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Evaluation of a peer educator stroke education program for the elderly

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Abstract

This paper reports on outcome and process evaluation of a stroke risk factor education program in a senior citizens' center using elderly peer facilitators. The two-phase program included training sessions for Peer Facilitators (PFs), and a period of both formal and informal education in the senior center and community. Outcome evaluation assessed knowledge of stroke and stroke risk factors in the PFs and center population, and the extent to which PFs provided health information, direct assistance and emotional and moral support for positive health behaviors. Knowledge scores for PFs and experimental center members were compared with those at another center without a program, and PF activities were assessed using simple logs kept by the PFs for twelve weeks. Process evaluation provided additional information about experiences with various components of the program and qualitative information related to program effectiveness. Findings for both outcome and process evaluations indicated that the Peer Facilitator Program was successful in training elderly laypersons to carry out health education, increasing knowledge at the program center, and facilitating information and advice for stroke risk reduction.

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Introduction

Stroke is the third leading cause of death in the United States (Surgeon General's Report, 1979) and the leading cause of disability. The incidence of stroke increases with age and the long-term survival rates decrease with age (Weinfeld, 1981). Stroke prevention and treatment are becoming increasingly important as the population of elderly individuals in the United States increases. With older adults living longer, the increased incidence of chronic disease can result in great burdens of disability, dependence and high medical costs. A reduction in risk factors for stroke, along with recognition of early warning signs, has the potential to benefit the elderly by helping them to avert unnecessary disease and disability, thus improving the quality and length of life.

Efforts to reach the elderly with community programs for health promotion and risk reduction are often conducted in organizations where senior citizens congregate. Senior centers are the single most numerous community service providers in the United States, and they play an important role in direct provision of health services and health education (Minkler, 1981). These settings provide good natural environments for building social networks conducive to health promotion (Goodman, 1984).

The use of age peers as lay educators is a promising approach to reach more of the elderly with greater effectiveness (Hoffman, 1983). From a theoretical perspective, peer educators can both be a credible source of information, and serve as role models for health-enhancing behaviors. The strength of the peer educators lies in their ability to identify with people whom they are helping. This may include shared life experiences and similar ethnic,

social, cultural, and economic backgrounds. These lay individuals can often overcome the barriers that many professionals may encountered in working with special groups. Programs to improve mental (Campbell and Chenoweth, 1981) and/or physical health (Shannon *et al.*, 1983) using the peer educator/counselor, or peer facilitator, approach have been implemented successfully in a number of programs for seniors. Our program was based in a senior citizens' center, and extended out into the community via peer facilitators who were involved in other organizations.

Based on a recent extensive review of health education for older persons by Rimer *et al.* (1985), it is clear that most programs for the elderly focus on a single health concern, e.g. hypertension, fitness, nutrition, arthritis; no programs have been reported to date which address the broad range of health and lifestyle factors related to prevention of early detection of stroke. Also, Rimer *et al.* (1985) have noted that most of the evaluations reported in the literature are one-group, case-study type evaluations, and thus have limited interpretability for other health educators. We were unable to locate experimental or quasi-experimental evaluations of similar programs, except for the case studies cited in the preceding paragraph.

This paper reports on outcome and process evaluation of a stroke risk factor education program using elderly peer facilitators. Such an evaluation examines both whether the program's goals were achieved, and what took place during the actual program experience with respect to participation, subjective reactions, and other events which might influence the outcomes. We believe that the quasi-experimental outcome evaluation, supplemented by qualitative data, provides comprehensive documentation of the program experience and an assessment of its effects.

Program design and objectives

The Peer Facilitator (PF) Program was implemented in a senior citizens' center in a small city in southeastern Pennsylvania. Its goals were to increase seniors' knowledge of stroke risk factors and warning signs; to establish a social support network at the center to promote healthy behaviors and to provide skills to reduce stroke risk.

Prior to the intervention phase of the program, a community advisory committee was established to provide expertise on both stroke and the needs of older adults. Advisory committee members include representatives from the Lehigh County Senior Citizens Center, the Lehigh Valley Stroke Program, the Area Agency on Aging and the Allentown Housing Authority.

A comprehensive packet of materials for the PFs was assembled from local and national resources. This packet included outlines for each topic to be covered, and samples of educational materials for later distribution by PFs. Guest speakers were invited for sessions on special topics, and included a physical educator, a dietitian and a pharmacist.

Senior center staff made recommendations for potential PFs. The Project Coordinator met with PF candidates to explain the program and requirements. Key requirements for PFs were the ability to attend training sessions, and willingness to learn and to share new information with others. A total of 17 individuals agreed to participate in the training program and to serve as PFs upon completion of the course.

Program design

The intervention program had two phases. *Phase I* was a seven-session training program for PFs who were identified as opinion leaders within the senior center. The training program covered content related to strokes, transient ischemic attacks (TIAs) and risk factors including diet, exercise, stress management and medications, as well as communication skills and the use of health services in the community. *Phase II* of the program included formal educational sessions for all senior center members (on the same topics) and also involved informal provision of support, information, advice and referral by PFs. Also, two 'booster sessions' to reinforce the PFs' Phase I training were held during this phase (Marger *et al.*, 1984).

Program objectives

For each phase of the program we developed a set of specific, measurable objectives. The objectives for

Phase I were that: (i) at least ten PFs would complete the seven-session training program: (ii) at the end of training, PFs would exhibit (a) increased knowledge of stroke risk factors and risk reduction; (b) attitudes conducive to health promotion/risk reduction and (c) increased knowledge of group process and communication; (iii) PFs would rate the training as interesting, practical and well organized and presented; and (iv) PFs would engage in supportive actions by (a) providing information to seniors at the senior center; (b) providing emotional and moral support to reinforce positive health behaviors and (c) providing direct assistance in health enhancement to seniors.

Objectives for *Phase II* were that older adults at the senior center would: (i) demonstrate increased knowledge of stroke and its risk factors; (ii) report attitudes conducive to stroke risk reduction; (iii) report greater awareness of community resources for stroke prevention and treatment; (iv) state their intentions to practice health behaviors to reduce the risk of stroke and (v) that a social support system at the senior center would positively influence members' knowledge and behavior for reduced risk of stroke.

Evaluation methodology

Both outcome and process evaluations were conducted to assess the program experience and effectiveness. Outcome evaluation assessed: (a) knowledge, (b) attitudes and (c) behavioral intent in the PFs and the center population, and (d) the extent to which PFs provided health information, direct assistance and emotional and moral support to reinforce positive health behaviors and health behavior change. Process evaluation provided information about exactly how the program was carried out, experiences with various components of the program and qualitative information related to the effectiveness of the program.

Evaluation design

In the outcome evaluation, knowledge, attitudes and behavioral intent were assessed using a quasi-experimental design in which pre-tests and post-tests were completed by the PFs, a sample of 67 center members and a control group of 43 seniors from another similar center without a stroke education program. The PFs were a cohort sample, with all PFs being studied at each test occasion. However, the experimental and control center groups were repeated cross-section samples of their respective senior center populations.

At the Lehigh County Senior Citizens' Center (LCSCC), the experimental center, these tests were administered three times to the PFs and center members — once at the beginning of Phase I, once at the end of Phase I, and again at the end of Phase II. These were labeled pre-test, post-test #1, and post-test #2 for both groups; though the first post-test for the experimental center population might be viewed as a second pre-test preceding the Phase II intervention. However, we viewed this measure as an initial post-test, because of our expectation that the PFs' informal educational activities would begin soon after the start of the training program (Phase I). A control group of seniors at the Bethlehem Senior Citizens' Center (BSCC) was used in the outcome evaluation. The control group center is in the same region as the LCSCC, and is also served by the Lehigh Valley Stroke Program, which sponsored the program. We felt the separate location and operation of the control center would prevent influences from the LCSCC program.

Activity of the PFs was assessed in the outcome evaluation using simple weekly logs kept by the PFs for 12 weeks, beginning midway through the training sessions. The outcome evaluation design is depicted in Figure 1.

Data sources for the process evaluation included both qualitative and quantitative records collected during the program. They came from attendance records, Session Reaction Questionnaires, training evaluation forms (completed by the PFs) and logs kept by the Program Coordinator.

Instruments and data collection

The pre- and post-test questionnaires were developed using detailed learning objectives specified during program planning. Draft instruments were reviewed by the Stroke Program and senior center staff,

GROUP	*PHASE I: Peer Facilitator Training*	*PHASE II: Senior Center Sessions*	
PFs (n = 15)*	Pre-test	Post-test 1 training evaluation 1	Post-test 2 follow-up questions training evaluation 2
	Weekly logs	– – – – – – – –	– – – – – – – –]
Experimental group (LCSCC) (n = 67)**	Pre-test	Post-test 1	Post-test 2 follow-up questions
Control group (BSCC) (n = 43)**	Pre-test	Post-test follow-up questions	
	Time 1 (T1)	T2 (T1 + 2 months)	T3 (T1 + 4 months)

*Cohort sample
**Repeated cross-section samples of center populations

Figure 1. *Peer facilitator program: outcome evaluation design*

a physician and a nurse, for their clarity and factual accuracy. Next, they were pre-tested with eight senior citizens at a high-rise apartment building for the elderly and revised for use in the study. The same tests (with 44 items for experimental and control centers and 49 items for the PFs) were used at each test administration. The approximate 2-month time lag between test dates was considered long enough to prevent significant testing effects.

Because the elderly may have problems with vision and/or reading comprehension, special efforts were made to administer the questionnaires so they would be well understood, i.e. by reading items aloud and waiting for respondents to answer on their own forms.

PFs' stroke education activities were assessed by simple two-page logs, which they completed for twelve consecutive weeks, beginning midway through the training sessions. The logs were completed by the PFs on their own and handed in weekly. For each day of the week, they checked boxes to indicate if they were at the center, whether they were involved in talking about health concerns or giving advice to other seniors, specific types of health-related activity and the number of people they talked to or helped. Also, each week they checked boxes indicating which specific topics they discussed or were asked questions about.

All PFs completed the evaluation instruments. Respondents for the experimental center were recruited from various craft groups and social gatherings (e.g. center lunches) held at the center. The same approach was used at the control center. Efforts were made to encourage the same individuals who completed the pre-tests to fill out post-test forms in the experimental and control center groups, but this was not always possible. Hence, the repeated tests in experimental and control groups actually represent repeated cross-section samples of those populations.

Data analysis

In our data analysis, all data were first tabulated and described, both in aggregate and in relevant groupings. They were then analyzed using chi-square and unpaired t-tests and analysis of variance to assess differences between groups and testing occasions (for the pre-test, post-test measures). For the process evaluation, logs kept by the Program Coordinator were reviewed and summarized qualitatively.

Results

An average of 15 PFs out of the initial total of 17 attended each of the training sessions, with eleven attending all sessions. Five PFs dropped out during the course of the program; three were hospitalized, one man's wife was in the hospital and he could not

Table I. *Summary of all SRQs (participants) (n = 190)**

[1=poor; 5=excellent]	Mean	Range of responses
How INFORMATIVE?	4.82	3–5
How INTERESTING?	4.73	3–5
How PRACTICAL WAS THE INFORMATION?	4.69	3–5
How WELL ORGANIZED?	4.71	3–5
PRESENTATION of material	4.91	4–5
HELPFULNESS of *leader*	4.94	4–5
HELPFULNESS of *guest speaker*	4.93	4–5

**Groups* PFs, 157 forms; Center participants, 29 forms; Center staff, 4 forms. There were no significant differences between groups on their ratings.

attend and one person simply failed to return.

Both participants and leaders completed Session Reaction Questionnaires (SRQs) at the conclusion of each session, during the training and the Phase II center sessions. A summary of program ratings from 190 SRQs appears in Table I. Various aspects of the program sessions were consistently rated good to excellent, with the highest ratings for presentations, the leader and guest speakers. In addition, 95% of the SRQs indicated feelings of learning 'a moderate amount' or 'a lot' from the session; participants felt their active involvement was 'just about right' 86% of the time; and 79% felt comfortable asking questions.

PFs completed training evaluations at the end of the 7-week training program (Evaluation 1) and again following the second booster session (Evaluation 2). The training evaluations had two sections: (i) self-rated understanding of various topics and preparedness to use the information and (ii) ratings of the training process and suggestions for changes in program style or content.

Self-rated understanding of program content related to stroke prevention was almost always between 'good' and 'excellent', though PFs rated their understanding of communication skills between 'fair' and 'good'. With respect to PFs' feeling prepared to use the information, only one-third felt 'definitely' prepared at Evaluation 1, though over three-quarters felt at least 'probably' prepared to use it.

Although there were some minor changes in findings at Evaluation 2 compared to Evaluation 1, no statistically significant differences were found. However, many fewer recommendations for changes were made at Evaluation 2, suggesting that PFs were satisfied with modifications that were made.

During Phase II, five open educational sessions were provided for all experimental center (LCSCC) members. Though attendance was limited, with a total of only 29 people for all five sessions, those who did attend seemed interested, participated in enthusiastic discussions and rated the sessions positively.

Outcome evaluation

The findings of the outcome evaluation focus on: (i) pre-test and post-test assessment of knowledge, attitudes and behavioral intent in the PFs, experimental and control center groups; and (ii) documentation of the extent to which PFs provided health information, direct assistance, and emotional and moral support to reinforce positive health behaviors and health behaviour change.

Data on background characteristics of all three study groups will be presented first, followed by results of knowledge-attitude pre-tests and post-tests. Responses to follow-up questionnaires and PF weekly logs will be presented last.

Background characteristics

Assessment of relevant background characteristics of the study population is important for two reasons: to describe the program's target audiences and to investigate differences between study groups which might affect interpretation of observed program effects. In addition to background information including demographic characteristics and the length of attendance at the senior center, subjects were asked whether they themselves, or an immediate family member, had ever had any of eight specific chronic illnesses or any 'other' chronic illnesses.

A summary of background characteritistics for all three groups appears in Table II. There were significant differences in age, marital status and years of formal schooling between the groups. However, there do not appear to be any major differences among the groups that would be expected to influence the focal outcome measures (knowledge-attitude tests, awareness and intentions). Though the PFs

Table II. *Background characteristics — group differences*

Characteristic	Group			Significance/comment
	PFs (n = 15)	Experimental (n = 67)	Control (n = 42)	
Age (mean)	69.21	71.28	75.82	$P < 0.01$; PFs youngest, controls oldest
Sex (% female)	73	85	77	n.s.*
Marital status (%)				
Married	60	58	12	$P < 0.001$; Controls more widowed, fewer married than PFs and experimental group
Separated/Divorced	–	5	2	
Widowed	40	34	78	
Never married	–	3	7	
Years of education (mean)	10.30	11.00	11.24	$P < 0.07$; tendency toward LCSCC/exper. and BSCC/controls higher than PFs
Years attending center (mean)	2.81	4.21	4.88	n.s. (P=0.11); tends to be higher in experimental and control center groups
Total number of illnesses Self (mean)	1.32	2.01	1.49	most in experimental group, but n.s.
Family (mean)	2.54	2.72	1.42	less in control group but n.s; may be reflective of higher proportion widowed

*n.s. = not (statistically) significant at $P < 0.05$ level.

Table III. *Raw test scores: number correct, mean and range*

Group	Pre-test (T1)			Post-test 1 (T2)			Post-test 2 (T3)		
	Mean	Range	N	Mean	Range	N	Mean	Range	N
PFs	21.31	2–36	15	31.02	19–39	13	29.93	10–40	9
Experimental center (LCSCC)	20.02	2–36	67	22.79	9–37	47	26.04	9–36	49
Control center	18.19	2–35	43	16.53	2–35	42	(no T3 measure: only one post-test for controls)		

were younger than the other two groups, they also had less formal education. The control group was older and more often widowed, but was not significantly more ill themselves than the PFs or the experimental center group. All three groups were ambulatory, alert, regularly attending senior centers and might be considered among the 'well' elderly. Further, we found the differences to be inconsequential given that we found no differences between groups in the baseline scores.

Changes in knowledge and attitudes

Pre-tests and post-tests assessed knowledge and attitudes related to stroke prevention. All 'attitude' questions could also be considered as 'knowledge' items, and were thus scored as either correct or incorrect and included as part of total test scores. In the data reported here, each item was counted as completely correct or incorrect (though some items could have been scored as 'partially correct'). Also, only the 44 items asked of all three groups were included in this analysis; five additional items on communication skills were asked only of the PFs. (Internal consistency of the instrument was examined using inter-item and inter-index correlations, with each of 10 indices representing the items pertaining to one of the 10 categories of learning objectives.

Table IV. *Comparison of raw test scores between and within groups*

Between groups				
	Groups			
Occasion	PFs/experimental/control	PFs/experimental	PFs/control	Experimental/control
Pre-test (T1)	n.s.	n.s.	n.s.	n.s.
Post-test 1 (T2)	$P < 0.001$	$P < 0.001$	$P < 0.001$	$P < 0.001$
Post-test 2 (T3)	–	$P < 0.001$	–	–

Within groups			
	Occasion		
Group	Pre-test – Post-test 1 (T1 – T2)	Pre-test – Post-test 2 (T1 – T3)	Post-test 1 – Post-test 2 (T2 – T3)
PFs	$P < 0.01$	$P < 0.05$	n.s.
Experimental center (LCSCC)	$P = 0.08$ (n.s.)	$P < 0.001$	$P < 0.05$
Control center (BSCC)	n.s.	–	–

Re-analysis of the tests excluding the six items with the item-index correlations <0.5 did not alter the overall results. Therefore, we have chosen to report only the findings using raw test scores.)

Table III shows the test scores for all three study groups. Table IV presents the results of statistical tests for differences between and within groups. Average group scores were not significantly different at the time of pre-tests. At post-test 1, there were highly statistically significant differences between all groups, with PFs scoring highest, followed by the experimental and control groups. There were statistically significant differences between the PFs and the experimental group at both post-tests. The bottom half of Table IV indicates that there were significant changes over time in the scores of the PFs and experimental center group, but a slight non-significant decrease in control group tests scores between pre-test and post-test.

Overall, the PF Program was effective in stimulating significant improvements in knowledge and attitudes toward stroke and stroke risk factors in both the PFs and experimental center group. These improvements were greatest in the PFs; however, in the experimental center significant gains accrued during Phase II while PF scores decreased slightly during that period.

Responses to follow-up questions

A set of follow-up questions asking for self-rating of understanding, reported awareness and attitudes about health and health habit change, self-reported behavior change among PFs and general reactions to the PF Program was completed by each group along with the final post-test. Table V summarizes the findings for follow-up questions.

The first question queried self-rated understanding. In all categories, PFs consistently rated themselves as having better understanding than either center group. The most significant differences between experimental and control center groups were for 'Strokes and TIAs' and 'risk factors'.

No statistically significant differences were found between experimental and control centers in self-rated knowledge and interest about health, or perceived ability to change health habits. The experimental center group indicated greater awareness of the Lehigh Valley Stroke Program, but not at a statistically significant level. Another finding based on the follow-up questions (not shown in Table V) was that the PFs judged themselves better at helping people to learn than to change their health habits. They viewed themselves as equally effective in the senior center and in the community. Overall, the program was rated as having a positive effect on their confidence and feelings that they could help others.

PFs' stroke prevention activities

A total of 152 PF logs were submitted over 12 weeks or an average of 12.7 each week. They reported 232 instances of involvement in discussing health, or an average of 1.57 instances per week per PF. The most frequent health-related activity was 'gave advice on health' (203 mentions), followed by 'answered ques-

Table V. *Follow-up questionnaire responses: mean scale scores*

	PFs (n = 9)	Experimental (n = 49)	Control (n = 26)	Differences	
				All three groups	Exp. versus Control
Rate understanding of:					
Strokes and TIAs	3.91	3.22	2.11	$P < 0.001$	$P < 0.001$
Risk factors	3.92	3.29	1.43	$P < 0.01$	$P < 0.001$
Fat and cholesterol	4.33	4.03	3.30	$P < 0.01$	n.s.
Sodium reduction	4.18	4.20	3.87	n.s.	n.s.
Weight reduction	4.21	4.18	3.71	n.s.	n.s.
Exercise	4.23	4.01	3.61	n s.	n.s.
Stress management	4.14	3.79	3.12	$P < 0.05$	$P < 0.01$
Smoking cessation	4.71	4.00	3.92	n.s.	n.s.
Average	4.20	3.84	3.13		
Communications	4.0				
(Scale: 1 = poor, 5 = excellent)					
Statements of feelings: (Center groups only)					
Know about health		3.70	3.61		n.s.
Interest in health		4.51	4.68		n.s.
Aware of LVSP		3.63	3.31		n.s.
Think I can change habits		3.80	3.78		n.s.
Talked with PFs		3.00	–		–
Learned from PFs		2.94	–		–
(Scale: 1 = not at all, 5 = a great deal)					

tions' (n=172 mentions) and 'gave emotional or moral support' (n=142 mentions). Informal health promotion activities greatly outnumbered formal education efforts (e.g. speaking to groups, working on center programs), according to the weekly logs

PFs reported speaking to a total of 2674 people over the 12 weeks, or an average of 17.6 people per PF per week. In order of frequency, the most frequent topics discussed were: fats and cholesterol; diet and nutrition in general; weight control; high blood pressure; exercise and stroke. PFs wrote many comments on their logs, indicating that they spoke to many groups both within and outside the senior center and that they distributed large quantities of printed educational materials and stroke 'calling cards'.

We also examined the PFs' activity patterns by week, by day of the week, and by PF, to gain a better understanding of what occurred during the program. Some of the more striking findings were that PF activity began to decline after week 8, which was the first booster session; and that 'emotional and moral support' were reported least often during the intense informational portion of the training.

Based on the PF weekly logs, it appears that the PFs eagerly used their new knowledge and roles to build awareness and a supportive environment for disseminating health information among their peers and all with whom they came into contact.

Discussion

Findings from both outcome and process evaluations indicated that the PF Program was successful in meeting its stated objectives of training elderly lay individuals to carry out stroke prevention education, increasing the knowledge of both the PFs and other seniors at the program center, and disseminating information covering a broad range of topics about stroke and stroke risk factor reduction. The objective pre-tests and post-tests indicated that those receiving the program gained more knowledge than those without a program. Weekly logs indicated a great frequency and amount of activity of the PFs, and SRQs attested to their general high level of satisfaction with various components of the program.

Though this evaluation was limited by a relatively small sample size, it is larger than most existing program evaluations with senior citizens in the community (Rimer *et al.*, 1985). The study has other methodological weaknesses which were imposed by the real-world setting: it lacks random assignment to experimental and control groups, and the experimental and control center groups are repeated cross-section samples rather than cohorts. Future studies would benefit from larger samples using cohorts, and a longer follow-up period to examine retention of learning, continuation of peer educator activities and health behavior and health status change. However, we feel that our evaluation approach and design, and data analysis, represent a reasonable compromise between methodological rigor and the reality of community-based research. It was not feasible or acceptable to the Center staffs to randomly assign individuals or centers to the program; and our initial attempts to enlist repeated participation in the testing from the same seniors met with resistance and threatened the good will between program staff and the participants.

One of the most noteworthy aspects of this program was that it ultimately reached large numbers of people in the community with a very modest investment of money and professional staff time. This, along with the unique peer educator advantage in influencing other seniors, makes this type of program increasingly attractive for other groups and topics.

Overall, the PF Program for stroke education was a valuable, interesting and enjoyable learning experience for all who were involved. Its impact on the senior center population and the community at large are clearly documented through this comprehensive evaluation.

Implications for practice and research

In our experience, the program ran smoothly due to early development of commitments from the Center staff and community advisory committee members. However, without such relationships a program such as this might not achieve successful implementation. This type of program could be generalized to other situations with minimal funding, provided that professional expertise and community commitment are available to operate the program. In other countries outside the United States, the program components would need to be adapted to the context of community programs for older adults.

Evaluation research for peer educator health education programs such as this could benefit from the use of several intact groups, either matched or randomly assigned to control or experimental conditions. If possible, data collection should take place in a more formal setting, to allow for studying cohorts of subjects. An alternative would be for additional research assistants to rigorously pursue respondents for retesting, while being careful not to interrupt the normal course of activities.

A positive, upbeat approach to health promotion for the elderly, along with thoughtful analysis of the situation and creative strategies to adapt both intervention and evaluation to the target community, can advance the state of practice and research regarding health education programs for older students.

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