Effects of a Community-Based Early Intervention Program on the Subjective Well-Being, Institutionalization, and Mortality of Low-Income Elders

Adam Shapiro, PhD, Miles Taylor, BA
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Purpose: This study examined the effects of an early interventional social service program on the subjective well-being, permanent institutionalization, and mortality risk of low-income community-dwelling elders. Design and Methods: From a waiting list for community-based services, 105 “moderately at-risk” community-dwelling elders were recruited. Forty of these persons were randomly assigned to receive the intervention, and the remainder did not receive the intervention. Participants were interviewed every 3 months for 18 months. Primary outcome measures were depression, satisfaction with social relationships, environmental mastery, life satisfaction, permanent institutionalization, and mortality. Results: No significant differences in sociodemographic or health characteristics were found between the intervention and control groups at baseline. Those elders who received the intervention had significantly higher subjective well-being and were less likely to be institutionalized or die than those in the comparison group across the 18-month period. Implications: The results make a strong case for the importance of community-based programs to the well-being of elders. Practitioners and policy makers should continue the search for community-based programs that are cost-effective and improve the quality of life for elders.

Key Words: Social services, Quality of life, Poverty
extend health into later life and prevent further disability and illness. The literature surrounding these programs is varied and complex, making generalization of outcomes difficult. Interventions for older adults can vary significantly in approach and practice, and many programs target only one or two major health issues, like nutrition or exercise (Elder, Williams, Drew, Wright, & Boulan, 1995). The common theme of these programs, however, is preventive care that promotes psychological and physical health among older adults extending independent functioning and quality of life (Ellis, 1996). Hirdes, Naus, and Young (1994) analyze preventive intervention services to frail elderly persons in three European countries. Although their findings are somewhat inconclusive, the work of Vetter, Jones, and Victor (1984) is highlighted, reporting lower mortality and higher life satisfaction among an urban intervention group. In addition, Hirdes and his colleagues (1994) emphasize the cost-effectiveness of such programs across countries, and the importance of timing and population targeting in the success of interventions.

The largest obstacle involved in the successful implementation of these programs is funding. Federal and state spending for long-term care is outdated in relation to the needs of older adults. Although specific services may be offered in a community, a comprehensive plan to install community-based programs as a part of a continuum of care does not yet exist (Quinn, 1995). At present, many needs of elderly adults still go unmet by community care because of ambiguous entrance requirements, diversity in intervention programs, and lack of continuity in physical and psychological assessment (Diwan & Moriarty, 1995).

The present study is an examination of an 18-month community-based social services intervention for low-income elders who are at risk of losing their ability to remain in their own homes. The project was designed to determine if providing interventive services to at-risk elders earlier than they normally would receive them results in an increased quality of life and a reduction in the risk of institutionalization and mortality. Our study uses each of the three trends in community-based care—case management, intervention, and a concern for quality of life. We believe that early intervention—specifically the provision of core services when they are needed, not when funding becomes available—coupled with a case management approach to providing necessary or desired core services will result in a high quality of life and a lower risk of institutionalization and mortality for older adults.

**Methods**

**Recruitment**

The sample consists of older adults who, in January 1998, were on a waiting list to receive social services through the State of Florida’s Community Care for the Elderly (CCE) program and were characterized as “moderate risk” based on a uniform statewide assessment device. Upon referral to CCE from local hospitals, rehabilitation centers, and physicians, each client was assigned a risk score, whose criteria is based on chronic health conditions, activities of daily living limitations, and other measures of physical and psychological impairment. Those classified as “high risk” were immediately given services provided by CCE. Medium- and low-risk individuals were placed on a waiting list to receive these services when they became “high risk.”

Figure 1 presents a chart of the recruitment strat-
A total of 212 moderate-risk persons were contacted by telephone by case managers and were evaluated for inclusion in the study. Potential participants were told that the purpose of the study was to determine if providing services to seniors earlier than they normally would receive them results in an appreciable difference in quality of life. They were also told that 40 people would be randomly selected to receive services, and there was a possibility that they would not receive services at all unless they became high risk. Of these potential participants, 108 met the requirements of the study, that is, they were of moderate risk and could self-report. A total of 104 persons were eliminated after identification and before baseline assessment because they refused to participate, they moved out of the moderate-risk classification, they died, they were unable to be contacted by telephone, they could not self-report, or they were institutionalized.

Once participants were identified, they were mailed a letter describing the program, were asked to sign a confidentiality agreement, and gave informed consent. A detailed baseline telephone survey was then conducted with the 108 moderate-risk study participants. Of those who completed the baseline assessment, 40 (37%) were then randomly assigned using a random number generator to an experimental group that would receive the intervention. Selection of these 40 participants was made as a result of projecting the average yearly service costs for a CCE client, about $2,500, to the amount of funding available for the study. The remaining 68 (63%) persons were assigned to the comparison group and would not receive the intervention. Both groups were assigned an unmasked case manager, and the same case manager made follow-up assessments every 3 months for a total of 18 months (seven data points). Given that these evaluators were unmasked, it is quite possible that their assessments could have been biased. It is also important to note that the services provided to those participants in the intervention group were not terminated at the end of the study. Additional monies were allocated for these persons to receive services regardless of their risk status. It should be noted that three members of the intervention group were removed from the study after baseline (two members were institutionalized and another member refused to participate), but prior to the receipt of the intervention. They were replaced by three members of the comparison group, which reduced the size of the comparison group from 68 to 65 and the total study size to 105.

As presented in Table 1, comparability of the intervention and comparison groups is quite high. There were no significant differences between the intervention and comparison groups on any of the sociodemographic and functional status variables. Additionally, the comparability of the intervention and comparison groups remained constant after attrition.

### Intervention

The intervention was designed to provide case-managed services earlier than clients would normally receive them to allow older adults to remain independent. All clients in the intervention group received a thorough in-home geriatric assessment by a registered nurse. A total of 212 moderate-risk persons were contacted by telephone by case managers and were evaluated for inclusion in the study. Potential participants were told that the purpose of the study was to determine if providing services to seniors earlier than they normally would receive them results in an appreciable difference in quality of life. They were also told that 40 people would be randomly selected to receive services, and there was a possibility that they would not receive services at all unless they became high risk. Of these potential participants, 108 met the requirements of the study, that is, they were of moderate risk and could self-report. A total of 104 persons were eliminated after identification and before baseline assessment because they refused to participate, they moved out of the moderate-risk classification, they died, they were unable to be contacted by telephone, they could not self-report, or they were institutionalized.

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### Table 1. Characteristics of Study Participants at Baseline

<table>
<thead>
<tr>
<th></th>
<th>Intervention Group</th>
<th>Comparison Group</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Total Completers</td>
<td>Noncompleters</td>
</tr>
<tr>
<td><strong>Sex</strong></td>
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<td></td>
</tr>
<tr>
<td>Male (%)</td>
<td>17.5</td>
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<tr>
<td>Female (%)</td>
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<td><strong>Race</strong></td>
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<tr>
<td>Hispanic (%)</td>
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<tr>
<td>Other (%)</td>
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<td>3.1</td>
</tr>
<tr>
<td><strong>Marital status</strong></td>
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<tr>
<td>Married (%)</td>
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<tr>
<td>Unmarried (%)</td>
<td>92.5</td>
<td>90.6</td>
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<tr>
<td><strong>Average monthly income (1998 dollars)</strong></td>
<td>$814</td>
<td>$871</td>
</tr>
<tr>
<td><strong>Average age</strong></td>
<td>77.7</td>
<td>77.8</td>
</tr>
<tr>
<td><strong>Average no. of ADL limitations</strong></td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td><strong>Average subjective health (1 = poor, 5 = excellent)</strong></td>
<td>2.9</td>
<td>3.1</td>
</tr>
<tr>
<td><strong>Average no. of health conditions</strong></td>
<td>3.9</td>
<td>3.9</td>
</tr>
<tr>
<td><strong>n</strong></td>
<td>40</td>
<td>32</td>
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</tbody>
</table>

*Note: t tests were used as significance tests for interval variables and χ² tests were used for categorical variables. ADL = activities of daily living.

* Differences between completers and noncompleters significant at $p < .05$. 

336 The Gerontologist
nurse. Services were prescribed to address specific needs and problems identified through this assessment. Clients, the geriatric nurse, and caregivers participated in the care planning process. Case managers were assigned a group of individuals in the intervention group to serve as active clients and coordinated the delivery of services to each of their clients. At the minimum, case managers contacted clients every 3 months (the same contact schedule as those in the comparison group) unless clients contacted case managers directly. Services were increased, reduced, or changed as the needs or problems of the individual clients changed.

In addition to the core case management services, several services were provided to those in the intervention group during the course of the study, including homemaking, home-delivered meals, help with chores, emergency alert response system, personal care, consumable medical supplies, medical transportation, and respite. The utilization of these services by clients in the intervention group is presented in Figure 2.

Measures

We use quality of life as the primary outcome in testing the effectiveness of a comprehensive, managed, community-based program aimed at providing “core” services to local elders in need. For this purpose, we define quality of life as a state of functioning governed by psychological and psychosocial domains and measured by depressive symptoms, satisfaction with social relationships, environmental mastery, and life satisfaction. Because these self-reported outcomes may be subject to bias of the Hawthorne effect, we also assess mortality and permanent nursing home institutionalization as two “hard” outcomes of the intervention that are less subject to this bias. Both institutionalization and mortality were verified by case managers.

Depression is measured with a 12-item version of the Center for Epidemiological Studies–Depression scale (Radloff, 1977). Respondents were asked during how many days they experienced a number of depressive symptoms during the past week. The 12 items were used to create an index by summing the responses for each case, ranging from 0 to 84 at baseline (α = .79). Satisfaction with social relationships is a summary index comprised of four items of subjective quality of life (Lehman, 1988). Using a Likert-type scale as response categories, respondents are asked: “How much satisfaction do you get from the things you do with other people? The amount of time you spend with other people? The people you see socially? How you get along with other people in general?” The index ranges from 4 to 28 and has a high degree of internal reliability (α = .83). Environmental mastery was measured by using a three-item version of an index by Ryff (1989). Respondents are asked the degree to which they agree or disagree with several statements: “The demands of everyday life get me down”; “In general, I feel I am in charge of the situation in which I live”; “I am quite good at managing the many responsibilities of my daily life.” The items were summed, ranging from 3 to 24 at baseline (α = .80). Life satisfaction was measured using a standard, single-item question that asked the respondents, “Now please think about your life as a whole. How satisfied are you with it?” Respondents were instructed to select a response ranging from 1 (not at all satisfied) to 5 (completely satisfied).

Results

Study Attrition

Of the initial 105 participants, 53 (50%) remained at the termination of the study. Among those in the intervention group, 32 (80%) of the participants completed the study. Among the comparison group, 21 (33%) completed the study. Although we did expect a rather large rate of attrition in the comparison group as a result of nonreceipt of services, this figure seemed quite high. Individuals left the study for a number of reasons. In all cases, those in the intervention group were less likely to leave than those in the comparison group, and most of the attrition occurred within the first 6 months of the study. Among the intervention group, 1 (2.5%) died, 3 (7.5%) refused to continue in
the program, 3 (7.5%) were unable to be contacted, and 1 (2.5%) was institutionalized. Among the comparison group, 4 (6.1%) died, 6 (9.2%) became at high risk for institutionalization, 15 (23%) refused to continue in the program, 8 (12.3%) were unable to be contacted, and 11 (16.9%) were institutionalized. Overall, those who completed the study had higher incomes ($p < .05) than those who did not complete the study duration (mean difference of $173 per month). No other significant differences between completers and those who left the study were found at baseline.

Because such a large number of persons in the comparison group were lost over time, we present an analysis of the baseline characteristics of comparison group members who were retained and comparison group members who were lost in Table 1. Among those in the intervention group, clients who completed the study had higher incomes ($p < .01) and reported being in better health ($p < .05) at baseline than those who did not complete the study. Among those in the comparison group, clients who completed the study had higher income than those who did not complete the study. There were no other differences between completers and those who left the study at baseline.

**Effect of the Intervention on Quality of Life**

Table 2 presents the results of repeated-measures analysis of variance that tests the effect of the intervention on the outcomes over time. Table 2 presents the means for all outcomes at each wave of data collection by group membership and the difference in mean between the end of the study and baseline. The Time x Intervention interaction is also presented in Table 2 and measures the effect of the intervention over time. Because there were no significant differences between the intervention and comparison groups on background characteristics as measured by $t$ and $\chi^2$ tests (see completers columns of Table 1), these characteristics were not used as covariates in the ANOVA.

As shown in Table 2, the effect of the intervention was quite strong. In ancillary analyses (not shown), the main effect of the intervention on all outcome variables except life satisfaction was statistically significant. Among those participants who completed the study, those in the intervention group were less depressed at baseline than those in the comparison group at a marginal level of significance. Between baseline and the 18-month follow-up, the mean depression score for those in the comparison group increased by 2.19 points (+13% or .42 standard deviations), whereas it decreased by 6.36 points (−34% or .29 standard deviations) for those receiving the intervention. However, the Time x Intervention interaction was marginally significant ($F = 1.93, p < .10$) and explained 19% of the variance in depression. There was also a significant impact of the intervention on satisfaction with social relationships ($F = 2.59, p < .05$). The Time x Intervention interaction explained almost 21% of the variance in satisfaction with social relationships. Scores for those receiving the intervention increased an average of 1.50 points (+10% or .28 standard deviations), whereas scores for those in the comparison group declined by 1 point (−7% or .41 standard deviations). The Time x Intervention interaction for mastery was also statistically significant ($F = 3.71, p < .05$) and explained about 25% of the variance in mastery. Those receiving the intervention had mastery scores that declined by only .06 points (−.05% or .29 standard deviations). Mastery scores for those in the comparison group declined by 3.57 points (−24% or .70 standard deviations). Finally, although the main effect of the intervention on life satisfaction was insignificant ($F = 1.41, p = .24$), the Time x Intervention interaction was statisti-

<table>
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<th>Outcomes</th>
<th>$n$</th>
<th>Baseline</th>
<th>3 Months</th>
<th>6 Months</th>
<th>9 Months</th>
<th>12 Months</th>
<th>15 Months</th>
<th>18 Months</th>
<th>Standardized Difference Score</th>
<th>Time x Intervention $F$ ($\eta^2$)</th>
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<tr>
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<td>21</td>
<td>16.91</td>
<td>20.24</td>
<td>12.33</td>
<td>17.48</td>
<td>18.95</td>
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<tr>
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<td>16.25</td>
<td>.28</td>
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<td>13.81</td>
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<td>15.00</td>
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<td>14.38</td>
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<tr>
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<td>3.18** (.319)</td>
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<td>3.45</td>
<td>3.40</td>
<td>3.55</td>
<td>−.51</td>
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*Note: Analysis performed with those clients who completed all seven waves of data collection.

$^*$Difference scores were computed by subtracting the 18-month mean from the baseline mean and transforming them to $z$ scores. The statistic indicates standard deviation units from the mean of the sample.

$^\#$Sample sizes vary due to missing data.

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

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338 The Gerontologist
cally significant ($F = 3.18, p < .05$) and explained almost 32% of the variance in life satisfaction. Those receiving the intervention increased their life satisfaction score by .80 points (26% or .51 standard deviations), whereas life satisfaction for those not receiving the intervention decreased by .10 points (−3% or .51 standard deviations).

Several trends in intergroup variation over the course of the study are worth noting. First, with the exception of mastery, the maximum mean difference between the intervention and comparison groups was reached either at 12 months (depression and life satisfaction) or at 15 months (satisfaction with social relations). This suggests that the effect of the intervention over time was nonlinear and the effect of the intervention, although still strong, may weaken somewhat with time. Second, for mastery, the differences between study groups grew larger with time. In particular, whereas the intervention group did not fluctuate much over time, there was a marked decline (14% between months 12 and 18) in mean mastery for the comparison group in the latter half of the study period.

To examine outcomes that are less subject to the Hawthorne effect, we conducted an analysis of the effect of the intervention on mortality and permanent institutionalization. During the 18-month period, one (2.5%) person in the intervention group and 11 (16.9%) persons in the comparison group were permanently admitted to a nursing home. Similarly, one (2.5%) person in the intervention group and four (6.1%) persons in the comparison group died. Due to the few cases of mortality, we combined institutionalization and mortality as a single endpoint. Logistic regression was used in a multivariate model to predict mortality/institutionalization. In the multivariate model, those in the intervention group were 82% less likely to be institutionalized or to die than those in the comparison group (odds ratio for the intervention group compared with the comparison group was .18, $p = .029$).

**Qualitative Evaluation**

At the conclusion of the study, those in the intervention group were given a final geriatric assessment in their home by a registered nurse. At the conclusion of the assessment, participants were asked to discuss the impact the receipt of services had on their lives. All responses were tape-recorded and then later transcribed.

Persons in the intervention group were, overall, very appreciative of the specific services offered to them. Because of the nature of the program, each client was assessed and provided with services specific to his or her needs. Many of the clients were not receiving such services before, especially in regard to certain cleaning tasks or tasks involving mobility. As one recipient reported, “. . . I cannot get down to the floor or do cleaning that needs to be done to keep the house clean, so I am very pleased with the help that comes to me once a week.” Another recipient described her gratitude for the program:

It’s been an enormous help to me because I can’t bend to pick up things and I had a wonderful person to help me with all the things I can’t do. It worked out just wonderfully. I am just very, very grateful.

Another positive reaction was that of security in the home and the knowledge that the client had someone to reach in case of an emergency. The majority of the clients lived alone and having a person to contact made a dramatic difference. One recipient simply stated, “Without this program, I would never be able to remain free and independent in my home.” Another said, “. . . it has been a great asset to me, and most of all it has given me a feeling of security to know I am free, if I’m in trouble, to contact these people.”

**Discussion**

The goal of this study was to determine whether the distribution of interventive services to underserved community-dwelling elders earlier than they normally would receive them resulted in an appreciable increase in their subjective well-being and a decreased probability of institutionalization and mortality. This program is part of a growing realization that long-term care can be positively addressed by community-level initiatives rather than solely within institutions.

The findings support our contention that early provision of in-home social services is positively associated with elders’ subjective well-being and negatively associated with permanent nursing home placement and mortality. These findings also confirm those conclusions of other studies (Hirdes et al., 1994; Stuck et al., 1995; Vetter et al., 1984). Those elders who received the intervention were significantly less depressed, had a greater sense of satisfaction with their life overall and with their social relationships, had a greater degree of mastery, and were less likely to die or experience permanent nursing home placement than those who did not receive the intervention. These findings are notable for several reasons. First, the nature of the wait-list sampling procedure allowed for a relatively rare opportunity to experimentally test an intervention on one group of individuals while essentially withholding the intervention from another group. Although this procedure may appear to have questionable ethics, we can assure readers that, if the risk score of a comparison group member reached the threshold for movement into the high-risk category, they were removed from the study and provided with services. Thus, participation in this study did not negatively or positively affect the treatment of those in the comparison group. Nevertheless, this methodology provides rich data that may not be accessible under other conditions or methodologies.

Second, these findings may suggest that community-based programs that use an early intervention case management approach can have an appreciable impact on the lives of persons living within the community in the long-term. Whereas other studies (see Weissert & Hedrick, 1994) suggest that the effects of
community-based interventions on elders’ well-being disappear after a few months, our findings suggest that the positive impact of this intervention on subjective well-being is evident 18 months after the intervention began.

Regarding cost-effectiveness, the average cost per client was approximately $2,300 per year, which is $200 less than the average cost for those in the less comprehensive CCE program. Part of this cost savings may be attributable to the lower risk scores for those in the present study than normal CCE clients, who are high risk. Nevertheless, given that only one of those in the intervention group became institutionalized and 11 in the comparison group became institutionalized, the cost savings relative to institutionalization are extraordinary. Thus, providing a more comprehensive, individually tailored program can be cost effective and can improve the quality of life of community-dwelling elders.

Several limitations of the study deserve attention. First, the present study is based on a relatively small sample from a select region. Thus, we do not suggest that our findings are representative of the entire at-risk elderly population. However, the present study suggests that this intervention be replicated among a more diverse group of elders in other locations. Second, there may also be bias caused by the unmasked assessment of outcomes. However, because all assessments were self-reports, we believe the effects of unmasking to be modest, unless the case managers persuaded the respondents to answer in certain ways. Third, because all participants were informed of the intervention goals, it may be possible that those who received the intervention artificially inflated their reports of subjective well-being. Unfortunately, ethical issues of full disclosure prevented us from masking the study goals. Fourth, it is possible that part of the effect of the intervention may be due to the Hawthorne effect—the effect of the attention given to the intervention group. Clearly, those receiving the intervention were given more attention than those in the comparison group. We did make every effort to ensure that both groups were contacted equally by case managers by placing these follow-ups at 3-month intervals. However, even when examining outcomes less subject to the Hawthorne effect, such as institutionalization and mortality, the intervention was highly effective. Fifth, high and unequal rates of sample attrition over the 18-month study period are a potential source of bias. We were diligent in attempting to contact persons who did not answer their telephones or return calls. At each wave of data collection, three separate calls were made to participants. If contact was still not made, a follow-up letter with a telephone number to call was sent. We believe this aggressive retention strategy was rewarded by the relatively few clients whom we were ultimately unable to contact. Nevertheless, refusals, attrition out of the study and into institutions, mortality, and movement into the high-risk classification significantly reduced our sample, particularly the comparison group, over the study period. Although income at baseline was a significant predictor of attrition, no other differences were found between those who completed the study and those who did not. Thus, we have more confidence in the validity of our results.

This research has important implications for both clinicians and scholars in the field of health and aging. For scholars, this research is supportive of the successful aging paradigm that highlights the importance of elders’ independence and personal control/mastery (Rowe & Kahn, 1998). Given the primacy of mastery for one’s subjective well-being (Mirowsky & Ross, 1989), the finding that those not receiving early intervention experienced a dramatic decline in mastery leads us to the conclusion that programs such as the one presented in this study contribute directly toward helping older adults age successfully as independent persons. For clinicians, these findings indicate a need to provide individually tailored care plans for at-risk homebound elders. Although the intervention had appreciable effects on depression and mastery, it had more modest effects on elders’ satisfaction with social relationships. These results suggest to clinicians that community-based care is not a panacea and does have its limitations in practice (see also Weisert & Hedrick, 1994)—it may affect some life domains more than others. As a result, clinicians should look for alternative strategies to engage elders in positive social relationships.

References


Received March 19, 2001
Accepted November 20, 2001
Decision Editor: Laurence G. Branch, PhD

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