

Senior Center Evaluation

Final Report

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EXECUTIVE SUMMARY

The establishment of innovative senior centers in New York City afforded a unique opportunity to evaluate the impact of senior center participation on the lives of older adults. This quasi-experimental, longitudinal study followed older adults who were participants in innovative and neighborhood senior centers, as well as older adults who had not participated in a senior center for at least one year. All study participants were interviewed at baseline (their first interview) and 12 Months later, and senior center members were also interviewed at 6 Months after the first interview. In order to reflect the diverse older adult population of New York City, interviews were conducted in English, Spanish and Mandarin, three major language groups for older adults in New York City.

Although this began as a study to examine differences in outcomes between ISC and NC members, findings indicate that both of these groups are achieving positive outcomes. This confirms that older adults are actively engaging in health and social programs at senior centers and are benefitting from these programs.

The study found that members attended a senior center at least two days a week and this decreased slightly over 12 Months. Over 70% of members attended at least as often, or more frequently, at the 12 Month interview as compared with baseline. The five most common reasons given for participation were socialization (avoiding isolation), educational programs, meals, recreational and exercise programs. One in six members also looked to the senior center for health-related programs.

It is important to note that non-members were younger, healthier, and better educated than senior center members. This was due to the locations where it was possible to recruit the non-member sample. These differences in the sociodemographic and health characteristics of the senior center members and non-members must be considered when comparing outcomes for these two groups.

Senior center members reported poorer health at Baseline than non-members. However, 23% of members at 6 Months reported an improvement in their health since starting to attend a senior center. At 12 Months, 22.5% reported improved health since the Baseline interview and an additional 65.6% reported that their health remained the same during this

time period. This, we believe is an important outcome. It demonstrates the impact senior center participation has on maintaining health as well as improving it.

There was no difference between members and non-members in self-rated mental health at Baseline. Non-members reported lower prevalence of depression at Baseline. They also reported lower prevalence of anxiety at Baseline. However, the majority of both members and non-members reported no depression or anxiety at baseline and this was also seen at 12 Months. Over one-third of members (35.8%) reported an improvement in mental health at 6 months after the Baseline interview, and 55.4% reported that their mental health remained the same. At 12 Months, almost one-third of members reported improved health since the 6-month interview and 59.8% reported that it stayed the same during this time period.

Members of innovative senior centers reported significantly more hours of exercising at baseline than members of neighborhood senior centers and non-members. Over four out of five senior center members maintained or increased the amount of exercise at 6-months as compared with Baseline, and at 12 Months as compared with 6 Months. Members were more likely than non-members to participate in a health program. ISC members were more likely than NC members and non-members to monitor their weight frequently, make exercise a part of their routine, and to become more physically active.

Senior centers provide an outlet for socialization for community-dwelling older adults. We found that two out of three members reported meeting at least some of their friends at the senior center. Members reported that the more of their friends they met at the senior center, the less likely they reported feeling isolated. At 6 Months and 12 Months, members reported spending fewer days alone than they had at baseline. The percent of innovative senior center members who reported hardly ever feeling isolated was higher than neighborhood center members and non-members at baseline, but was no longer different from neighborhood center members at 6-months and at 12-months.

Non-members reported active social lives that prevented isolation. The five most common types of activities engaged in by non-members were group trips, volunteer activities, exercise classes, playing board games, and discussion groups. The mean number of these activities that non-members did sometimes or often was 1.8 (SD = 1.7), and the median was 2.0 activities. Over half (52.3%) of non-members reported participating in at least two of the 10 activities listed.

The most common reasons given for nonparticipation in senior centers for those who had never attended a senior center were work, active engagement in social and leisure activities, disinterest in senior centers and not needing or wanting socialization.

In summary, senior center participants reported improved physical and mental health, increased participation in health programs, frequent exercising, positive behavior change in monitoring weight and keeping physically active. Participation in a senior center also helped to reduce social isolation. Senior centers are not only a place for socialization, but also provide health education, fitness programs, meals and recreational and educational programs. The older adult population served by senior centers are typically among those with the lowest incomes, the fewest resources, the poorest health, the greatest social isolation, and most in need of services. For many of these older adults, senior centers tend to be the only source of socialization and support. The findings of this study indicate that senior centers are attracting this group that has multiple needs, and SC members experience improved physical and mental health not only in the time period after joining a senior center, but maintain or even continue to improve even one year later. This is a very important finding, given the decline in health and social activity in this age group, especially among those with low income. Maintenance of health and social activity, rather than a decline in health, is a major benefit of senior centers.

Summary of Findings

CHARACTERISTIC	OUTCOME	FINDING
Time Point	Attendance	SC members (ISC and NC) attended more days at Baseline than at 6 Months or at 12 Months. There was no difference between 6 Months and 12 Months.
Time Point	Self-rated Physical Health	At Baseline, Non-members were more likely to rate their physical health as excellent or good as compared with SC members. There was no difference at 12 Months. 23% of SC members had a better health rating at 6 Months as compared with Baseline, 17% SC Members reported a poorer health rating at 6 Months, and 60% reported no decline 20.9% of SC members had a better health rating at 12 Months as compared with Baseline, 19.6% reported a poorer health rating at 12 Months, and 59.5% reported no decline
Time Point	Change in Physical Health	At Baseline, most SC members reported improved or stable health: since they started attending a SC (96.9%); from Baseline to 6 Months (81%); and from 6 Months to 12 Months (81.6%).
Time Point by Had Serious Health Issue	Change in Physical Health	At 6 Months, SC members who reported having a serious health issue since Baseline were more likely to report decline in health. At 12 Months, SC members who reported having a serious health issue since 6 Months were more likely to report decline in health.
Study Group	Self-rated Mental Health	There was no difference in self-rated mental health for SC members and Non-members at either Baseline or 12 Months.
Time Point	Self-rated Mental Health	69% of SC members improved or maintained the same level of mental health from Baseline to 6 Months. 76% of SC members rated their mental health better or the same at 12 Months than they did at Baseline
Time Point	Change in Mental Health	At Baseline, the majority of SC members reported improved or stable mental health since they started attending SC, also reported improved or stable mental health from Baseline to 6 Months, and 6 Months to 12 Months.

CHARACTERISTIC	OUTCOME	FINDING
Time Point by Had Serious Health Issue	Change in Mental Health	Change in mental health from Baseline to 6 Months was not associated with having a serious health issue. From 6 Months to 12 Months, SC members who had a serious health issue since 6 Months were three times more likely to report that their mental health had declined.
Study Group	Depression	Non-members were more likely than SC Members to report No Depression and SC Members were 2.6 times more likely than Non-members to report Moderate to Severe Depression.
Self-rated Physical Health	Depression	The percent of SC members with moderate to severe depression increased as rating of physical health and of mental health worsened. Language of interview and ethnicity were not associated with depression level.
Time Point	Depression	Depression level remained stable or improved from Baseline to 12 Months.
Study Group	Anxiety	There was borderline significant difference between SC members and Non-members at Baseline, with SC members having slightly higher level of Anxiety.
Time Point	Anxiety	Anxiety level remained stable or improved from Baseline to 12 Months. At least half of those who had Mild or Moderate-to-Severe Anxiety at Baseline reported No Anxiety at 12 Months.
Study Group and by Time Point and Age	Hours of Exercise	ISC members reported more hours of exercise than Non-members at Baseline There was no difference between ISC and NC members at Baseline or at 6 Months. NC members reported more hours of exercise than ISC members and Non-members at 12 Months. The association between study group and hours of exercise did not differ by age at each time point.
Time Point and Study Group	Hours of Exercise	ISC members reported fewer, hours of exercise from Baseline to 6 Months, with no significant change from 6 Months to 12 Months. NC members also reported fewer hours of exercise from Baseline to 6 Months, and an increase from 6 Months to 12 Months. ISC members exercised significantly more than non-members at Baseline. ISC members exercised significantly more than NC members at 12 Months. Non-members also reported an increase in exercise from Baseline to 12 Months.

CHARACTERISTIC	OUTCOME	FINDING
Time Point and Study Group	Change in Amount of Exercise	For SC members, there was no difference in reported change in the amount of exercise comparing the time points from joining the SC to Baseline, from Baseline to 6 Months, and from 6 Months to 12 Months. At 6 Months and 12 Months, most SC members reported exercising the same or more than the previous time point, although this was not supported by the number of hours of exercise they reported at each time point.
Time Point by Had a Serious Health Issue	Change in Amount of Exercise	At 6 Months, those who had experienced a serious health issue since Baseline exercised less at 6 Months. At 12 Months, those who had experienced a serious health issue since 6 Months, exercised less at 12 Months.
Study Group	Attend Health Program	At Baseline, ISC and NC members were more likely than Non-members to report having attended a health program in the last year.
Study Group	Attend a Health and Wellness Program	Exercise programs were the most frequently attended health and wellness programs, followed closely by health and nutrition education and blood pressure screening. Health and wellness programs had relatively low attendance, and this did not differ for ISC and NC members.
Study Group	Change in Health Behavior	ISC members were more likely than NC members and Non-members to monitor their weight frequently, make exercise a part of their routine, and to become more physically active. The rate of starting to perform monthly breast self-exam due to participation in a health program among female study participants was highest among non-members and lowest among NC members. There were no significant differences in other health behaviors by Study Group
Number of Friends Met at SC	Frequency Feel Isolated	The more friends that were met at the SC, the less frequently SC members reported feeling isolated.
Study Group and Time Point	Number of Days Spent Alone	There was no difference in the reported number of days spent alone for ISC members, SC members, and Non-members at any time point.
Study Group and Time Point	Number of Days Spent Alone	At the 6 Months and at 12 Months, SC members reported spending fewer days alone, on average, than they did at Baseline and at 6 Months, respectively. There was a very minor, but significant, decline in number of days spent alone from 6 Months to 12 Months.

CHARACTERISTIC	OUTCOME	FINDING
Study Group and Time Point	Frequency Feel Isolated	<p>ISC members were least likely to report that they hardly ever felt isolated from others at Baseline, as compared with NC members and with Non-members, who were similar to each other. NC members were most likely to report often feeling isolated from others and non-members were least likely to report this.</p> <p>There were no differences in frequency of feeling isolated comparing ISC and NC members at 6 Months and at 12 Months.</p> <p>ISC members were more likely to report hardly ever feeling at 12 Months compared with Baseline and with 6 Months. NC members were more likely to report hardly ever feeling lonely at 6 Months compared with Baseline.</p>
Previous Attendance at a SC	Reason for Not Attending	<p>For Non-members, those who had not previously attended a SC were more likely than those who had to say that the reason they did not currently attend was because they did not need or want socialization and that they were too busy working. There was no difference in other reasons for not attending by previous attendance.</p>

INTRODUCTION

Since their advent in 1943, senior centers have played a vital role in community-based services for older adults by providing opportunities for recreation, socialization, volunteerism, advocacy on senior issues, as well as access to information and benefits, education, nutrition and health services. New York City has played an important role in the evolution of senior centers, with the first senior center, the William Hodson Center, opening in 1943 in the Bronx. Senior centers serve a diverse base of consumers, and their services are especially relevant for low income, vulnerable and socially-isolated older adults. As an integral component of the continuum of long term care, senior centers aim to promote independence and self-reliance, and to enhance the well-being of the aging cohort.

There is a growing body of research on the outcomes of specific evidence-based interventions offered in senior centers, such as falls prevention, improving cognitive health and chronic disease self-management. But, there is no research that has looked at a senior center model as an evidence-based model. We know very little about the impact of senior center participation and the outcomes of specific senior center programs and services, except for anecdotal evidence. Some research has found that senior center participants have better psychological well-being than non-participants on several measures, including depressive symptomatology, friendship formation and associated well-being, and stress level. Studies have also shown that participation in senior center programs is associated with greater self-esteem, life satisfaction and perceived social support, expanded social networks and reduced isolation, and improved perception of general well-being. However, an important limitation of these studies is that they are cross-sectional, use volunteer samples, and often use a customer satisfaction format. These studies rely on retrospective assessment of the impact of participation on participants' lives. Thus, it is not clear whether the outcomes listed here improved as a result of participation in senior center activities.

The evaluation described in this report was an improvement on previous studies because it used a prospective design, enrolled a probability sample of new ISC members, and had two comparison groups: Neighborhood Senior Center members (NC) and older adults who

are non-members in senior centers. This design and sampling plan allowed a more rigorous examination of the benefits of senior citizen participation.

STUDY METHODS

Study Design

A cohort study design was used to follow three groups of study participants over time. There were two groups of senior center members, those attending an Innovative Senior Center (ISC) and those attending a Neighborhood Senior Center (NC) and one group of non-members. The senior center members were interviewed in person at the senior center for the Baseline interview, and by telephone at the 6-Month and 12-Month Follow-up Interview. Non-members were interviewed by telephone at Baseline and will be interviewed by telephone for the 12-Month Follow-up Interview. The first 12-Month Follow-up Interview for non-members will be in July, 2015. Interviews were conducted in English, Mandarin, and Spanish.

Sampling Plan

There were different sampling plans used for the senior center samples and the non-member sample. Participants were compensated \$20 for each interview.

Senior Center Sample

Seven ISCs were selected by the Department for the Aging based on their having been approved as an ISC and their interest in participating in the evaluation. In addition, two special ISCs were included: VISIONS, which has programming planned for members with low vision, and SAGE, which has programming planned for LGBT members. The seven NCs were selected based on best matching the ISCs based on their proximity and demographic characteristics of members.

At each of the ISCs and NCs, the sampling frame was constructed by including the members who had joined most recently, in order to include members who were likely to show the most change from their Baseline to 12-Month Follow-up Interview. Members who had joined in the last month were added to the list first, then those who had joined in the previous month, and so on, until there were at least 55 names of male members and 55 names of female members in the sampling frame. The reason for stratifying on gender was to ensure that there would be a large enough number of male senior center members in the sample.

The inclusion criteria for the study were: age 60 or older; able to be interviewed in English, Mandarin, or Spanish; currently attending that senior center at least once a week; and

cognitively able to give informed consent and to participate in the interview. The exclusion criterion was not being a spouse or sibling of another member at that senior center.

Three different methods were used to recruit study participants, based on the preference of the senior center director.

Method #1: An invitation letter from Fordham was sent to all names in the sampling frame. Information was provided on contacting the study to request that we do not call to schedule an interview. Those who did inform us that they did not want us to call them, received a phone call from one of the research assistants, either an MSW or PhD student at the Graduate School of Social Service. The purpose of the phone call was to check that the letter was received, to answer questions, and to determine if the senior wanted to participate in the study. If the senior did want to participate, eligibility was determined and an interview was scheduled.

Method #2: An invitation letter from Fordham was sent to all names in the sampling frame. Staff at the senior center then asked each of the seniors who were invited to participate if they would give permission to share their phone number with the Fordham researchers so a research assistant could call the senior. The purpose of that phone was the same as for Method #1. Information was included in the invitation letter so that any seniors who wanted to participate or ask questions about the study, could contact the researchers.

Method #3. This method was used at VISIONS and for low vision and blind seniors, at other ISCs and NCs. Rather than mailing the invitation letter, a Fordham research assistant called the senior to ask permission to read the invitation letter. The letter was also mailed to the senior if requested. A mailing will not be sent to the senior unless they request this. In cases where a senior could read a large type letter, that was provided, following either Method #1 or Method #2, depending which was chosen by the senior center Director.

Non-Members

Non-members were selected using both volunteer and snowball nonprobability sampling methods. Non-members were recruited from a wide range of agencies, organizations, health facilities, libraries, and senior housing locations through the five boroughs of New York

City. At some locations, research assistants from the study made an announcement and met with seniors at that site. At other locations, staff of the agency or organization made an announcement. Brochures describing the study were left at all of these locations. The brochure was available in English, Mandarin and Spanish.

Due to lack of success in using these methods to recruit the sample of Mandarin-speaking non-members, research assistants who were from China and spoke Mandarin went to locations in Flushing frequented by Mandarin-speaking seniors (e.g., McDonald's) to explain the study and invite participation.

The response rate for the Baseline phase of the study was 56.8%. There was undoubtedly selection bias, with probably underrepresentation of older adults who were physically disabled or who were clinically depressed or anxious.

Measures

The measures obtained at each time point are shown in Table 1.

Table 1. Study measures by time point.

MEASURE	TIME POINT		
	BASELINE	6 Months	12 Months
Sociodemographic characteristics	x		
Self-rated physical health	x	x	x
Chronic conditions	x		
Serious health issue since last interview		x	x
Exercise	x	x	x
Self-rated mental health	x	x	x
Depression	x		x
Anxiety	x		x
Alcohol Use	x		x
Life Satisfaction	x	x	x
Social Isolation	x	x	x
Senior Center (members)			
Attendance	x	x	x
Reasons started attending/continue or stop attending	x		x
Activities engage in at senior center	x		x
Use of social services provided by senior center	x		
Benefits of attending	x		x
Health literacy and health behaviors	x	x	
Non-members			
Activities participate in	x		x
Reasons for not attending a senior center	x		
Inducements for attending a senior center	x		
If started attending: reasons why and benefits			x
If started and stopped attending: reasons why			x

SAMPLE DESCRIPTION

Table 2. Completion of study interviews by study group and time point.

STUDY GROUP	TIME POINT						ATTRITION FROM BASELINE TO 6 MONTHS		ATTRITION FROM BASELINE TO 12 MONTHS	
	Baseline		6 Months		12 Months		N	%	N	%
	N	%	N	%	N	%				
Baseline - ISC	368	46.2	293	75.3	296	45.8	75	20.4	72	19.6
Baseline - NC	131	16.5	96	24.7	99	15.3	35	26.7	32	24.4
Baseline - Non-member	297	37.3			251	38.9			46	15.5
TOTAL	796	100.0	389	100.0	383	100.0	110	22.0	150	18.8

The attrition rate was higher for Neighborhood Centers than for Innovative Centers. The attrition rate for non-members was lower than for senior center members.

Table 3. Sociodemographic characteristics of the sample.

SOCIODEMOGRAPHIC CHARACTERISTIC		STUDY GROUP						p-value on chi-square
		ISC		NC		Non-Members		
		N	%	N	%	N	%	
Gender	Male	177	48.2	47	35.9	49	37.9	<.01
	Female	190	51.8	84	64.1	174	62.1	
Age	60-64	96	26.2	24	18.9	43	22.9	<.01
	65-69	115	31.4	36	28.3	48	21.8	
	70-74	73	19.9	29	22.8	42	19.1	
	75+	82	22.4	38	29.9	87	39.5	
Language	English	292	79.3	109	83.2	187	83.9	<.01
	Mandarin	44	12.0	4	3.1	2	0.9	
	Spanish	32	8.7	18	13.7	34	15.2	
Sexual Orientation	Lesbian	13	3.6	1	0.8	2	2.2	<.01
	Gay Male	41	11.2	1	0.8	4	6.4	
	Bisexual	16	4.4	3	2.3	1	2.8	
	Heterosexual	296	80.9	123	96.1	215	88.5	
Ethnicity	White non-Hispanic	195	54.9	60	47.6	141	56.5	<.01
	Hispanic/Latino	41	11.5	22	17.5	41	14.8	
	Black/African American	46	13.0	28	22.2	24	14.0	
	Asian	53	14.9	10	7.9	9	10.3	
	Native Hawaiian /Pacific Islander	0	0.0	0	0.0	2	0.1	
	Other	20	5.6	6	4.8	4	4.3	
Marital Status	Married	128	34.8	38	29.5	56	31.1	0.25
	Living together as a couple	10	2.7	3	2.3	5	2.5	
	Widowed	63	17.1	27	20.9	61	21.1	
	Divorced	74	20.1	26	20.2	40	19.6	
	Separated	26	7.1	12	9.3	15	7.4	
	Never married	67	18.2	23	17.8	40	18.2	
Household composition	Lives alone	186	50.8	61	46.6	96	43.0	.18
	Lives with others	180	49.2	70	53.4	127	57.0	
Born in the U.S.	Yes	220	59.8	77	58.8	152	68.2	0.22
	No	147	39.9	54	41.2	71	31.8	
Educational Status	Some elementary school	4	1.1	3	2.3	10	1.4	0.10
	Elementary School	13	3.5	5	3.8	27	4.1	
	Middle School	13	3.5	6	4.6	29	4.5	
	High School or GED	90	24.5	48	36.6	212	33.3	
	Associate degree of vocational school	61	16.6	27	20.6	33	14.9	
	Undergraduate college degree	93	25.3	16	12.2	43	19.4	
	Graduate professional degree (Masters or Doctorate)	92	25.0	26	19.8	50	22.5	

This table displays the sociodemographic characteristics of the sample for each of the study groups (ISC members, NC members, and non-members). The last column of the table indicates whether there were statistically significant differences between the three groups for that characteristic. If the p-value is $\leq .05$, at least two of the three study groups were different from each other on this characteristic. For example, the three study groups differed significantly on the percent who spoke English, Mandarin and Spanish, but there was no statistically significant difference in the percent who were born in the U.S.

The ISC sample was almost evenly divided between male and female study participants, while the NC and non-member samples were more likely to be female. Over half of all ISC participants were between the ages of 60 and 69, while NC participants and non-members were more likely to be older. Most of the ISC and NC members, as well as non-members in this sample were interviewed in English. The highest representation of participants interviewed in Mandarin was in the ISC sample, and those interviewed in Spanish were least represented in the ISC sample. The majority of participants in all three groups identified as heterosexual, nearly one-fifth of ISC participants identified as gay male, lesbian or bisexual, largely due to members from the SAGE senior center. There was a higher proportion of Latino and African American respondents in the NC and non-member samples than in the ISC sample. Being currently married was the most common marital status, but marital status was not associated with study groups. Approximately half of senior center members lived alone as compared with 57% of non-members, but this difference was not significant. Although non-members had the highest percent of participants born in the U.S., place of birth was not associated with study group. ISC members were more likely to have a college degree than their cohorts in the NC or non-members, but this association was borderline significant.

SENIOR CENTER ATTENDANCE

Table 4. Mean number of days per week attended senior center at Baseline and 12 Months by study group

	TIME POINT		
	Baseline	6 Months	12 Months
N	492	384	393
Mean	2.2	1.7	1.8
Median	2.0	1.5	1.5
Std. Deviation	1.4	1.5	1.6

Senior center members attended the senior center at which they were interviewed at Baseline, on average, two days a week. There was virtually no difference between these two study groups. Attendance for study participants was slightly lower at 6 Months and at 12 Months as compared with Baseline.

Table 5. Comparison of mean number of days per week attended senior center at three time points.

TIME POINT	N	NUMBER OF DAYS	
		Mean	SD
Baseline	377	2.2	1.3
6 Months		1.7	1.5
P value comparing Baseline and 6 Months		<.001	
Baseline	376	2.2	1.4
12 Months		1.8	1.6
P value comparing Baseline and 12 Months		<.001	
6 Months	356	1.7	1.5
12 Months		1.8	1.6
P value comparing 6 Months and 12 Months		.54	

The decline in mean number of days from Baseline to 6 Months and Baseline to 12 Months was significant.

Table 6. Change in senior center attendance since last interview.

CHANGE IN ATTENDANCE SINCE LAST INTERVIEW	AT 6 MONTHS Compared with Baseline N = 279		AT 12 MONTHS Compared with 6 Months N = 285	
	N	%	N	%
More	39	14.0	30	10.2
About the Same	185	66.3	179	60.7
Less	55	19.7	86	29.2

Participants' estimation of whether they were attending more, about the same, or less at 6 Months and at 12 Months was consistent with the reported number of days attending at each time point. It is important to note that even though attendance declined, over 70% attended more or at the same level since Baseline.

REASONS FOR ATTENDING SENIOR CENTER

Table 7. Reason for attending a senior center by study group

REASON FOR ATTENDING MENTIONED	N	%
Socialization / Avoid Isolation	330	66.4
Classes/Educational Programs	247	49.7
Meals	202	40.6
Recreational Programs	202	40.6
Exercise	154	31.0
Pass the time/something to do	134	27.0
To be with people like me	114	22.9
Health Programs	154	14.5
Trips	60	12.1
Information & Referral	41	8.2
Help signing up for benefits	29	5.8
Volunteering	27	5.4

Opportunities for socialization and avoiding isolation were the most common reason given for attending a senior center, followed by classes and educational programs, meals, recreational programs, exercise, to pass the time and having something to do, and to be with people like themselves. This underscores the significance of strategic and innovative program planning with an emphasis on continued learning and wellness. Other reasons were mentioned by less than one fifth of participants. ISC and NC members were similar in the reasons given.

PHYSICAL HEALTH

Table 8. Self-rated physical health by study group at Baseline

RATING	STUDY GROUP				P value on chi-square
	Member		Non-member		
	N	Percent	N	percent	
Excellent	67	13.6	48	21.6	.02
Good	149	30.2	67	30.2	
Fair	152	30.8	68	30.6	
Poor or Bad	126	25.5	39	17.6	

Senior center members reported being in poorer health than non-members. At Baseline, members were most likely to rate their health as good or fair, with one quarter rating their health as poor or bad. Non-members were very similar to members in the percent rating their health as good or fair, but much more likely to rate their health as excellent and less likely to rate their health as poor or bad. It must be noted that non-members tended to be younger and more active (in our sample). This may have resulted in them reporting better health than their senior center counterparts.

Self-rated health is a valid measure of health status, with predictive validity with respect to morbidity and mortality (Idler & Benyamini, 1997; Latham & Peek, 2012; Schnittker & Bacek, 2014).

Table 9. Self-rated physical health of members at 6 Months

RATING	N	PERCENT
Excellent	52	13.5
Good	130	33.7
Fair	117	30.3
Poor or Bad	87	22.5

There was virtually no difference between ISC and NC members in rating their health at Baseline and at 6 Months.

Table 10. Change in self-rated physical health from Baseline to 6 Months for members.

PHYSICAL HEALTH AT 6 MONTHS	PHYSICAL HEALTH AT BASELINE			
	Excellent	Good	Fair	Poor or Bad
Excellent	28 57.1%	16 13.1%	7 5.8%	1 1.1%
Good	13 26.5%	74 60.7%	38 31.94%	2 2.2%
Fair	5 10.2%	23 18.9%	64 52.9%	24 26.7%
Poor or Bad	3 6.1%	9 7.4%	12 9.9%	63 70.0%
TOTAL	49 100.0%	122 100.0%	121 100.0%	90 100.0%

This table shows the change in rating of health from Baseline to 6 Months for senior center members (ISC and NC members). The blue cells indicate no change in health from Baseline to 6 Months, the yellow cells indicate an improvement from Baseline to 6 Months, and the gray cells indicate a decline from Baseline to 6 Months. There were 23.0% of senior center members who had a better health rating at 6 Months as compared with Baseline, and 17.0% who reported a poorer health rating at 6 Months ($p < .001$). It is also noteworthy that 60.0% of senior center members reported no decline in health over this time period. This highlights a trend that a majority of senior center members tended to maintain their positive health status over the length of participation.

Table 11. Self-rated physical health at 12 Months.

RATING	N	PERCENT
Excellent	105	16.3
Good	199	30.9
Fair	204	31.6
Poor or Bad	137	21.2

There were very minor, and not significant, differences in self-rated health at 12 Months for ISC members as compared with NC members.

Table 12. Change in self-rated physical health from Baseline to 12 Months for members.

RATING OF HEALTH AT 12 MONTHS	RATING OF HEALTH AT BASELINE			
	Excellent	Good	Fair	Poor or Bad
Excellent	58 59.8%	33 15.9%	8 4.1%	3 2.2%
Good	27 27.8%	118 56.7%	44 22.8%	10 7.2%
Fair	8 8.2%	45 21.6%	112 58.0%	35 25.2%
Poor or Bad	4 4.1%	12 5.8%	29 15.0%	91 65.5%
TOTAL	97 100.0%	208 100.0%	193 100.0%	139 100.0%

This table shows the change in rating of health from Baseline to 12 Months for senior center members (ISC and NC members). The blue cells indicate no change in health from Baseline to 12 Months, the yellow cells indicate an improvement from Baseline to 12 Months, and the gray cells indicate a decline from Baseline to 12 Months. There were 20.9% of senior center members who had a better health rating at 12 Months as compared with Baseline, and 19.6% who reported a poorer health rating at 12 Months ($p < .001$). The majority (59.5%) of

senior center members showed no decline in health over this time period. This is very similar to the trend observed at the 6-month interviews.

Table 13. Improvement in health at three time points for senior center members and at 12 months for non-members.

SAMPLE	IMPROVEMENT IN HEALTH SINCE...	N	PERCENT	
MEMBERS	Joining the senior center (measured at Baseline)	Improved	213	43.7
		Stayed the same	259	53.2
		Declined	15	3.1
	Baseline interview (measured at 6 Months)	Improved	105	27.3
		Stayed the same	207	53.7
		Declined	73	19.0
	6-Month Interview (measured at 12 Months)	Improved	153	29.9
		Stayed the same	264	51.7
		Declined	94	18.4
NON-MEMBERS	Baseline (measured at 12 Months)	Improved	56	22.7
		Stayed the same	138	55.9
		Declined	53	21.5

Virtually all senior center members reported either no decline or improvement since joining the senior center. At both the 6 Month and 12 Month interviews, more than half reported no decline and over one-quarter reported an improvement in their health since the Baseline interview. Non-members were similar to members, although the time frame for them was from Baseline to 12 Months

Table 14. Change in physical health since started attending the senior center and since the Baseline interview for senior center members.

CHANGE IN PHYSICAL HEALTH SINCE BASELINE INTERVIEW (measured at 6 Months)	CHANGE IN PHYSICAL HEALTH SINCE STARTED ATTENDING THE SENIOR CENTER (measured at Baseline)			p value
	Improved	Stayed the same	Declined	
Improved	61 39.1%	38 18.0%	2 20.0%	<.001
Stayed the same	68 43.6%	132 62.6%	4 40.0%	
Declined	27 17.3%	41 19.4%	4 40.0%	

This table indicates that 39.1% of senior center members who reported improvement in their health since they started attending a senior center continued to report improved health from their Baseline to 6 Months. Equally important is that over three-fifths of those who reported that their health had stayed the same since they started attending a senior center reported that they continued to stay the same 6 Months later, indicating maintenance of health status since joining the senior center. Only 10 senior center members reported a decline in health since they started attending a senior center.

Table 15. Association between improvement in physical health since Baseline measured at 6 Months and whether members had a serious health issue since Baseline for senior center members.

IMPROVEMENT IN HEALTH SINCE BASELINE (measured at 6 Months)	HAD A SERIOUS HEALTH ISSUE SINCE BASELINE (measured at 6 Months)				p-value on chi-square
	Yes		No		
	N	Percent	N	Percent	
Improved	23	27.1	82	27.3	<.001
Stayed the same	25	29.4	182	60.7	
Declined	37	43.5	36	12.0	

Senior center members who reported having a serious health issue since Baseline were more likely to report that their health declined in that time period than those who did not report this.

Table 16. Change in physical health since Baseline and since 6 Months for senior center members.

CHANGE IN PHYSICAL HEALTH SINCE 6-MONTH INTERVIEW (measured at 12 Months)	CHANGE IN PHYSICAL HEALTH SINCE BASELINE INTERVIEW (measured at 6 Months)			p-value on chi square
	Improved	Stayed the same	Declined	
Improved	57 57.6%	32 16.8%	21 30.9%	<.001
Stayed the same	31 31.3%	132 69.5%	20 29.4%	
Declined	11 11.1%	26 13.7%	27 39.7%	
TOTAL	99 100.0%	190 100.0%	68 100.0%	

More than half of senior center members reported improvement in their health at 6 Months also reported improved health from 6 Months to 12 Months. Equally important is that

nearly 7 out of 10 members who reported that their health had stayed the same at 6 Months continued to stay the same at 12 Months, indicating maintenance of health status since joining the senior center. Of those who reported that their health had declined from Baseline to 6 Months, only 27 reported that their health continued to decline at 12 Months.

Table 17. Association between improvement in physical health since 6 Months measured at 12 Months and whether members had a serious health issue since 6 Months for senior center members.

IMPROVEMENT IN HEALTH SINCE 6 MONTHS (measured at 12 Months)	HAD A SERIOUS HEALTH ISSUE SINCE 6 MONTHS (measured at 12 Months)				p-value on chi-square
	Yes		No		
	N	Percent	N	Percent	
Improved	32	23.9	147	28.8	<.001
Stayed the same	35	26.1	307	60.2	
Declined	67	50.0	56	11.0	

Senior center members who had a serious health issue since the 6 Month interview, as measured at the 12 Month interview, were less than half as likely as those who did not report a serious health issue to say that their health had stayed the same, and almost five times as likely to report that their health had declined.

MENTAL HEALTH

Table 18. Self-rated mental health by study group at Baseline

RATING	STUDY GROUP				P value on chi-square
	Members		Non-member		
	N	Percent	N	percent	
Excellent	64	21.6	92	18.6	.41
Good	98	33.1	170	34.3	
Fair	90	30.4	140	28.3	
Poor or Bad	44	14.9	93	18.8	

The majority of study participants rated their mental health as good or excellent. There was no difference between members and non-members in self-rated mental health at Baseline.

Table 19. Self-rated mental health of members at 6 Months

RATING	N	PERCENT
Excellent	68	17.6
Good	130	33.6
Fair	126	32.6
Poor or Bad	63	16.3

As at Baseline, the majority of senior center members reported their mental health as good or excellent.

Table 20. Change in self-rated mental health from Baseline to 6 Months (n=377).

MENTAL HEALTH AT 6 MONTHS	MENTAL HEALTH AT BASELINE			
	Excellent	Good	Fair	Poor or Bad
Excellent	38 48.1%	19 14.1%	7 6.8%	3 4.5%
Good	30 38.0%	60 44.4%	32 31.1%	7 10.4%
Fair	8 10.1%	45 33.3%	43 41.7%	29 43.3%
Poor or Bad	3 3.8%	11 8.1%	21 20.4%	28 41.8%
TOTAL	79 100%	135 100%	103 100%	67 100%

The change in rating of mental health from Baseline to 6 Months for senior center members. The blue cells indicate no change in health from Baseline to 6 Months, the yellow cells indicate an improvement from Baseline to 6 Months, and the gray cells indicate a decline from Baseline to 6 Months. There was improvement ($p < .01$) from Baseline to 6 Months for 25.3% of the senior center members and 44.0% maintained the same level of mental health. Almost one-third (30.7%) of the senior center members reported poorer mental health at the 6-Month interview as compared with Baseline. Thus, the majority of senior center members reported an improved mental health or no change in their status since Baseline.

Table 21. Self-rated mental health at 12 Months by study group

RATING	STUDY GROUP				P value on chi-square
	Members		Non-member		
	N	Percent	N	percent	
Excellent	69	17.6	49	19.8	.79
Good	138	35.1	87	35.1	
Fair	127	32.3	72	29.0	
Poor or Bad	59	15.0	40	16.1	

There was no difference in self-rated mental health at 12 Months for members and non-members. In analyses not shown here, there was also no difference in self-rated mental health at 12 Months for ISC Members and NC members.

Table 22. Change in self-rated mental health from Baseline to 12 Months for Members

RATING OF HEALTH AT 12 MONTHS	RATING OF HEALTH AT BASELINE			
	Excellent	Good	Fair	Poor or Bad
Excellent	64 48.1%	38 17.0%	12 6.7%	4 3.9%
Good	48 36.1%	117 52.5%	49 27.5%	10 9.7%
Fair	17 12.8%	51 22.9%	92 51.7%	37 35.9%
Poor or Bad	4 3.0%	17 7.6%	25 14.0%	52 50.5%
TOTAL	133 100.0%	233 100.0%	178 100.0%	103 100.0%

At 12 Months, 23.5% of senior center members rated their mental health better than they did at Baseline, 51.0% rated their mental health the same as at Baseline, and a quarter

(25.7%) rated their mental health lower than they did at Baseline. This finding of 74% of senior center members maintaining or improving their mental health status since Baseline is noteworthy.

Table 23. Improvement in mental health at three time points for senior center members and at 12 months for non-members.

SAMPLE	IMPROVEMENT IN MENTAL HEALTH SINCE...	N	PERCENT	
MEMBERS	Joining the senior center (measured at Baseline)	Improved	287	58.7
		Stayed the same	198	40.5
		Declined	4	.8
	Baseline interview (measured at 6 Months)	Improved	138	35.8
		Stayed the same	214	55.4
		Declined	34	8.8
	6-Month Interview (measured at 12 Months)	Improved	287	58.7
		Stayed the same	198	40.5
		Declined	4	.8
NON-MEMBERS	Baseline (measured at 12 Months)	Improved	57	23.2
		Stayed the same	162	65.9
		Declined	27	11.0

Almost three-fifths of senior center members reported that their mental health had improved since they started attending the senior center, and virtually all of the remaining senior centers members reported that their mental health had stayed the same since that time. The majority of senior center members reported improved mental health in the six months since the Baseline interview, 40.5% had maintained the same level of mental health, and only 4 seniors (.8%) reported a decline in health since the Baseline interview. For senior center members, the findings at 12 Months, based on change since the 6 Month interview, were similar to those at the 6 Month interview.

The findings for non-members were quite different. Less than one quarter reported improved mental health one year after the Baseline interview and 11% reported a decline in their mental health.

Table 24. Change in mental health since started attending the senior center and since the Baseline interview for senior center members.

CHANGE IN MENTAL HEALTH SINCE BASELINE INTERVIEW (measured at 6 Months)	CHANGE IN MENTAL HEALTH SINCE STARTED ATTENDING THE SENIOR CENTER (measured at Baseline)			p-value on chi square
	Improved	Stayed the same	Declined	
Improved	93 68.9%	104 49.8%	22 64.7%	<.01
Stayed the same	41 30.4%	103 49.3%	11 32.4%	
Declined	1 0.7%	2 1.0%	1 2.9%	

Over two-thirds of senior center members who reported at Baseline that their mental health had improved since they started attending a senior center, also reported improvement of their mental health at 6 Months. Half of those who at Baseline reported that their health had stayed the same since joining a senior center and almost two-thirds of those who reported that their mental health had declined, reported that their mental health improved at 6 Months. Only four senior center members reported that their mental health had declined in the time from the Baseline to the 6-Month interview.

Table 25. Association between improvement in mental health since first interview by whether had a serious health issue since the Baseline interview for senior center members.

IMPROVEMENT IN HEALTH SINCE BASELINE (measured at 6 Months)	HAD A SERIOUS HEALTH ISSUE SINCE BASELINE (measured at 6 Months)				p-value
	Yes		No		
	N	Percent	N	Percent	
Improved	26	29.9	112	37.5	.14
Stayed the same	49	56.3	165	55.2	
Declined	12	13.8	22	7.4	

There was no association between whether there was a serious health issue since the Baseline interview and improvement in mental health since the Baseline interview.

Table 26. Change in self-rated mental health since Baseline and since 6 Months for senior center members.

CHANGE IN MENTAL HEALTH SINCE 6 MONTH INTERVIEW (measured at 12 Months)	CHANGE IN MENTAL HEALTH SINCE BASELINE INTERVIEW (measured at 6 Months)			p-value
	Improved	Stayed the same	Declined	
Improved	64 50.4%	44 21.9%	8 26.7%	<.001
Stayed the same	54 43.5%	143 71.1%	15 50.0%	
Declined	7 5.5%	14 7.0%	7 23.3%	

Half of senior center members who reported at 6 Months that their mental health had improved since Baseline, also reported improvement of their mental health at 12 Months.

This may point to continued benefits as perceived by members. Only 28 participants reported that their mental health had declined since the 6 Month interview.

Table 27. Association between improvement in mental health since 6 Months measured at 12 Months, by whether had a serious health issue since 6 Months for senior center members.

IMPROVEMENT IN MENTAL HEALTH SINCE 6 MONTHS (MEASURED AT 12 MONTHS)	HAD A SERIOUS HEALTH ISSUE SINCE 6 MONTHS (MEASURED AT 12 MONTHS)				p-value on chi-square
	Yes		No		
	N	Percent	N	Percent	
Improved	36	26.7	151	29.7	<.001
Stayed the same	73	54.1	326	64.2	
Declined	26	19.3	31	6.1	

Senior center members who reported at 12 Months having had a serious health issue since 6 Months were three times more likely to report that their mental health had declined during this time period as compared with those who did not report having a serious health issue.

Table 28. Depression level at Baseline and 12 Months by study group

TIME POINT	DEPRESSION LEVEL	STUDY GROUP				p-value comparing study group within time point
		Members		Non-member		
		N	Percent	N	percent	
Baseline	No depression	335	67.8	236	80.8	<.001
	Mild depression	106	21.5	44	15.1	
	Moderate to severe depression	53	10.7	12	4.1	
12 Months	No depression	295	75.1	197	79.4	.44
	Mild depression	72	18.3	38	15.3	
	Moderate to severe depression	26	6.6	13	5.2	

The majority of study participants were in the No Depression group. Non-members were more likely than senior center members to report No Depression. Senior center members were 2.6 times more likely than non-members to report Moderate to Severe Depression. This difference between senior center members and non-members is most likely due to the sampling method. A probability sampling plan, in which members were randomly selected and invited to participate, was used for senior center members. The volunteer sampling plan was used for non-members made it less likely that individuals who were depressed would contact the Senior Center Study and request that they be interviewed. It is important to note that senior centers are providing activities and socialization to depressed seniors.

There were no differences at 12 Months between members and non-members in depression level. This may be partially due to greater attrition among the moderate to severe group (31.2%) as compared with the no depression (20.9%) and mild depression (17.0%) groups.

Table 29. Depression level at Baseline by self-rated health, self-rated mental health, language of interview and ethnicity.

		N	DEPRESSION LEVEL			P value
			No Depression %	Mild Depression %	Moderate to Severe Depression %	
Self-rated health	Excellent	120	80.8	16.7	2.5	<.001
	Good	236	78.4	17.4	4.2	
	Fair	234	77.4	16.2	6.4	
	Poor or Bad	191	54.5	26.7	18.8	
Self-rated mental health	Excellent	155	92.3	5.8	1.9	<.001
	Good	266	79.7	16.9	3.4	
	Fair	228	69.7	21.9	8.3	
	Poor or Bad	133	42.1	32.3	25.6	
Language of Interview	English	596	72.0	19.5	8.6	.40
	Mandarin	95	80.0	12.6	7.4	
	Spanish	95	69.5	23.2	7.4	
Ethnicity	White Non-Hispanic	404	71.5	20.0	8.4	.21
	Hispanic	117	70.1	19.7	10.3	
	Non-Hispanic black	100	69.0	20.0	11.0	
	Asian	117	81.2	12.8	6.0	
	Other race	29	69.0	31.0	0.0	

Table 29 indicates that self-rated physical and mental health were associated with depression level. The percent with moderate to severe depression increased as rating of physical health and of mental health worsened. Language of interview and ethnicity were not associated with depression level.

Table 30. Depression level at Baseline and 12 Months for members.

DEPRESSION SEVERITY LEVEL AT 12 MONTHS	DEPRESSION SEVERITY LEVEL AT BASELINE			p value
	No depression	Mild depression	Moderate to Severe depression	
No depression	401 86.6%	68 55.3%	15 33.3%	<.001
Mild	48 10.4%	44 35.8%	17 37.8%	
Moderate to Severe	14 3.0%	1 8.9%	13 28.9%	
TOTAL	463 100.0%	123 100.0%	45 100.0%	

Most senior center members who were in the No Depression group at Baseline remained in this group at 12 Months. Only 13 participants who had Moderate to Severe Depression at Baseline continued to have this level of depression at 12 Months. There were 15.9% of senior center members whose mental health improved since Baseline, 72.6% whose mental health remained the same, and only 10% with a decline in mental health.

Table 31. Anxiety level at Baseline and 12 Months by study group

TIME POINT	ANXIETY LEVEL	STUDY GROUP				p-value comparing study group within time point
		Members		Non-member		
		N	Percent	N	Percent	
Baseline	No anxiety	386	78.5	252	84.8	.06
	Mild anxiety	80	16.3	31	10.4	
	Moderate to severe anxiety	26	5.3	14	4.7	
12 Months	No anxiety	252	84.8	386	78.5	.06
	Mild anxiety	31	10.4	80	16.3	
	Moderate to severe anxiety	14	4.7	492	5.3	

Most respondents were in the No Anxiety group at Baseline. Non-members had a lower proportion with no anxiety at Baseline and 12 Months, although this was only borderline significant ($p=.06$).

Table 32. Anxiety level at Baseline and 12 Months for members.

ANXIETY SEVERITY LEVEL AT 12 MONTHS	ANXIETY SEVERITY LEVEL AT BASELINE			P value
	No anxiety	Mild anxiety	Moderate to Severe anxiety	
No anxiety	266 87.8%	39 57.4%	9 50.0%	<.001
Mild	35 11.6%	23 33.8%	7 38.9%	
Moderate to Severe	2 0.7%	6 8.8%	2 11.1%	
TOTAL	303 100.0%	68 100.0%	18 100.0%	

Most participants who were in the No Anxiety group at Baseline remained in this group at 12 Months. At least half of those who had Mild Anxiety or Moderate to Severe Anxiety at Baseline were also in the No Anxiety group at 12 Months. Only one participant who had No Anxiety at Baseline and six who had Mild Anxiety were in the Moderate to Severe Anxiety group at 12 Months.

EXERCISE

Table 33. Hours of Exercise at Baseline and 12 Months by study group

STUDY GROUP	BASELINE			6 MONTHS			12 MONTHS		
	N	Mean	SD	N	Mean	SD	N	Mean	SD
ISC	368	8.2	12.8	285	5.1	5.2	288	5.4	5.4
NC	131	7.7	10.4	93	5.3	4.7	98	8.0	7.6
Non-member	297	6.0	10.7				246	7.1	8.4
p value	.05 P value on ANOVA for the difference in means among three study groups. Difference between ISC and non-members was significant (p<.05)			.63 P value on t test comparing ISC and NC members at 6 Months			<.001 P value on ANOVA for the difference in means among three study groups. Difference between ISC with both NC and non-members was significant (p<.05)		

ISC members reported significantly more hours of exercise per week than non-members at Baseline. There was no difference in the mean number of hours of exercise for ISC and NC members at 6 Months. At 12 Months, ISC members reported fewer hours of exercise than both NC members and non-members.

Table 34. Hours of Exercise at Baseline and 12 Months by study group, adjusted for age.

STUDY GROUP	BASELINE			12 MONTHS		
	N	Adjusted Mean	SD	N	Adjusted Mean	SD
ISC	368	8.2	12.8	278	5.3	5.4
NC	131	7.7	10.4	96	8.0	7.7
Non-member	297	6.0	10.7	245	7.1	8.4
p value	.06 P value on ANCOVA for the difference in means among three study groups, controlling for age. P value for age = .50			.001 P value on ANCOVA for the difference in means among three study groups, controlling for age. P value for age = .01		

The number of hours of exercise by study group was virtually unchanged when controlling for age.

Table 35. Comparison of hours of exercise at different time points for members

TIME POINT	N	NUMBER OF HOURS	
		Mean	SD
Baseline	378	7.8	11.8
6 Months		5.1	5.1
P value comparing Baseline and 6 Months		<.001	
Baseline	386	7.8	11.0
12 Months		6.0	6.1
P value comparing Baseline and 12 Months		<.01	
6 Months	345	5.1	4.7
12 Months		5.8	6.0
P value comparing 6 Months and 12 Months		.01	

Comparing the number of hours of weekly exercise for all senior center members at different time points revealed a decrease in the mean number of hours from Baseline to 6 Months and from Baseline to 12 Months. There was an increase in hours of exercise from 6 Months to 12 Months.

Table 36. Change in amount of exercise by time point for senior center members

TIME POINT	STUDY GROUP	CHANGE IN AMOUNT OF EXERCISE				p-value
		Same or More		Less		
		N	%	N	%	
At Baseline since joined Senior Center	ISC	343	96.9	11	3.1	.23
	NC	122	94.6	7	5.4	
At 6 Months Since Baseline	ISC	228	80.6	55	19.4	.85
	NC	79	81.4	18	18.6	
At 12 Months since 6 Months	ISC	246	84.8	44	15.2	.48
	NC	86	87.8	12	12.2	

Many senior center members reported exercising more at Baseline than they did prior to joining a senior center and many also reported that they had maintained their level of exercise in that time period. Very few reported exercising less since joining a senior center. Most senior center members reported exercising the same or more at 6 Months than they did at Baseline, and the same or more at 12 Months than they did at 6 Months. There was no significant difference between ISC and NC members on amount of exercise over time.

Table 37. Change in amount of exercise by time point for senior center members

TIME POINT	STUDY GROUP	CHANGE IN AMOUNT OF EXERCISE						p-value
		More		Same		Less		
		N	%	N	%	N	%	
Baseline since joined Senior Center	ISC	147	41.5	196	55.4	11	3.1	.20
	NC	61	47.3	61	47.3	7	5.4	
6 Months Since Baseline	ISC	60	21.2	168	59.4	55	19.4	.95
	NC	22	22.7	57	58.8	18	18.6	
12 Months since 6 Months	ISC	64	22.1	182	62.8	44	15.2	.77
	NC	22	22.4	64	65.3	12	12.2	

Examining the data with three categories of change in amount of exercise indicates that for each of the three time periods examined, there was no difference between ISC and NC members.

Table 38. Serious health issue since last interview by amount of exercise.

STUDY GROUP	SERIOUS HEALTH ISSUE SINCE LAST INTERVIEW	AMOUNT OF EXERCISE SINCE LAST INTERVIEW				p-value on chi-square
		Same or More		Less		
		N	%	N	%	
MEMBERS Since Baseline at 6 Months	Yes	59	68.6	27	31.4	.001
	No	248	84.4	46	15.6	
MEMBERS Since 6 Months at 12 Months	Yes	63	70.0	27	30.0	<.001
	No	269	90.3	29	9.7	

Those who reported at 6 Months that they had experienced a serious health issue since Baseline were more than twice as likely to exercise less than those who did not report having a serious health issue. The same pattern was also seen at 12 Months, comparing those who did and did not report a serious health issue since 6 Months.

PARTICIPATION IN HEALTH PROGRAMS AT SENIOR CENTER

Table 39. Attended a health program at each time point by study group

TIME POINT	ATTENDED A HEALTH PROGRAM IN THE LAST YEAR	STUDY GROUP						p-value on chi-square
		ISC		NC		NON-MEMBER		
		N	Percent	N	Percent	N	Percent	
Baseline	No	226	61.4	86	65.6	161	72.2	.03
	Yes	142	38.6	45	34.4	62	27.8	
6 Months	No	101	34.7	35	35.7			.86
	Yes	190	65.3	63	64.3			

ISC members were most likely, and non-members were least likely, to have attended a health program in the year before the Baseline interview. Over one third of senior center members attended a health program at a senior center in the year prior to the Baseline interview, as compared with 27.8% of non-members who attended a health program at any location.

At the 6 Month interview, almost two-thirds of ISC and NC members had attended a health program in the last year. This indicates a major increase in attending a health program between Baseline and 6 Months.

Table 40. Participation in specific health and wellness programs by study group

HEALTH & WELLNESS PROGRAM	ISC	NC
	Attends sometimes or often (compared with rarely or never)	
	Percent	Percent
Yoga	18.2	15.3
Aerobics	15.2	9.9
Chair Exercise	14.7	11.5
Nutrition Education	12.8	9.9
Blood Pressure	12.0	16.0
Health Education Workshops for diabetes, hypertension, weight management and other health conditions	12.0	6.9
Tai Chi	12.0	9.2
General Health	11.1	9.2
Swimming	10.9	10.7
Cognitive Strengthening (like memory exercises, puzzles etc.)	9.2	6.1
Health Fairs	9.0	6.9
Program with local medical providers	8.4	7.6
Walking Club	7.3	7.6
Cancer Screening	4.9	4.6
Vision Testing	4.9	2.3
Personal Training	4.3	1.5
Hearing Testing	4.1	1.5
Weight Watchers	4.1	0.8
Alzheimer's Programs	3.3	1.5
Tennis	1.9	1.5
AA Meetings	0.3	0.8

Exercise (yoga, aerobics, and chair exercise) was the most common health and wellness program attended. Nutrition and health education workshops and blood pressure screening were also among the most regularly attended health programs. However, attendance was less than 20% of seniors even for the most popular of these programs, and below 10% of the seniors

for more than half of these programs. There were no significant differences for ISC and SC members in attendance at any of these program.

BEHAVIOR CHANGE DUE TO PARTICIPATION IN HEALTH PROGRAMS

Table 41. Change in health behavior at Baseline due to participation in a health program by study group.

CHANGE IN HEALTH BEHAVIOR DUE TO PARTICIPATION IN HEALTH PROGRAM	STUDY GROUP									p-value on chi-square
	ISC			NC			NON-MEMBER			
	Yes % (N)	No % (N)	NA (already doing) % (N)	Yes % (N)	No % (N)	NA (already doing) % (N)	Yes % (N)	No % (N)	NA (already doing) % (N)	
Understand the importance of exercise	76.4 (81)	5.7 (6)	17.9 (19)	50.0 (10)	0.0 (0)	50.0 (10)	72.6 (45)	1.6 (1)	25.8 (16)	.02
Made exercise part of routine	69.8 (74)	8.5 (9)	21.7 (23)	55.0 (11)	10.0 (2)	35.0 (7)	50.0 (31)	24.2 (15)	25.8 (16)	.03
Became more physically active	67.9 (72)	12.3 (13)	19.8 (21)	50.0 (10)	10.0 (2)	40.0 (8)	50.0 (31)	24.2 (15)	25.8 (16)	.05
Do monthly breast exams	12.9 (18)	16.5 (23)	11.5 (16) 59.0% male	4.3 (1)	26.1 (6)	11.5 (16) 43.5% male	19.4 (12)	43.5 (27)	21.0 (13) 16.1% male	<.01

This table shows the change in health behaviors due to participation in a health program at a senior center for ISC and NC members and at any health program for non-members among those who were not already performing this health behavior. Only the behaviors for which there was a significant difference by study group in the proportion who had changed a health behavior are shown in this table. ISC members were more likely than NC members and non-members to monitor their weight frequently, make

exercise a part of their routine, and to become more physically active. The rate of starting to perform monthly breast self-exam due to participation in a health program among female study participants was highest among non-members and lowest among NC members.

SOCIAL ENGAGEMENT

Table 42. Number of friends the respondent met at the senior center

NUMBER OF FRIENDS MET AT THE SENIOR CENTER	N	PERCENT
All	15	3.0
Most	48	9.7
Some	267	54.2
None	163	33.1

The majority of senior center members met at least some to their current friends at the senior center where the Baseline interview was conducted, and almost 10% met most or all of their current friends at that senior center. There was no difference between ISC and NC members.

Table 43. Number of friends the respondent met at the senior center by feeling isolated

NUMBER OF FRIENDS MET AT THE SENIOR CENTER	N	FREQUENCY FEEL ISOLATED			p value
		Hardly Ever %	Sometimes %	Often %	
All or Most	62	80.6%	17.7%	1.6%	.03
Some	264	72.7%	23.5%	3.8%	
None	162	66.0%	24.1%	9.9%	

The number of friends that the respondent met at the senior center is associated with frequency of feeling isolated. The more friends that were met at the senior center, the less frequently SC Members reported feeling isolated.

Table 44. Mean number of days spent alone by time point and study group

TIME POINT	STUDY GROUP	N	MEAN	SD	p-value on ANOVA
Baseline	ISC	368	2.9	12.4	.23
	NC	131	3.4	14.7	
	Non-member	297	1.6	8.1	
6 Months	ISC	362	1.3	1.7	.26
	NC	128	1.1	1.6	
12 Months	ISC	291	1.1	1.6	.57
	NC	98	.95	1.4	
	Non-member	245	1.1	1.7	

ISC members reported, on average, spending three days a week alone, in which they did not see any of their friends or family, or a paid staff person, such as an aide or housekeeper. Non-members reported spending fewer days alone as compared with senior center members, but this difference was not significant. The difference between members and non-members, albeit not significant, may be explained by the way in which non-members were recruited. Some non-members were recruited from programs that involve more active engagement than might be typical for this age group.

Table 45. Mean number of days spent alone for senior center members by time point

TIMEPOINT	N	M	SD	p-value on paired t-test
Baseline	376	2.6	11.2	.03
6 Months		1.3	1.7	
Baseline	389	2.5	11.1	.01
12 Months		1.1	1.6	
6 Months	346	1.3	1.7	.02
12 Months		1.1	1.5	

At the 6 Months and at 12 Months, senior center members reported spending fewer days alone, on average, than they did at Baseline and at 6 Months, respectively. There was a very minor, but significant, decline in number of days spent alone from 6 Months to 12 Months. This may reflect expanded social networks and greater friendships being developed as participation continued at the senior center over 12 months.

Table 46. Frequency feel isolated from others at each time point by study group.

TIME POINT	FREQUENCY FEEL ISOLATED FROM OTHERS	STUDY GROUP						p-value on chi-square
		ISC		NC		NON-MEMBER		
		N	Percent	N	Percent	N	Percent	
Baseline	Hardly ever	247	68.0	103	79.8	239	81.0	<.001
	Sometimes	98	27.0	17	13.2	41	13.9	
	Often	18	5.0	9	7.0	15	5.1	
6 Months	Hardly ever	196	68.3	69	71.9			.80
	Sometimes	73	25.4	22	22.9			
	Often	18	6.3	5	5.2			
12 Months	Hardly ever	224	75.4	80	81.6	194	78.5	.76
	Sometimes	61	20.5	15	15.3	44	17.8	
	Often	12	4.0	3	3.1	9	3.6	

ISC members were least likely to report that they hardly ever felt isolated from others at Baseline, as compared with NC members and with non-members, who were similar to each other. NC members were most likely to report often feeling isolated from others and non-members were least likely to report this. At 6 Months, the percent of NC members who reported hardly ever feeling isolated was similar to that of ISC members. At 12 Months there was no difference among the three study groups.

In analyses not shown here, there was a significant increase from Baseline to 12 Months and from 6 Months to 12 months in the percent of ISC members who reported hardly ever feeling isolated. For NC members, there were significant increases in the percent who reported hardly ever feeling lonely comparing Baseline to 6 Months.

ACTIVITIES ENGAGED IN BY NON-MEMBERS

Table 47. Activities engaged in by non-members

ACTIVITIES ENGAGED IN BY NON- MEMBERS	SOMETIMES OR OFTEN	
	N	%
Group Trips	104	35.0
Volunteer Activities	96	33.0
Exercise Classes	80	27.0
Educational classes (e.g., language, computer)	72	24.3
Playing games (e.g., bingo, cards, dominoes, checkers)	71	24.0
Regular Discussion Group	69	23.3
Civic Associations	30	10.2
Arts or Crafts Activity Groups	25	8.5

The most common activities that non-members engaged were group trips (museums, theater, etc.), volunteer activities, exercise classes, playing board games, and discussion groups. The mean number of these activities that non-members did sometimes or often was 1.8 (SD = 1.7), and the median was 2.0 activities. Over half (52.3%) of non-members reported participating in at least two of the 10 activities listed.

REASONS FOR NOT PARTICIPATING IN A SENIOR CENTER

Table 48. Reasons mentioned by non-members for not attending a senior center, by whether or not they have previously attended (n=219).

REASON	DID NOT PREVIOUSLY ATTEND A SENIOR CENTER N=189 63.9%	DID PREVIOUSLY ATTEND A SENIOR CENTER N=107 36.1%	p- value on chi square
Too busy working	50 27.2	11 10.5	.001
Too busy with social and leisure activities	50 27.0	33 31.4	.43
Not interested / don't need programs or services	50 26.6	24 22.6	.45
Don't need or want socialization	41 21.8%	11 10.5	.02
Other members are not like me: age, function	19 10.2	11 10.4	.97
Inconvenient to get to	9 4.8	15 14.2	<.01

This table shows the top five reasons that non-members gave for not attending a senior center, for those who had previously attended (67.6%) and those who had not previously attended (32.4%) a senior center. The most common reasons given by non-members who had not previously attended a senior center for not attending a senior center were: they were too busy with social and leisure activities, they were not interested or did not need the programs or services, they did not want or need socialization, they were too busy working, and they felt that the other members were not similar to them in age or functional ability. This may point to the fact that most senior centers (ISCs and NCs) are not designed to meet the needs of working older adults.

Those who had not previously attended a senior center were more likely than those who had to say that the reason they did not currently attend was because they did not need or want socialization and that they were too busy working.

Four of the top five reasons given by non-members who had previously attended a senior center were the same as for those who had attended a senior center. They did not list too busy working as one of their top five reasons, but instead mentioned that the senior center is inconvenient to get to.

The mean number of reasons given by non-members for not attending a senior center was 1.4 (SD=1.2) and the median = 1.

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