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Frail Elderly Homecare Clients: The Costs and Effects of Adding Nursing Health Promotion and Preventive Care to Personal Support Services

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Table of Contents

Key Implications for Decision Makers i

Executive Summary ii

Context 1

Research Questions...*3*

Implications..4

Implications for Policy...*4*

Implications for Service Delivery and Clinical Practice.................*8*

Approach 10

Study Design, Setting, and Data Collection Methods....................*10*

Study Population..*11*

Study Groups..*11*

Analysis..*12*

Response Rate..*12*

Dose of the Study Intervention..*13*

Results 13

Elderly Homecare Clients...*13*

Informal Caregivers of Elderly Homecare Clients...........................*16*

Research Dissemination...*17*

Further Research 18

Endnotes...20

References..22

Key Implications for Decision Makers

This is the first Canadian randomized trial with a full economic evaluation that gives evidence for the effectiveness and efficiency of having a nurse provide health promotion and preventive care to a general population of elderly homecare clients and their caregivers. It assessed the effects and expense of adding nursing health promotion and preventive care to usual homecare services in a national system of health and social insurance.

- This study provides scientific support for re-investment of professional nursing services in health promotion and preventive care for chronic and vulnerable elderly homecare populations.
- Providing seniors with nursing health promotion, compared to providing professional services on a reactive and on-demand basis, results in better overall mental health functioning, a reduction in depressive symptoms, and an enhanced level of perceived social support without increasing the overall costs of healthcare.
- Health promotion by nurses results in a clinically important improvement in caregivers' level of social functioning (23.7 percent) versus 5.9 percent in the usual care group, and a reduction in depressive symptoms (1.5 percent) versus a 7.7 percent increase in the usual care group.
- The maintenance and promotion of mental health in seniors should be identified explicitly as a role for homecare. Homecare programs should have sufficient resources to overcome barriers to service access and provide effective care and support for clients with mental health issues, even if those clients do not have physical limitations.
- Organizations should provide a variety of professional development opportunities to support nurses in effectively developing strategies for promoting health, including assessing mental health status in seniors within the homecare sector.
- Organizational models of care delivery should allow for a flexible, client-centred approach and support nurses' ability to develop continuous, uninterrupted, and meaningful relationships with elderly homecare clients and their caregivers. Nursing organizations should provide ongoing opportunities for discussion, education, and reflection to reinforce the importance of best practices.
- Support for elderly caregivers of clients with chronic health problems should be seen as an essential component of a publicly funded homecare program. A national public homecare program should provide a continuum of services, including health promotion and prevention and curative, rehabilitative, and palliative services.

Executive Summary

This randomized controlled trial in a homecare program in southern Ontario, Canada was designed to assess the effects and expense of adding nursing health promotion and preventive care to usual homecare services in a national system of health and social insurance. The findings of this study have implications for elderly homecare clients and their caregivers and for decision makers who determine how to allocate scarce homecare resources.

The study sample was comprised of elderly persons and their informal caregivers [5] referred to the community care access centre of Halton from an acute-care hospital, the community, and other institutional settings. Clients were eligible to participate in the study if they met the following criteria: (1) were 75 years of age and older; (2) were newly referred to and eligible for personal support services [6] through the community care access centre of Halton; (3) communicated in English (client and/or caregiver); and (4) expected to receive treatment and/or reside in the Halton region for the six months of the study. It was not necessary for a subject to have a family caregiver to participate in the study. Clients were considered ineligible for the study if they were newly referred to the community care access centre for nursing services.

Of 288 eligible and consenting subjects who were randomly allocated to receive the nursing intervention or not, 242 (or 84 percent) completed the study. The subjects who completed the study were similar to those who did not, with the exception of gender: more completers were female. The study sample consisted of 242 seniors (75 years and older) eligible for personal support services through the homecare program. A nurse

telephoned or visited 84.7 percent of those frail elderly participants who were randomly allocated to the nursing group at baseline. Subjects randomized to the nursing group received an average of 3.94 home visits and 1.81 telephone contacts over the six-month follow-up.

At six months, results showed that having nurses provide seniors with health promotion, compared to providing professional services on a reactive and on-demand basis, results in better overall mental health functioning, a reduction in depressive symptoms, and an enhanced level of perceived social support at no additional expense from a societal perspective. This is the first randomized controlled trial in a Canadian homecare setting that used a comprehensive cost assessment. It demonstrates that nursing health promotion, provided to a general population of frail seniors, 25.6 percent of whom are depressed and 93.4 percent of whom are functionally limited, enhances quality of life while not increasing the overall costs of healthcare, thus making the intervention highly feasible. The results provide scientific support for re-investment of professional nursing services in health promotion and preventive care for chronic and vulnerable elderly homecare populations.

Of 288 eligible and consenting subjects randomly allocated at baseline to receive the nursing intervention or not, 171 (or 59.3 percent) had an available and consenting caregiver. Of 171 caregivers, 116 (or 67.8 percent) were retained in the six-month follow-up period. Caregivers who completed the study were similar to those who were lost to follow-up, with the exception of use of prescription medications; caregivers who completed the study reported taking a higher mean number of prescription medications

daily (4.22) compared to those lost to follow up (3.6). A nurse telephoned or visited 65.1 percent of the available caregivers (n=86) of those elderly participants who were randomly allocated to the nursing group at baseline. Caregivers of subjects randomized to the nursing group received an average of 1.47 home visits and 0.92 telephone contacts over the six-month follow-up.

At six months, results showed that providing caregivers with nursing health promotion results in a clinically important improvement in social functioning (23.7 percent) versus 5.9 percent in the usual care group, and a reduction in depressive symptoms (1.5 percent) versus a 7.7 percent increase in the usual care group, at no additional expense from a societal perspective. In this group of caregivers, 40.7 percent were 75 years and older, 16.7 percent were depressed, 35.3 percent were functionally limited related to their physical health, and 60.3 percent were limited in terms of social functioning. The study findings also suggest that many caregivers are elderly themselves, and so face significant issues related to later life themselves. Decision makers and the public need to recognize and support the role of caregivers of elderly homecare clients with chronic health needs.

The overall conclusion from this study is that proactive health promotion and preventive care from nurses results in measurable gains in quality of life for frail elderly homecare clients eligible for personal support services and their informal caregivers at no additional expense from a societal perspective. The most notable improvement at the six-month follow-up was in mental health.

Context

Budget constraints, technological advances, and a growing elderly population have led to major healthcare reforms across Canada. The result is fewer acute-care hospitals and increasing pressure on community-based services.[1] Over the past decade in Canada, hospital beds have been reduced by 30 percent, nursing home beds by 11 percent, and ambulatory care has increased.[2] In response to these changes, homecare spending in Canada has increased at a rate of about 20 percent a year over the last two decades,[3] and Canadians older than 65 years of age account for 64 percent of total homecare expenditures.[4] Predictions are homecare expenditures will jump almost 80 percent between 1999 and 2026.[5]

One of the key factors that accounts for this increase in homecare spending is the belief that the public sector can save money by redirecting care away from institutions and toward the community.[6, 7, 8, 9] Yet evidence for the cost effectiveness of homecare in the Canadian context is limited and inconclusive. One of the problems is that research tends not to distinguish between different functions of homecare: as a substitution for acute care, as a substitution for long-term care, and for maintenance and prevention. Most studies and literature reviews on the cost effectiveness of homecare are American, focus on homecare as a substitute for acute or long-term care, and found little evidence for the cost effectiveness of homecare.[10, 11, 12]

While homecare budgets across the country are increasing, the facts suggest that additional funds are not enough to meet the increasing demands of an aging population and the increased demand for post-acute care resulting from earlier discharge from hospitals.[6, 16] Despite the growth in homecare expenditures, homecare still accounts for only one out of every 20 dollars governments spend on health.[5] The result is increasing competition for publicly funded homecare services and a shift in away from maintenance and preventive functions to acute-care functions.[[1] 17, 18, 19] This shift is based on the belief that reductions in services (particularly professional services) for preventive and maintenance functions save the system money.

However, empirical evidence for this assumption is limited and inconclusive.[9, 13, 20] On the contrary, for elderly persons living with chronic conditions and physical and mental disabilities, these changes create service gaps and a fragmented system of healthcare delivery characterized by the provision of on-demand and isolated services, rather than a proactive system of care.[21, 22] Recent literature suggests that high users of healthcare resources are much more likely than other users to have multiple, chronic, and complex health problems.[23, 24, 25, 26] Hollander and Tessaro [27] reported that people with chronic needs who experienced reductions in homemaking and personal care services had higher death rates and were more likely to be admitted to an institution.

Noteworthy is that nursing is the service most frequently reported as being insufficiently provided by public homecare programs.[28] For example, Hollander[29] reported that approximately 90 percent of the funding for chronic homecare services (providing maintenance and preventive functions) for people with chronic needs was for home-support services, and 10 percent was for professional services. Whereas registered nurses can perform "basic care" when needed, unregulated care providers can only perform a narrow range of procedures and have limits to their independent judgment and ability.[30, 31] Delays or an error in responding to the client's changing healthcare needs increases both the potential for complications and the use of costly healthcare resources to address complications.[19] Published evidence concludes that the provision of on-demand care by a health professional is inadequate and that seniors who present later with problems require more costly resources such as hospitalization and premature institutionalization.[21, 32, 33, 34] Furthermore, this experience with the acute-care system often undermines chronically ill older persons' self-confidence and interest and ability to participate in their own care. The result is a vicious circle of reliance on institutional care.[35]

Studies show that for clients with multiple problems, it is more expensive in the same year to not provide these clients with proactive and comprehensive interventions.[21] Preventive homecare of elderly patients reduces hospital admissions and lengths of stay in hospital,[36, 37,38,39,40] improves functional status,[36,39,41,42] reduces mortality,[37,38,39,43] decreases admission to long-term institutional care,[36,37,40,41,44] decreases the level of

depression,[36] increases use of health and social services,[38,39,41,42,43,45] reduces cost,[36,38,40,41,42] and improves caregiver outcomes.[40]

Published evidence supports the effectiveness of home-based health promotion and preventive care, when compared with standard care, for older people. However, the findings of the various studies failed to show a consistent pattern in terms of whether the home visits could prevent or reduce functional decline, mortality, hospitalization, and nursing home admissions. This is likely related to the diversity of program components, populations assessed, types of outcomes measured, and contexts among the studies.[47, 48, 49] In addition, the majority of studies focus on preventive care, rather than the promotion of health. Studies are further limited by the lack of evidence for the effectiveness of a preventive intervention on emotional health outcomes such as depression, perceived social support, caregiver well-being, and a comprehensive cost assessment. A final limitation of the literature is related to the dearth of evidence for preventive homecare programs in a Canadian context and within the context of homecare services.

Research Questions

This project was designed to address the following research questions:

1. Does proactive nursing health promotion and preventive care, in addition to usual homecare services,[2] improve the outcomes for a frail elderly homecare population and their caregivers with respect to functional health status and quality of life?
2. What are the comparative expenditures for health and social service use at six months with nursing health promotion and preventive care versus usual homecare services for a frail elderly homecare population and their caregivers from a societal point of view?
3. Does nursing health promotion and preventive care in addition to usual homecare services improve the outcomes for a frail elderly homecare population with respect to mental status (presence of depression), coping, and perceived social support?

4. Does nursing health promotion and preventive care in addition to usual homecare services improve the outcomes for caregivers of frail elderly homecare clients with respect to mental status (presence of depression) and level of burden associated with caregiving?

Specific attention will be given to identifying the characteristics of elderly clients and caregivers that benefit most from health promotion and preventive care interventions. This information will help target resources to those for whom outcomes can be positively influenced. The results of this study will inform policy makers, administrators, and clinicians regarding resource allocation and service integration of homecare services across Canada.

Implications

Implications for Policy

Elderly Homecare Clients

Homecare services are undergoing a shift from maintenance and prevention to acute-care functions, on the assumption that reducing access to professional nursing services for preventive and maintenance functions saves the system money. For the first time, in the context of a national system of health and social insurance, this study demonstrates that this assumption is incorrect and untenable. In fact, nursing health promotion, provided to a general population of frail seniors, 25.6 percent of whom are depressed and 93.4 percent of whom are functionally limited, enhances quality of life (by enhancing mental health and reducing depression) while not increasing the overall costs of healthcare, thus making the intervention highly feasible. The results provide scientific support for re-investment of professional nursing services in health promotion and preventive care for chronic and vulnerable elderly homecare populations. Enhanced quality of life can be achieved with existing homecare resources by simply reorganizing services. The findings confirm the role that nurses assume in the management of chronic and complex health problems, including considerable economic benefit.

These policy implications are significant given the current emphasis on the acute-care function of homecare rather than on the maintenance and preventive functions of homecare. The Romanow commission[5] and the Kirby committee[50] made recommendations for post-acute and palliative homecare programs, but did not emphasize the role of homecare services for people with chronic conditions, physical and mental disabilities, and frail older adults. These reports and the first ministers' health accord have focused on the short-term, post-acute-care functions of homecare rather than on the maintenance and preventive functions of homecare. Yet recent literature suggests that high users of healthcare resources are much more likely than other users to have multiple, chronic, and complex health problems.[23, 24,25,26] Re-investment of professional nursing services in preventive functions for chronic and vulnerable elderly homecare populations must become a priority.

The findings from this study also highlight the complex interactions among different levels of care in the health system and the fact that making changes in one part of the healthcare system may affect other parts of the system.[27] The focus on short-term, acute-care homecare functions is designed to facilitate reductions in hospital stays at the expense of dealing with the ever-increasing demand for services.[29] This demand side is where preventive homecare functions can have a significant impact. The results of this study provide scientific support for a national homecare program that provides a continuum of services including health promotion and prevention, and curative, rehabilitative, and palliative services.[19]

Improvements in mental health outcomes for frail elderly homecare clients receiving proactive nurse health promotion and preventive care, at no additional expense, provides convincing evidence for prioritizing and reallocating professional nursing services toward mental health promotion for frail elderly homecare clients. Recent evidence indicates that the prevalence of depression among those receiving homecare is estimated to be between 26 and 44 percent — at least twice that among elderly people in general.[51, 52] Unrecognized, untreated, and under-treated mood disorders such as depression increase the risk of functional decline[53, 54] and the use of expensive healthcare resources.[53,54,55]

The presence of a co-morbid depression has been shown to increase expenditure on health and social services two- to threefold, largely related to use of expensive crisis resources.[56]

A recent report noted that homecare is well-positioned to contribute to seniors' mental health.[57] Yet, the maintenance and promotion of good mental health in seniors is not an explicit role for homecare in recent policy recommendations,[5, 50] nor is it a priority when allocating resources. Access to homecare primarily depends upon the presence of a physical illness or disability;[57] homecare programs should work with nursing and other mental health agencies to overcome barriers to access to services and provide effective care and support for clients with mental health issues, regardless of physical needs or disability.

There were no particular types of clients or caregivers who benefited more from nursing health promotion versus usual homecare services. This supports and extends the findings of Browne et al,[21] which concluded that regardless of age, chronic illness, circumstance, geographic setting, or specific interventions, early proactive and comprehensive care is both more effective and no more expensive in a system of national health insurance. The costs of the added intervention pay for themselves in the same year.

Informal Caregivers of Elderly Homecare Clients

The caregiver results have important implications for policy. Although the literature on caregiving burden has addressed the emotional and social problems associated with caregiving, small samples, a focus on particular diseases, and a lack of focus on elderly homecare recipients limit the applicability of the findings.[58, 59] There is a distinct lack of information on the emotional, social, and physical problems associated with informal caregivers of elderly homecare clients, yet they are the largest group of caregivers.[17]

It is critical that the prevalence of informal caregiving and its associated health problems be documented, because caregivers and not professionals are the main providers of care to older, community-dwelling persons with chronic illnesses.[60] Approximately 80 percent

of community-dwelling, functionally impaired elderly individuals receive assistance entirely from informal care providers.[61, 62, 63] Clinicians, practitioners, and policy makers acknowledge the sustained energy and commitment required by caregivers, and clearly sanction the need to support family caregivers in their role.[63, 64, 65] This is related to the recognition that without adequate supports in place to enable caregivers to fulfil their roles, the cost of formal healthcare will rise substantially,[19, 63,66,67] particularly related to institutionalization[68, 69] and potential secondary disability in the primary caregiver.[70]

This study provides insight into and a profile of informal caregivers of frail elderly persons eligible for homecare services, 40.7 percent of whom are 75 years and older, 16.7 percent of whom are depressed, 35.3 percent of whom have problems with daily functioning, and 60 percent of whom are limited in terms of social functioning. The study finding that a significant proportion of elderly homecare study participants are being cared for by individuals who are themselves elderly and facing significant issues related to later life offers further evidence of the importance of providing support for informal caregivers of persons with chronic needs. This is significant in that support for elderly caregivers of older persons eligible for homecare services has not been identified as an essential component of a publicly funded homecare program.[5]

A recent report on homecare human resources in Canada identified the lack of recognition of the role of informal caregivers by governments and the public as a key issue to be addressed within the homecare sector.[58] One of the implications of the shift away from preventive and maintenance functions to acute homecare functions is that more expectations are being placed on informal caregivers,[17] who "must bear the consequences of the current cost-shifting in the publicly funded system."[17(p.21)] This could lead to a negative cost spiral in which further support for caregivers is reduced, leading to greater demands on acute and long-term care services because caregivers are no longer able to cope at home. The desired result in terms of cost-effectiveness is unlikely to be achieved unless governments and the public begin to attend to the needs of informal caregivers of elderly homecare clients.

The finding that nurse health promotion results in measurable gains in caregivers' quality of life (attributable to improved social functioning and a reduction in depression), at no additional expense, provides convincing evidence for reinvestment of professional nursing services in proactive and early health promotion interventions that target both elderly homecare clients and their informal caregivers.

Implications for Service Delivery and Clinical Practice

This study shows the effects personal resources and environmental supports have on health outcomes and the use of healthcare resources. Pawson and Tiley[71] stated that realistic evaluations of multi-faceted community interventions require understanding of contextual factors and the mechanisms by which interventions work in addition to measuring outcomes. The process of bolstering personal resources (physical and mental health functioning) and environmental supports (level of perceived social support), both of which are considered determinants of health, resulted in significant improvements in health status to considerable economic effect (no additional expense).

A focus on health and health promotion rather than illness and disease prevention will require a fundamental change in values. "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."[73 (p.27)] The findings underscore the importance of education related to health, the determinants of health, and strategies for promoting health. "Skill development efforts need to encompass the valuing of process-related practice approaches not premised on the medical model of care."[73 (p.38)]
This study supports and extends the literature regarding models for best practice in providing proactive preventive services for elderly homecare clients. That is, in order to be effective, a preventive care and health promotion intervention must allow for a flexible, client-centred,[3] and interdisciplinary approach to care delivery, involve an initial and comprehensive assessment or screening combined with regular home visits,[49, 74, 75, 76] and provide referral to and co-ordination of community services.[47] Several studies suggest that health professionals must really come to know and connect with clients to obtain good results.[35] Organizational models of care delivery are needed that support

nurses' ability to develop continuous, uninterrupted, and meaningful relationships with clients. Finally, the positive impact of this collaborative nursing health promotion intervention underscores the need to maintain and expand mechanisms to promote collaborative care among primary healthcare providers (physicians, homecare case managers, and other community services) for clients with chronic needs.

The positive effect of the nursing health promotion intervention on mental health outcomes underscores the importance of adequate planning, resources, and organizational and administrative support for the role of the nurse in mental health promotion within the homecare sector. Screening of older adults' mental health status should be considered integral to nursing practice.[77] This study provides a model for best practice in relation to assessing mental health status in older adults that includes the following recommendations: (1) initial and ongoing education related to normal aging and mental health promotion (screening assessment and caregiving strategies for dementia and depression); (2) use of a standardized screening tool to objectively identify symptoms of depression and dementia and support clinical observations; (3) development of mechanisms for referral to specialized services (family physician, specialized geriatric mental health services, and/or other members of the interdisciplinary team) when a nurse determines the client is exhibiting depressive symptoms and/or features of dementia; and (4) opportunities for ongoing professional development and mentorship to educate, support, and reinforce best practice related to assessing older adults' mental health status.

This study also provides a model for best practice in the provision of proactive caregiver services that includes the following recommendations: (1) models of care that support the development of continuous, uninterrupted, and meaningful relationships with caregivers; (2) systematic assessments of caregiver's physical, emotional, and social needs in order to proactively identify and address risk factors for functional decline; (3) use of a standardized screening tool to support early identification and management of depression;

(4) individual counselling and education to assist caregivers in making decisions and solving problems related to their own health and their caregiving roles; and (5) education to assist caregivers in identifying appropriate community services and how to access them.

It is noteworthy that, although one in three caregivers reported that they themselves were frail, disabled, and/or needed help, only one in eight were using any kind of formal homecare service. The finding that there is not a good match between caregiver needs and use of services has been widely discussed in a growing literature on the use of community services by informal caregivers.[78, 79,80,81,82,83] Health promotion interventions for informal caregivers that include referral to formal community services need to proactively identify and address any barriers to service use in order to encourage appropriate use, discourage inappropriate use, and promote cost-effective care.[84, 85]

Approach

Study Design, Setting, and Data Collection Methods

A randomized controlled trial design was used to compare the costs and effects of a nursing health promotion and preventive care intervention on usual homecare within the community care access centre of Halton in southern Ontario, Canada.[4] Data were collected from participants at two points in time: prior to randomization and six months after randomization. The model of vulnerability[72] and the literature guided the selection of study variables and their measures. Interviewers used questionnaires to collect data on client variables (functional health status and quality of life, mental health, perceived social support, coping style, cost of health and social services used, socio-demographic information), and administrative records were used for access centre admission forms and monthly nursing visit reports. Data on caregiver variables were also acquired through questionnaires (functional health status and quality of life, mental health, caregiver burden, cost of health and social services used, socio-demographic information) and administrative records (monthly nursing visit report). Details regarding the constructs, variables, and measures used in the study are outlined in Appendix A. Primary data

collection took place over a period of three years and four months (February, 2000–December 31, 2003, see Appendix B).

Study Population

The study sample was made up of elderly persons and their informal caregivers[5] referred to the access centre of Halton from an acute-care hospital, the community, and other institutional settings. Clients were eligible for the study if they met the following criteria: (1) were 75 years of age and older; (2) were newly referred to and eligible for personal support services[6] through the centre; (3) communicated in English (client and/or caregiver); and (4) expected to receive treatment and/or reside in the Halton region for the six months of the study. The subject did not need to have a family caregiver to participate in the study. Clients were ineligible if they were newly referred to the access centre for nursing services.

Study Groups

Case management services through the access centre were part of both study groups. This service consisted of intake, eligibility assessments, and regular ongoing eligibility assessments by the case manager. Clients and caregivers receiving the nursing health promotion model of service delivery received standard care provided by the centre *plus* regular in-home or telephone contacts by a registered nurse over a period of six months. Using a client-centred approach to care,[3] the visit encompassed both health promotion and preventive care. The model of vulnerability[72] provided the conceptual approach to the development, implementation, and evaluation of the health promotion and preventive care intervention. Specifically, the intervention was designed to improve personal resources and/or enhance environmental supports — both of which are considered determinants of health — in order to change clients' level of vulnerability and thus the cost of health and social services used.[72] The study intervention focused on both the client and caregiver as the recipients of care. Consistent with a client-centred approach to care, the type, frequency, and duration of the nursing contacts were based on client and

caregiver needs and preferences. The main focus of the visit was on mutual identification of goals and the development of personal health skills, using a problem-solving approach, with referral to appropriate community services (see Appendix C for the conceptual model for the study intervention, the main components, and the flow).

Analysis

The six-month follow-up proceeded as follows. Participant elderly clients and their caregivers in the six-month follow-up were compared to those lost to follow-up on their general characteristics at baseline. Statements were made about how representative study clients and their caregivers are. The comparability of participant elderly clients and their caregivers in each of the two study groups was assessed on their baseline characteristics. Even though randomization was used as a means of ensuring comparable groups at the onset of the trial, dropout events after randomization may have rendered study groups non-equivalent on characteristics known to affect the outcome. The direction and impact of any differences or biases on the results are highlighted.

The dose of the study intervention is described. The hypothesis that proactive nursing health promotion and preventive care in addition to usual homecare services improves health outcomes at no additional expense from a societal perspective is tested in a two-group comparison on all clients and their caregivers allocated to groups. Repeated measures ANOVA was used to compare the change in mean scores between the two groups over the six-month follow-up period. Analysis of covariance (with pre-intervention scores as covariates) was also used to compare the groups at six months, in order to control for differences in pre-intervention functioning. The service-use data, summarized as dollar values, were skewed, and thus comparisons were also done using the non-parametric Kruskall-Wallis analysis of variance.

Response Rate

Of 288 eligible and consenting subjects, who were randomly allocated to receive the nursing intervention or not, 242 or 84 percent were retained in the analysis. The demographic and social profile of study completers (n=242) versus those lost to follow-

up (n=46) was similar with the exception of gender. A greater proportion of completers were female (76.9 percent) than those lost to follow-up (63 percent).

Of 288 subjects who were randomly allocated to receive the nursing intervention or not, 171 or 59.3 percent had an available and consenting caregiver. Of 171 caregivers, 116 or 67.8 percent were retained in the six-month follow-up period. The demographic and social profile of caregiver completers (n=116) versus those lost to follow-up (n=55) was similar, with the exception of use of prescription medications. Caregiver completers reported taking a higher mean number of prescription medications daily (4.22) compared to those lost to follow-up (3.60). The flow of the elderly homecare participants and their caregivers is illustrated in Appendix D.

Dose of the Study Intervention

A nurse engaged 84.7 percent of those frail elderly participants who were randomly allocated to the nursing group at baseline. Subjects randomized to the nursing group received an average of 3.94 home visits and 1.81 telephone contacts over the six-month follow-up. A nurse engaged 65.1 percent of the available caregivers (n=86) of those elderly participants who were randomly allocated to the nursing group at baseline. Caregivers of subjects randomized to the nursing group received an average of 1.47 home visits and 0.92 telephone contacts over the six-month follow-up.

Results

Elderly Homecare Clients

Social, Demographic, and Clinical Characteristics

The study participants were a fairly elderly group, predominantly female (76.9 percent), with a mean age of 83.8 years. Most were functionally limited, with 93.4 percent reporting that they were limited to some degree in performing activities of daily living. Most were fairly ill, with 63.6 percent reporting a hospital admission in the previous six months, 52.4 percent reporting more than one illness, 25.6 percent exhibiting depressive symptoms, and 86.4 percent taking four or more prescription medications daily. Most

subjects were widowed, separated, or single (65.7 percent), and almost half (48.3 percent) lived alone. More than half (51.7 percent) reported that they received help from their informal support network (see Table 1). The health of the study participants was particularly compromised in the areas of physical functioning, role functioning related to physical health, social functioning, and energy/vitality, compared to published norms (see Table 2).

Functional Health Status and Quality of Life

Both approaches to care resulted in immediate improvements in functional health status and quality of life at six months (see Table 3). However, the nursing intervention resulted in several clinically and statistically significant improvements in both physical and mental health functioning, compared to usual care. In terms of physical health, there was a clinically important 61.7 percent improvement in physical functioning in the nursing group versus a 34.7 percent improvement in the usual care group. In addition, the nursing intervention had a clinically important 106 percent improvement in physical role functioning versus an 83.2 percent improvement in the control group.

As expected, improvements in physical health in the nursing group resulted in several clinically and statistically significant improvements in mental health functioning. With the nursing intervention there was a clinically and statistically significant improvement in both emotional role functioning (13.7 percent) and mental health functioning (10.1 percent) versus a respective 0.5 percent and 1.3 percent drop in the usual care group. Improvements in mental health at the six-month follow-up were also captured by both a clinically and statistically significance improvement for the nursing group (20.4 percent) versus a 7.4 percent increase in the usual care group. This is the first study to provide strong evidence for the effectiveness of a proactive nursing health promotion and preventive care intervention on mental health outcomes.

Mental Health, Perceived Social Support, and Coping Style

As expected, with an improvement in physical and mental health functioning in both groups, there was a reduction in depression in both groups (see Table 4). Specifically,

there was a clinically and statistically significant percentage reduction in depressive symptoms in the nursing group (23.9 percent) versus an 8.8 percent reduction in the usual care group.

At six months, the level of perceived social support was relatively high in both groups (see Table 4). However, there was a small, statistically significant increase in the level of perceived social support in the nursing group (2.43 percent) compared to a small reduction in the usual care group (0.82 percent). Respondents in both groups used all types of coping styles to some extent in handling current stressors, but there was no difference in the two groups' coping styles (see Table 5).

The overall conclusion from these results is that proactive nursing health promotion and preventive care results in measurable gains in both mental and physical functioning for frail elderly homecare clients eligible for personal support services. Of note is that the major improvement at the six-month follow-up was concentrated in the mental dimension of health.

Cost of Services Used

Not only did the nursing intervention enhance quality of life, but these benefits were produced at no additional expense to society as a whole. Even when the cost of the nursing intervention was added to the total cost, there were no statistically significant differences between the two groups in total annual per person direct expenditures. While the nursing group used more family physicians, emergency rooms, psychiatrists, psychologists, occupational therapists, social workers, acute hospital days, nutritionists, homemakers, and meals on wheels, these costs were offset by significantly lower use of medications, physiotherapists, supplies, physician specialists, other healthcare providers, ambulances, and laboratory tests compared to the usual care group (see Table 6).

This is the first study to provide strong evidence for the effectiveness of a proactive nursing health promotion and preventive care intervention on the use and costs of a full range of health and social services from a societal perspective. Although other studies of

this type have suggested cost benefits, they have been limited to the costs of institutional care such as reduction in nursing home [36, 41, 42] and hospital admissions,[36, 38, 40] have not addressed the full range of services, and were not conducted in a Canadian system of national health insurance.

Informal Caregivers of Elderly Homecare Clients

This is the first randomized controlled trial in a Canadian homecare context to evaluate the effects and expense of a nursing health promotion intervention for both frail elderly clients and their informal caregivers.

Social, Demographic, and Clinical Characteristics

Approximately one out of three caregiver participants reported difficulty performing activities of daily living as a result of his/her physical health (33.6 percent) and emotional problems (30.4 percent). In addition, one out of three caregivers (38.8 percent) reported that his/her physical health or emotional problems moderately to extremely interfered with normal social activities, and one out of six (16.7 percent) exhibited depressive symptoms. Noteworthy is that 40.5 percent of the caregivers were 75 years of age and older. These findings suggest that elderly individuals are caring for a significant proportion of elderly homecare clients and facing issues related to later life themselves. Yet, only one out of eight (13 percent) of all caregivers reported using formal homecare services, and one-quarter (23 percent) indicated that they did not receive support from other informal sources such as family members. So there is probably a substantial subgroup of caregivers who are in need of formal homecare services but are not receiving them (see Table 7).

Functional Health Status, Quality of Life, and Caregiver Burden

Both approaches to care resulted in immediate improvements in functional health status and quality of life at six months. However, nursing health promotion resulted in greater improvements in social functioning (23.7 percent) compared to the usual care group (5.9 percent).This difference was not statistically significant. Notably, there was a 7.7 percent

increase in the number of caregivers who became depressed in the usual care group compared to a 1.5 percent decrease in the nursing group. Although this difference was not statistically significant, it suggests a favourable trend (see Table 8). Both approaches to care resulted in immediate reductions in the level of burden associated with caregiving. However, no significant differences were found between the two groups at the six-month follow-up (see Table 9).

Cost of Services Used

The main finding is that there was no statistically significant difference between the two groups in caregivers' total annual per person cost of services used. Even when the cost of the nursing intervention was added to the total cost, there were no significant differences found between the two groups at the six-month follow-up. Higher use of prescription medications, physiotherapy services, acute hospitalization, emergency room, social work, and nutritionists in the nursing group were offset by a lower use of family physicians, physician specialists, psychologists, homemakers, and other healthcare professionals (see Table 10).

Research Dissemination

The findings of the study will be shared not only among researchers, but also with healthcare practitioners, decision makers, and health services consumers:

- The results and the implications have been documented as a working paper series. It will be distributed to the Office of the Ministry of Health and Long-Term Care for the Halton region, staff and administrators of the other 42 community care access centres in Ontario, and other relevant decision makers (including the local district health council, the Ontario Association of Community Care Access Centres, and other local and provincial organizations). It is available for a minimal charge to other interested individuals and organizations upon request.
- Findings will be posted on the web sites of the Ontario Ministry of Health and Long-Term Care and the McMaster University System-Linked Research Unit.
- Two articles based on this study are being prepared by the investigators for submission to academic and professional journals.

- The findings were presented and abstracts submitted for local, national, and international conferences (see Appendix E for a list of conferences).
- An article describing the nursing health promotion intervention will be prepared and disseminated to local, provincial, and national audiences.
- An executive summary of the results will be distributed to local, provincial, and national organizations involved in community care of the elderly in order to maximize the potential impact of the research (see Appendix F for a list of organizations).

Further Research

Further analyses of the data from this project need to be done to address the following policy relevant research issues:

- comparing the cost of services for elderly homecare clients with and without mental health problems in an Ontario setting;
- preventive and maintenance functions of homecare as predictors of health outcomes, costs, institutionalization, and caregiver stress in a frail elderly population;[7] and
- the predictors of quality of life for caregivers of elderly homecare clients?

Additional research needs to be done which includes:

- a randomized controlled trial to evaluate the impact of a mental health promotion intervention among frail elderly homecare clients and their caregivers;
- identification of process by which the nursing health promotion improved quality-of-life and development of different or new scales and measurement approaches to determine fully the outcomes of health promotion;
- development and evaluation mechanisms for promoting collaborative care among primary healthcare providers (physicians, homecare case managers, and other community services) for clients with chronic need;

- documentation, implementation, and evaluation of this intervention in other contexts, (different regions and provinces) to establish the generalizability of the results; and
- identification and implementation of strategies to enhance recruitment and retention of low-functioning community dwelling elderly and their caregivers in community-based clinical trials.

Endnotes

[1] Homecare can be divided into three distinct functions:

- substitution for other more costly services such as hospitals and long-term care facilities;
- maintenance that allows clients to remain in the current environment; or
- prevention that invests in client services and monitoring at additional short-run but lower long-run costs.[14]

[2] Usual homecare services under the current delivery system consisted of:

- standard case management services, including intake eligibility assessments and regular ongoing eligibility assessments by an access centre case manager;
- personal support services through the centre; and
- other professional homecare services with the exception of nursing services.[86]

[3] Client-centred care is an approach in which "clients are viewed as whole persons […and which] involves advocacy, empowerment, and respecting client's autonomy, voice, self-determination, and participation in decision-making."[87]

[4] The access centre of Halton is the 10th largest centre in Ontario when measured by population served.[88] It provides publicly funded homecare using a contractual model of service delivery. Community boards that are accountable to the Ontario Ministry of Health and Long-Term Care manage the centres. Publicly funded case managers contract out professional and home support services to for-profit and not-for-profit agencies, which provide care to clients. Access centres also place clients in long-term care facilities and provide information and referral to other community services.[3]

[5] Family caregivers were recruited when (1) the elderly client was eligible for the study; and (2) the caregiver was an unpaid person (family member or friend) who is responsible for daily decision-making and provision of care to the client.[89, 90]

[6] Clients are eligible for personal support if they require assistance with personal care. Personal care may be provided by a caregiver that lives inside or outside of the home or a personal support worker contracted by the centre. Clients who live in rest/retirement homes are entitled to receive personal support services.[86] Effective August 2001, assistance with housekeeping was no longer provided. Service levels were capped at 60 hours for regular clients and 80 hours for palliatives. This change in policy was in response to funding restrictions for the 2001-02 fiscal year.[91]

[8] During the period of February 2001 to June 2003, 122 individuals 75 years of age and older, eligible for personal support services through the access centre of Halton and not receiving the study intervention will be followed up at six months to evaluate the impact of these policy changes that affected access to personal support services. Three

groups of clients will be compared based on their level of use of support services over the six-month study period: (a) the 27.9 percent of clients who received no hours; (b) the 36.9 percent who received less than one hour per week; and (c) the 35.2 percent who received more than one hour per week.

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