Home-based health promotion for chronically ill older persons: results of a randomized controlled trial of a critical reflection approach

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SUMMARY
The purpose of this study was to test a health promotion intervention for people over 65 years of age discharged from hospital to care at home for chronic medical conditions. Researchers hypothesized that chronically ill older people who received the intervention would have a significantly more positive mindset (or attitude toward their life, self, health, and health care), would use significantly less hospital and home care services, and would have a significantly better quality of life. At the time of discharge from hospital, 298 seniors were randomized to receive the usual home care plus the intervention, or to an attention control group receiving the usual home care. The intervention was comprised of approximately 10 weekly hour-long sessions in which a nurse facilitated critical reflection on life and health. Data collected by personal interview at baseline, 22 weeks, and 1 year later were analyzed using ANOVA and logistic regression, controlling for age, gender, living arrangements, accommodation, number of chronic medical problems and baseline differences, as appropriate. Results: Those who received the intervention had significantly greater independence (p = 0.008) and perceived ability to manage their own health (p = 0.014) and significantly less desire for information (p = 0.021) immediately post-intervention. At the 1-year follow-up, the pattern persisted, although significant differences were limited to independence (p = 0.007) and desire for information (p = 0.035). As well, at 1-year the intervention group had higher yet more significantly declined self-care agency (p = 0.025) and locus of authority (p = 0.017). Comparison of changes in health resource utilization by the two groups did not differ significantly. However, the intervention group had a significantly greater (p = 0.006) chance of having higher quality of life immediately post-intervention. This trend persisted at 1 year, although differences were non-significant. Results suggest the clinical potential of critical reflection to enhance the health of chronically ill older persons. Further investigation with less frail populations is needed.

Key words: critical reflection; health care for chronic illness; health promotion; perspective transformation

In 1994, Canadians over 65 years of age constituted 11.9% of the population and accounted for 38.7% of the total national health expenditures (Health Canada, 1996), having approximately twice as many admissions to hospital per 100 000 population, and over twice as long an average length of stay as individuals aged 45–64 years (Hospital Morbidity, 1984/85). Eighty percent of older persons have chronic conditions (National Advisory Council on Aging, 1993). To address both the quality of life and cost concerns raised by these figures, health promotion for older persons with chronic illness has become a high priority (Lubkin, 1990; Minkler and Estes, 1991).

To date, research in this area has focused largely on identifying risk factors and preventive care to minimize the risks of chronic diseases and debilitation associated with aging. As yet,
research has contributed little to understanding the behavioural, social and psychological processes which might temper and, indeed, improve functioning in old age (Kaplan, 1992). For example, there has been limited attention to the individual’s frame of mind in efforts to promote health. Experts have suggested the importance of the individual’s: interest in, need for, and belief in the type of intervention offered (Wills, 1991); perception of care (Wills, 1991); unwillingness or inability to take advantage of support people (Vaux, 1991); experience of power (Seligman, 1975; Seeman and Seeman, 1983; McKnight, 1985; Wallerstein, 1992); and personal values, resourcefulness, determination, self-confidence, motivation to improve, and hope for a better future (Lord and Hutchinson, 1993). Such findings suggest the appropriateness of an intervention aimed at enhancing sense of self, health, self-care agency and personal control.

Research has confirmed that positive outcomes can be achieved with older persons through several health promotion interventions, including: protocols (i.e. semi-annual health habit questionnaires, Leith et al., 1992); educational materials; cost reimbursement or waivers for preventive medical care (Burton et al., 1995; German et al., 1995; Ohmit et al., 1995; Lave et al., 1996); specific health promotion theory courses (Gift, 1992; Rowland et al., 1994; Harter et al., 1995; Newman et al., 1996; White and Nezey, 1996) and specifically designed health-oriented programs (Vetter et al., 1984; Hall et al., 1989; Kutner et al., 1992; Edwards et al., 1993; Hornbrook et al., 1993; Mayer et al., 1994; Tinetti et al., 1994; Elder et al., 1995; Hickey et al., 1996; Rizzo et al., 1996).

Much of the research to date has tested group interventions (Zimpfer, 1987). The combined results of these studies suggest that general purpose group counseling as yet has been of limited usefulness in promoting the health of older persons (Hauser and Feinberg, 1976; Lieberman and Gourash, 1979; Tosland et al., 1981; Zgliczynski, 1982; Yalom and Vinogradov, 1988; Benson et al., 1989; Higgins, 1989; Wyd, 1990; Heller et al., 1991; Ruffing-Rahal, 1994; Viverais-Dresler et al., 1995).

Studies have confirmed that individualized in-home care of elderly patients may reduce hospital readmission (Hendriksen et al., 1984; Mor et al., 1985; Townsend et al., 1988; Weinberger et al., 1988; Van Rossum et al., 1993; Martin et al., 1994; Rich et al., 1995; West et al., 1997), lengths of stay in hospital (Hendriksen et al., 1984; Martin et al., 1994); admission to nursing homes (Hendriksen et al., 1984; Carpenter and Demonpolos, 1990; Stuck et al., 1995); institutionalization in long-term care facilities (Hall et al., 1989); mortality rates (Vetter et al., 1984), and depression (Banerjee et al., 1996). Studies using in-home preventive care for older people have achieved positive outcomes, including: a home-based exercise program which improved physical status (Jette et al., 1996); in-home telemedicine which increased health status (Lindberg, 1997); and in-home screening, advice and instruction which altered loneliness, emotional reaction, isolation, and attitudes toward aging (McEwan et al., 1990), as well as mortality rates, self-rated health, and shorter hospital stays (Pathy et al., 1992).

Our recent qualitative studies (McWilliam, 1991; McWilliam et al., 1994) have documented the significant role which the chronically ill older patient’s mindset (or attitude toward life, health, self, and self-care) played in determining successful at-home management of chronic illness. Older persons’ negative mindsets interacted dynamically with support systems to create unsuccessful dependence, with frequent readmissions to acute care hospitals (McWilliam et al., 1994). The potential for enhancing the older person’s mindset and, in turn, participation in one’s own health and health promotion through application of the theory of perspective transformation (Burnside and Hodgins, 1992; Van Nostrand, 1993; Carpenter, 1994) was thereby identified.

Thus, the purpose of this study was to test a health promotion intervention for older patients with chronic medical problems and repeated admissions to acute care institutions for conditions which might have been managed at home. The overall aim of the intervention was to assist these older persons to develop greater ability to realize aspirations, satisfy needs and respond positively to the challenges of living with chronic medical problems, and thereby, to decrease their need for hospital and home care services. Researchers hypothesized that chronically ill older persons who received the home-based health promotion intervention in comparison with chronically ill older persons in an attention control group would have:

(i) significantly more positive mindset;
(ii) significantly lower utilization of hospital and home care services; and
(iii) significantly greater quality of life.
DESIGN

The prospective randomized controlled trial enrolled consenting subjects at the time of discharge from hospital. The principal investigator randomized subjects immediately following completion of baseline data collection. Information on the utilization of hospital resources, demographics, and on all scalar measures was gathered in the subject’s place of residence at baseline, at 22 weeks (the maximum potential end-point of the intervention) and at 1 year following enrollment. Data were collected by a research assistant, who was kept blind to the subject’s randomization. The experimental group received the intervention plus the usual home care, while the attention control group received the usual care and attention associated with in-home service, with minimum hours of service equal to the maximum intervention hours.

The intervention

The intervention was premised upon the adult education theory of perspective transformation (Mezirow, 1991; Mezirow et al., 1991). Through participation in reflective dialogue guided by one of two specially trained, experienced community nurses, the individual was intended to acquire an understanding which altered their expectations, beliefs, values and perceptions related to their experience of chronic illness. Through the individualized process, begun within 1 week of hospital discharge, the individual might redefine needs and action priorities, and thereby consciously choose to modify his or her everyday living (Mezirow et al., 1991). As well, through participation in the process, the individual might achieve greater empowerment, through attaining a more equitable distribution of knowledge, status, and authority (Lloyd, 1991) in the health promotion process.

The steps of perspective transformation vary with the topic, and in this study reflected a therapeutic application (Gould, 1990) intended to transpire over the course of 12–16 home visits approximately 1 h in length. The specific duration, times, and total numbers of visits were to be negotiated by subject and nurse. In actuality, study participants negotiated with their nurses for an average of 10.55 h of intervention (range = 1.00–20.75 h) over 10.39 visits (range = 1.00–16.00 visits). The aims of the intervention were to: (i) enable older persons to participate as partners in their own care; (ii) foster a self-help philosophy; (iii) enhance active decision-making; and (iv) improve the individual’s overall mindset, or attitude toward life, self, health and health care. The ultimate goal was to reduce hospitalization rates and enhance the quality of life of chronically ill older persons through promoting health.

The theoretical basis of the intervention reflects the work of theorists from several disciplines, particularly those who adopt a eudaemonistic definition of health (Newman, 1986; Carlson, 1988; Bruner, 1990). For example Newman (1986, p. 14) described the process of health as one of discovery of ‘the meaning of life and health and what those of us in the health profession can do about it’ through expanding consciousness. The intervention was also consistent with empowerment theory, which recognizes that people cannot be given power, but rather can only be enabled to strengthen their skills and resources to gain power over their own lives, transferring these skills and resources to other situations (Israel et al., 1994).

Sample

Inclusion criteria limited the study sample to individuals who were: 65 years of age or older; cognitively intact; hospitalized two or more times in the past year; discharged from hospital within the past week; and in receipt of professional home care to manage chronic illness. Chronic illness was defined in keeping with the US National Center for Health Statistics definition, as any illness of ≥3 months duration (Stedman, 1990). Exclusion criteria eliminated those who were cognitively impaired (a score of 20 or less on the mini-mental state scale) (Folstein et al., 1975) or diagnostically labeled ‘terminally ill’. Individuals who met the inclusion criteria were initially recruited by home care case managers in three small community hospitals discharging patients to a small city (population = 30 000) and the surrounding rural agricultural county and in two large urban teaching hospitals, discharging patients to a larger city (population = 350 000) as well as to smaller communities within a 20 km radius.

Sample size

The sample size requirements to compare the differences in mean change scores on the
selected outcome measures of mindset for a small to medium effect size of 0.40 with \( \alpha \) set at 0.05 (two-tailed) and \( \beta \) set at 0.20 was 100 subjects in each group (Cohen, 1988). The sample size required to detect a 20% difference in hospital readmission rates between the intervention and control groups with \( \alpha \) set at 0.05 (two-tailed) and \( \beta \) set at 0.20, assuming the rate of hospital readmission in non-intervention subjects to be 80% or greater (Fleiss, 1981), was 91 subjects in each group. Allowing for a 25% refusal and loss-to-follow-up rate, the required sample size was calculated to be 266 study participants.

**Instruments**

**Hypothesis 1**

Measures of the dependent variable, mindset, included eight scales to assess: morale, self-esteem, self-care agency, interpersonal dependency, locus of authority, desire for information, self-rated health, and perceived ability to manage own health.

To measure morale, the LSI-A containing 20 items representing five dimensions (zest versus apathy; resolution and fortitude; congruence between desired and achieved goals; self-concept; and mood tone) was used (Lawton, 1975). Designed specifically for use with the elderly, item scores range from 0 to 2, with a scale score of 0–40. Reliability of the LSI-A has been reported as 0.79 and validity tests have elicited correlations of 0.57 and 0.55 (Wood et al., 1969; Lawton, 1975).

Rosenberg’s Self-Esteem Scale (1965) was used to measure self-esteem. On the 10-item scale, scores range from 1 to 4 for each item, creating a potential total score of 10–40, with high scores indicating high self-esteem. The scale has been used in studies of the elderly’s experience of successful aging (Shimoaka et al., 1996); and the impact of reminiscence activities on self-esteem (Lappe, 1987; Stevens-Ratchford, 1992). It has a reported reproducibility coefficient of 0.92, a test–retest correlation of 0.85 and Cronbach’s alpha of 0.74, and validity test correlations ranging from 0.65 to 0.83 (Mangen and Peterson, 1982).

Self-care agency was measured using an instrument developed by Kearney and Fleischer (1979). Scores for each of the 43 items range from 0 to 4, with the total score ranging from 0 to 172. The measure has reported test–retest reliability of 0.62 and validity (Cronbach’s alpha = 0.67–0.70) in a study of pre-discharge patients over 65 years of age in geriatric rehabilitation settings (Whetstone, 1987; van Achterberg et al., 1991).

To measure independence, Hirschfeld et al.’s (1983) Interpersonal Dependency Inventory (IDI) was used. The 48-item self-report measure consists of three subscales: emotional reliance on others; lack of social self-confidence; and assertion of autonomy with reported split half reliabilities of 0.87, 0.78, and 0.72, respectively (Hirschfeld et al., 1977). Scores can range from 48 (more independent) to 192 (most interpersonally dependent) (Hirschfeld et al., 1977). Use with an older population has not been previously reported; however, in our study internal consistency was satisfactory (Cronbach’s alpha = 0.75).

Beiseckers’ (Beisecker, 1988; Beisecker and Beisecker, 1990) 13-item scale on Locus of Authority in Decision-Making was used to measure participants’ attitudes toward medical decision-making. The scale scores range from 0 to 26, with high scores representing a belief in greater decision-making authority for the patient (versus the doctor). The scale’s inter-item reliability has been reported to be 0.73. Another aspect of an empowered attitude toward health and health care, the person’s desire for medical information, was measured by Beisecker’s (1988) Desire for Information Scale. Developed for studies of the elderly and reported to have an inter-item reliability of 0.86, the 14-item Likert scale elicits scores on the importance of information to the patient, with scores ranging from 14 (low importance) to 70 (high importance).

The Medical Outcome Study (MOS) Short Form General Health Survey (Stewart et al., 1988), was used to measure the concept of self-rated health. The five items each elicit scores ranging from 1 to 5, for a potential total score range of 5 to 25. Testing with adults over 65 years of age has elicited evidence of a high degree of internal consistency, with the Cronbach’s alpha for the general health perceptions parameter being 0.83 (Lyons et al., 1994). The MOS has been found to correlate significantly \( p < 0.01 \) with both physical \( r = 0.53 \) and mental \( r = 0.45 \) health, role functioning \( r = 0.57 \) and social functioning \( r = 0.53 \) (Ware et al., 1980). As well, a one-item visual analogue scale designed especially for this study elicited a continuous score ranging from 0.0 to 10.0 in response to the
question, ‘How would you rate your own ability to manage your health at home right now?’

Hypothesis 2
To test hypothesis 2, numbers of hospital re-admissions were measured by self-report, along with numbers of visits to hospital emergency departments and total days in hospital. Home care program records provided total hours of homemaking services and total numbers of professional visits (nursing, physiotherapy, occupational therapy, respiratory therapy and social work).

Hypothesis 3
Spitzer’s Quality of Life Index (1981), designed to assess the benefits of health care programs, was used for hypothesis 3. The scale, which has been used extensively with cancer patients and with the chronically and seriously ill, and on occasion, with an elderly sample (Rockwood et al., 1993) addresses a holistic biopsychosocial experience of quality of life. It has five items eliciting scores of 0–2, for a total potential score of 0–10, with low scores indicating low quality of life and high scores indicating a high quality of life. Mean scores have been shown to decline with age in several studies (Wood-Dauphinee and Williams, 1991), but have ranged from 8.8 to 9.2 for healthy people, 7.3 for the chronically ill, and 3.3 for the seriously ill. Inter-item consistency (Cronbach’s alpha = 0.775) (Spitzer, 1981) and external validity, established through comparison with other measures of older persons’ functional capacity (r = 0.52 with the Barthel Index; r = 0.45 with the Functional Independence Measure; r = 0.48 with Katz’s Index of ADL) (Rockwood et al., 1993), have been reported (McDowell and Newell, 1996).

Potential confounding variables
Demographic and socio-economic characteristics were recorded at baseline, 22 weeks, and 1 year post-intervention and assessed as potential confounding variables to be controlled for, as appropriate. Comparison of intervention and control groups’ characteristics on the final sample size of n = 162 identified only one statistically significant difference at baseline; accommodation [i.e. ‘own home’ versus ‘other’ (p = 0.002; not shown on table 1)]. Consideration of non-significant but potentially clinically meaningful differences between the groups led to the identification of gender, living arrangements (i.e. ‘with someone’ versus ‘alone’), and sum of chronic problems (i.e. one to three or four or more chronic medical problems). While age did not differ between the two groups, age is viewed clinically to be an important factor. Therefore, we also controlled for age.

DATA ANALYSIS

Hypothesis 1
Unpaired t-tests were performed to make an initial comparison of the intervention and control groups on the eight outcome measures of mindset. Controlling for age, gender, living arrangements, accommodation, and sum of chronic problems, analyses of variance of the change scores for each of the outcome measures were then performed using MANOVA in SPSS. Subsequently, multivariate analysis of co-variance was performed to determine whether there was a global measure of change in mindset between the intervention and control groups, controlling simultaneously for the same potentially confounding variables, as listed above.

Hypothesis 2
Initially, t-test analyses were used to compare the intervention and control groups’ hospital readmissions, lengths of stay, emergency room visits, the number of hours of homemaker service and visits by professionals. Controlling for age, gender, living arrangements, accommodation, and sum of chronic problems, analyses of variance of the change scores for each of the outcomes were performed using the MANOVA program of SPSS. To adjust for the large difference in standard deviation between intervention and control groups on number of days in hospital in the past year and visits to emergency, logarithmic transformations were made before completing the analyses on these two variables. Subsequently, multivariate analysis of co-variance was done to determine a global measure of variance in change in health resource utilization between the intervention and control groups, controlling simultaneously for the same confounding variables. Finally, a logistic regression was done to determine significant differences in the chance of hospitalization of those receiving the intervention as compared with those who did not, again controlling for the same list of confounding variables.
Hypothesis 3

To determine the clinical significance of the intervention, scores on Spitzer’s Quality of Life Index were dichotomized into low quality of life (0–5) and high quality of life (6–10). The mid-point of the scale was chosen as the cut-off point after careful review of the literature, which reported the mean score of chronically ill people to be 7.31, and that for seriously ill people to be 3.31 (Spitzer, 1981), suggesting a mid-point score of 5 to differentiate between these two medical states. Once scores for the intervention and control groups were dichotomized, logistic regression analysis was used to compute four odds ratios: unadjusted; adjusted for baseline scores; adjusted for the potentially confounding variables of age, gender, living arrangements, accommodation, and sum of chronic problems; and adjusted for both baseline scores and this same set of potential covariates.

RESULTS

Data were collected from 298 consenting subjects at baseline, 203 (68.1%) at 22 weeks, and 162 (54.4%) at the 1-year follow-up. Sixty-three of the originally enrolled participants withdrew from the study. Seventy-three were lost to follow-up through death, admission to a nursing home or long-term re-hospitalization. Drop outs \((n = 136)\) were compared with those who completed the study \((n = 162)\). No significant differences were found on the majority of demographic variables. However, the two groups differed significantly \((p = 0.03)\) on age [with the mean age of dropouts \((\bar{X} = 79.5\text{ years})\) being three years older than those remaining in the study] and on a number of chronic conditions, with dropouts having significantly more \((p = 0.02)\). Dropouts were thus older, more frail study participants, limiting generalizability accordingly.

Table 1 presents the demographic characteristics of study participants at baseline. The

<table>
<thead>
<tr>
<th>Variable</th>
<th>Value labels</th>
<th>Intervention/control</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>I (%) ((n = 149))</td>
<td>C (%) ((n = 149))</td>
</tr>
<tr>
<td>Gender</td>
<td>1. Male</td>
<td>41.6</td>
<td>35.6</td>
</tr>
<tr>
<td></td>
<td>2. Female</td>
<td>58.4</td>
<td>64.4</td>
</tr>
<tr>
<td>Rural/urban</td>
<td>1. Oxford</td>
<td>50.3</td>
<td>52.3</td>
</tr>
<tr>
<td></td>
<td>2. London</td>
<td>49.7</td>
<td>47.7</td>
</tr>
<tr>
<td>Age</td>
<td>1. 65–74</td>
<td>30.9</td>
<td>36.9</td>
</tr>
<tr>
<td></td>
<td>2. 75+</td>
<td>69.1</td>
<td>63.1</td>
</tr>
<tr>
<td>Marital status</td>
<td>1. Married/ common law</td>
<td>43.0</td>
<td>40.3</td>
</tr>
<tr>
<td></td>
<td>2. Widowed</td>
<td>47.7</td>
<td>49.7</td>
</tr>
<tr>
<td></td>
<td>3. Other</td>
<td>9.4</td>
<td>10.1</td>
</tr>
<tr>
<td>Education</td>
<td>1. Public school</td>
<td>34.2</td>
<td>38.9</td>
</tr>
<tr>
<td></td>
<td>2. Secondary</td>
<td>46.3</td>
<td>47.7</td>
</tr>
<tr>
<td></td>
<td>3. Post-secondary</td>
<td>19.5</td>
<td>13.4</td>
</tr>
<tr>
<td>First language</td>
<td>1. English</td>
<td>89.3</td>
<td>89.9</td>
</tr>
<tr>
<td></td>
<td>2. French</td>
<td>1.3</td>
<td>1.3</td>
</tr>
<tr>
<td></td>
<td>3. Other</td>
<td>9.4</td>
<td>8.7</td>
</tr>
<tr>
<td>Place of birth</td>
<td>1. Canada</td>
<td>77.9</td>
<td>77.2</td>
</tr>
<tr>
<td></td>
<td>2. Other</td>
<td>22.1</td>
<td>22.8</td>
</tr>
<tr>
<td>Income</td>
<td>1. &lt;$20 000</td>
<td>55.0</td>
<td>67.0</td>
</tr>
<tr>
<td></td>
<td>2. $20 000–$39 000</td>
<td>39.6</td>
<td>29.1</td>
</tr>
<tr>
<td></td>
<td>3. &gt;$39 000</td>
<td>5.4</td>
<td>3.9</td>
</tr>
<tr>
<td></td>
<td>(Missing)</td>
<td>(25.5)</td>
<td>(30.9)</td>
</tr>
<tr>
<td>Living arrangements</td>
<td>1. Alone</td>
<td>49.0</td>
<td>51.7</td>
</tr>
<tr>
<td></td>
<td>2. With somebody</td>
<td>51.0</td>
<td>48.3</td>
</tr>
<tr>
<td>Accommodation</td>
<td>1. Other</td>
<td>35.6</td>
<td>44.3</td>
</tr>
<tr>
<td></td>
<td>2. Own home</td>
<td>64.4</td>
<td>55.7</td>
</tr>
<tr>
<td>Sum of chronic problems</td>
<td>1. 1–3 Chronic problems</td>
<td>61.7</td>
<td>60.1</td>
</tr>
<tr>
<td></td>
<td>2. 4–6 Chronic problems</td>
<td>38.3</td>
<td>39.9</td>
</tr>
</tbody>
</table>

*Divorced, separated, never married.*
The typical study participant was an English-speaking Canadian female whose average age was 77.9 years (range = 65–100 years). Almost half of study participants were widowed. More than one-third had no post-secondary education, and over half reported an annual income of less than $20,000. Typical of the generation, one-quarter of study participants had been born outside of Canada, many taking up Canadian residence in the post-war years. Approximately one-half of study participants lived alone, and 60% reported owning their own home. More than 60% of all the subjects have one to three chronic problems. Cardiac problems (64%) constituted the most common chronic condition, followed by arthritis (62%), respiratory problems (61%), diabetes (28%), cerebral vascular accidents (24%), and cancer (14%).

The intervention group (Time 1, n = 149; Time 2, n = 91; Time 3, n = 73) experienced greater attrition than did the control group (Time 1, n = 149; Time 2, n = 112; Time 3, n = 89). Significant baseline differences were found between the intervention and control groups on measures of mindset, with those in the intervention having significantly greater: desire for information (p = 0.000); self-care agency (p = 0.000); life satisfaction (p = 0.003); and self-esteem (p = 0.000) for those in the study at 22 weeks; and: independence (p = 0.038); desire for information (p = 0.004); self-care agency (p = 0.000); life satisfaction (p = 0.011); and self-esteem (p = 0.003), for those in the study at the 1-year follow-up. These baseline variables were controlled for in appropriate subsequent analyses.

**Hypothesis 1**

Scores measuring change in ‘mindset’, or attitude toward life, health, self, and health care, from that at baseline (controlling for age, gender, living arrangements, accommodation, sum of chronic medical problems, and baseline scores, as appropriate) indicated that the intervention group became significantly more independent (p = 0.008) and had significantly greater perceived ability to manage their own health (p = 0.014) immediately following the intervention (Table 2) in comparison with the control group. As well, the intervention group’s desire for information declined, differing significantly (p = 0.021) from that of the control group, who developed an increased desire for information during the 22-week intervention period.

This pattern of difference between the two groups persisted at the 1 year follow-up, (Table 3) with the intervention group’s change scores still significantly more independent (p = 0.007), and less desirous of information (p = 0.035) than the control group, and having non-significant but greater perceived ability to manage their own health. At the same time, however, the intervention group, while still having higher scores than the control group, had significantly greater declines in self-care agency (p = 0.025) and locus of authority (p = 0.017).

**Table 2: ANOVA of measures of mindset—adjusted means and change at 22 weeks from baseline**

<table>
<thead>
<tr>
<th>Outcome</th>
<th>Intervention (n = 91)</th>
<th>Control (n = 112)</th>
<th>F statistic</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Life satisfaction</td>
<td>23.1 0.03 (0.91)</td>
<td>22.5 –0.38 (0.82)</td>
<td>F₁,195 = 0.11</td>
<td>0.745</td>
</tr>
<tr>
<td>Self-rated health</td>
<td>12.0 1.62 (0.50)</td>
<td>12.1 1.93 (0.45)</td>
<td>F₁,194 = 0.21</td>
<td>0.648</td>
</tr>
<tr>
<td>Self-esteem</td>
<td>32.8 –0.09 (1.02)</td>
<td>31.5 0.80 (0.92)</td>
<td>F₁,195 = 0.40</td>
<td>0.528</td>
</tr>
<tr>
<td>Interpersonal dependency</td>
<td>106.1 –5.76 (1.76)</td>
<td>111.4 0.69 (1.59)</td>
<td>F₁,195 = 7.15</td>
<td>0.008</td>
</tr>
<tr>
<td>Self-care agency</td>
<td>127.0 –0.40 (3.26)</td>
<td>125.8 5.55 (2.95)</td>
<td>F₁,195 = 1.77</td>
<td>0.185</td>
</tr>
<tr>
<td>Locus of authority</td>
<td>9.47 0.69 (0.93)</td>
<td>7.92 0.91 (0.84)</td>
<td>F₁,195 = 0.03</td>
<td>0.861</td>
</tr>
<tr>
<td>Desire for information</td>
<td>63.5 –2.10 (1.53)</td>
<td>64.9 2.77 (1.38)</td>
<td>F₁,176 = 5.41</td>
<td>0.021</td>
</tr>
<tr>
<td>Perceived ability to manage own health</td>
<td>6.88 1.12 (0.32)</td>
<td>6.13 0.040 (0.29)</td>
<td>F₁,176 = 6.16</td>
<td>0.014</td>
</tr>
</tbody>
</table>

*aAdjusted for age, gender, living arrangements, accommodation, sum of chronic problems and baseline value of outcome.

*bFor the change in self-rated health there were 90 in the intervention group and 112 in the control group.

*cFor the change in perceived ability to manage own health there were 84 in the intervention group and 100 in the control group.
Both immediately post-intervention and 1 year later, multivariate analyses of co-variance to compare the overall mindset of the two groups, as measured by the eight scales together, controlling for age, gender, living arrangements, accommodation, and sum of chronic problems, indicated no significant difference between the overall mindset of the two groups.

**Hypothesis 2**

Table 4 presents the results of analyses of variance of change in hospital and home care service utilization in the year following the intervention, as compared with the year prior to the intervention. Both groups experienced decreased hospital stays, with the decrease being slightly greater for the intervention group. At the same time, in-home services increased for both groups, with the intervention group’s overall service utilization increasing slightly less than that of the control group. After adjustments were made to improve the equality of variance within each of the two groups, there were no significant differences between the intervention and control groups in the year following enrolment in the study. Logistic regression indicated that the 13% difference in hospitalization rates was not significant (Table 5).

### Table 3: ANOVA of measures of mindset—adjusted means and change at 1 year from baseline

<table>
<thead>
<tr>
<th>Outcome</th>
<th>Intervention (n = 73)</th>
<th>Adjusted*</th>
<th>Control (n = 89)</th>
<th>F statistic</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0 Change score (SE)</td>
<td>0 Change score (SE)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Life satisfaction</td>
<td>21.9 –1.58 (1.10)</td>
<td>22.7 0.18 (1.00)</td>
<td>F_1,154 = 1.35</td>
<td>0.246</td>
<td></td>
</tr>
<tr>
<td>Self-rated health</td>
<td>12.4 1.65 (0.67)</td>
<td>13.0 3.03 (0.60)</td>
<td>F_1,135 = 2.26</td>
<td>0.135</td>
<td></td>
</tr>
<tr>
<td>Self-esteem</td>
<td>25.8 –8.07 (1.13)</td>
<td>25.0 –5.90 (1.02)</td>
<td>F_1,135 = 0.164</td>
<td>0.64</td>
<td></td>
</tr>
<tr>
<td>Interpersonal dependency</td>
<td>111.6 –0.76 (2.25)</td>
<td>118.6 7.72 (2.04)</td>
<td>F_1,154 = 7.50</td>
<td>0.007</td>
<td></td>
</tr>
<tr>
<td>Self-care agency</td>
<td>101.9 –30.0 (3.24)</td>
<td>98.6 –19.9 (2.94)</td>
<td>F_1,135 = 5.16</td>
<td>0.025</td>
<td></td>
</tr>
<tr>
<td>Locus of authority</td>
<td>3.92 –5.76 (0.82)</td>
<td>3.72 –3.04 (0.74)</td>
<td>F_1,154 = 5.83</td>
<td>0.017</td>
<td></td>
</tr>
<tr>
<td>Desire for information</td>
<td>66.3 1.25 (1.25)</td>
<td>67.2 4.89 (1.13)</td>
<td>F_1,154 = 4.51</td>
<td>0.035</td>
<td></td>
</tr>
<tr>
<td>Perceived ability to manage own health</td>
<td>7.02 1.27 (0.39)</td>
<td>6.59 0.47 (0.37)</td>
<td>F_1,135 = 2.14</td>
<td>0.146</td>
<td></td>
</tr>
</tbody>
</table>

*aAdjusted for age, gender, living arrangements, accommodation, sum of chronic problems, and baseline value of outcome.

*bFor self-rated health there were 72 in the intervention group and 89 in the control group.

*cFor the change in perceived ability to manage health there were 67 in the intervention group and in the control group.

### Table 4: ANOVA of health resource utilization—adjusted means and change at 1 year from baseline

<table>
<thead>
<tr>
<th>Outcome</th>
<th>Intervention (n = 73)</th>
<th>Adjusted*</th>
<th>Control (n = 89)</th>
<th>F statistic</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0 Change score (SE)</td>
<td>0 Change score (SE)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No. times hospitalized</td>
<td>1.05 –1.36 (0.21)</td>
<td>0.94 –1.51 (0.20)</td>
<td>F_1,149 = 0.26</td>
<td>0.612</td>
<td></td>
</tr>
<tr>
<td>No. days in hospital in past year</td>
<td>10.0 –17.9 (4.81)</td>
<td>18.1 –9.7 (4.53)</td>
<td>F_1,148 = 1.50</td>
<td>0.415</td>
<td></td>
</tr>
<tr>
<td>No. visits to emergency</td>
<td>3.50 0.68 (0.98)</td>
<td>1.93 –0.94 (0.91)</td>
<td>F_1,148 = 1.43</td>
<td>0.515</td>
<td></td>
</tr>
<tr>
<td>Utilization–homemaking (h)</td>
<td>93.3 25.7 (11.91)</td>
<td>112.0 44.8 (10.73)</td>
<td>F_1,153 = 1.56</td>
<td>0.245</td>
<td></td>
</tr>
<tr>
<td>Utilization–professional services</td>
<td>38.3 20.2 (5.23)</td>
<td>34.4 16.5 (4.71)</td>
<td>F_1,153 = 0.28</td>
<td>0.599</td>
<td></td>
</tr>
</tbody>
</table>

*aAdjusted for age, gender, living arrangements, accommodation, sum of chronic problems, and baseline value of outcome.

*bANOVA based on log transformed data to improve equality of variances.

*cProfessional Service includes nurses, physical therapists, occupational therapists, speech pathologists, respiratory therapists (none actually observed), social workers, and nutritionists.
Hypothesis 3

Also presented in Table 5, logistic regression, controlling for baseline quality of life, age, gender, living arrangements, accommodation and sum of chronic problems, indicated a clinically significant impact of the intervention on quality of life ($p = 0.006$) at the end of the intervention period and a greater, although non-significant ($p = 0.129$), chance of enhanced quality of life in the intervention group as compared with the control group at the 1-year follow-up.

### DISCUSSION

The generalizability of the results of this study is limited by the high attrition of subjects who were older and had more chronic problems. Furthermore, high attrition reduced the statistical power for the 1-year follow-up, thereby decreasing the study’s ability to find statistically significant differences at this data point. As well, this study was the first attempt to test the critical reflection health promotion intervention specifically designed to address concerns of undermined health [or ‘the ability to realize aspirations, satisfy needs, and respond positively to the challenges of the environment’ (WHO, 1986)]. For all of these reasons, further investigation is needed to test fully the intervention’s efficacy.

Despite these limitations, however, several insights are afforded by the results of this study. The gestalt of the older persons’ mindsets overall did not change significantly more in the intervention group than in the control group; perhaps because some components changed positively whereas others changed negatively. Changes in the various components of the construct labelled ‘mindset’ are informative. The intervention group’s significant gains in independence and perceived ability to manage their own health at the end of the intervention period reflect an enhanced emotional self-reliance consistent with the aims of the intervention. While it had been hypothesized that ‘desire for information’ also would improve for those in the intervention, as one indicator of interest in their own care, the opposite occurred. The intervention may have afforded participants in this group an opportunity to meet their information needs, and/or motivated their self-directed mobilization of resources to meet this need, thereby leading to decreased desire for more information.

By the 1-year follow-up, both groups had experienced a significant decline in self-care agency and locus of authority. Beyond the limitations created by the reduced statistical power at this data point, this pattern may reflect participants’ response to the ageism still very much apparent in society, or alternatively, an age-related deterioration of study participants with the passage of time. The significantly greater decline of the intervention group on these outcome measures is difficult to explain, but may be attributable to their having higher, more difficult to sustain scores than the control group.

While desire for information had increased

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**Table 5: Impact of the intervention on hospitalization and quality of life (low vs high) outcomes at 1 year**

<table>
<thead>
<tr>
<th></th>
<th>Unadjusted</th>
<th></th>
<th>Adjusted*</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Percentage of respondents</td>
<td>Odds ratio (95% confidence interval)</td>
<td>$p$-value</td>
<td>Odds ratio (95% confidence interval)</td>
</tr>
<tr>
<td></td>
<td>Intervention</td>
<td>Control</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hospitalization at 1 year</td>
<td>43.7%</td>
<td>56.3%</td>
<td>1.289 (0.686, 2.425)</td>
<td>0.430</td>
</tr>
<tr>
<td>High quality of life at 22 weeks</td>
<td>90.1%</td>
<td>70.5%</td>
<td>3.806 (1.712, 8.463)</td>
<td>0.001</td>
</tr>
<tr>
<td>High quality of life at 1 year</td>
<td>86.3%</td>
<td>70.8%</td>
<td>2.600 (1.158, 5.836)</td>
<td>0.021</td>
</tr>
</tbody>
</table>

*Adjusted for age, gender, living arrangements, sum of chronic problems and, for quality of life, the baseline value.
in both groups, once again, as at 22 weeks, those in the intervention persisted in expressing significantly less desire, perhaps indicating persistently less need for more information at 1 year. Importantly, the intervention group continued to be significantly more independent. In all, the measures of mindset elicited somewhat inconsistent results, perhaps shaped by several factors. The intervention group’s tendency to have higher, more difficult to sustain scores at baseline inevitably created more of a challenge for them to sustain scores or to show improvement. Furthermore, critical reflection on one’s life and health, when one is chronically ill and aged, may have also heightened awareness of the negative attributes of life and health. This may have resulted in limited positive gains on measures of self-rated health, life satisfaction and self-esteem. Indeed, as measures selected left subjects to use their own definitions of health, scores may not have measured the elements of health conceptualized to be part of the construct ‘mindset’. In hindsight, the expectation that changes in mindset would also be conveyed through changes in behaviours such as self-care agency and exercise of decision-making authority may have been overly ambitious. Others (Segall and Goldstein, 1989) have sought to explain the variance in self-care behaviours based on age, gender, education, religion, health status, medical knowledge, scepticism in doctors, preventive control beliefs and health maintenance beliefs, and have only been able to explain 10–14% of the variance. In a recent review of relevant research, Kemper et al. (1993) concluded that the practice of self-care has not been explained by demographic, attitudinal, or health status characteristics. Nevertheless, in terms of clinical outcomes, somewhat positive gains in health, as currently defined, did occur. While the intervention and control groups did not differ significantly in health services resource utilization, the clinical patterns of actual resources consumed merit consideration. Chronically ill older people in the study intervention received on average 10.6 h of critical reflection (costed at $34/h) in approximately ten 1 h long visits. Even after adjustments to control for potentially confounding variables, baseline differences and imbalances in group variance, these individuals used, on average, 19.1 fewer hours of homemaking services (costed at $16/h), 3.7 more professional visits (average cost = $35/h), and 8.2 fewer days in hospital over the 1-year follow-up period. (The per diem costs of hospitalization obviously vary, but average costs per diem for all age groups and diagnoses ranged from $450/day to $650/day in participating institutions at the time of this study.) This trend, consistent with the findings of Hall et al. (1989) meant that the cost of the intervention was offset by the overall savings in the usual health services resource utilization, making the intervention highly feasible in light of its clinical benefits.

The major clinical benefit of the intervention is clearly apparent in measures of quality of life. The chance of having a high quality of life (defined and measured globally to include activity level, activities of daily living, feelings of healthiness, quality of social support and psychological outlook) was significantly greater for the intervention group immediately following their experience, and this chance was non-significant but still higher at the 1-year follow-up. An intervention which enhances quality of life while not increasing overall costs of health care deserves further attention. Recent research has identified several behavioural and psychosocial attributes related to ‘quality of life’ to be predictors of successful aging (Strawbridge et al., 1996). These attributes also have been found to significantly lower risk of death in old age, independent of physical health status, health practices, social network participation, and other covariables (Carswell, 1996).

The findings of this study also suggest that different or new scales and measurement approaches may be needed to determine fully the outcomes of health promotion through critical reflection. If health is defined as a process of becoming (Parse, 1981; Eriksson, 1992), of heightening conscious awareness (Newman, 1986), or of ‘realizing aspirations, satisfying needs, and responding positively to the environment’ (WHO, 1986), then perhaps the traditional outcome measures of mental health, including scales measuring morale, life satisfaction, and self-esteem are not appropriately applied to determine the more process-oriented notion of health. The search for knowledge and theory development in the field of health promotion may also be undermined by use of measures of health which look at biopsychosocial status. Furthermore, raising critical consciousness to confront the realities of living with chronic illness may have an ascending and descending spiral of learning from both positive and negative experiences (Freire,
rendering measurement at singular data points uninformative.

As well, measures of behaviours which portray the process of health as an empowered pursuit of resources for everyday living need to be carefully selected to capture the process, rather than merely the individual’s motivation to pursue the process as measured at one point in time (for example, as is measured by ‘desire for information’ or ‘locus of authority’). In fact, the relationship of empowerment to health also must be considered. How empowerment is conceptualized in practice, its measurement and its application to health promotion practice is still unclear (Israel et al., 1994). Definitions often encompass empowerment as a process and as an outcome simultaneously. Empowerment as an outcome is captured by ‘the ability of people to gain understanding and control over personal, social, economic, and political forces in order to take action to improve their life situations’ (Swift and Levin, 1987; Zimmerman and Rappaport, 1988; Israel et al., 1994, p. 152) and by the development of self-value, self-acceptance, self-knowledge, and ability to take action (Shields, 1995). Empowerment as an outcome has been likened to the constructs of self-efficacy (Bandura, 1982), self-esteem (Rosenberg, 1965), a sense of mastery and control, and participation to influence institutions and decisions (Zimmerman, 1990). Yet the on-going processes of developing a positive self-concept and personal competence (Israel et al., 1994, p. 152) and of cultivating both individual and collective resources and skills for social action (Kieffer, 1984) are also recognized to be a part of empowerment. The challenge of measuring empowerment thus is greater than identifying the right concepts to measure, and the right instruments to measure those concepts. Capturing the dynamic, constantly changing, and evolving process of empowerment requires in-depth consideration of the timing, frequency, and duration of measurement, as well as the nature of the measurement.

Israel et al. (1994, p. 153) also emphasize the importance of considering the impact of the individual’s larger life context upon the individual’s influence and control and concomitant improvement in health and the quality of life. Considering the impact of life context necessitates further consideration of whether the outcome of empowerment refers to perceived feelings of power and control, or to the actual reality of the reallocation of power and resources through structural change. When the individual’s own definition of health and enactment of health promotion encompass a more traditional medical perspective, capturing empowerment as a component of health is particularly challenging.

Clearly, these multiple conceptual challenges of measurement of health and health promotion are far from simplistic, and the instruments selected for this study are each conceptually congruent with the endeavour in some way. Nevertheless, the merits of developing new instruments and of concomitantly continuing to gather in-depth qualitative data of the process of health and health promotion have been underscored by this investigation.

CONCLUSIONS

This study has initially identified the clinical potential of critical reflection as a health promotion approach. Further research is needed to determine the efficacy of the health promotion intervention tested in this study with groups other than the frail elderly. Those with chronic illness in all age groups, those with newly acquired physical disabilities, and those with newly diagnosed or recurring cancer might all benefit from this approach to health promotion. Indeed, anyone who experiences frustration in realizing personal aspirations, satisfying needs, and responding positively to the environment might benefit from this critical reflection approach to health promotion. Study of the cost-effectiveness of the approach as an integrated part of health care must also be undertaken. Any future research in these areas also needs to employ or develop and test new instruments which measure new definitions of health and health promotion, and the processes and outcomes of empowerment.

Until further research more fully substantiates the intervention’s effectiveness, health professionals can proceed to refine person-centred, health-oriented, participatory approaches to care with the knowledge that these directions will do no harm, and indeed, may promote health, improve independence and enhance quality of life at no extra cost to the current medically oriented system of ‘health’ care. Health care delivery strategies which include care focused on health, as opposed to illness, are clearly warranted, as
are efforts to convey more consciously professional attitudes which recognize shared authority on care.

As well, educational programs for all health professions need to expand their theoretical course offerings on health and health promotion, and foster both evidence-based practice and continuous quality improvement through client outcomes research related to health promotion. Skills development efforts need to encompass the valuing of process-related practice approaches not premised on the medical model of care. Full illumination of these practice approaches in the qualitative study that comprised part of this research (McWilliam et al., 1996, 1997) provides concrete assistance in this regard.

Additional health policy work is also needed to advance the theory and practice of health promotion. The ethical and legal dimensions of risk management policy in particular need serious consideration in any health care reform encompassing the evolution of the participatory, emancipatory approach essential to care which is genuinely health oriented. Perhaps most importantly, policy makers, professionals, and the public alike may benefit from an effort to enhance the general understanding of health promotion as an antecedent, supplement, and indeed, sometimes alternative to our current medical model of ‘health’ care.

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