is maintained over time.*

Dissemination and Translation Study

- Centers for Disease Control and Prevention (CDC) R18 grant to test translation of Fit and Strong! in IL and NC
- Enabled us to develop interactive website; track attendance and outcomes.
- Developed implementation guidelines and procedures to assure program fidelity
- Developed trainings for T Trainer, Master Trainer and Instructors
- Finalized instructor and participant manuals



Dissemination Findings: Effectiveness Participant Outcomes

	Baseline Mean	2-Month Mean	N	p-value
WOMAC Pain	5.05	4.28	308	0.000
WOMAC Stiffness <u>T-Test Results</u>	2.80	2.51	326	0.000
Energy/ Fatigue - SF 36	2.63	2.99	307	0.000
Lorig Self-Efficacy for Exercise	6.49	7.45	336	0.000
RAPA Aerobic	2.98	3.26	214	0.008
RAPA Strength and Flexibility	2.48	2.77	174	0.000



Currently...

- Instructors Trained = **212**
 - T Trainers = **2** ; Master Trainers = **8**
- Number of Sites that have implemented Fit & Strong! = **60**
- Total number of participants who have completed Fit & Strong! = **4107**
- Offering in 6 states (IL, NC, TX, MI, AZ and OR)
- Hispanic version of Fit and Strong! (¡Fuerte y en Forma!) now available
- Plans to implement in Portugal and Lithuania
- Participating in prospective CMS evaluation regarding impact on Medicare reimbursement



New Weight Management Version

- Participants on South Side asked for diet help
- Osteoarthritis symptoms exacerbated by obesity
- Weight loss of 5.1 kg over a 10-year period decreases the odds of developing knee OA by more than 50% (Felson 1992)
- Currently, no evidence-based program exists that combines physical activity with weight loss for overweight/obese older adults with OA



Fit & Strong! Plus

- Comparative effectiveness trial examining whether Fit & Strong! is more effective with an added *weight management/dietary change* component
- 5-year R01 funded by National Institute on Aging



Fit & Strong! Plus Study Aims

1. Determine whether Fit and Strong! Plus produces statistically significant superior
 - dietary changes at 8 weeks
 - 5% weight loss at 6 months that is maintained at 18 months
2. Assess the comparative impact of the two programs at baseline, 2, 6, 12, and 18 months on
 - Primary Outcomes:
 - dietary change and weight loss
 - Secondary:
 - exercise participation; Lower Extremity (LE) pain, stiffness, function, strength (time-sit-stand); aerobic capacity (6-minute distance walk); self-efficacy for eating and physical activity behaviors; and anxiety and depression
3. Exploratory: Impact of each program on *perceived need for hip or knee replacement surgery and health care use and cost* (Medicare data)

Preliminary Study

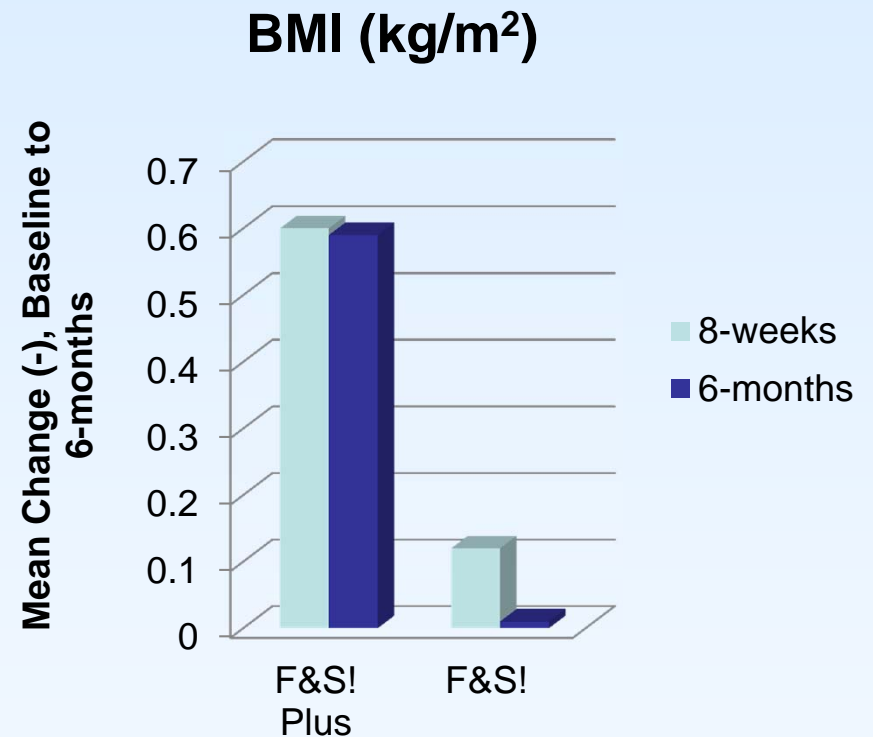
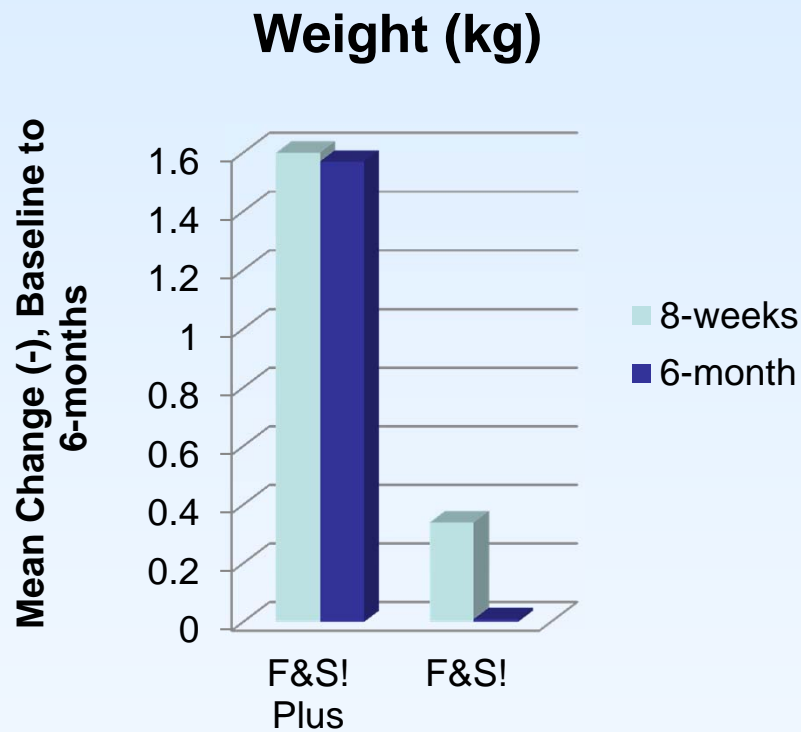
Outcomes (N=130, baseline, 2 and 6 months)

	Baseline ^a		Change, Baseline to Post-intervention ^a			Change, Baseline to 6-month follow-up ^a		
	F&S! Plus Mean	F&S Mean	F&S! Plus ^b Mean	F&S ^b Mean	p	F&S! Plus ^b Mean	F&S ^b Mean	p
Weight, kg	92.7	93.3	-1.60***	-0.34	.004	-1.57***	-0.01	.01
BMI, kg/m ²	34.7	34.4	-0.60 ***	-0.12	.02	-0.59***	-0.01	.01
WOMAC OA Index ^c								
<i>LE Pain, range 0-20</i>	6.0	6.4	-1.35**	-0.84*	.38	-1.73***	-1.42**	.65
<i>LE Stiffness, range 0-8</i>	3.2	3.1	-0.79***	-0.25	.07	-0.84***	-0.39	.12
<i>LE Physical function, range 0-68</i>	20.1	19.4	-5.94***	-3.00*	.09	-7.00***	-2.25	.02
Chair stands in 30 sec ^d	8.1	7.5	1.87***	1.66***	.67	1.96***	2.06***	.85
Six-minute distance walk, ft	1156	1089	136.0***	55.2*	.03	71.2	24.2	.35
Physical activity score ^e	94.8	84.7	25.9***	9.2	.11	25.5**	25.7**	.99
Anxiety/Depression ^f	2.2	2.5	-0.38*	-0.41**	.88	-0.46**	-0.15	.18

Baseline: N=130; post-intervention: N=122; 6 months: N=108. Ns slightly lower due to missing data for the chair stand, distance walk, and physical activity score.

^b *p<.05; **p<.01; ***p<.001 from paired t-test for change greater than 0 within each group.

Participant Study Outcomes



Latest development....

- F&S is serving as an “anchor” program in CMS prospective evaluation of suitability for Medicare reimbursement

CMS Prospective Evaluation

- Mandated by Congress/ part of ACA
- Conducted by Acumen and Westat
- Evaluation of EB wellness programs
- Examine the health and wellbeing of participating beneficiaries and cost outcomes for Medicare
- 1-year Evaluation (10/2014 - 9/2015)
- F&S! is one of 7 programs invited to participate nationally
- Enroll 2000 new participants in 12 months

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