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Living Well Could Save \$31 Million Annually

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Research Report

Living Well Could Save \$31 Million Annually

Behavior change can improve health status for many adults. Further, for adults with chronic illness and permanent injuries, a growing body of literature identifies health promotion as both effective in improving health and cost-effective compared to treatment alternatives.

Yet third-party payers (Medicaid, Medicare, and private insurance) typically do not reimburse health promotion interventions. This is a problem for many individuals with disabilities who have significant health care costs and cannot pay for health promotion programs.

For more than a decade, the Office on Disability and Health at the Centers for Disease Control and Prevention has supported research culminating in the Living Well with a Disability health promotion program for people with disabilities. This research has progressed from an initial focus on behavioral epidemiology and the risk factors for secondary conditions experienced by people with physical impairments to development, implementation and evaluation of the Living Well intervention.

The Living Well workshop differs from many medically-based health promotion interventions because improved health is an objective to a goal, rather than the goal itself. Living Well links health with function; and participants' goal-setting and problem-solving activities drive their health behavior changes.

Research Process

A pair of lay facilitators presented eight weekly, two-hour Living Well sessions which covered goal-setting, problem-solving, attribution training, depression, healthy communication, information-seeking, physical activity, nutrition, advocacy, and health maintenance. For this study, a total of nine Centers for Independent Living (CILs) in eight states recruited a total of 246 participants into 34 Living Well workshops.

Participants completed self-report surveys at five intervals (immediately pre-intervention, immediately post-intervention, and at two-, four- and twelve-month post-intervention intervals). An

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additional wave of data was collected at two months pre-intervention for approximately half of the participants who were randomly assigned to wait two months before receiving the Living Well intervention, serving as an extended baseline control group. Because this study focused on longitudinal changes for people who completed the Living Well workshop, the study sample was confined to 188 participants who completed both an immediate pre- and immediate post-intervention survey instrument.

Health outcomes were measured using the sum of participant ratings for the limitation they experience due to secondary conditions. Health behavior frequency and intensity were measured using the Health Promoting Lifestyle Inventory II. Finally, using a 2-month retrospective recall, health care utilization rates were determined from participants' reports of their physician and emergency room visits, outpatient surgeries and hospital days.

The extended baseline group was similar to the larger study group in terms of demographics, health outcomes, and medical care utilization rates. As a result, significant changes in health outcomes and costs after participation in the program can be more confidently attributed to the Living Well intervention. Reported results include this extended baseline group.

Cost Analysis

The cost analyses were approached from two perspectives. From an economic perspective, costs were totaled for all participants who reported data at each wave regardless of whether respondents had completed either previous or subsequent waves of data. These estimates provide the best estimates of healthcare expenditure at each point in time. Because the composition of the sample changes across time, however, the estimates are not applicable to assessing the efficacy of the intervention on healthcare costs. As interventionists, we also computed cost estimates using a repeated measures analysis for the consistent sample of individuals who returned outcome data at each wave of data collection.

Health care cost estimates were skewed by a small number of extremely high medical care users. Specifically, cost estimates associated with hospital stays showed that 3.6% of the sample accounted for 80% of hospitalization expenditures. To mitigate this effect, results are presented for the entire cohort and a trimmed data set which excludes hospital stays longer than 7 days for any 2 month retrospective. The rationale for presenting a trimmed data set comes from the assertion that individuals requiring hospitalization for more than a week are experiencing medical conditions that would not be prevented by health promotion efforts examined within a six-month time frame.

Preliminary Results

The average participant in this study was 45 years old and had experienced disability for 17 years. The sample was predominately female (64.2%), unmarried (63.4%), and unemployed (83.8%). Additionally, 80.3% of our study sample participants were Medicaid or Medicare beneficiaries and 58.2% depended on Medicaid and/or Medicare coverage exclusively.

First, results are reported from an economic perspective on costs incurred by the total cohort at each wave. Next, costs are presented using the intervention evaluation perspective using a repeated measures analysis of variance.

Economic Perspective

From an economic perspective, we can project savings due to declines in medical service utilization pre- to post-intervention. A financial cost-benefit analysis from the perspective of a third party payer measures the program's net benefits (program outcomes minus programmatic costs) and shows a six-month return on investment.

Programmatic costs include costs for contracted services to implement the Living Well workshop, instructor training, and variable costs for participant workshop materials. Based on 188 participants, programmatic costs are \$596 per participant.

Program outcomes (PO) are measured as changes in medical care utilization costs. In each survey round, participant medical utilization rates were multiplied by unit Medicare cost estimates to generate total medical expenses at each survey point. Program outcomes (PO) measure the change between pre-intervention medical costs (COST_B) and three post-intervention medical cost measures (COST_C, COST_D, and COST_E) to generate a six-month change in medical costs. Specifically:

$$PO = (COST_B - COST_C) + (COST_B - COST_D) + (COST_B - COST_E)$$

Table 1 shows the mean cost estimates for each survey point and the projected program outcome and net benefit measures. Data are presented for both the entire cohort and the trimmed data set.

Table 1. Mean Cost Estimates

Economic Perspective Costs	Entire Cohort	Trimmed Data
COST_B	\$2,089	\$725
COST_C	\$686	\$487
COST_D	\$1,215	\$593
COST_E	\$1,139	\$372
Program Outcomes	\$3,227	\$723
Net Benefits	\$2,631	\$127

The net benefits show a remarkable payback for the Living Well intervention. For the entire cohort, programmatic costs are completely recovered within the first two-month interval and for the trimmed data set in the first six months. While the entire cohort shows a much larger intervention payback than the trimmed data, paired comparisons were not significant after the initial intervention period.

Using non-parametric paired Wilcoxon signed ranks tests, results show significant cost decreases from the immediate pre to immediate post measures for both the entire cohort (p=.005) and trimmed data (p=.033).

The trimmed data also show significant decreases from immediate pre- to 4-months post-intervention (p=.035)

Interventionist perspective:

Using a repeated measures analysis of variance, Table 2 presents results for a consistent sample of participants who provided complete data at each intervention point. Although sample size is compromised, intervention efficacy of health care costs can be determined.

Table 2. Repeated Measures ANOVA Cost Estimates

Repeated Measures ANOVA Costs	Entire Cohort	Trimmed Data
COST_B	\$1,508	\$712
COST_C	\$724	\$403
COST_D	\$896	\$474
COST_E	\$1,306	\$323
Program Outcomes	\$1,598	\$936
Net Benefits	\$1,002	\$340

The repeated measures results parallel trends presented using the economic perspective. For both evaluation methods, net benefits are positive which sends a clear message to third party payers to support health promotion efforts for individuals with disabilities. ANOVA pairwise comparisons show corresponding significance levels in Table 3.

Table 3. ANOVA Pairwise Comparisons

Paired Comparisons	Entire Cohort	Trimmed Data
COST_B to COST_C	0.240	0.019*
COST_B to COST_D	0.319	0.132
COST_B to COST_E	0.781	0.008**
COST_B to COST_F	0.740	0.802

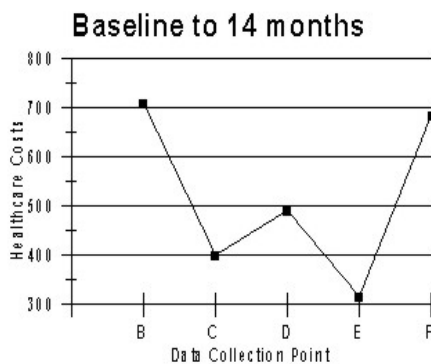
* Significant at the .05 level

** Significant at the .01 level

The statistical differences between the entire cohort and the trimmed data set are attributed to a small group of participants (n=13) who inflated cost outcomes and variances through significant hospitalization costs. For the trimmed data, tests of within-subjects contrasts show significant quadratic (p=.005) and Order 4 (p=.004) effects indicating an initial decrease in medical costs with

rebound outcomes over time. Figure 1 charts the repeated measures values across the one-year study span. Description of Figure 1.

Figure 1: Repeated Measures



Despite the longer term rebound effects shown, the Living Well workshop paid for itself through decreased medical utilization costs within the first six months of program implementation.

Cost Implications

During one year, if a state contracted with CILS to conduct 30 Living Well programs averaging eight participants per program, a total of 240 participants would be served. Based on our repeated measures data, we project the state would save approximately \$81,000 to \$240,000 above the cost of the Living Well program for each year. If we use all available data presented in the economic perspective this savings expands to \$631,440 per state. Nationally, annual savings to Medicare, Medicaid, and private insurers would be in the range of \$4 to \$31 million.

Limitations and Next Steps

Although the reported data show positive health outcomes and reduced medical care costs, there are weaknesses in study design and data collection. First, while random assignment of participants to treatment allowed examination of effects at baseline, the design does not allow examination of differences between groups at follow-up. Additionally, self-reported data, missing

data and respondent attrition across time create measurement problems. Although such limitations may compromise our ability to generalize, the results do parallel those found in three separate smaller studies. This mediates some concern about generalizing the study's results, but indicates the need for further research.

To address the limitations of this study, we recently began another study which uses both self-report plus other healthcare utilization data sources. Additionally, its randomized experimental design will allow examination of effects on follow-up outcome measures.

A financial risk analysis is being conducted using confidence intervals of costs from this study. Rather than focusing on statistical significance levels, confidence intervals provide a range of expected outcomes that demonstrate magnitude of risk. Regardless of effects on cost, the health improvements remain. This indicates the importance of conducting formal cost-effectiveness research that compares alternate programs based on implementation costs and corresponding health outcomes such as change in depression, lifestyle or quality of life indicators.

Evidence continues to indicate that Living Well with a Disability is an efficacious health promotion program which can be provided by Centers for Independent Living and other community based agencies. The efficacy results parallel the program's previously-reported results and suggest that effects can be ascribed to the intervention itself. Further, the cost outcomes are also consistent with our ongoing conclusion: For adults with mobility impairments, Living Well can lead to better health.

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