Social Support and Health Decline Among Older Adults with Diabetes

Emily Joy Nicklett & Jersey Liang
Health Management & Policy
University of Michigan

American Public Health Association, Family Caregiving & Aging
Washington, DC November 5, 2007

Background

- Social Support and Health:
  - Some previous research has suggested that social support positively influences health:
    - Self-esteem and control (Krause & Borawski-Clark, 1999)
    - Provision of informal care (Langa et al., 2002)
    - Illness self-management (Gallant, 2003)
  - Lack consensus on relationship or mechanisms
  - Need for population-based studies on this relationship
  - Need to study trends over time

Research Questions

- What is the association between social support (in contrast to competing forms of social relationships) and health decline among diabetic older adults?
- What is the relationship between social support and regimen adherence among this population?
- What are the socio-demographic correlates of social support and health—how do they vary by gender, race/ethnicity, socioeconomic status, and age?

Research Hypotheses

- Controlling for regimen adherence, health status, and certain sociodemographic characteristics:

  1. We hypothesize that social support is negatively associated with health status decline

  2. We hypothesize that social support is positively associated with adherence to regimen components

Data

- Health and Retirement Study (HRS) wave six (2002), linked with 2003 Diabetes Supplement, HRS Tracker data
  - HRS is a national, population-based study that has tracked individuals and households over a 12-year period
  - 1992-2004 data used for preliminary analysis

Analytic Sample

HRS 2002 Wave Participants (n=10,104 to 1,788)
and Type 2 Diabetes Mellitus ("Diabetes") status

HRS 2002 Participants
n = 10,104
RR 84.9%

Reported Diabetes in 2002
N = 3194

Returned Diabetes Supplement
n= 1,901
RR 79.8%

Subsample: Indicated Regimen & 2004
n = 1,788

Figure 1: Subject Flow Diagram

Hypothesis 1: The Models

- Preliminary Analysis for Influence of Social Support on Diabetic Health:
  - Explore graphic and correlational trends in the data with diabetics and non-diabetics
  - Previous studies with interaction variables and individualized adherence variables
  - Previous study using a series of ordinal logistic regressions found that each social support regimen attribute was statistically associated with its corresponding adherence
- Model 1: Preliminary 'Raw' Analysis
  Social support variables and global adherence on decline, controlling for age and self-reported health status.
- Model 2: Social Relationships, Support
  Addition of Marital Status and Informal Care Variables
- Model 3: Full Model
  Addition of Additional Diabetes and Sociodemographic Characteristics

Hypothesis 2: The Models

- Series of 6 ordinal logistic regressions:
  - Social support regressed on corresponding attribute of regimen adherence (all covariates from third model included)

The Variables

Primary Social Support:

Health Decline in 2002 (i) – Collapsed from change in health over the past two years (better, worse, same)

Adherence - Reported difficulty with a diabetes regimen (i) – Includes medications, exercise, meal plan, checking blood sugar, feet, and seeing doctors and other providers (Global Measure for descriptives)

Social Support received from friends and families in adhering to each regimen component (i)

Illness-specific Variables

Total Illness Burden Index (TIBI)

Duration of Diabetes in Years

The Variables

Sociodemographic Variables:

Educational Background – dichotomized into three distinct groups, Less than High School (LTHS), High School only (HS)*, and College Grad (CG)

Race/Ethnicity – dichotomized in three groups, Non-Hispanic Black, (NHB), Non-Hispanic White (NHW)*, and Hispanic Origin

Gender – Female* and Male

Age – in 2002

Other Support-Related Control Variables

Marital Status – Marital status in 2002 (i)

Informal Care – response to "Besides your health care providers, who helps you with the most in caring for your diabetes?", (1) includes spouse, other family, or friends. (0) includes paid helper or nobody.

Preliminary Analyses: Marital Status

Reported Health Change by Marital and Diabetic Status

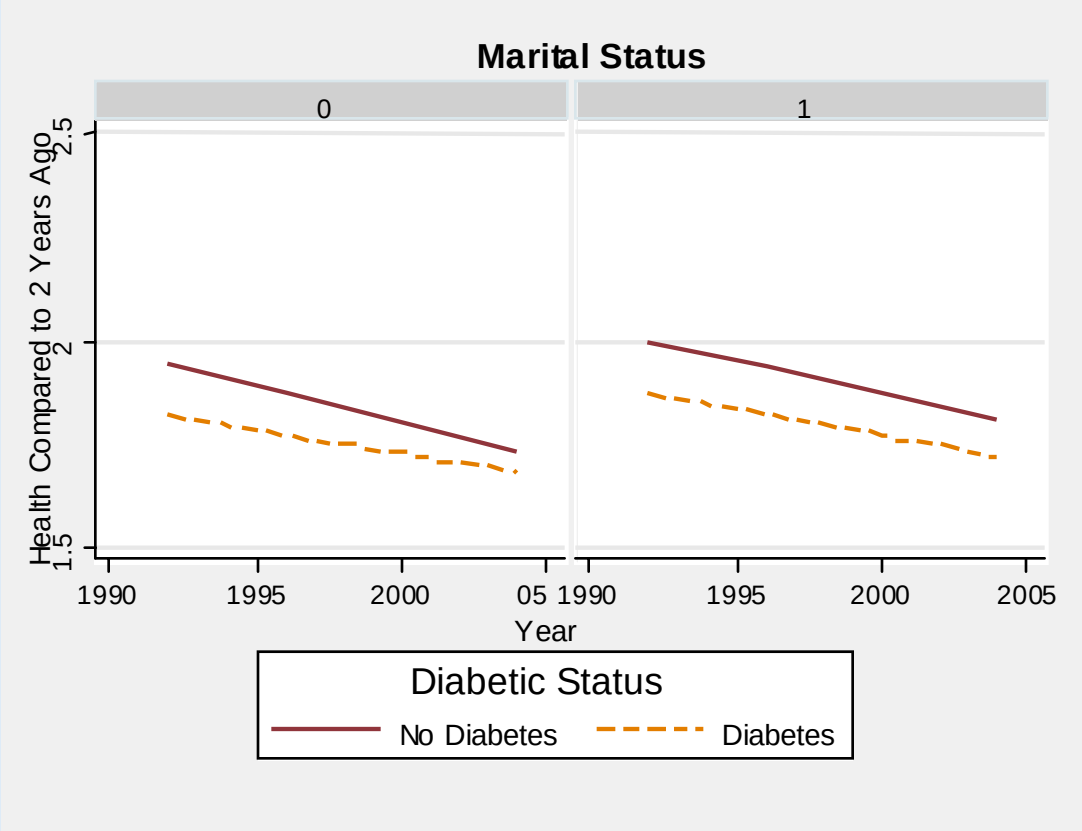

Figure 2

Preliminary Analyses: Marital Status (cont.)

Reported Adherence to Diabetes Regimen by Marital Status

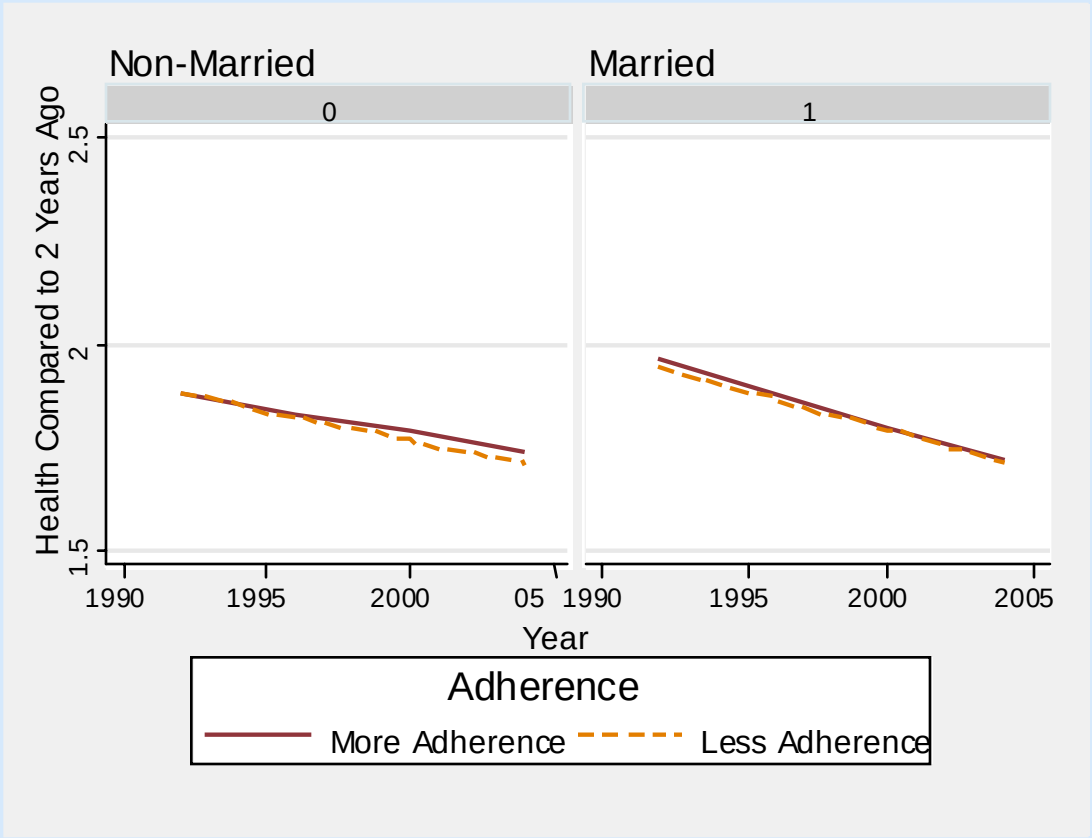

Figure 3

Preliminary Analyses: Informal Care

Provision of Informal Care by Marital Status

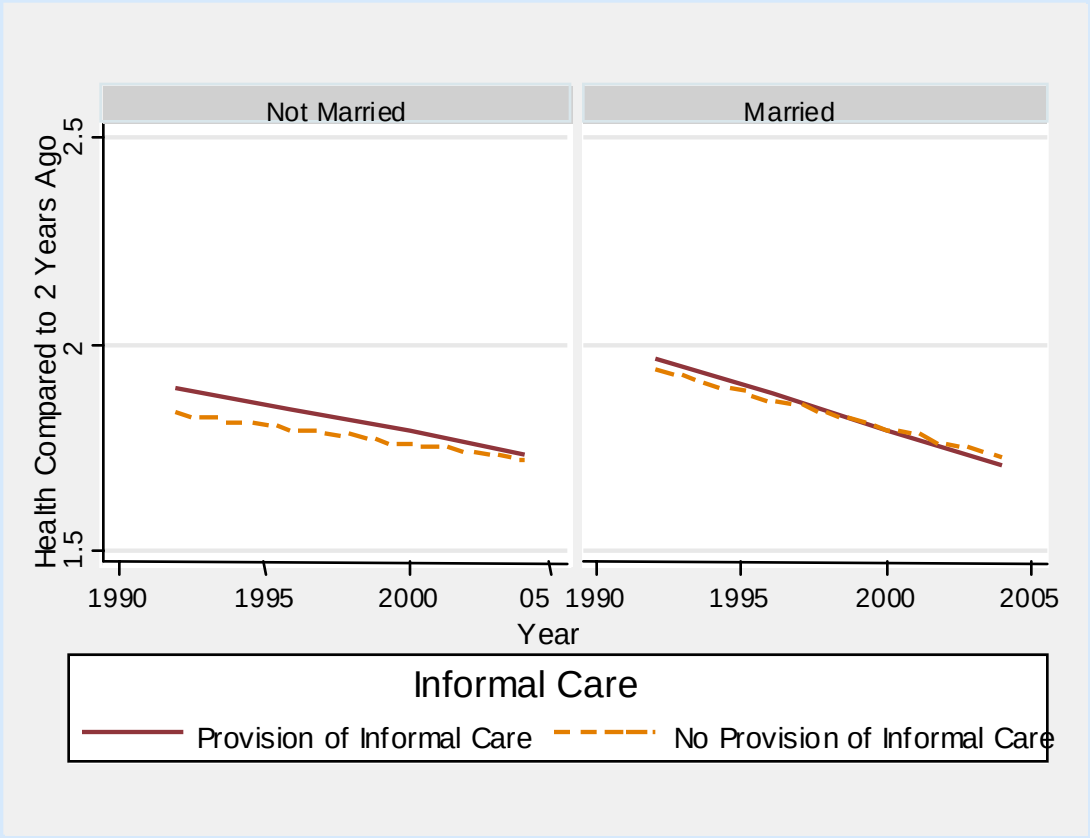

Figure 4

Preliminary Analyses: Social Support

Reported Support for Foot Care by Self Care

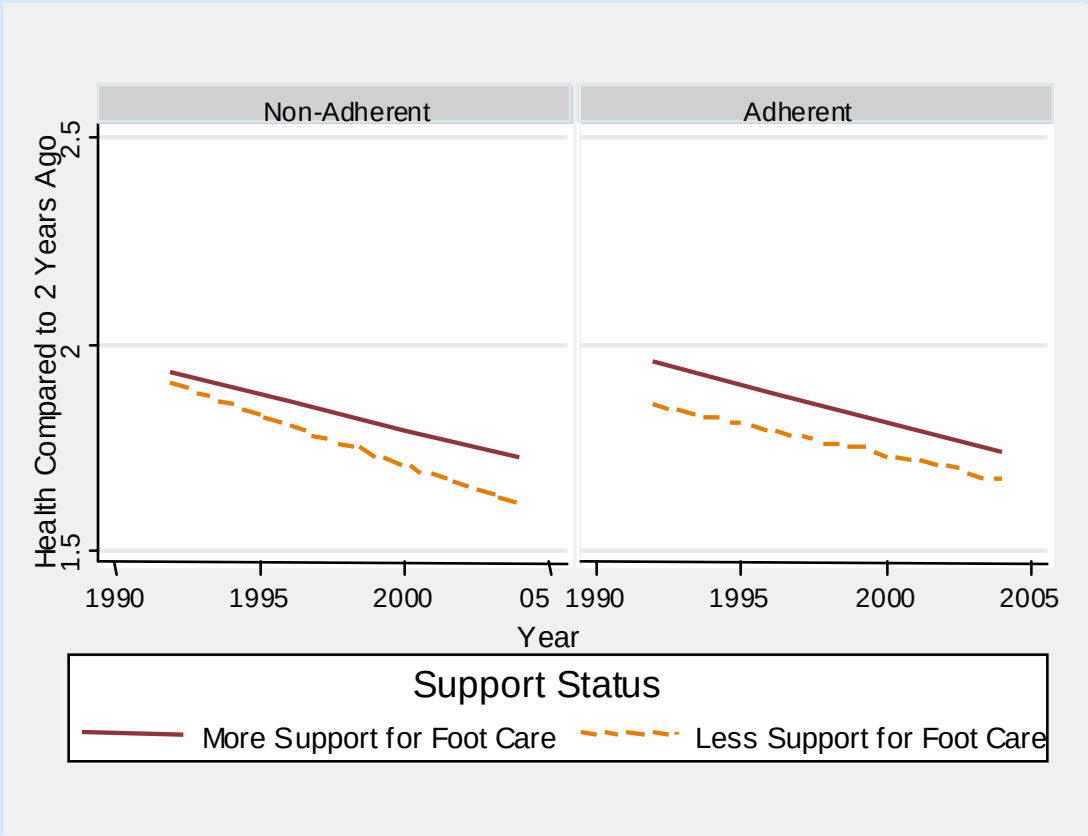

Figure 5

Preliminary Diagnostics

- Proportion reporting health decline varies by Sociodemographic Group:
  - Age (highest burden in age group 80-89)
  - Being female (37 v. 32 percent)
  - Fewer years of education
  - Some ethnic differences (Hispanics 40%)

Preliminary Diagnostics 2

- Proportion reporting health decline also varies by:
- Health/Illness Status:
  - Self-rated health (79% among poor health)
  - Duration of Diabetes and TIBI
- Social Characteristics
  - Marital Status and Provision of Care (34-34%)

Models 1-3, Main Variables

Health Decline Models 1-3

	Model 1		Model 2		Model 3	
	OR	**P-value**	**OR**	**P-value**	**OR**	**P-value**
Social Support						
Medications	0.859	.529	0.799	.344	0.734	.230
Physical Activity	1.397	.167	1.382	.174	1.444	.136
Meal Plan	0.957	.805	1.032	.857	0.943	.745
Suggested Tests	0.895	.508	0.961	.803	0.888	.464
Checking Feet	1.247	.337	1.231	.361	1.343	.251
Provider Appts.	1.063	.696	1.212	.267	1.253	.228
Rate Health 2002	1.500	.000*	1.506	.000*	1.551	.001*
Age	0.972	.013*	0.973	.017*	0.978	.115
Marital Status	--	--	0.947	.806	0.914	.228
Informal Care	--	--	1.832	.029*	1.975	.032*
Adherence	--	--	--	--	0.961	.868
Diabetes Duration	--	--	--	--	1.007	.528
TIBI	--	--	--	--	1.011	.111

Models 1-3, Main Variables

Health Decline Models 1-3

	Model 1		Model 2		Model 3	
	OR	**P-value**	**OR**	**P-value**	**OR**	**P-value**
Social Support						
Medications	0.859	.529	0.799	.344	**0.734**	**.230**
Physical Activity	1.397	.167	1.382	.174	1.444	.136
Meal Plan	0.957	.805	**1.032**	**.857**	**0.943**	**.745**
Suggested Tests	0.895	.508	0.961	.803	**0.888**	**.464**
Checking Feet	1.247	.337	1.231	.361	1.343	.251
Provider Appts.	1.063	.696	1.212	.267	1.253	.228
Rate Health 2002	1.500	.000*	1.506	.000*	1.551	.001*
Age	0.972	.013*	0.973	.017*	0.978	.115
Marital Status	--	--	0.947	.806	0.914	.228
Informal Care	--	--	1.832	.029*	1.975	.032*
Adherence	--	--	--	--	0.961	.868
Diabetes Duration	--	--	--	--	1.007	.528
TIBI	--	--	--	--	1.011	.111

Models 1-3, Main Variables

Health Decline Models 1-3

	Model 1		Model 2		Model 3	
	OR	**P-value**	**OR**	**P-value**	**OR**	**P-value**
Social Support						
Medications	0.859	.529	0.799	.344	0.734	.230
Physical Activity	1.397	.167	1.382	.174	**1.444**	**.136**
Meal Plan	0.957	.805	1.032	.857	0.943	.745
Suggested Tests	0.895	.508	0.961	.803	0.888	.464
Checking Feet	1.247	.337	1.231	.361	**1.343**	**.251**
Provider Appts.	1.063	.696	1.212	.267	**1.253**	**.228**
Rate Health 2002	1.500	.000*	1.506	.000*	1.551	.001*
Age	0.972	.013*	0.973	.017*	0.978	.115
Marital Status	--	--	0.947	.806	0.914	.228
Informal Care	--	--	1.832	.029*	1.975	.032*
Adherence	--	--	--	--	0.961	.868
Diabetes Duration	--	--	--	--	1.007	.528
TIBI	--	--	--	--	1.011	.111

Models 1-3, Main Variables

Health Decline Models 1-3

	Model 1		Model 2		Model 3	
	OR	**P-value**	**OR**	**P-value**	**OR**	**P-value**
Social Support						
Medications	0.859	.529	0.799	.344	0.734	.230
Physical Activity	1.397	.167	1.382	.174	1.444	.136
Meal Plan	0.957	.805	1.032	.857	0.943	.745
Suggested Tests	0.895	.508	0.961	.803	0.888	.464
Checking Feet	1.247	.337	1.231	.361	1.343	.251
Provider Appts.	1.063	.696	1.212	.267	1.253	.228
Rate Health 2002	1.500	.000*	1.506	.000*	1.551	.001*
Age	0.972	.013*	0.973	.017*	0.978	.115
Marital Status	--	--	0.947	.806	0.914	.228
Informal Care	--	--	1.832	.029*	1.975	.032*
Adherence	--	--	--	--	0.961	.868
Diabetes Duration	--	--	--	--	1.007	.528
TIBI	--	--	--	--	1.011	.111

Models 1-3, Main Variables

Health Decline Models 1-3

	Model 1		Model 2		Model 3	
	OR	**P-value**	**OR**	**P-value**	**OR**	**P-value**
Social Support						
Medications	0.859	.529	0.799	.344	0.734	.230
Physical Activity	1.397	.167	1.382	.174	1.444	.136
Meal Plan	0.957	.805	1.032	.857	0.943	.745
Suggested Tests	0.895	.508	0.961	.803	0.888	.464
Checking Feet	1.247	.337	1.231	.361	1.343	.251
Provider Appts.	1.063	.696	1.212	.267	1.253	.228
Rate Health 2002	1.500	.000*	1.506	.000*	**1.551**	**.001***
Age	0.972	.013*	0.973	.017*	**0.978**	**.115**
Marital Status	--	--	0.947	.806	0.914	.228
Informal Care	--	--	1.832	.029*	1.975	.032*
Adherence	--	--	--	--	0.961	.868
Diabetes Duration	--	--	--	--	1.007	.528
TIBI	--	--	--	--	1.011	.111

Models 1-3, Main Variables

Health Decline Models 1-3

	Model 1		Model 2		Model 3	
	OR	**P-value**	**OR**	**P-value**	**OR**	**P-value**
Social Support						
Medications	0.859	.529	0.799	.344	0.734	.230
Physical Activity	1.397	.167	1.382	.174	1.444	.136
Meal Plan	0.957	.805	1.032	.857	0.943	.745
Suggested Tests	0.895	.508	0.961	.803	0.888	.464
Checking Feet	1.247	.337	1.231	.361	1.343	.251
Provider Appts.	1.063	.696	1.212	.267	1.253	.228
Rate Health 2002	1.500	.000*	1.506	.000*	1.551	.001*
Age	0.972	.013*	0.973	.017*	0.978	.115
Marital Status	--	--	0.947	.806	**0.914**	**.228**
Informal Care	--	--	1.832	.029*	**1.975**	**.032***
Adherence	--	--	--	--	0.961	.868
Diabetes Duration	--	--	--	--	1.007	.528
TIBI	--	--	--	--	1.011	.111

Models 1-3, Main Variables

Health Decline Models 1-3

	Model 1		Model 2		Model 3	
	OR	**P-value**	**OR**	**P-value**	**OR**	**P-value**
Social Support						
Medications	0.859	.529	0.799	.344	0.734	.230
Physical Activity	1.397	.167	1.382	.174	1.444	.136
Meal Plan	0.957	.805	1.032	.857	0.943	.745
Suggested Tests	0.895	.508	0.961	.803	0.888	.464
Checking Feet	1.247	.337	1.231	.361	1.343	.251
Provider Appts.	1.063	.696	1.212	.267	1.253	.228
Rate Health 2002	1.500	.000*	1.506	.000*	1.551	.001*
Age	0.972	.013*	0.973	.017*	0.978	.115
Marital Status	--	--	0.947	.806	0.914	.228
Informal Care	--	--	1.832	.029*	1.975	.032*
Adherence	--	--	--	--	**0.961**	**.868**
Diabetes Duration	--	--	--	--	**1.007**	**.528**
TIBI	--	--	--	--	**1.011**	**.111**

Models 1-3, Covariates

Health Decline Models 1-3, Continued

	OR	P-value	OR	P-value	OR	P-value
Education (r:HS)						
Less than HS	--	--	--	--	**1.024**	**.923**
College Grad	--	--	--	--	**0.554**	**.044***
Race/Ethn (r:W)						
NH Black	--	--	--	--	1.401	.247
Hispanic Origin	--	--	--	--	2.085	.025*
Female	--	--	--	--	0.961	.854

Models 1-3, Covariates

Health Decline Models 1-3, Continued

	OR	P-value	OR	P-value	OR	P-value
Education (r:HS)						
Less than HS	--	--	--	--	1.024	.923
College Grad	--	--	--	--	0.554	.044*
Race/Ethn (r:W)						
NH Black	--	--	--	--	**1.401**	**.247**
Hispanic Origin	--	--	--	--	**2.085**	**.025***
Female	--	--	--	--	0.961	.854

Models 1-3, Covariates

Health Decline Models 1-3, Continued

	OR	P-value	OR	P-value	OR	P-value
Education (r:HS)						
Less than HS	--	--	--	--	1.024	.923
College Grad	--	--	--	--	0.554	.044*
Race/Ethn (r:W)						
NH Black	--	--	--	--	1.401	.247
Hispanic Origin	--	--	--	--	2.085	.025*
Female	--	--	--	--	**0.961**	**.854**

Hypothesis 2

Ordinal Logit Analysis of Social Support on Regimen Adherence

	OR	P-value	Adj. Wald, F & DF	Prob > F
Social Support				
Medications	**1.587**	.168	11.35 (1, 966)	**.0008***
Physical Activity	**1.696**	.140	44.90 (2, 1026)	**<.0001***
Meal Plan	**2.096**	.216	58.44 (1, 1037)	**<.0001***
Suggested Tests	**1.617**	.153	27.35 (1, 973)	**<.0001***
Checking Feet	**1.641**	.143	29.82 (1, 988)	**<.0001***
Provider Appts.	**1.612**	.172	15.52 (1, 1023)	**.0001**

(Controlling for all covariates from model 3)

Conclusions:

- Findings:
  - Social Support for Adherence was not consistently associated with health status decline
    - Protective (Medications, Meal Plan, Tests)
    - Risk (Physical Activity, Feet, Appointments)
  - Relationship not statistically significant between Social Support for Adherence & Health Decline
  - Social Support for Adherence positively (and significantly) associated with Adherence

Conclusions:

- New Areas:
  - More population-based, longitudinal research needed to better examine these relationships among chronically ill populations
  - Also, such studies should comparatively address whether the relationships only hold in certain groups

Limitations:

- Social Support and Health:
  - Short Period of Analysis
  - Self-Report
  - Missing Data Problems, despite complex design
  - Not able to examine additional measures of social support found to be significant in previous health research (social networks and ties, community involvement & participation, support groups)
  - Availability of adherence measures only in 2003 poses limitations on analyzing data over time

Thank you…

- Research Advisors
  - Jersey Liang, PhD
  - Caroline Blaum, MD
  - Steven Heeringa, PhD
- AHRQ Predoctoral Award (T32)

Reference Slides

- Sample Characteristics
- Expanded Model Statistics (SEs)

Sample Characteristics 1

Regimen Components and Social Support

	Unweighted Percent	Weighted Percent	n (missing)
Support			
Medications	**96.25**	**96.03**	1,632 (83)
Physical Activity	**86.22**	**84.49**	1,443 (104)
Meal Plan	**91.69**	**91.41**	1,515 (128)
Suggested Tests	**72.51**	**71.63**	1,196 (129)
Checking Feet	**89.53**	**90.01**	1,522 (78)
Seeing Providers	**81.63**	**80.56**	1,326 (155)

	Unweighted %	Weighted %	n (missing)
Overall Self-Care	**70.60**	**70.42**	1,048 (298)
Married/Coupled	**66.00**	**62.68**	1,171 (0)
Informal Care	**24.12**	**24.42**	396 (134)

Sample Characteristics 2

Sociodemographic Characteristics

	Unweighted Percent	Weighted Percent	n (missing)
Race/Ethnicity W	**69.45**	**75.17**	1,234 (4)
NH Black	**19.84**	**15.35**	351 (3)
Hispanic Origin	**10.70**	**9.47**	190 (4)
Education HS	**35.74**	**33.85**	558 (0)
LTHS	**33.17**	**32.93**	638 (0)
College Grad	**31.10**	**33.21**	553 (0)
Female	**51.79**	**50.78**	921 (0)

Age Group	Unweighted %	Weighted %	n (missing)
60-69	**31.54**	**36.44**	560 (0)
70-79	**40.10**	**34.55**	714 (0)
80-89	**23.43**	**23.78**	417 (0)
90-99	**4.92**	**5.25**	88 (0)

Sample Characteristics 3

Health Characteristics

	Unweighted Percent	Weighted Percent	n (missing)
Health Decline	**10.06**	**9.41**	179 (9)
Rate Health 2002			
1 (Excellent)	**34.53**	**15.28**	247 (1)
2 (Very good)	**46.73**	**32.36**	575
3 (Good)	**47.94**	**35.09**	639
4 (Fair)	**36.31**	**14.78**	279
5 (Poor)	**16.01**	**2.49**	47

Models 1-3, Main Variables

Health Decline Models 1-3

	Model 1	Model 2	Model 3
	OR, (SE) P-value	**OR, (SE) P-value**	**OR, (SE) P-value**
Social Support			
Medications	0.859 (.207) .529	0.799 (.189) .344	0.734 (.189) .230
Physical Activity	1.397 (.338) .167	1.382 (.329) .174	1.444 (.355) .136
Meal Plan	0.957 (.172) .805	1.032 (.183) .857	0.943 (.171) .745
Suggested Tests	0.895 (.150) .508	0.961 (.155) .803	0.888 (.144) .464
Checking Feet	1.247 (.287) .337	1.231 (.280) .361	1.343 (.345) .251
Provider Appts.	1.063 (.166) .696	1.212 (.210) .267	1.253 (.235) .228
Rate Health 2002	1.500 (.145) .000*	1.506 (.146) .000*	1.551 (.197) .001*
Age	0.972 (.011) .013*	0.973 (.011) .017*	0.978 (.134) .115
Marital Status	-- -- --	0.947 (.209) .806	0.914 (.235) .228
Informal Care	-- -- --	1.832 (.597) .029*	1.975 (.628) .032*
Adherence	-- -- --	-- -- --	0.961 (.231) .868
Diabetes Duration	-- -- --	-- -- --	1.007 (.012) .528
TIBI	-- -- --	-- -- --	1.011 (.007) .111

Models 1-3, Covariates

Health Decline Models 1-3, Continued

	OR, (SE)			Coef (Std. Err)			OR, (SE) P-value
Social Support							
Medications	--	--	--	--	--	--	0.961 (.231) .868
Exercising	(previous slide)			(previous slide)			(previous slide)
Eating Plan	1.500 (.145) .000*			1.506 (.146) .000*			1.551 (.197) .001*
Marital Status	--	--	--	0.947 (.209) .806			0.914 (.235) .228
Informal Care	--	--	--	1.832 (.597) .029*			1.975 (.628) .032*
Education (r:HS)							
Less than HS	--	--	--	--	--	--	1.024 (.253) .923
College Grad	--	--	--	--	--	--	0.554 (.162) .044*
Race/Ethn (r:W)							
NH Black	--	--	--	--	--	--	1.401 (.407) .247
Hispanic Origin	--	--	--	--	--	--	2.085 (.683) .025*
Female	--	--	--	--	--	--	0.961 (.209) .854