

The Impact of Activity Interventions on the Well-Being of Older Adults in Continuing Care Communities

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Abstract

As the U.S. population ages, interventions are needed to ensure quality of life continues as boomers enter assisted and independent living communities (AICs). These transitions can significantly affect quality of life. Activity and continuity theories maintain that participation in discretionary/informal activities is crucial for psychosocial health and well-being (aspects of quality of life). This study evaluates the impacts of participation in discretionary activities on life satisfaction, social isolation, and loneliness, using data from a longitudinal study of older adults in AICs. Older adults who participated in 8 weeks of discretionary activities reported greater life satisfaction and lower levels of social isolation compared with non-participants. Forming alliances and group identities is the key for building new relationships and maintaining relationships in the community. Determining the impact participation in

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activities has on residents is vital to being able to help develop a more comprehensive understanding of how quality of life can be maintained in AICs.

Keywords

activities, continuing care, life satisfaction, older adults

Introduction

As people live longer, greater emphasis is being placed on healthier, more productive and successful aging. Rowe and Kahn (1987) popularized the term *successful aging* in the late 1980s, proposing that aging is not, nor must it be, a period of continuous decline and removal from society. Part of successful aging, as described by Rowe and Kahn, involves maintaining social contacts and engaging in activity throughout the aging process. Research evaluating the impact of meaningful types of activities on aspects of quality of life (Park, 2009), levels of depression (Adams, Sanders, & Auth, 2004; Park, 2009), and loneliness (Adams et al., 2004) has shown that participation in activities has a positive impact on many quality of life measures. Participation in activities affects quality of life among older adults who live in assisted and independent living communities (AICs) (Mitchell & Kemp, 2000; Silverstein & Parker, 2002). This article examines whether participation in 8 weeks of focused intervention activities affects life satisfaction, loneliness, and social isolation for residents of AICs.

Literature Review

Adjustment to and living in an AIC can significantly affect, both positively and negatively, the quality of life of the individual (Ball et al., 2000; Chapin & Dobbs-Kepper, 2001; Dupuis-Blanchard, Neufeld, & Strang, 2009; Park, 2009). Although aging in place in one's home or home community is preferred (Kassner et al., 2008), it is often not possible. Although one negative consequence of relocation is the potential loss of the previous neighborhood-based social networks (Dupuis-Blanchard et al., 2009), moving into AICs provides a safety net wherein older adults may receive additional assistance with activities of daily living (ADLs) and instrumental activities of daily living (IADLs) that they might not be receiving at home. However, living in an AIC removes individuals from their familiar surroundings and places them in new social networks (Rowe & Kahn, 1987). Although residents may desire to maintain former social relationships, declining health, both physical and

mental, may impair their ability to do so. This may result in individuals feeling socially isolated and lonely (Bear, 1990; Cutchin et al., 2003; Park, 2009).

Previous research has shown the importance of social networks and social interaction for successful aging and quality of life; individuals living in AICs provide a unique sample for examining how to improve quality of life and connection to social networks. As their already established social networks have been geographically removed and are therefore more difficult to access, greater emphasis on building new social networks is important for maintaining or increasing quality of life (Litwin & Shiovitz-Ezra, 2006).

One way research proposes building new social networks is through participation in activities (Ball et al., 2000; Park, 2009; Park, Zimmerman, Kinslow, Shin, & Roff, 2012). By participating in various activities offered in AICs, residents are able to meet new people and begin to build new social networks. As the composition of residents in the AIC is in constant flux (e.g., people moving in and out), it is not simply enough to be active for a brief period (e.g., meal-time); residents should continue to be active to best maintain their social networks and thus continue to maintain their quality of life (Ball et al., 2000).

Factors That Affect Quality of Life

Quality of life is a multidisciplinary concept that includes economic, social, and physical measures (Ferriss, 2004; Mitchell & Kemp, 2000). The phrase *quality of life* has been widely adapted in both subjective (happiness, well-being, satisfaction) and objective (health, education, marital status) measures, although subjective measures are considered to be better indicators of quality of life (Ferriss, 2004; Mitchell & Kemp, 2000). While there is no standard accepted measure for quality of life (Arnold, 1991; Ferriss, 2004), in the social sciences subjective quality of life has been measured in terms of happiness, life satisfaction, and well-being (Ferriss, 2004). Arnold (1991) proposes, "Because there is no absolute theoretical model of what constitutes quality of life, measures must approximate our understanding of the elements of a very abstract concept" (pp. 58-59). For the purpose of this work, quality of life is examined as satisfaction with life, social isolation, and loneliness, all measures of well-being.

Loneliness and social isolation are often used as partial indicators of quality of life (Victor, Scambler, Bond, & Bowling, 2000). Loneliness is a subjective measure that operationalizes the difference between the desire for social contacts and the availability of social contacts (Perlman & Peplau, 1998). Victor et al. (2000) note that most research on loneliness has evaluated what factors are linked to increase risk, not what factors offer buffering effects.

What is known about loneliness in AICs is that the ability to interact with others does not necessarily buffer an individual's loneliness score because of the lack of deep, meaningful relationships with other AIC patrons (Park, 2009). The question then becomes, can continuing, weekly activities with the same group of participants facilitate more in-depth interactions among residents, and thus address some issues of loneliness?

Social isolation is an objective measure in which the number of social relationships available is reduced or limited (Russell, Campbell, & Hughes, 2008). This may occur as a result of geographic displacement and removal from former social networks (Park, 2009; Winstead et al., 2013). Participation in activities is a main way in which many residents begin to improve their quality of life through building new social networks (Ball et al., 2000; Mitchell & Kemp, 2000; Park, 2009).

Overall, research shows that the greater the number of activities in which residents participate, the lower their levels of depression and the higher their life satisfaction (Mitchell & Kemp, 2000). Diener, Emmons, Larsen, and Griffin (1985) note that life satisfaction is a "cognitive, judgmental process" and "comparison of one's circumstances with what is thought to be an appropriate standard" (p. 71), determined by the individual. Therefore, it is not domain specific but rather an overall global assessment of the totality of an individual's life satisfaction (Diener et al., 1985).

Prior studies have found that residents who participated in fewer activities were more likely to report higher levels of depression (Adams et al., 2004; Mitchell & Kemp, 2000) and thus, less likely to participate in the future, affecting quality of life (Adams et al., 2004). Using activity and continuity theory, this article examines the theoretical underpinnings of the impact of activities on quality of life outcomes.

Activity Theory

Activity theory is predicated upon the assumption that people use two mechanisms for development of sense of self: roles and activities. As people age, they give up activities and roles and thus may experience a loss of identity. Previous ideas about self may be inwardly contested impacting the inner self. (Kossuth & Bengtson, 1988). Activities, then, play a restorative function in that older adults engage in activities that supplant previous roles and activities or behaviors.

In the development of activity theory, Lemon, Bengtson, and Peterson (1972) divide the occurrence into three distinct spheres: informal (activities that facilitate social interactions), formal (organizational activities such as participation by volunteering), and solitary activity. They assert that

opportunities for the development of relationships, such as those found in participation in informal activities, provide role support, which can then be accompanied by opportunities for positive affirmation of the performance of their role. Informal activities, such as the types of activities offered in AICs, provide the greatest potential for well-being because informal activities usually occur within the social context of the “primary group” of the individual (Litwin & Shiovitz-Ezra, 2006). These types of more personal relationships are more likely to present opportunities for greater role support, which in turn may promote the well-being of the older adult.

Continuity Theory

Continuity theory (Atchley, 1989), an expansion and modification of activity theory, proposes that aging adults seek to maintain attributes of self-identity by continued maintenance of activities that have been central to their lives. Continuance of previous activities is theorized to be a crucial component of positive psychosocial aging because it allows the aging adults to “adapt and express their identity appropriately” over the course of aging (Pushkar et al., 2010, p. 3).

Continuity is expressed in two ways: internal continuity, which references the connection of new experiences to those remembered from the past, and external continuity, which references the continuation of people and environments that are familiar (Atchley & Barusch, 2004). Older adults make strategic choices to involve themselves in activity choices linked to their past experiences, both personal and social (Atchley, 1989). Therefore, optimal aging occurs when individuals are able to maintain the same patterns of daily living, maintain the same roles, and remain in their homes. Effective adaptations to changes that do occur are made through the mechanism of continuation of roles and activities throughout the life course. Change is therefore connected to the person’s perception of their past, which produces a continuity in both individual characteristics and in social conduct and social situations. This allows the older adult to adapt through the aging process with strategies that allow for individual choices and societal sanction (Atchley, 1989).

Both activity and continuity theories provide a conceptual framework for examining the impact of activities participation. We further contribute to the previous literature on activities participation and older adults by using both of these theories as a foundation for examining whether a focused activity intervention can affect residents of AICs with regard to quality of life measures. The purpose of this study is to determine whether an association exists between ongoing participation in structured activities and well-being among

residents of AICs. We hypothesize that participants in activity session interventions will have higher levels of life satisfaction and lower levels of social isolation and loneliness than non-participants.

Method

Design and Data

This article utilizes data collected as part of an ongoing longitudinal investigation involving three groups of residents living in 15 AICs in a medium-sized metropolitan city in the Deep South region of the United States. The analysis presented in this article was not the original intention of the study, but rather based on observations made in the early stages of the study. For the purpose of this work, participants of the larger project were categorized into two groups: participants in activities from 10 of the AICs that had activity interventions, and a non-participant control group from 5 AICs with no activity intervention. Those who resided in the AICs with activity interventions participated in group activities, spending 180 min each week (twice weekly 90-min sessions) in activities. Different locations participated in different activities, each tailored for the community (part of the original study). Participants in the activity group were asked to complete 8 weeks of group activities. They were included in analysis if they missed no more than four sessions throughout the 8 weeks. Data were collected through the use of in-person surveys conducted at baseline, 8 weeks post-baseline, and 3 months post-baseline.

Sample

The overall sample was comprised of study participants who had completed the Time 3 survey ($n = 141$). The participant group ($n = 104$) was much larger than the non-participant group ($n = 37$), which is noted as a limitation in the final section of this article. At the point of analysis for this work, 64 participants had dropped by the 3-month follow-up. Forty-seven percent were dropped due to absences, 23% dropped out because of health issues. Eight participants moved, six participants reported that they no longer wished to continue, two participants died, and two participants dropped out for unknown reasons. The average age of participants who dropped out was 82.46 years. A total of 82.5% were female, 56.3% lived in assisted living, and 15.6% reported being married. To address the issue of selection bias, descriptive statistics were run for participants who were dropped from the study for comparison purposes.

Surveys

Surveys were conducted in person by a member of the survey staff at the resident's home in the AIC. Each survey took approximately an hour. Changes in survey measures were tracked over time for each participant. Data for this study are taken from Surveys 1 (pre-test) and 3 (3-month post-test). Data were taken from the 3-month post-test, rather than the survey immediately following the intervention, so that effects of the activities were analyzed rather than effects of relationships that might have formed with study personnel. Prior to the first survey, all participants were screened for cognitive impairment using the Mini-Mental State Examination (Folstein, Folstein, & McHugh, 1975). The aim of this analysis is to evaluate the impact, if any, activities (ICT (Information and Communication Technologies) or AC (Attention Control) group activities) have on residents' life satisfaction, social isolation, and loneliness.

Dependent Variables

The dependent variables are satisfaction with life, social isolation, and loneliness. Life satisfaction is measured by five items, which comprise the Satisfaction With Life Scale (Cronbach's $\alpha = .687$; Diener et al., 1985). This scale has been shown to be useful for varied age groups and has consistent internal validity and reliability (Diener et al., 1985). The scale measures overall life satisfaction as one aspect of "subjective well-being" (Diener et al., 1985, p. 71). Items include the following: "In most ways my life is close to my ideal," "The conditions of my life are excellent," "So far, I have gotten the important things I want in life," "I am satisfied with my life as a whole," and "If I could live my life over, I would change almost nothing." Responses ranged from *strongly disagree* to *strongly agree* with Likert-type values from 1 to 5. Responses are summed to obtain the life satisfaction scores for each respondent. Higher scores indicate greater satisfaction with life.

We also included both a social isolation scale and a loneliness scale as control variables at Time 1 and as outcome variables at Time 3. Although these two constructs are related, they are subtly differentiated with loneliness as a subjective measure of negative feelings about levels of social interaction and social isolation as an objective measure of availability of social contacts (Cotten, Anderson, & McCullough, 2013; Hughes, Waite, Hawkey, & Cacioppo, 2004). Social isolation and loneliness can be correlated, but are not always causally related (Tomaka, Thompson, & Palacios, 2006). Older adults, particularly those who move into AICs, are at greater risk of feelings of loneliness and social isolation (Cotten et al., 2013; White et al., 1999).

Loneliness is measured using a short, three-item version of the UCLA Loneliness Scale (Hughes et al., 2004). The items are as follows: (a) How often do you feel that you lack companionship? (b) How often do you feel left out? and (c) How often do you feel isolated from others? Responses were measured as 1 = *hardly ever*, 2 = *some of the time*, and 3 = *often*. Higher scores indicate greater feelings of loneliness (Cronbach's $\alpha = .663$).

To measure social isolation, we looked at items used as social capital measures of strong ties with the reasoning that separation from strong ties represents a kind of distinct and objective social isolation. Social isolation in this sense is the separation from strong ties measured by proxy as how much of the time the respondent feels bothered by lack of contact. Although this separation may cause feelings of loneliness (the subjective feeling that may or may not be associated with social isolation), it is not loneliness in and of itself. A factor analysis of the six items used to measure these concepts (in both scales) indicated clear analytical distinctions between our two measures with a varimax rotated solution. In addition, a correlation matrix showed that none of the items between the two scales were highly correlated. The social isolation scale included the following three questions: How often are you bothered by (a) not having a close companion, (b) not having enough friends, and (c) not seeing enough of the people you feel close to? Responses ranged from 1 = *never*, 2 = *a little of the time*, 3 = *some of the time*, 4 = *most of the time*, and 5 = *all of the time*. Higher scores indicate greater feelings of social isolation (Cronbach's $\alpha = .652$).

Independent Variables

The primary independent variable is participation in activities. Study participants were randomly divided (by AIC) into two groups: an activity participant group and a non-participant group. The non-participant group is a control group such that individuals in this group were in one of the five AICs at which no activity intervention occurred. The activity participant group is coded as 1 and non-participants as 0. Although the two groups included in the activity participant group were involved in different types of activities, both groups met for the same amount of time weekly and were involved in similar types of interactions between participants as well as team members and participants. For this study, differences in types of activities were not examined. Through observation and data from focus groups, we noted that participation in either group seemed to facilitate social interactions and group cohesion; as such, the purpose of this study is to determine whether there is an association between improved quality of life and participation in 8 weeks of activities of any form, not to examine the type of activity.

We also examined the hours of activities in which respondents participated each week. Although study participants in the non-participant group had no opportunity for selection into the 8-week intervention component of the study, they might still be engaged in other activities offered by their AIC as members of the other two groups could be. The average number of hours per week spent in activities better reflects participant involvement in activities than number of activities because a resident may only list three activities but may spend several hours every day involved in those three activities. In addition, we examined whether respondents reported that they had close friends in their particular AIC at 3 months post-intervention. A dummy variable was created with 1 = *yes* and 0 = *no*.

Demographic Characteristics

Covariates for the study include age, gender, marital status, close friends in the AIC, whether participants lived in an independent living community (IL) or an assisted living community (AL), and how long residents in both study groups had lived in an AIC. Level of education and financial resources were included in the demographic table for the purpose of comparison between groups, but were not used as covariates. Race was also excluded as an independent variable because 95.7% of the sample reported their race/ethnicity as White, indicating little variability in the measure. Gender was coded as female = 1. Marital status was coded as currently married = 1 and unmarried or separated = 0. Whether a participant lives in IL or AL was coded as IL = 1 and AL = 0. Self-rated health was also included using the single item, "In general, would you say your health is excellent, very good, good, fair or poor?" The variable was recoded so that higher scores indicate better perceived health. AIC residents with perceptions of poor health may have less satisfaction in life even if they are involved in activities in their communities. We also controlled for Time 1 (baseline) levels of each dependent variable to assess whether any relationships found between the predictors and outcomes at Time 3 could be explained away by the respondents' scores at baseline.

To address the potential for selection bias for the participants who remained in the study, we included demographic characteristics for the participants who dropped out of the study at some point after the initial survey.

Data Analysis

Descriptive statistics were calculated for the sample demographics and the number of hours and activities in which residents participated in organized activities in their particular AIC. Because there were no significant

Table 1. Demographic Characteristics by Participation, and Participants Who Dropped Out.

	Overall (n = 141)	Non-participants (n = 37)	Participants (n = 104)	Participants—Dropped out (n = 64)
Female	80.85%	83.78%	79.80%	87.5%
Currently married	12.77%	13.51%	12.50%	15.6%
Age	83.24 (7.37)	83.92 (5.67)	82.98 (7.91)	82.46 (8.26)
Education				
High school graduate/GED	27.70%	27.00%	27.90%	17.20%
Some college	27.70%	29.70%	26.90%	32.80%
College graduate	17.70%	18.90%	17.30%	26.60%
Financial resources				
Just enough money	59.60%	51.40%	62.50%	54.20%
Not enough money	6.40%	8.10%	5.80%	10.20%
More than enough	31.20%	40.50%	27.90%	35.60%

Note. Percentages or means (with standard deviations in parentheses) are reported. GED = General Educational Development.

differences in the number or hours of activities between groups or between time points, a table summarizing these differences was not included. A correlation matrix between major variables was run to check for multicollinearity between these variables. Statistics were computed for comparison of demographic characteristics of participants, non-participants, and residents who were dropped from the study. In addition, descriptive statistics were computed for study variables by group. Baseline statistics were included for residents who were dropped from the study.

Ordinary least squares (OLS) regression was used to examine the effects of participation in activities on each dependent variable with three regression sets. All measures in the regression models are from Survey 3 except for the demographic characteristics including age, marital status, sex, whether they reported living in assisted living or independent living, and satisfaction with life, feelings of isolation, and loneliness at baseline. Because of the small sample size, $p < .10$ is used to indicate statistical significance.

Results

Sample Characteristics

Table 1 presents descriptive statistics of demographic variables. The mean age of the sample is 83.24 years with a standard deviation of 7.37 years. Approximately 81% of the sample is female. The majority of the sample is widowed (69.5%), 12.8% are married, and 17.7% reported being either

divorced, separated, or never married. A total of 27.7% of the sample has a high school diploma with an equal number having some college. In all, 17.7% of the sample has a college degree. Only 6.4% of the sample report not having enough money to get by, with 59.6% reporting that they have just enough money to get by. Approximately 95.7% of the sample is White, which is consistent with the racial make-up of the AICs that participated in the study. Again, due to the lack of variance in racial/ethnic background of the sample, race was not included in the OLS regression analysis.

The group of residents who dropped out of the study was slightly younger and a larger percentage of the group was married and female, as compared with participants who remained in the study. A greater percentage of the dropout group reported having some college or a college degree. Although more of the dropout group reported not having enough money to get by, a greater percentage reported having more than enough money to get by compared with the overall sample.

Table 2 presents means and percentages of variables used in the regression analysis based on participation. Both groups were overrepresented by females and individuals who were not currently married. Participants reported participating in almost one more hour of activity per week than non-participants at Time 3. Life satisfaction scores were slightly higher for the non-participation group at baseline but declined slightly at Time 3. In contrast, the life satisfaction scores increased slightly for participants from Time 1 to Time 3. At Time 1, activity participants reported slightly higher isolation scores than non-participants. At Time 3, isolation scores declined for participants but increased for non-participants. Participants had slightly lower loneliness scores than non-participants at both Times 1 and 3. At Time 3, participants' scores had decreased slightly whereas non-participants' scores increased slightly. Self-rated health scores were almost the same for both groups. There was a greater percentage (55%) of assisted living residents in the participation group compared with the non-participants. Interestingly, 70% of the non-participants reported having a close friend in their AIC compared with only about 57.3% of participants. Almost 70% of participants had lived in their community for 4 years or less compared with approximately 57% of non-participants.

At baseline, the dropout group had slightly lower life satisfaction scores and higher loneliness scores. Their mean perceived social isolation scores were slightly lower and self-rated health was virtually the same between the dropout group and the overall sample. They participated in fewer activities weekly, 51.3% of them had lived in their AIC less than a year compared with 22.7% of the study sample, and 56.3% of the dropout group lived in assisted living.

Table 3 is a correlation table that examines the correlations between major study variables. Because the isolation and loneliness measures are conceptually

Table 2. Study Variables for Total Sample and by Activity Participation.

	Overall (n = 141)	Non-participants (n = 37)	Participants (n = 104)	Participants—Dropped out (n = 64)
Female	80.85%	83.78%	79.80%	87.5%
Currently married	12.77%	13.51%	12.50%	15.6%
Age	83.24 (7.37)	83.92 (5.67)	82.98 (7.91)	82.46 (8.26)
Life satisfaction t1	18.41 (2.72)	18.73 (2.82)	18.30 (2.69)	17.80 (3.52)
Life satisfaction t3	18.55 (3.03)	18.24 (3.61)	18.66 (2.81)	*
Isolated t1	5.88 (2.38)	5.35 (2.06)	6.07 (2.47)	5.84 (2.33)
Isolation t3	5.52 (2.25)	5.75 (2.23)	5.44 (2.26)	*
Lonely t1	4.09 (1.38)	4.14 (1.31)	4.08 (1.40)	4.67 (1.72)
Lonely t3	4.09 (1.41)	4.27 (1.48)	4.03 (1.38)	*
Hours of activities per week t3	8.37 (7.19)	7.68 (5.44)	8.61 (7.72)	3.87
Self-rated health t3	3.07 (.97)	2.97 (1.01)	3.02 (.97)	2.95 (1.11)
Assisted living	52.86%	45.95%	55.34%	56.30%
Close friends present in the AIC	60.71%	70.00%	57.30%	53.10%
Years in the AIC				
1 year or less	22.70%	21.60%	23.10%	51.30%
>1-2 years	24.8%	18.9%	26.9%	15.8%
>2-4 years	18.5%	16.3%	19.2%	22.0%
>4-10 years	26.90%	35.10%	24.10%	10.90%
>10 years	7.10%	8.10%	6.70%	0%

Note. Percentages or means (with standard deviations in parentheses) are reported. t1 = Time 1; t3 = Time 3; AIC = assisted and independent living community. *no scores collected.

related, it is important to ensure that multicollinearity is not a problem when both measures are used as controls in the same regression model (see Table 4). None of the study variables in the same regression sets were highly correlated, with the exception of life satisfaction at both time points, which has a moderate to high correlation (.680; $p < .01$)

Table 4 presents the findings from the OLS regression of activity participation on satisfaction with life. The regression models test the hypothesis that there is a positive relationship between participation in a focused activity intervention over 8 weeks and satisfaction with life. Model 1 shows a positive relationship between those who participated in the activities and life satisfaction ($b = 0.741$, $p < .10$) controlling for life satisfaction at baseline, which is also significant ($b = 0.832$, $p < .001$). This indicates a direct relationship between participation in 8 weeks of focused activities and life satisfaction 3 months post-intervention, as compared with those who did not participate in the activity intervention, controlling for the life satisfaction score at baseline.

Model 2 examines the effects of participants reporting that they have close friends in the AIC and the average number of hours of activities in which they

Table 3. Bivariate Correlations of Major Study Variables.

	1. Isolation t1	2. Isolation t3	3. Loneliness t1	4. Loneliness t3	5. Satisfaction with life t1	6. Satisfaction with life t3	7. Self-rated health	8. Hours in activities	9. Friends in AIC	10. AL/IL
1. Isolation t1	1.00									
2. Isolation t3	.525**	1.00								
3. Loneliness t1	.496**	.420**	1.00							
4. Loneliness t3	.492**	.586**	.555**	1.00						
5. Satisfaction with life t1	-.294**	-.247**	-.227**	-.349**	1.00					
6. Satisfaction with life t3	-.272**	-.280**	-.223**	-.309**	.680**	1.00				
7. Self-rated health	-.118	-.215**	-.207**	-.223**	.341**	.337**	1.00			
8. Hours in activities	.106	.020	.051	-.006	.116	.107	.167*	1.00		
9. Friends in the AIC	-.157*	-.183*	-.259**	-.287**	.182*	.296**	.180*	.193*	1.00	
10. AL/IL	.138*	.070	.190**	.104	-.143*	-.123	-.100	-.204	-.219**	1.00

Note. t1 = Time 1; t3 = Time 3; AIC = assisted and independent living community; AL = assisted living community; IL = independent living community.

* $p < .05$. ** $p < .01$.

Table 4. OLS Regression of Participation in Activities on Satisfaction With Life ($n = 141$).

	Model 1	Model 2	Model 3	Model 4	Model 5
Life satisfaction t1	0.832***		0.820***	0.805***	0.741***
Participation in activities	0.741†		0.829*	0.905*	0.929**
Friends in the AIC		1.494**	0.534	0.550	0.567
Hours of activities per week		0.011	0.026	-0.024	-0.035
Isolated t1				-0.105	-0.157†
Loneliness t1				0.128	0.325*
Demographic variables					
Age					-0.027
Self-rated health					0.816***
Assisted or independent (assisted = 1)					-0.235
Sex (female = 1)					-0.505
Marital status (married = 1)					1.051*
Constant	2.654***	17.530***	2.721*	3.002†	3.914
F	85.150***	4.374*	43.140***	27.504***	20.717***
R ²	.548	.047	.550	.537	.616

Note. OLS = ordinary least squares; t1 = Time 1; AIC = assisted and independent living community.
† $p < .10$. * $p < .05$. ** $p < .01$. *** $p < .001$.

participate weekly. Participants who report having close friends in the AIC had significantly greater satisfaction with life compared with those who reported that they did not have close friends in the AIC ($b = 1.494, p < .01$). Model 3 reintroduces the participation variable and controls for life satisfaction at Time 1. The effect of close friends in the AIC disappears but the coefficient for participation is increased by almost 9% ($b = 0.829, p < .05$) from Model 1, controlling for life satisfaction at baseline which is also significant ($b = 0.820, p < .001$).

In Model 4, variables for loneliness and social isolation baseline are added to the previous model. The participation variable increases by about 9% again in the model ($b = 0.905, p < .05$) controlling for life satisfaction at baseline ($b = 0.805, p < .001$). Model 5 is a full model and includes demographic controls. In this model, the coefficient for participation increases slightly ($b = 0.929, p < .01$). Self-rated health at Time 3 is significant ($b = 0.816, p < .001$), indicating an association between perceived health and satisfaction with life. How isolated respondents feel was also significant ($b = -0.157, p < .10$). As to be expected, residents who feel less isolated report greater life satisfaction. How lonely residents feel at Time 1 was also significant in this model but in a surprising direction ($b = 0.325, p < .05$). This indicates a positive relationship between loneliness at Time 1 and life satisfaction at Time 3. Marital

Table 5. OLS Regression of Activities Participation on Isolation.

	Model 1	Model 2	Model 3	Model 4
Isolation time 1	.526***		.515***	.495***
Participation in activities	-.650†		-.683†	-.627†
Friends in the AIC		-.786*	-.417	-.322
Hours of activities per week		.033	.013	.021
Demographic variables				
Age				-.004
Self-rated health				-.392*
Assisted or independent (assisted = 1)				-.012
Sex (female = 1)				.084
Marital status (married = 1)				-.114
Constant	2.901***	5.731***	3.145***	4.592***
F	30.464***	2.476†	15.967***	7.512***
R ²	.298	.021	.303	.301

Note. OLS = ordinary least squares; AIC = assisted and independent living community.

† $p < .10$. * $p < .05$. ** $p < .01$. *** $p < .001$.

status was also significant with married respondents reporting greater satisfaction with life compared with unmarried respondents ($b = 1.051, p < .05$). Controlling for life satisfaction at Time 1 ($b = 0.741, p < .001$) indicates that the significant relationship between participation in activities and life satisfaction at Time 3 is due to the effect of activity participation on satisfaction with life.

The findings from the OLS regression of activity participation on isolation are presented in Table 5. The models for this regression test the hypothesis that there is an inverse relationship between participation in a focused activity intervention over 8 weeks and feelings of isolation. Model 1 shows a negative relationship between those who participated in the activities and levels of isolation ($b = -0.650, p < .10$) controlling for isolation at baseline, which is also significant ($b = 0.526, p < .001$). This indicates a direct relationship between participation in 8 weeks of focused activities and lower levels of isolation at 3 months post-intervention, as compared with those who did not participate in the activity intervention, controlling for levels of isolation reported at baseline.

Model 2 examines the effects of participants reporting that they have close friends in the AIC and the average number of hours of activities in which they participate weekly on feelings of isolation. Participants who report having close friends in the AIC had significantly lower levels of feelings of isolation compared with those who reported that they did not have close friends in the AIC ($b = -0.786, p < .05$). When the participation variable and isolation at

Table 6. OLS Regression of Activities Participation on Loneliness.

	Model 1	Model 2	Model 3	Model 4
Loneliness at time 1	.553***		.526***	.502***
Participation in activities	-.131		-.183	-.154
Friends in the AIC		-.872***	-.457*	-.464*
Hours of activities per week		.009	.001	.007
Demographic variables				
Age				.008
Self-rated health				-.165
Assisted or independent (assisted = 1)				-.080
Sex (female = 1)				.331
Marital status (married = 1)				.177
Constant	1.906***	4.558***	2.336***	1.981***
F	29.649***	6.758**	17.176***	7.741***
R ²	.292	.077	.319	.308

Note. OLS = ordinary least squares; AIC = assisted and independent living community.
[†] $p < .10$. * $p < .05$. ** $p < .01$. *** $p < .001$.

Time 1 are added to the variables in Model 3, the effect of close friends in the AIC disappears but the coefficient for participation increases slightly ($b = -0.683$, $p < .10$) from Model 1, controlling for isolation at baseline ($b = 0.515$, $p < .001$).

Model 4 is a full model with the addition of demographic variables. The participation variable decreases slightly but is still significant ($b = -0.627$, $p < .10$), controlling for isolation at Time 1 ($b = 0.495$, $p < .001$). The only other significant variable in this model is self-rated health ($b = -0.392$, $p < .05$).

Table 6 shows results for the third regression with perceived loneliness as the outcome variable. Model 1 shows no relationship between whether residents participated in the 8 weeks of activities and levels of loneliness. Loneliness at Time 1 is significant ($b = 0.553$, $p < .001$). In Model 2, the relationship between whether residents reported having close friends in their AIC and loneliness is significant ($b = -0.872$, $p < .001$). Residents who have friends in their community are less lonely than residents who do not report having close friends in their AIC. There is no relationship between the average hours of activity in which residents participate and perceived loneliness. In Model 3, the addition of participation and loneliness at Time 1 reduces the coefficient for whether residents report having close friends in the AIC by about 48% but remains significant ($b = -0.457$, $p < .05$). However, there is no relationship between participation in activities and loneliness. Loneliness at Time 1 is significant ($b = 0.526$, $p < .001$). Model 4 is a full model with the addition of demographic variables. Whether a resident reports having close

friends in the AIC is significantly related to loneliness ($b = -0.464, p < .05$) even controlling for age, sex, health, and whether the resident lives in independent or assisted living. Again, loneliness at Time 1 is significant ($b = 0.502, p < .001$).

Discussion

This study examined the impact of participation in 8 weeks of focused activities on various measures of quality of life, including satisfaction with life, social isolation, and loneliness. Results indicate that there is an association between participation in ongoing informal activities and greater satisfaction with life and lower levels of social isolation. Our results support previous findings indicating that participation in activities increases quality of life among residents of AICs (Ball et al., 2000; Jenkins, Pienta, & Horgas, 2002; Mitchell & Kemp, 2000; Park, 2009). Residents of AICs that have been displaced from their former residences and communities whether by choice, or out of necessity, may feel isolated or removed geographically and socially from former social networks. The feelings of isolation these residents may experience are linked to lower levels of quality of life (Winstead et al., 2013). Regular participation in focused activities gives residents the opportunity to rebuild social networks, which are part of successful aging and help maintain greater life satisfaction and reduce feelings of isolation. Even when controlling for health and other salient factors, those who participated in the 8 weeks of ongoing activities reported higher satisfaction with life and lower social isolation than those who did not participate in any organized activities throughout the study. This may be due to individuals feeling more connected with members of their community after participating in activities as they all were now identified as participants and had just spent the prior 8 weeks building and maintaining social bonds.

Although the study finds evidence to support the benefits of structured activities in AICs, an interesting finding was that there was no difference in levels of loneliness between the activity sample and the non-participant sample, despite there being a significant finding regarding social isolation. As previously mentioned, although social isolation and loneliness are similar concepts, they are different and capture different aspects of quality of life. Social isolation is defined as a more objective experience whereas loneliness is more subjective. Although results are not statistically significant, they suggest that participating in activities may reduce objective measures of perceived social interaction more so than subjective measures; the participants in the study who were randomized in the activity interventions appear to have more meaningful relationships than the non-participant group, but these

relationships may not be enough to overcome their feelings of loneliness that may stem from relocation, loss of family/friends from death, and so forth. Although the differences in findings for these variables may seem odd at first, other studies have found that isolated individuals do not always feel lonely, and lonely individuals do not always feel isolated (de Jong Gierveld & Havens, 2004; Havens, Hall, Sylvestre, & Jivan, 2004).

The participants in this study made an 8-week commitment to participate in structured, focused activities; thus they were more likely to attend at least the majority of sessions. As noted earlier, residents of AICs provide a unique sample because of their physical and sometimes social removal from previous networks, which can potentially affect quality of life. Participation in activities regularly with a standing group enables residents to maintain and present an identity as a group member, thereby giving them a greater feeling of connectedness to their new community. The addition of these new bonds may be beneficial but may not replace the bonds that individuals may have severed upon moving to the AIC. Although the new relationships may increase the life satisfaction of residents, they may have less of an impact on feelings of loneliness or separation from the larger world.

Participants in this study were together in activities in which they were active participants, rather than passive observers. Activities were geared toward older adults so that trivia, music, computer classes, and games were developed with an emphasis on nostalgic references and were geared toward older adult learning. Observational and anecdotal evidence from the larger project provides evidence of participants cohering as a group, which may provide the impetus to maintain future involvement in planned activities as well as development of a new primary group membership. In addition, participants included residents from the same community but from different levels of care, both assisted living and independent living, who participated in the intervention together as a group, people who, under normal circumstances, might not have opportunities for interaction due to differing activities directors, different schedules, and differing medical needs.

There were no statistically significant differences in hours of participation between the participant and non-participant groups in activities in their AICs at both time points. The participant group did report participating in more activities, and spent an average of an hour more per week in activities 3 months after the intervention although, again, the difference was not statistically significant. Community characteristics were not taken into account in this study and may play a major role in how many activities and hours per week participants and non-participants spent in activity participation at 3 months past the intervention. Communities offer varied types and numbers of activities that could affect resident participation. In addition, staff characteristics (i.e., how

interactive and involved the activities director is) could affect participation choices of residents. Higher participation rates may also be a result of maintaining relationships formed during the initial 8 weeks of training. This would allow a continuation for role support and maintenance of group identity, which are important to greater life satisfaction (Litwin & Shiovitz-Ezra, 2006).

Although the 8-week interventions may not offer the residents the option of participation in exactly the same activities they may have participated in earlier years, they can offer the same attributes for presentation of self-identity, opportunities for building social networks, social interaction, and role support, which are all crucial components of successful aging. In addition, although these new relationships may not be as meaningful or intimate as relationships from the past (Cannuscio, Block, & Kawachi, 2003; White et al., 1999), they appear to be important in maintaining life satisfaction.

As to be expected, residents who reported better health had better measures of quality of life. However, in this study, satisfaction with life and social isolation were significant even when accounting for self-reported health. Although healthy individuals would be more likely to participate in community activities (Jenkins et al., 2002), even those who believe that they are less healthy have greater life satisfaction when they do participate. This study corroborates previous studies that have found that participation in social activities was predictive of life satisfaction (Jenkins et al., 2002).

Limitations and Future Research

Although this research adds to the gerontological literature on continuity theory and how activities affect satisfaction with life and isolation among residents of AICs, it is not without limitations. Assessing an aging population in an AIC provides an interesting opportunity for study, but is limited only to older adults who reside in these types of communities, not to older adults who have other types of living situations.

Certain aspects of the sample and methods also limit the study. One factor that should be addressed in future studies is that of the sample size. Although efforts were made at each community to bring in groups of approximately 20 participants, some dropped out of the study due to death, lack of participation, health issues, or general disinterest. Having larger sample sizes would allow for a more robust analysis. Because the study is ongoing, future studies will include larger samples with results that examine outcomes at 6 months and 1-year post-intervention. The sample size of each group should also be addressed in future studies. In this study, the non-participant group was only 26% of the total sample of 141. For future studies, the number of respondents in each group should be similar.

Some of the differences in responses between participants and non-participants could be a result of bias due to relationships formed with team members during the activity interventions. Several of the team members involved also conducted surveys with the activity participants, thereby potentially affecting responses post-intervention.

A significant area for potential bias is who chooses to enter the original study. It is possible that individuals who choose to participate are already healthier, report higher quality of life outcomes, and are more integrated into their AIC. To enroll in the study, they must already have high cognitive capacity and be willing to not miss more than five sessions throughout the time of the study. This does limit who is able to complete the study to those who are healthy enough and possibly to those who already have a certain level of comfort with other residents in the AIC. As with any study on well-being, participant dropout can significantly affect the sample and the results, especially when dropout is related to poor or declining well-being. For those who remained in the study, it is possible that they were biased toward the activities or felt that they had established a relationship with the researchers and did not want to disappoint the researchers by not attending the activity sessions. Although we attempted to determine the reason individuals did not complete the activities, some of the strongest reasons might have been issues related to mental and physical health, meaning that the remaining sample may have been biased toward those who exhibited better well-being independent of the activities.

Further research should examine nationwide samples for greater racial and ethnic diversity. Although our sample mimics the known population of AICs, there would likely be greater racial/ethnic diversity in other geographical areas. In addition, further analysis could control for social support from family members and the amount of contact AIC residents still have with their families. Perhaps if they are more involved with their families, they are less likely to be present in the community to participate in activities at the same rates as others. They might be just as satisfied with life, but they are fulfilling their social needs through their families rather than the AIC.

Activity theory distinguished outcomes based on the type of activity (Lemon et al., 1972). The measures present did not allow for a complete analysis of the informal activities individuals in the analysis were having with other AIC residents. Future studies could evaluate each different type of social interaction for a more robust theoretical analysis.

The results presented here support that greater interaction with others in ongoing meaningful activities improves quality of life, specifically satisfaction with life and feelings of social isolation, for residents of AICs. Greater attention should be given to integrating residents into meaningful activities

and not simply interaction over meals or in medication lines. When possible, ongoing activities should be encouraged to ensure the maintenance of quality of life for these individuals.

Authors' Note

The content is solely the responsibility of the authors and does not necessarily represent the official views of the National Institute on Aging or the National Institutes of Health.

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