

The Impact of Professionally Conducted Cultural Programs on the Physical Health, Mental Health, and Social Functioning of Older Adults

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Purpose: The aim of this study was to measure the impact of professionally conducted community-based cultural programs on the physical health, mental health, and social activities of individuals aged 65 and older. **Design and Methods:** Participants in the study were 166 healthy, ambulatory older adults from the Washington, DC, area. We assigned them to either an intervention (chorale) or comparison (usual activity) group and assessed them at baseline and after 12 months. **Results:** Results obtained from utilizing established assessment questionnaires and self-reported measures, controlling for any baseline differences, revealed positive findings for the effectiveness of the intervention such that the intervention group reported a higher overall rating of physical health, fewer doctor visits, less medication use, fewer instances of falls, and fewer other health problems than the comparison group. The intervention group also evidenced better morale and less loneliness than the comparison group. In terms of activity level, the comparison group evidenced a significant de-

cline in total number of activities, whereas the intervention group reported a trend toward increased activity. **Implications:** The positive impact of participatory art programs for older adults in this study on overall health, doctor visits, medication use, falls, loneliness, morale, and activities reflects important health promotion and prevention effects and a reduction of risk factors driving the need for long-term care.

Key Words: Creativity, Arts, Health promotion, Prevention, Risk reduction

In 2001, we designed a multisite longitudinal study, the Creativity and Aging Study, with the aim of measuring the impact of professionally conducted, community-based cultural programs on the general health, mental health, and social activities of older adults aged 65 and older. We conducted the study in three geographic locations: the metropolitan Washington, DC, area in conjunction with the Levine School of Music; Brooklyn, New York, in conjunction with Elders Share the Arts; and San Francisco, California, in conjunction with the Center for Elders and Youth in the Arts. The coordinating site was the Center on Aging, Health & Humanities at the George Washington University in Washington, DC. The study had a staggered start, beginning in Washington, DC, then Brooklyn, followed by San Francisco.

The cultural programs comprise diverse participatory art programs, ranging from painting, writing, poetry, jewelry making, and material culture, to music in the form of singing in chorales. No previous study of this nature, using a quasi-experimental design with a comparison group, has measured physical health, health services utilization, mental health, and social functioning in community-based

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older adults involved in diverse participatory art programs conducted by professional artists. This article focuses on the Year 1 results of the Washington, DC, area participants, of whom all participants in the intervention group were involved in a chorale.

There have been descriptive art therapy studies on community-based and nursing home-based older adults that described a positive impact on expressing feelings, mood, functional ability, and quality of life. However, these studies did not report using a quasi-experimental design with a comparison group, nor did they focus on a specific target population (Callanan, 1994; Ferguson & Goosman, 1991; Harrison, 1980; Wikstrom, Theorell, & Sandstrom, 1993; Zeltzer, Stanley, Melo, & LaPorte, 2003). For example, the art therapy study by Kinney and Rentz (2005) did employ an experimental design but examined only dementia patients, reporting “more interest, sustained attention, pleasure, self-esteem, and normalcy” (p. 220). Another controlled study by Wikstrom (2002) compared older women involved in visual art discussions to a matched control not engaged in this activity; the former group demonstrated significantly greater social interaction than the latter.

A number of studies have attempted to investigate the therapeutic effects of music, but these have typically been uncontrolled, often focused on dementia patients, and usually concerned with one or a limited number of areas of impact. One study reported results consistent with the hypothesis that dementing illness may be less prevalent among orchestral musicians, offering the explanation that the outcome possibly reflected the role of a lifetime engaged in a cognitively stimulating endeavor (Grant & Brody, 2004). Another study reported that music therapy increased melatonin levels in patients with Alzheimer’s disease, which may have contributed to the “patients’ relaxed and calm mood” (Kumar et al., 1999, p. 49). Another study described the effect of reminiscence music therapy in the absence of a control group and reported that “participation in small group reminiscence focused therapy groups might help to reduce depressive symptoms in elderly people with dementia” (Ashida, 2000, p. 170). Another uncontrolled investigation, which focused on four case studies, reported that therapeutic instrumental music playing helped hand rehabilitation in older adults with osteoarthritis (Zelazny, 2001). One researcher studied the effects of music therapy on the quality and length of life of people diagnosed with terminal cancer using a control group of cancer patients not receiving music therapy; the intervention group reported a higher quality of life than did the comparison group, but the two groups did not differ in length of life with cancer (Hilliard, 2003).

Researchers have also described the effects of other art forms applied clinically. For example, one

descriptive study used poetry to enhance the quality of life for frail older adults (Reiter, 1994). Theater art was the subject of a controlled study designed to investigate the benefits of a short-term (4 weeks) intervention for older adults that targeted cognitive functioning and quality of life issues important for independent living (Noice, Noice, & Staines, 2004). The study involved 124 community-dwelling participants (aged 60 to 86). The investigators found that after 4 weeks of instruction, those who had been given theater training made significantly greater gains on both cognitive and psychological well-being measures than did the controls.

Historical Context for the Study

The problem focus in gerontology that emerged during the mid-1970s contributed to growth of the field of geriatrics. The view at that time was that many of the decremental changes observed in later life were not due to aging per se, but to age-associated problems. By the end of the 20th century, a new focus was emerging based on the recognition that potential continued throughout the life cycle, independent of and, at times, as a consequence of aging (Cohen, 2000a, 2005). The focus on potential, reflected in the model and design of this study, provides important new possibilities for advancing health maintenance, health promotion, and disease prevention efforts.

Theoretical Background for the Study

The theoretical background for this study built upon two major bodies of gerontological research: (a) sense of control and (b) social engagement. Studies on aging have shown that when older adults experience a sense of control (e.g., a sense of mastery), they demonstrate positive health outcomes (Rodin, 1986, 1989). Similarly, researchers observe positive health outcomes when older individuals are in situations that provide meaningful social engagement with others (Avlund, Damsgaard, & Holstein, 1998; Bennett, 2002; Glass, de Leon, Marottoli, & Berkman, 1999). Biological studies reveal the involvement of mind-immune system pathways playing a protective role in both sense of control and social engagement contexts, as described in research on psychoneuroimmunology (Coe & Lubach, 2003; Kiecolt-Glaser, McGuire, Robles, & Glaser, 2002; Lutgendorf & Costanzo, 2003; Lutgendorf, Vitaliano, Tripp-Reimer, Harvey, & Lubaroff, 1999). In the current study we combined both of these dimensions (i.e., individual sense of control and social engagement).

In all three sites where we have conducted the study, there have been numerous qualitative reports of individuals who participated in the arts programs describing a sense of satisfaction and exhilaration

because their performance exceeded their expectations and actually improved. Their growing sense of control was readily apparent. The artists involved with the various groups reported how the repeated success of the various participants profoundly affected their motivation and desire to continue; they consistently reported high self-esteem and mood as their involvement continued. This was well reflected by a 94-year-old woman in the Washington, DC, chorale, who shared the following:

I'm 94 years old, and wasn't sure I could sing, and was even less sure that I could follow the notes. [Becoming increasingly animated] But I found that I could sing! In fact, I'm improving! And, I can't believe it, but I'm finding it easier and easier to read the notes! I am so glad I decided to take a chance and join the chorale. This has been one of the most important experiences of my life. I hope it will never stop. My daughter feels the same way about it.

Because all of the art programs involved participation and interpersonal interaction with others, social engagement was enhanced.

The significance of the art programs is that they foster sustained involvement because of their beauty and productivity. They keep the participants involved week after week, compounding the positive effects being achieved. Many general activities do not have this highly engaging and sustaining quality. Apart from the underlying mechanisms of sense of control and social participation, the amount of exposure to these factors is critical in relation to positive health effects, again reflecting the importance of the sustaining factor of an intervention. Analogous to the impact of physical exercise, many people seek involvement for the natural appeal of the art; secondary positive health benefits are an added bonus. In these situations, utilization tends to be more consistent. Moreover, art programs are accessible to communities around the country, in urban and rural areas alike, making them feasible to set up and reasonable to replicate.

Methods

Sample

The data used in these analyses were from a site-specific subsample of our ongoing longitudinal study involving three study sites with a total recruitment of more than 300 participants. The study subsample described here was from the Washington, DC, area and consisted of English-speaking older adults older than age 64 who were ambulatory and healthy enough to participate regularly in community-based activities. In general, these included weekly group activities facilitated through the Levine School of Music. Study data showed that participants in both the intervention and comparison groups were no

more or less likely to be engaged in ongoing physical or cultural activities.

The recruitment process involved sending out two notices requesting volunteers for the comparison group and for the intervention group. Both notices indicated that the goal of the study was to assess the general state of health and mental health as well as involvement in overall individual and group activities of older adults living in the community. The notice for the intervention group differed only in that it sought singers for a chorale; no singing experience was required, and the study's purpose was to explore the impact of this activity on general health and mental health as well as involvement in overall individual and group activities of older adults living in the community. Both notices targeted the same neighborhoods or programs (e.g., senior center, retirement community, or area of a given neighborhood) where older adults were involved or residing. The goal was that both groups be comparable in age, other demographic considerations, involvement in activities, and in as many of the other major measures of the study as possible. Whereas participants in the intervention group altered their routines by becoming involved in the chorale, participants in the comparison group continued their regular activities as usual, with the study introducing no changes other than the assessments. Individuals from both the intervention and comparison groups came to designated satellite locations near where they lived for their assessments. These locations were the same for both groups and included a local senior center and offices that nearby retirement communities made available. All of these locations had convenient parking or were easily accessible by public transportation.

Measures

Baseline measures of physical health and health service use included the following: dichotomous, self-reported assessments of general physical health (e.g., cardiovascular, pulmonary, gastrointestinal, sensory systems); and continuous level self-reported assessments of health services utilization (e.g., doctor visits and medication usage). Baseline measures of mental health included the following: the Philadelphia Geriatric Center Morale Scale (Lawton, 1975; overall study range of 4–17; $M = 13.85$, $SD = 2.75$), the Loneliness Scale-III (Russell, 1996; overall study range of 20–63; $M = 36.57$, $SD = 9.17$), and the Geriatric Depression Scale-Short Form (Sheikh & Yesavage, 1986; overall study range of 0–10; $M = 1.73$, $SD = 1.97$). Additionally, there was baseline measurement of engagement in social activities, in which we obtained a detailed inventory of participants' activities, with attention to the nature, frequency, and duration of each.

We requested that participants keep an inventory of doctor visits and bring in the medications or a list

Table 1. Means (SD) for all Impacted Survey Measures for Intervention and Comparison Groups at Baseline

Variable	Intervention Group (<i>n</i> = 90)	Comparison Group (<i>n</i> = 76)
Health indicator		
Overall health rating	7.88 (1.50)	7.63 (1.71)
Number of doctor visits	5.85 (7.20)	7.44 (9.24)
Number of over-the-counter medications	2.01 (1.77)	2.66 (2.18)
Number of falls	0.40 (0.93)	0.36 (0.82)
Other health problems**	0.24 (0.43)	0.37 (0.48)
Mood indicator		
Morale	14.15 (2.42)	13.51 (3.07)
Depression**	1.39 (1.66)	2.12 (2.23)
Loneliness**	35.11 (8.09)	38.26 (10.07)
Level of activity		
Total number of weekly activities	5.37 (2.86)	4.88 (2.86)
Total number of activities	8.61 (3.54)	9.09 (4.00)

Note: SD = standard deviation.
***p* < .05.

of the medications they were taking. Whereas we used formal, established assessment instruments in order to assess the three mental health domains of depression, loneliness, and morale, we relied on participant self-reports in response to a specific set of structured questions in order to obtain data on general physical health and social activities questions (see the preceding paragraph for types of items assessed; see also Tables 1). A recent study confirmed the use of self-reports as a viable method for obtaining health care utilization data from community-dwelling seniors (Lubeck & Hubert, 2005).

The intervention consisted of participating in a professionally conducted chorale in which there were weekly singing rehearsals for 30 weeks as well as public performances several times during the intervention period. After a period of 12 months, research assistants readministered general health, health services utilization, mental health, and social engagement assessments to participants in both of the groups.

Analytic Strategy

We performed the analyses for this study in two parts. First, we examined the baseline data in order to assess for any unintentional differences between the intervention and comparison groups on all survey measures prior to the beginning of the intervention. Second, for measures that showed no group differences at baseline, we performed direct comparisons of the groups at first follow-up using either an independent sample *t* test or Pearson chi-square appropriate to

Table 2. Means (SD) for all Impacted Survey Measures for Intervention and Comparison Groups at 12-Month Follow-Up

Variable	Intervention Group (<i>n</i> = 77)	Comparison Group (<i>n</i> = 64)
Health indicator		
Overall health rating***	7.97 (1.58)	7.25 (1.91)
Number of doctor visits**	6.73 (7.00)	10.84 (14.49)
Number of over-the-counter medications***	2.61 (2.13)	4.25 (4.60)
Number of falls**	0.23 (0.69)	0.55 (1.30)
Other health problems*	0.30 (0.46)	0.45 (0.50)
Mood indicator		
Morale**	14.08 (2.66)	13.06 (3.29)
Depression	1.14 (1.84)	1.84 (1.89)
Loneliness*	34.60 (7.86)	37.02 (10.33)
Level of activity		
Total number of weekly activities**	4.29 (2.55)	2.58 (1.82)
Total number of activities ^a	10.55 (5.04)	8.02 (3.70)

Notes: SD = standard deviation.

^aPaired sample *t* test revealed a significant decrease in activity level for the control group across time, $t(63) = 2.15, p < .05$, while, although not significant, activity level for the intervention group increased across time.

p* < .10; *p* < .05; ****p* < .01.

the resulting data type (e.g., interval or categorical). For measures that demonstrated significant differences at baseline, we performed analyses of covariance controlling for baseline assessments.

Results

At baseline, 166 participants (comparison group = 76; intervention group = 90) had filled out informed consent forms and completed the baseline assessment of the measures evaluated here. At 12-month follow-up, 141 remained in the study (comparison group = 64; intervention group = 77) and completed the first follow-up assessment. Based on the sample size of 166 respondents, baseline demographic analyses revealed no statistically significant differences between the groups. The intervention group's mean age was 79.0 years compared to 79.6 years for the comparison group. Additionally, the intervention group was composed of 78% females, 92% Whites (non-Hispanic), and 8% minorities. The comparison group was similarly comprised of 80% females, 93% Whites (non-Hispanic), and 7% minorities (African American, Asian American, and Hispanic).

Mean values on measures for the intervention and comparison groups that demonstrated significant differences from baseline to 12-month follow-up are presented in Tables 1 and Table 2, respectively. We found no other measures to be significantly different

between the groups at baseline or at the 12-month follow-up. Because of the exploratory nature of this study, we report differences between group statistics at the $p < .10$ level of significance. We present results for the categories of general physical health (including health services utilization data) and mental health as well as level of activity. These findings showed that at baseline there were significant differences between the intervention and the comparison groups with respect to the following measures: (a) depression scale score, (b) loneliness scale score, and (c) other health problems. In each instance the comparison group findings were more negative than those of the intervention group; that is, the comparison group reported greater initial scores in the direction of depression and loneliness and reported more other health problems than did the intervention group. On all other measures, there were no significant differences between the two groups at baseline.

Physical Health and Health Services Utilization

We found significant differences between the two groups on the physical health measures at the 12-month follow-up assessment period on the following items.

Self-Rating of Overall Health, $t(134) = -2.39$; $p = .01$.—At baseline, the intervention and comparison groups rated their overall health on a scale of 0–10 (0 being worst and 10 being best) as 7.88 and 7.63, respectively. At 12-month follow-up they rated their overall health as 7.97 and 7.25, respectively. This finding shows that after the initial intervention period, the intervention group rated their health as improved whereas the comparison group showed a decline in the average self-rating of overall health.

Number of Doctor Visits During the Past 12 Months, $t(134) = 2.06$; $p = .04$.—During the baseline assessment phase, the intervention group reported their average yearly number of doctor visits to be 5.82, and the comparison group reported an average of 7.44 visits per year. At the 12-month follow-up, the intervention group reported an average of 6.73 doctor visits during the past year, whereas the comparison group reported an average of 10.84 doctor visits. Although the overall number of doctor visits increased for both groups, this finding clearly shows that the number of doctor visits reported by the comparison group was significantly greater than that reported by the intervention group.

Number of Over-the-Counter Medications, $F(1,137) = 10.02$; $p < .01$.—During the initial assessment, prior to the onset of the intervention, the intervention group reported having taken an average

of 2.01 over-the-counter medications within the past 12 months, whereas the comparison group reported having taken an average of 2.66 over-the-counter medications. At the 12-month follow-up, the average number of over-the-counter medications reported being taken by the intervention group had risen to an average of 2.61. During the same time period, the comparison group reported an average increase in over-the-counter medication to 4.25, a much greater rate of increase. Notably, although differences in the use of prescription medication did not reach statistical significance, the data pointed to a slightly greater increase in use in the comparison group as compared to in the intervention group. At baseline the intervention group reported taking an average of 3.94 prescription medications, over the past 12 months, and the comparison group reported an average of 3.64 prescription medications, over the last 12 months; at the first follow-up the intervention average had increased to 4.42 medications (a 0.48 increase), whereas the comparison average had increased to 4.31 (a 0.67 increase).

Instances of Falls During the Past 12 Months, $t(135) = 1.82$; $p = .05$.—At baseline, the intervention group reported an average of 0.40 falls per person, whereas the comparison group reported an average of 0.36 falls per person. At the first follow-up, the intervention group reported a decrease in falls to an average of 0.23 falls per person, whereas the comparison group reported an increase to 0.55 falls per person during the preceding 12 months.

Other Health Problems ($\chi^2(1, N=137) = 3.58$; $p = .06$).—The findings from this general measure of health problems not directly assessed by the other measures (0 = no other health problems, 1 = other health problem present) revealed an average reporting of 0.24 problems for the intervention group at baseline and 0.30 for the comparison group. At the 12-month follow-up, although both groups reported an increase in other health problems (0.37 problems for the intervention group and 0.45 for the comparison group), the results suggested a marginal difference between the groups, with the comparison group slightly more likely than the intervention group to report having other health problems.

Mental Health

We utilized three measures to assess the impact of the intervention on mood. We found that measures of morale, depression, and loneliness were all impacted by the intervention as follows:

1. The assessment of morale (statistically equivalent at baseline) demonstrated a significant difference between the two groups at first follow-up, $t(125) = -1.92$; $p < .06$. Further examination of the

findings showed that the mean morale scores at baseline for the intervention and comparison groups were 14.15 and 13.51, respectively. Although both groups evidenced a slight decline in morale over the 12-month period, the morale score for the comparison group (13.06) was significantly lower than that for the intervention group (14.08).

2. The baseline assessment for depression between the two groups was statistically significant and indicated that prior to the start of the study the comparison group reported a higher score than the intervention group on the depression scale in the direction of depression, $t(162) = 2.41$; $p < .03$. Therefore, we used analysis of covariance in order to assess for differences between the two groups at the 12-month follow-up. When controlled for the differences at baseline, follow-up findings revealed no significant differences between the two groups on a measure of depression.
3. The baseline assessment of group means for the measure of loneliness indicated that prior to the start of the intervention the two groups differed, with the comparison group reporting a higher level of loneliness (38.26) than the intervention group (35.11), $t(162) = 2.22$; $p < .03$. Analysis of covariance of the 12-month follow-up assessment continued to demonstrate a marginally significant difference between the two groups, $F(1,126) = 3.08$; $p = .08$. Both groups evidenced a slight decrease in loneliness at the 12-month follow-up (comparison = 37.02; intervention = 34.60); however, the decrease in loneliness was greater for the intervention group than for the comparison group.

Assessment of Level of Activity

We asked participants to list activities they routinely participated in and to indicate how often they engaged in each activity. They could indicate their participation for the activity as daily, weekly, monthly, or yearly. We then summed activities to arrive at a variable representing the total number of activities engaged in on a regular basis. A preliminary assessment of the total number of activities; as well as individual assessments of daily, weekly, monthly, and yearly activities; were not significantly different at baseline, with the intervention group reporting an average of 8.61 total activities and the comparison group reporting an average of 9.09 activities. At the 12-month follow-up, although the total number of activities was not statistically different between the groups, the two did evidence significant differences in the number of weekly activities reported. The average number of weekly activities for the intervention group went from 5.37 at baseline to 4.29 12 months later. During that same

period, the comparison group reported a decrease in weekly activities from 4.88 at baseline to 2.58, $t(140) = -4.62$; $p < .01$. This finding indicates that although both groups evidenced a decrease in their reporting of consistent weekly activities, the comparison group reported a more significant decrease in level of weekly activity than did the intervention group.

Although we found that, in general, the overall activity levels were not statistically significantly different between the groups at the first follow-up, this finding warrants further analysis and comment. As reported above, prior to the start of the study, those assigned to the intervention group reported an average of 8.61 activities in which they routinely engaged, whereas those assigned to the comparison group reported an average of 9.09 activities. At the first follow-up the intervention group reported engaging in an average of 10.55 total activities, whereas the comparison group reported engaging in an overall average of 8.02 ($p = .15$). Use of post hoc paired sample t tests to examine changes within each group (across time) demonstrated that although there was no significant difference between the baseline and first follow-up for the intervention group, there was a significant decrease in overall activity level for the comparison group from 9.09 to 8.02, $t(63) = 2.15$, $p < .05$. These findings suggest that, although taken in aggregate, a statistically significant level of difference was not supported by conventional standards; there does appear to be some movement toward an increased (or at least stabilized) level of activity for the intervention group, with a corresponding decrease in overall activity level for the comparison group.

Discussion

Areas of Critical Concern

Three major areas in which the chorale (intervention group) participants showed improvement particularly stand out in this study. This is especially noteworthy given that the mean age of the participants was nearly 80—greater than life expectancy. The three areas of critical concern are:

1. Self-rating of overall health, in which the intervention group reported improvement and the comparison group reported a decline in overall health.
2. Activities, in which the intervention group (chorale) reported a trend toward increased activities 12 months post-baseline, whereas the comparison group reported a decline during this same time period. This finding is especially interesting in that it is an important measure of level of independent functioning. Long-term care is a response to a significant increase in

dependency, whereas, here, the members of the chorale on the whole appeared to be every bit as independent, and in fact more active, 1 year into the study. Sense of control studies point to more activity as a potential outcome, in that as one experiences a sense of mastery in a new area, a common reflection is, “If I’m good in this area that I was not aware of, could there be other endeavors that I might also be good at that I was not aware of?” The result, then, is often a branching out into new areas. But in this study, with participants nearing an average age of 80, was this a reasonable outcome to consider? Again, the fact that this outcome occurred at an average age greater than life expectancy illustrates the importance of the intervention in terms of impact on level of independence and reduction of risk factors contributing to greater dependency.

The reporting of an increased level of activities is also consistent with the reporting of better health in this intervention group. Moreover, researchers have found that level of involvement in activities correlates with a positive impact on cognition in older adults (Newson & Kemps, 2005; Verghese et al., 2003). We should also note that the most frequent question we received from colleagues to explain the differences in results among the intervention and comparison group was, in effect, “Were those in the intervention group more active at the start of study, and did those in the comparison group tend to be less active people—perhaps couch potatoes?” But the data showed that, if anything, the comparison group was involved in more activities than the chorale at the start of the study.

Although essentially comparable at the start of the study, the nature of the activities that the intervention and comparison groups were involved in differed after the start of the study. We are performing secondary analyses on these activities that we will report in a future article. But the impression at this point is that the activities the comparison group was involved in on the whole—after the study began—provided less opportunity for individual mastery (sense of control). Their activities were basically those that they had been involved in prior to the start of the study. In addition, it appears that those in the comparison group, although indeed active in activities, did not have comparable sustained involvement in specific activities the way the intervention group did through the chorale. This resulted in less opportunity to build new close relationships with the support that such relationships would provide. These two factors—ongoing sense of control and sustained social support—were critical to the initial hypothesis (i.e., that participants in art groups would manifest better outcomes because of their marked strength in these areas resulting from their involvement in

sustained participatory art programs). The activities of the intervention group, of course, changed with the initiation of the study; these participants were provided the opportunity for involvement in intense, sustained participatory art programs that provided major new opportunities for a new sense of mastery and meaningful social engagement.

3. Falls were the third area in which intervention-group participants reported improvements. At 1 year post baseline, the intervention group reported a decline in falls, whereas the comparison group reported an increase. This is another critical area associated with risk factors driving the need for long-term care, where the intervention group described a reduction in the influence of falls as a risk factor.

Other Findings Showing Better Outcomes With the Intervention Group

In addition to the afore-mentioned major findings reflecting actual improvements in health and functioning among those in the intervention group, the following results reflect further positive effects with the intervention group in terms of maintaining health status and minimizing decline as compared to the comparison group.

1. Doctor visits increased in both the intervention and comparison groups, but the comparison group reported a statistically greater increase than did the intervention group 12 months post baseline. Relevant to health services utilization, this finding is very important in terms of potential cost savings both to Medicare and out-of-pocket expenses to patients and their families.
2. Medication usage, though increased in both the intervention and comparison groups, increased at a greater rate in the comparison group, again reflecting relative cost savings for the intervention group from a health services utilization perspective. Even small changes in prescription medication usage translate into significant Medicare dollar savings given the Medicare Part D benefit covering prescription medications for older adults.

The significant increase in over-the-counter medication use in the comparison group compared to the intervention group is consistent with the experiencing of more problems and poorer overall health than the comparison group reported. The literature also reports it to be associated with more side effects from prescription medications, which themselves are influenced by the number of prescription drugs one is taking (Poole, Jones, & Veitch, 1999).

3. Loneliness diminished in both groups, but more so in the intervention group. This finding is consistent with the better rating of overall health

in the intervention group, given the adverse effects on health associated with increased loneliness in later life (Cohen, 2000b).

4. Morale declined slightly in both groups, but to a statistically lower level in the comparison group. This finding is also consistent with the better rating of overall health in the intervention group, given the adverse effects on health associated with diminished morale in later life (Iwasa, Kawaai, Gondo, Inagaki, & Suzuki, 2005; Mroczek & Spiro, 2005).
5. Depression scale scores were lower in both the intervention and comparison groups at 1 year post baseline (the higher the score, the greater the risk for depression). Although there was no significant difference in change between the two groups after 1 year, movement toward reduced risk in the actual scores was proportionately greater in the intervention group. Depression in general, but particularly in older adults, is associated with increased risk for morbidity, disability, and mortality, with minor depression as well adversely affecting morbidity, disability, and service utilization (Beekman, Deeg, Braam, Smit, & Van Tilburg, 1997).

Limitations of the Study

We should point out two potential limitations of the data from the Washington, DC, site. First, we did not use random selection and assignment. It is possible that the selection process into the study groups affected the results, which the statistical analysis may not have completely controlled for. It is possible, for example, that the intervention participants were in a different health and well-being trajectory than comparison group participants even prior to the beginning of the study. But we feel the careful selection of participants from the same community settings, community programs, and neighborhoods, and the high degree of comparability among nearly all the major measures at baseline mitigated against such possibilities as being significant problems.

Second, the sample in both groups was mostly White, with just more than three fourths female, therefore not achieving the desired degree of diversity that we aimed for the study to have at the Washington, DC, study site. The overall study, though, will be significantly helped in this regard by the diversity achieved by the other two sites (Brooklyn and San Francisco), resulting in the overall study having approximately a 30% representation by racial and ethnic minorities. Moreover, the average age at each of the three sites, in both the comparison and intervention groups, is greater than life expectancy—approximately 79 to 80 years.

Conclusion

In conclusion, in examining the positive impact of participatory art programs for older adults in this study on overall health, doctor visits, medication use, falls, loneliness, morale, and the total number of activities one is engaged in, we have witnessed true health promotion and prevention effects. Moreover, the actual improvement reported in general health and the actual increase in involvement in overall activities 1 year into the study among individuals with an average age greater than life expectancy reflect a reduction in risk factors driving the need for long-term care. All of this is achieved through sustained involvement in a high-quality participatory art program—in this case, in an ongoing chorale directed by a professional conductor.

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