Multi-session self-care training improves knowledge, self-efficacy and self-care behaviors for low and high-literacy patients with heart failure

George M. Holmes, Darren A. DeWalt, David W. Baker, Bernice Ruo, Victoria Hawk, Kimberly Broucksou, Dean Schillinger, Kirsten Bibbins-Domingo, Aurelia Macabasco-O'Connell, Morris Weinberger, Brian Erman, Michael E. Pignone

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THE UNIVERSITY of NORTH CAROLINA at CHAPEL HILL

NORTHWESTERN UNIVERSITY FEINBERG SCHOOL OF MEDICINE 1859

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AT SAN FRANCISCO GENERAL HOSPITAL AND TRAUMA CENTER

Heart Failure Common and Costly Condition

- Heart failure common condition with significant burden of disease[1]
  - 5.7 million with condition
  - 1.1 million admissions (2006)
  - 292,000 annual deaths
  - $37.2b annual direct and indirect cost

[1] AHA. Heart Disease and Stroke Statistics – 2009 Update.

Self-management training can be effective

- Self-management training programs have demonstrated
  - fewer hospitalizations
  - lower mortality
  - improved health-related quality of life
- Optimal program is unclear
  - dose?
  - mode?
  - population to target?

Self-management training programs

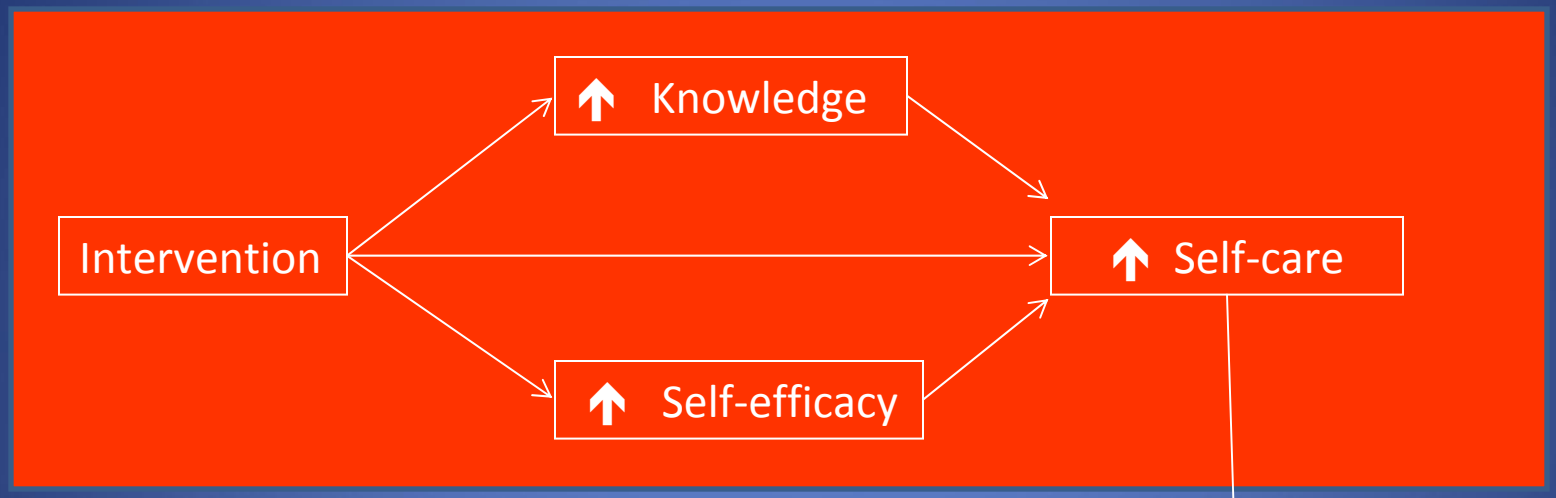
- Self-management training programs vary considerably, but often address
  - general HF knowledge,
  - salt knowledge,
  - self-care skills,
  - medication adherence, and
  - exercise

Patients with Low Literacy at Risk

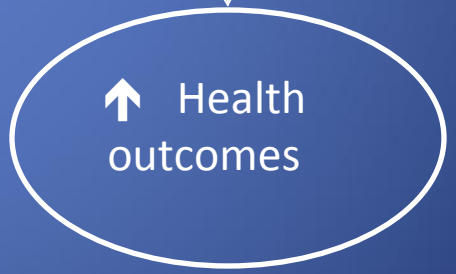
- Low literacy confers risk for
  - all-cause mortality
  - all-cause hospitalization
  - heart failure hospitalization
- Well designed self-management training may mitigate the relationship between literacy and heart failure hospitalization[1,2]
- Mixed evidence suggesting programs may be more effective among disadvantaged populations
- Whether the optimal amount of heart failure self-management training differs by literacy level is not known

[1]Murray et al. Ann Intern Med. 2007;146(10):714-725
[2]DeWalt et al. BMC HSR 2006; 6:30

Conceptual Model

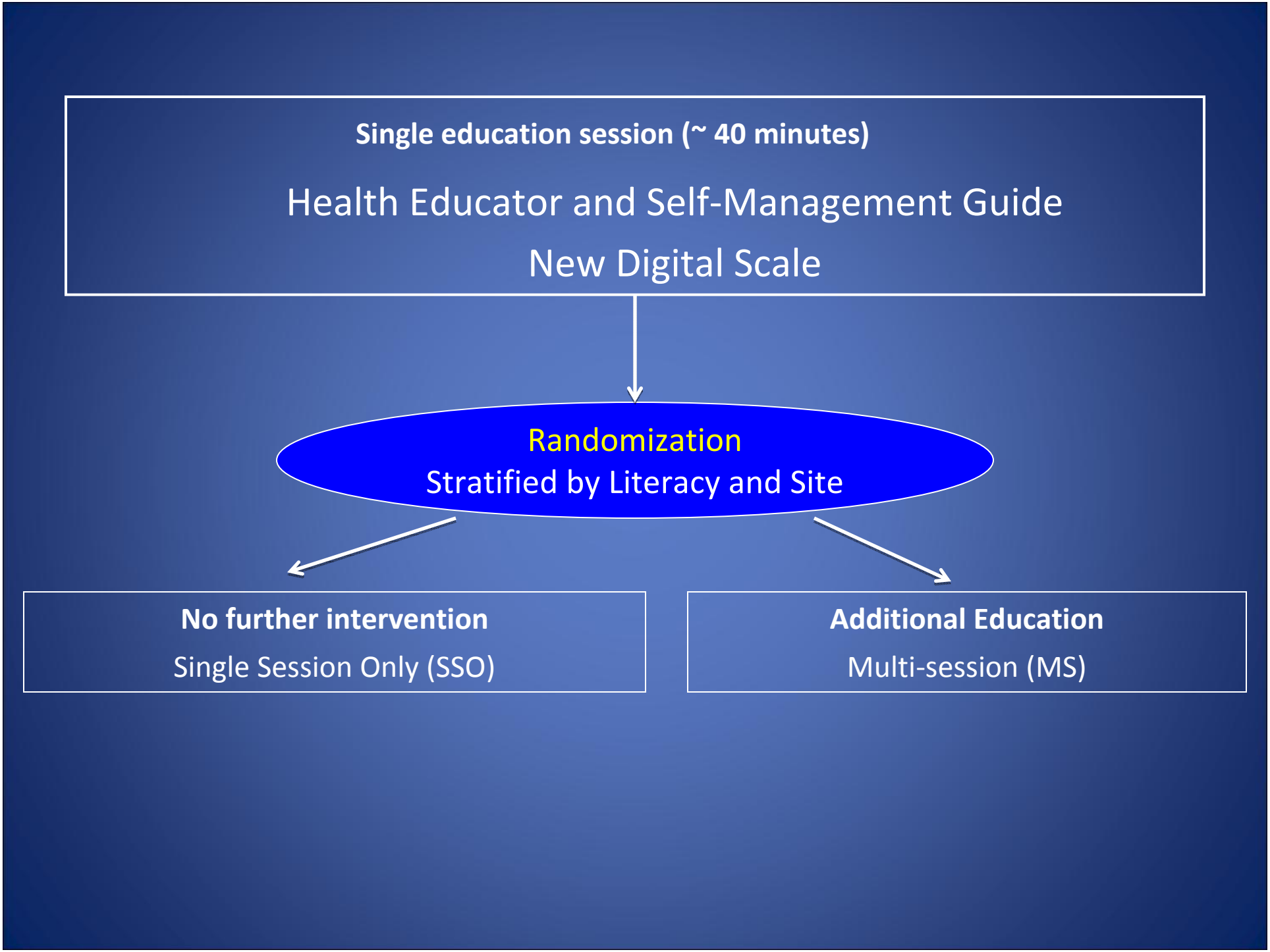


Focus of this talk



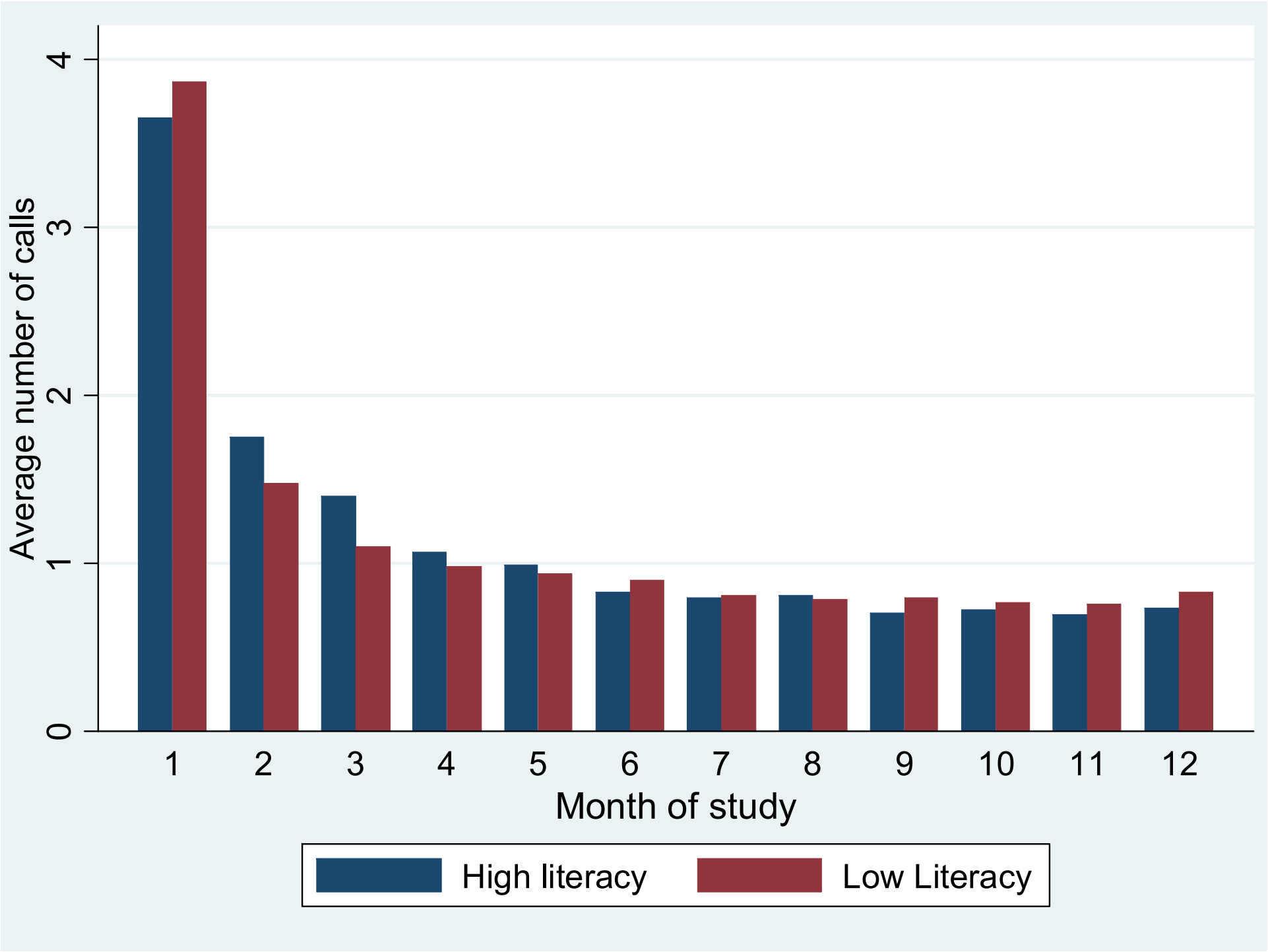
Specific Aim

- To determine in a randomized trial whether those assigned a higher amount of self-management training had more durable improvements in self-management measures than those receiving a single session, and whether the durability varied by literacy


Single education session (~ 40 minutes)
Health Educator and Self-Management Guide
New Digital Scale
Randomization
Stratified by Literacy and Site
No further intervention
Single Session Only (SSO)
Additional Education
Multi-session (MS)

Intervention design

- Intervention was designed as “teach to mastery”
  - Delivered telephonically by trained health educators
  - More calls in the beginning of the study period, tapered off over time
  - Median number of calls was 14.2 and did not vary by literacy level
    - 3.8 calls in first month, 1.1 per month in next 5 months, and .8 calls per month in the last 6


Average number of calls
0
1
2
3
4
1
2
3
4
5
6
7
8
9
10
11
12
Month of study
High literacy
Low Literacy

Study Sites and Eligibility

- Study Sites – 4 medical centers
  - University of North Carolina at Chapel Hill
  - Feinberg School of Medicine, Northwestern
  - UC San Francisco, San Francisco General Hospital
  - Olive View-UCLA Medical Center

- Eligibility criteria (N=605)
  - Clinical diagnosis of HF, ≥ 1 supportive test result
  - Symptomatic HF (NYHA II-IV) in the past 6 months
  - Current use of a loop diuretic
  - Fluent in English or Spanish
  - Literacy assessed by s-TOFHLA: Inadequate & Marginal = “Low literacy”, n = 225 (37%)

Outcomes

- General HF Knowledge[1] (8 items, α=.66)
  - "What is heart failure?"
- Salt Knowledge[1] (10 items, α=.36)
  - "Do hot dogs have a lot of salt?"
- Self-efficacy[2] (10 items, α=.73)
  - "How sure are you that you know when body has too much or too little fluid?"
- Self-care (10 items, α=.55)
  - "How often do you weigh yourself?"

Blinded measurement at baseline, 1, 6, 12 months

- 1 month improvement already identified[3]

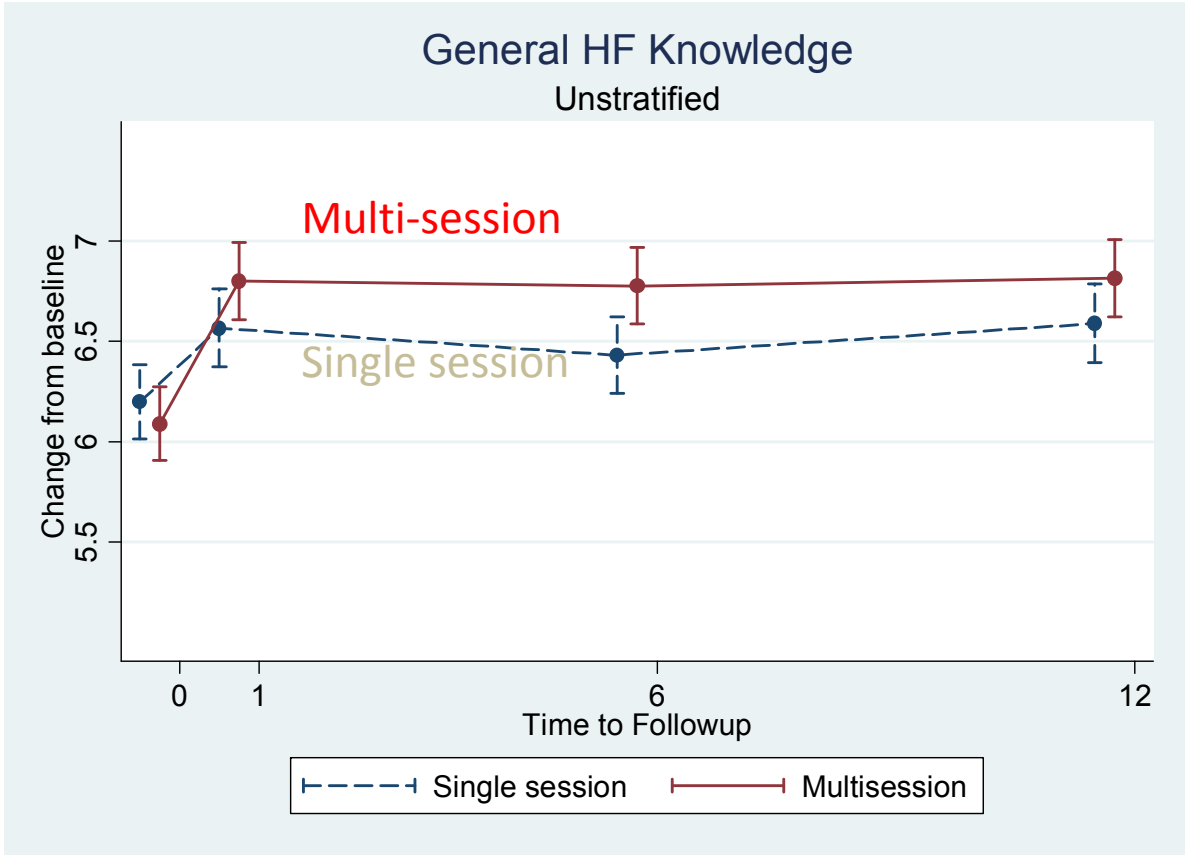
[1] Baker et al. *J Cardiac Failure.* 2005. [2] DeWalt et al. *BMC HSR.* 2009. [3] Baker et al. *J Cardiac Failure.* 2011

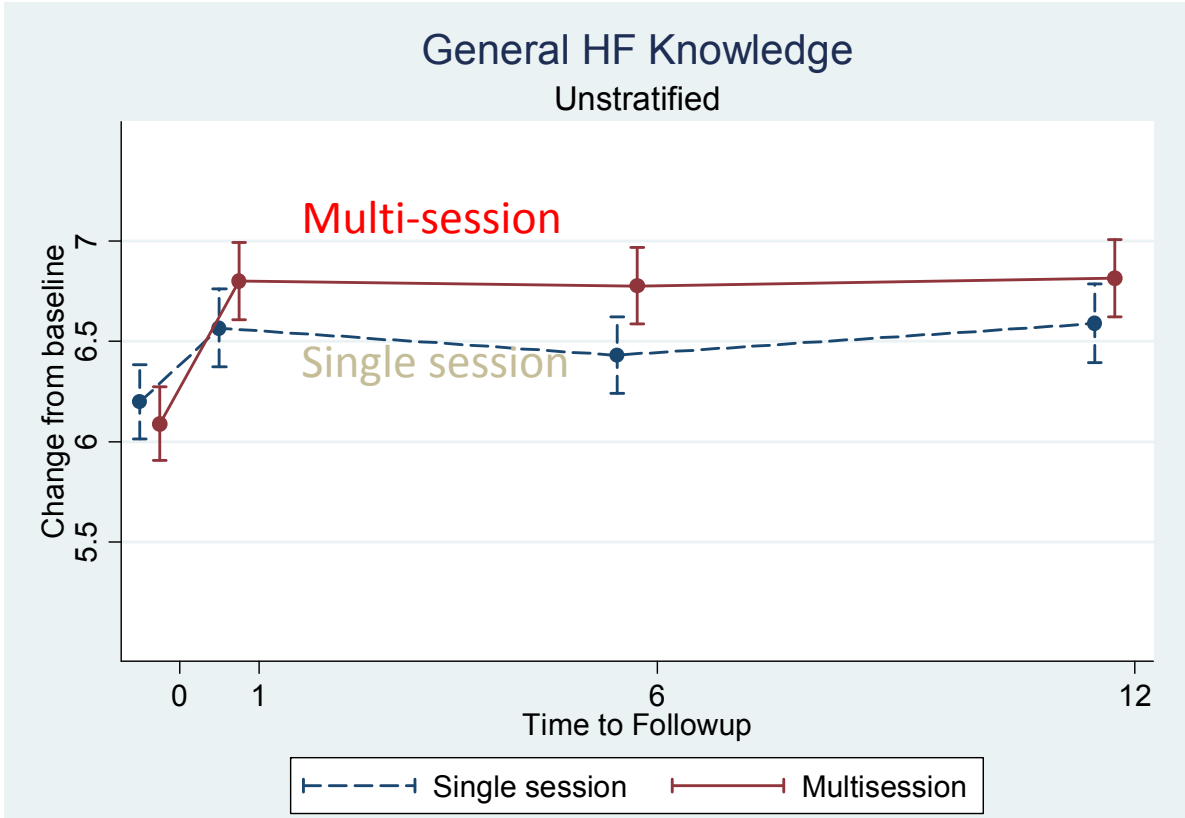
Method

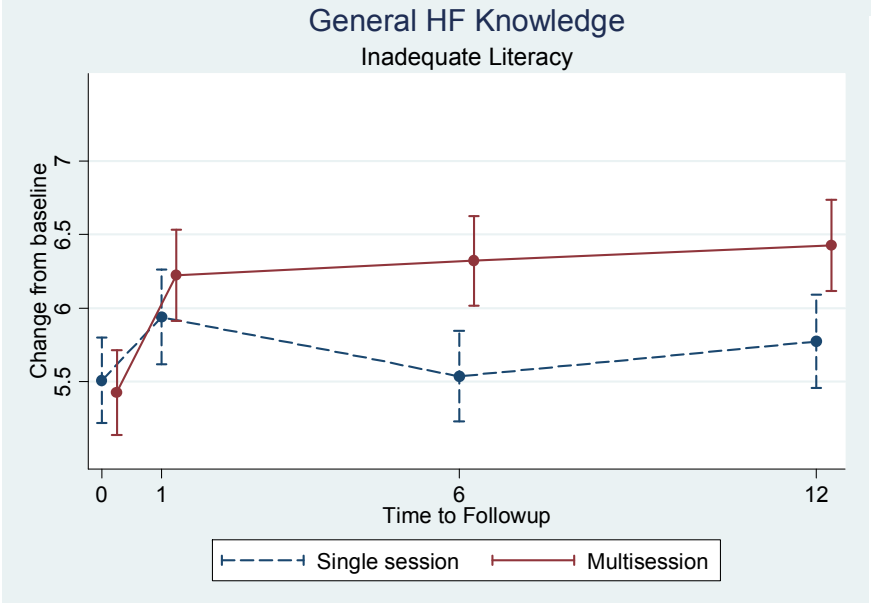
- Generalized Estimating Equations account for repeated measures
  - "Fully saturated" models: study arm X time X literacy = 2 * 4 * 2 = 16 variables
  - Parsimonious models developed by testing interactions

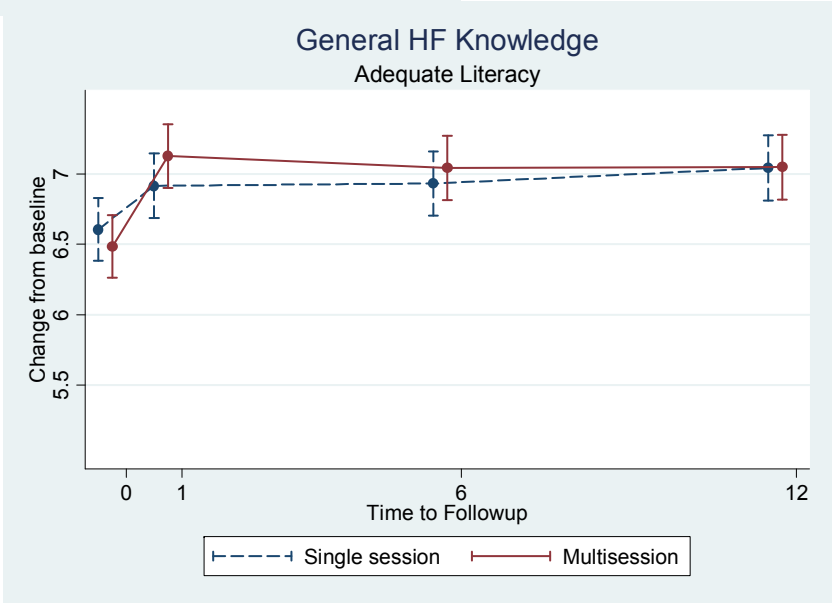
Participant Sociodemographics

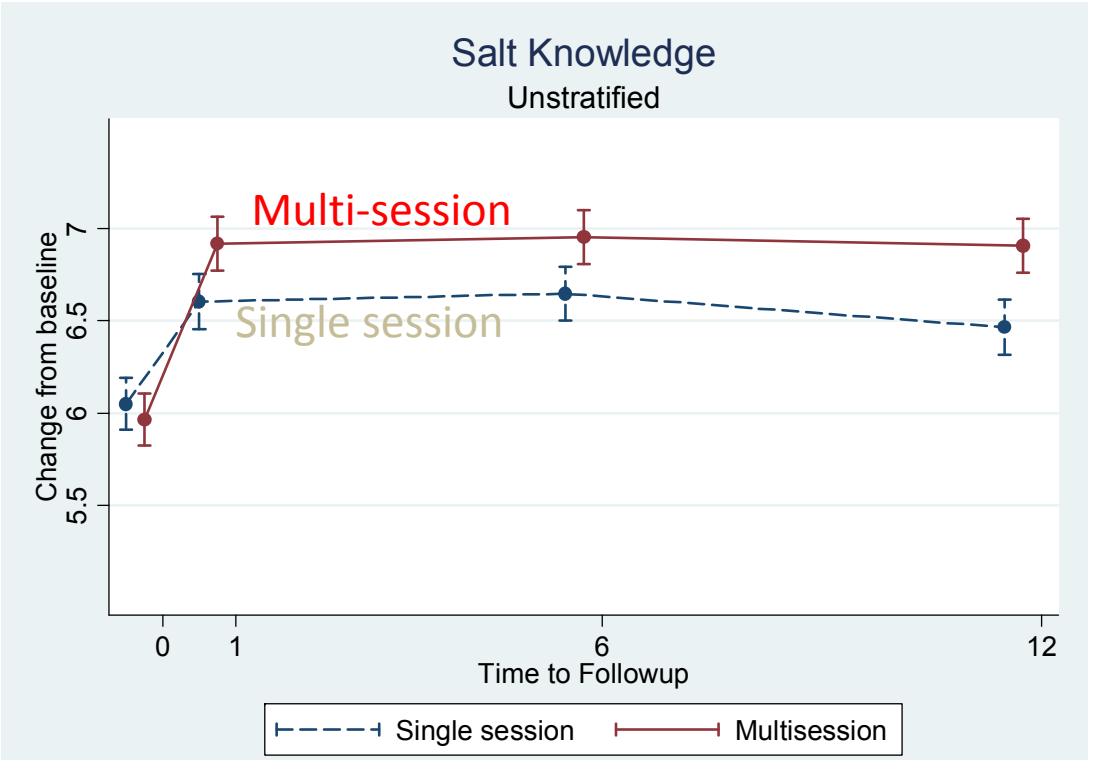
	Single Session Only (N=302)		Multi-session (N=303)		p
Age, mean ± SD	60.3	± 12.3	61.1	± 13.8	0.49
Race/Ethnicity, N (%)					0.73
White, non-Hispanic	122	(40)	111	(37)	
African American	114	(38)	118	(39)	
Hispanic	43	(14)	54	(18)	
Male, N (%)	156	(52)	158	(52)	0.90
Language: English, N (%)	261	(88)	261	(87)	0.67
Low Literacy, N (%)	112	(37)	113	(37)	0.96
< 12 yrs education, N (%)	78	(26)	82	(27)	0.73
Subjective Social Status, mean ±SD (Range 1-10)	5.0	±2.4	4.6	± 2.6	0.02

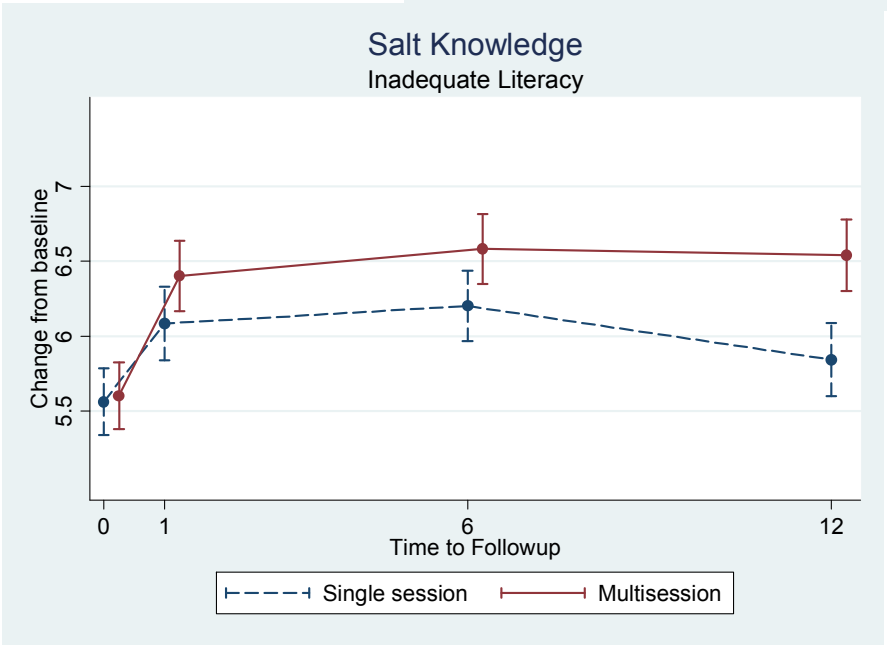

General HF Knowledge
Unstratified
Multi-session
Single session
Change from baseline
5.5
6
6.5
7
0
1
6
12
Time to Followup
Single session
Multisession

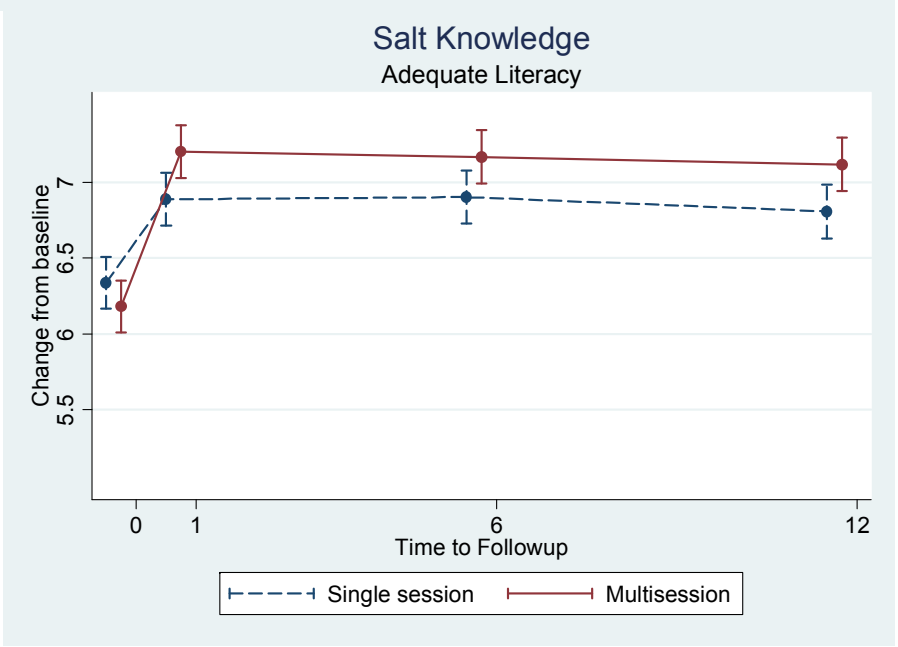

General HF Knowledge
Unstratified
Multi-session
Single session
Change from baseline
5.5
6
6.5
7
0
1
6
12
Time to Followup
Single session
Multisession

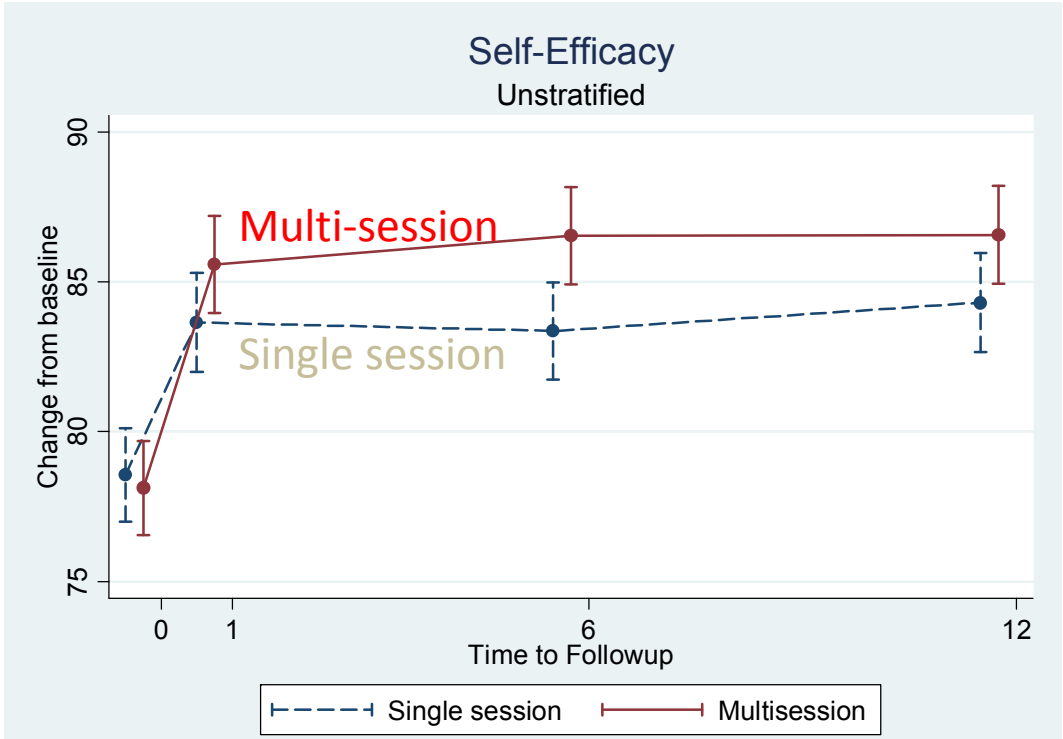

General HF Knowledge
Inadequate Literacy
Change from baseline
5.5
6
6.5
7
0
1
6
12
Time to Followup
Single session
Multisession

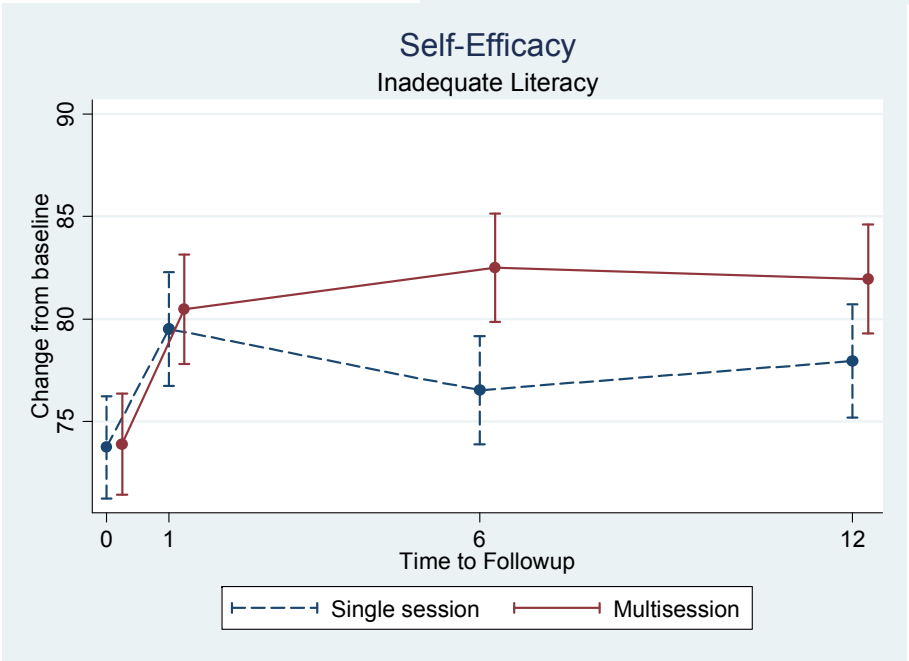

General HF Knowledge
Adequate Literacy
Change from baseline
5.5
6
6.5
7
0
1
6
12
Time to Followup
Single session
Multisession

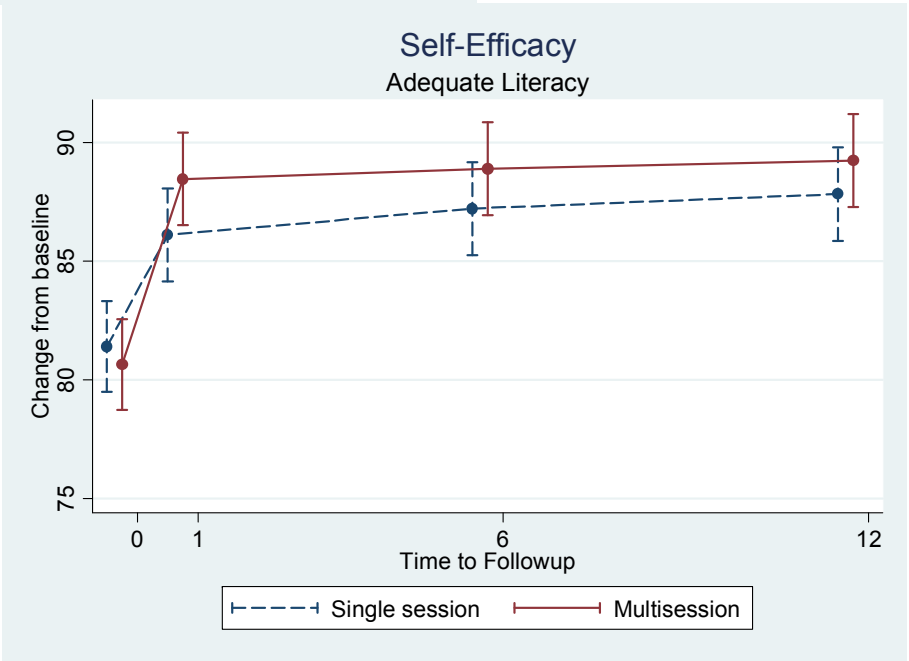

Salt Knowledge
Unstratified
Multi-session
Single session
Change from baseline
5.5
6
6.5
7
0
1
6
12
Time to Followup
Single session
Multisession


Salt Knowledge
Inadequate Literacy
Change from baseline
5.5
6
6.5
7
0
1
6
12
Time to Followup
Single session
Multisession


Salt Knowledge
Adequate Literacy
Change from baseline
5.5
6
6.5
7
0
1
6
12
Time to Followup
Single session
Multisession


Self-Efficacy
Unstratified
Multi-session
Single session
Change from baseline
75
80
85
90
0
1
6
12
Time to Followup
Single session
Multisession


Self-Efficacy
Inadequate Literacy
Change from baseline
75
80
85
90
0
1
6
12
Time to Followup
Single session
Multisession


Self-Efficacy
Adequate Literacy
Change from baseline
75
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1
6
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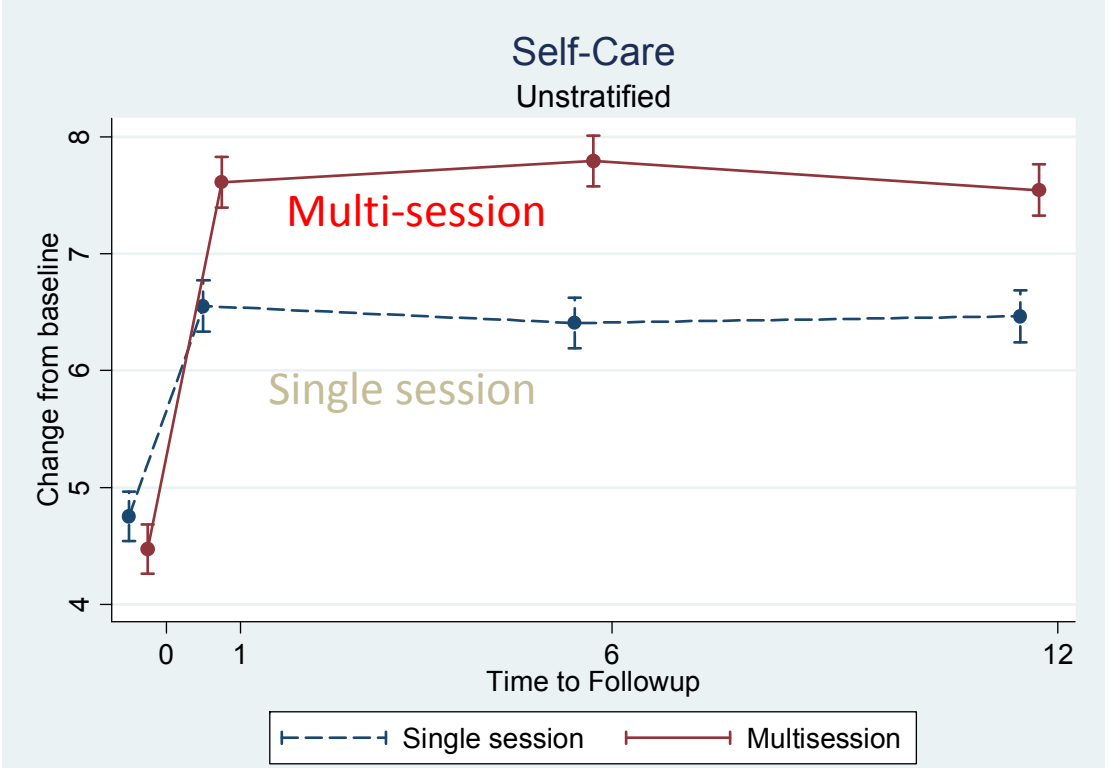
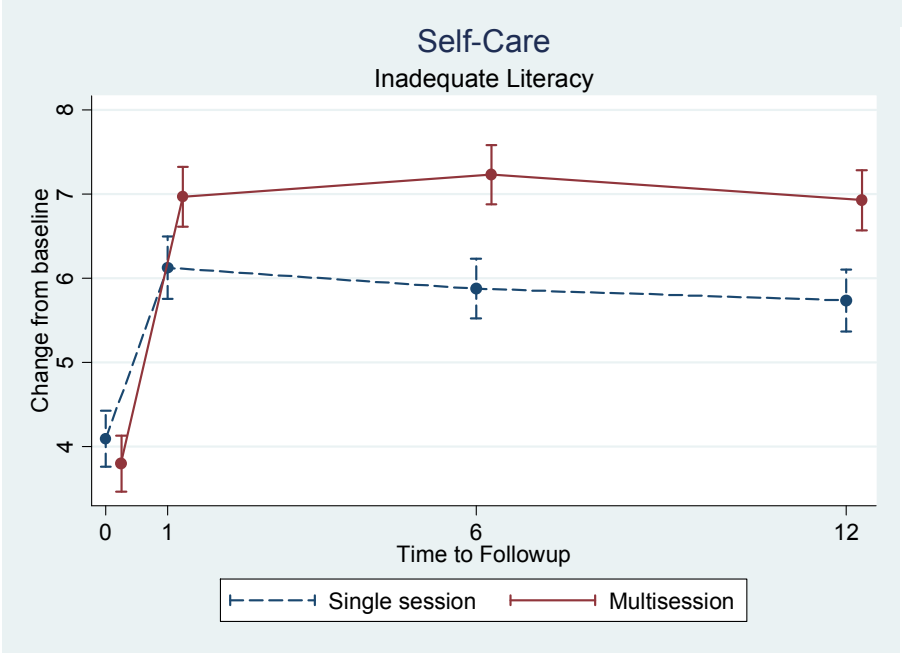
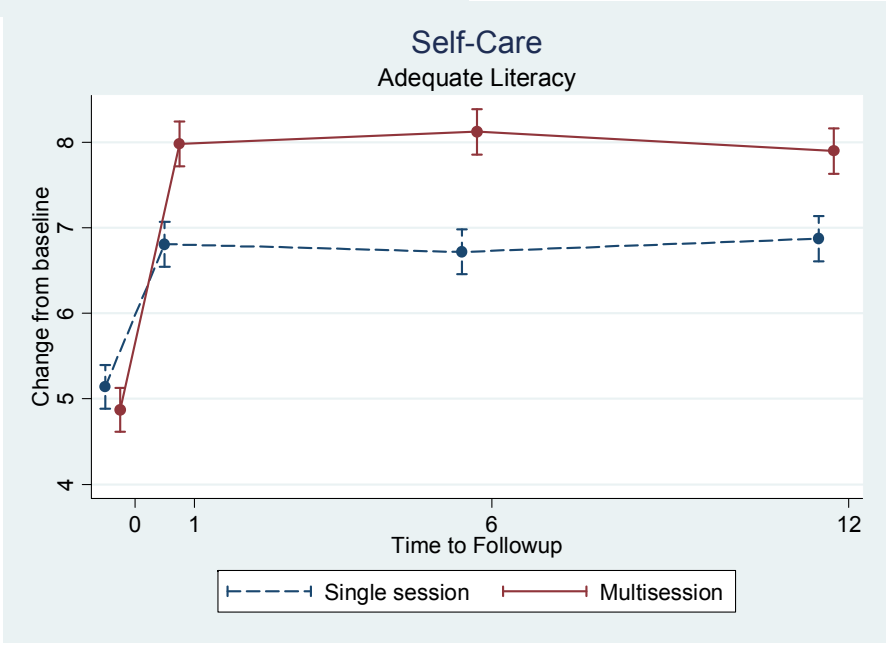
Time to Followup
Single session
Multisession


Self-Care
Unstratified
Multi-session
Single session
Change from baseline
4
5
6
7
8
0
1
6
12
Time to Followup
Single session
Multisession


Self-Care
Inadequate Literacy
Change from baseline
4
5
6
7
8
0
1
6
12
Time to Followup
Single session
Multisession


Self-Care
Adequate Literacy
Change from baseline
4
5
6
7
8
0
1
6
12
Time to Followup
Single session
Multisession

Statistical results

- Differences at six and twelve months were no different than differences at one month
- Measures were higher in months one, six, and twelve among those receiving multiple sessions
- Differences in study arm were typically independent of patient literacy

Conclusions

- Those receiving multiple self-management training sessions had higher knowledge, salt knowledge, self-care, and self-efficacy.
  - Differences from baseline to 1 month were preserved at 6 and 12 month outcomes
- No evidence that effect of intervention dose varied by literacy

Limitations

- Salt and self-care are not unidimensional scales
- Measured outcomes are intermediate outcomes , not clinical
- Dose delivered not as “teach to mastery” as we had intended
  - Did not differ by literacy

Implications

- Multiple self-management training sessions led to more improvement and greater durability in improvement
- Matching training to need needs more refinement in order to reduce literacy-related differences in outcomes
- Patients with low literacy improved by similar amounts as high literacy patient for the given training, suggesting that they can learn self-management skills just as well if given the opportunity.