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Desktopped by Kate McDonnell

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Look

WHAT'S COMING TO THE

Canadian Journal of Nursing Research!

The Canadian Journal of Nursing Research is pleased to announce a new section entitled

Focus: Research and Issues

Starting with the 1994 Fall issue (vol. 26, no. 3), our section editors will take their turn as guest editor for articles featuring an important nursing topic. This section will lend added depth to the diverse subject matter that we currently enjoy in each issue.

Over the coming months you will notice other sections being introduced periodically:

DISCOURSE, for critical thoughts on substantive issues;
BRIEFS, for research reports and commentaries;
PLAUDITS AND GRIPES, for letters to the editor;
DESIGNER'S CORNER, for tools and techniques required to build knowledge;
HAPPENINGS, for reports on innovative research and clinical programs;
BOOK REVIEWS; and
PUBLICITY for announcements of new positions, career opportunities, conferences, and so on.

This broadened format provides a more comprehensive, up-to-date coverage of issues and concerns pertinent to the development of nursing. Your comments, reflections, news items, and manuscripts will make **The Canadian Journal of Nursing Research** a truly Canadian voice for nursing research. We invite submissions for any of these sections.

Du nouveau

À LA

Revue canadienne de recherche en sciences infirmières!

La rédaction de la **Revue canadienne de recherche en sciences infirmières** est heureuse de vous annoncer la création d'une nouvelle rubrique, intitulée :

Le Point : recherche et actualité

Dès le numéro d'automne 1994 (vol. 26, n° 3), nos chroniqueurs prendront alternativement la parole en tant que rédacteurs invités sur un sujet d'importance touchant les soins infirmiers. Cette nouvelle rubrique permettra d'approfondir, pour le plus grand plaisir des lecteurs, les nombreux sujets abordés dans chacun des numéros de la revue.

Au cours des mois à venir, d'autres rubriques viendront périodiquement étoffer la publication :

DISCOURS portera un regard critique sur des questions d'envergure;
EN BREF s'intéressera aux rapports de recherches et à leurs commentaires;
ÉLOGES ET REPROCHES recevra le courrier des lecteurs;
LE COIN DU CONCEPTEUR recueillera outils et techniques d'apprentissage;
L'ÉVÉNEMENT mettra en lumière les recherches et les programmes cliniques novateurs;
PUBLICATIONS, fera le compte rendu de livres récents; enfin,
PUBLICITÉ annoncera les nouvelles nominations, les possibilités de carrière, les conférences, etc.

Ce format élargi permettra une couverture plus exhaustive et plus à jour des questions et défis touchant le développement des sciences infirmières. Vos commentaires, réflexions, nouvelles et manuscrits donneront à la **Revue canadienne de recherche en sciences infirmières** un ton résolument canadien dans le concert des publications sur les sciences infirmières. Nous vous invitons à contribuer à l'une ou l'autre des rubriques.

Upcoming Focus Issues:

Coping and Adaptation

Guest Editor: Dr. Judith Ritchie
Submission Deadline: July 15, 1994
To appear: Fall 1994 (vol. 26, no. 3)

Women's Health

Guest Editor: Dr. Ellen Hodnett
Submission Deadline: September 15, 1994
To appear: Winter 1994 (vol. 26, no. 4)

Family Health

Guest Editor: Dr. Kathleen Rowat
Submission Deadline: December 15, 1994
To appear: Spring 1995 (vol. 27, no. 1)

Philosophy/Theory

Guest Editor: Dr. June Kikuchi
Submission Deadline: February 15, 1995
To appear: Summer 1995 (vol. 27, no. 2)

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Les femmes et leur santé

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rédactrice invitée: Dre June Kikuchi
date-butoir des soumissions: 15 février 1995
publication: été 1995 (vol. 27, no. 2)

CALLS FOR PAPERS

Coping

Fall 1994 (vol. 26, no. 3)

We invite submissions of empirical reports on individuals and families who are coping with acute and chronic illnesses; the social support processes involved in coping; and the outcomes of coping behaviours or nursing interventions that enable coping and adaptation.

Guest Editor: Dr. Judith Ritchie

Submission Deadline: July 15, 1994

Women's Health

Winter 1994 (vol. 26, no. 4)

We invite submissions of manuscripts in the field of health. Topics include but are not restricted to reproduction and gynecological health, breast cancer, abuse and assault, cultural variations, child care, aging, health promotion and illness prevention. While theoretical and literature review papers may be submitted, priority will be given to reports and research projects.

Guest Editor: Dr. Ellen Hodnett

Submission Deadline: September 15, 1994

Family Health

Spring 1995 (vol. 27, no. 1)

We invite submissions of manuscripts relating to family health including such topics as families across the life cycle, transitional phases within family life, and families dealing with acute or chronic illness in one of their members. Priority will be given to research reports. However review articles will also be considered.

Guest Editor: Dr. Kathleen Rowat

Submission Deadline: December 15, 1994

Philosophy/Theory

Summer 1995 (vol. 27, no. 2)

The aim of this call is to elicit manuscripts which have the potential to stimulate discussion of issues/problems that face the discipline of nursing in the areas of philosophical thought and theory development. Research/scholarly papers are invited that address critical issues/problems of a philosophical, conceptual, theoretical, or methodological nature related to the advancement of the discipline of nursing.

Guest Editor: Dr. June Kikuchi

Submission Deadline: February 15, 1995

Please send manuscripts to:
The Editor,
Canadian Journal of Nursing Research,
McGill University School of Nursing,
3506 University Ave., Montreal, Qc H3A 2A7

ARTICLES À PUBLIER

Le soutien

publication : automne 1994 (vol. 26, nº 3)

Nous vous invitons à soumettre des rapports empiriques touchant des personnes et des familles aux prises avec des affections chroniques aiguës; les processus sociaux de soutien; et les conséquences de comportements de soutien ou des interventions en soins infirmiers qui permettent le soutien et l'adaptation.

Rédactrice invitée : Dre Judith Ritchie

Date-butoir des soumissions: 15 juillet 1994

Les femmes et leur santé

publication : hiver 1994 (vol. 26, nº 4)

Nous vous invitons à soumettre des manuscrits portant sur le domaine de la santé. Sujets proposés (non limitatifs): techniques de reproduction et santé gynécologique, cancer du sein, abus et agressions, variantes culturelles, puériculture, vieillesse, promotion de la santé et prévention des maladies. Bien que les textes théoriques et les critiques de documents soient appréciés, la priorité sera donnée aux rapports et aux projets de recherche.

Rédactrice invitée : Dre Ellen Hodnett

Date-butoir des soumissions: 15 septembre 1994

La famille et la santé

publication : printemps 1995 (vol. 27, nº 1)

Vous êtes invité à nous soumettre des articles sur la santé familiale. Les sujets comprendront la famille dans les différents cycles de la vie, les phases de transition dans la vie de la famille et la famille aux prises avec la maladie aiguë ou chronique de l'un de ses membres. Les rapports de recherche auront la priorité. Cependant, les articles critiques seront également pris en considération.

Rédactrice invitée: Dre Kathleen Rowat

Date-butoir des soumissions: le 15 décembre 1994

Philosophie/Théorie

publication: été 1995 (vol. 27, nº 2)

Le but de cet appel est d'obtenir des articles pouvant provoquer la discussion sur des questions ou des difficultés que rencontrent les sciences infirmières dans les domaines de la pensée philosophique et de l'élaboration théorique. Vous êtes invité à écrire des articles de recherche érudits qui concernent les questions ou les difficultés importantes de nature philosophique, conceptuelle, théorique ou méthodologique et qui son liés au progrès des sciences infirmières.

Rédactrice invitée: Dre June Kikuchi

Date-butoir des soumissions: le 15 février 1995

Prière de faire parvenir les manuscrits à la :
Rédactrice en chef
Revue canadienne de recherche en sciences infirmières
École des sciences infirmières de l'Université McGill
3506, rue University, Montréal (Québec) H3A 2A7

SPRING EDITORIAL

Pitfalls of Partnerships: The Differential Status of Disciplines

The Winter Editorial (vol. 25, no. 4) described the new/old realities of granting. One of its cornerstones was that of partnership – partnerships between researchers from different disciplines; researchers and consumers; and researchers and granting agencies. Of the three forms of partnerships, the longest has been those entered into between disciplines.

Interdisciplinary research is not a new practice. Its popularity has waxed and waned depending on many factors – most notably, political and socio-economic realities. To be sure, there have been many reasons to support an interdisciplinary approach to research. Its virtues are well documented: most commonly cited is that interdisciplinary research leads to innovative and creative endeavours due to cross-fertilization of paradigms and methodologies that result in a deeper understanding of identified problems.

Notwithstanding these apparent benefits, not all interdisciplinary research results in productive inquiry. The reasons for this failure are many. However, of special importance to nurse researchers is an unspoken but very insidious phenomenon that often sabotages the collaborative research process and in so doing, undermines the contributions of each partner: Luszki (1958) refers to this as the "differential status of the disciplines".

"Differential status of the disciplines" relates to the power structure within a team and the unequal partnership among team members. "Differential status of the disciplines" derives from differences in social class, epistemological developments of disciplines, philosophical underpinnings, historical relationships among disciplines, and societal attributions of each discipline's worth. Until recently, nursing has occupied the low echelons in the hierarchical structure of disciplines. Arguably, an ill-defined knowledge base has contributed to this state of affairs. Thus, many nurses felt that "higher" education would correct this imbalance in the power structure. If only it were so.

Many highly educated nurses ascribe to the belief that membership on interdisciplinary research is synonymous with true professional collaboration. It signifies to themselves and to others that nursing has arrived as a full member of the research community. But in nursing's profound desire to be accepted as a full partner, there are some who still are willing to define collaboration

in traditional terms by assuming the roles of coordinator and general "do-gooder" on the team, slipping into familiar patterns of deferential interaction that validate the old order. This approach not only risks compromising the research goals and methodologies needed to develop knowledge for and by the discipline, but worse, it fails to take advantage of an opportunity to educate team members who have not been exposed to the new intellectual reality that is nursing today. We have a responsibility not only to further knowledge but to help others unlearn old expectations and stereotypes that serve to undermine rather than validate the unique potential contributions of all interdisciplinary members.

The ethos of interdisciplinary research is compatible with nursing's collaborative spirit. However, nursing has to proceed with caution. It must distinguish how it has operationalized collaboration in the past with how it must be conceptualized in the future. Without careful consideration of the role nursing plays in these partnerships, it runs the risk of thwarting its own possibilities for full participation in the research process and thus, also shortchanging the team. Therefore, nursing has to enter into partnerships that are mutually respectful and that distribute power equitably.

Laurie Gottlieb,
Editor

Mary Grossman,
Assistant Editor

Reference

Luszki, M. B. (1958). *Interdisciplinary team research.* New York: New York University Press.

ÉDITORIAL DU PRINTEMPS

Le piège des associations : Le statut différentiel des disciplines

Notre éditorial d'hiver (volume 25, N° 4) décrivait les anciennes et les nouvelles réalités du financement. L'une de ses pierres angulaires traitait des associations entre chercheurs de différentes disciplines, entre chercheurs et consommateurs, et entre chercheurs et organismes subventionnaires. De ces trois types d'associations, celles qui perdurèrent furent celles qui s'établirent entre les différentes disciplines.

La recherche interdisciplinaire n'est pas un phénomène récent. Sa popularité a fluctué selon diverses réalités, essentiellement politiques et socio-économiques. En vérité, il existe bien des raisons de soutenir l'approche interdisciplinaire dans la recherche. Ses vertus sont solidement étayées; celle qui est le plus souvent citée est que la recherche interdisciplinaire conduit à des tentatives innovatrices et créatives résultant du croisement des paradigmes et des méthodologies qui favorisent une meilleure compréhension des problèmes soulevés.

Malgré ces apparents avantages, toutes les recherches interdisciplinaires ne mènent pas à une information productive. Les raisons de cet échec sont nombreuses. Il existe un phénomène d'importance pour les chercheurs en sciences infirmières. C'est un phénomène inexprimé et très insidieux qui contrarie souvent le processus de recherche en collaboration et qui mine alors les contributions de chaque partenaire : Luszki (1958) qualifie ce phénomène de «statut différentiel des disciplines».

Le «statut différentiel des disciplines» se rapporte à la structure de pouvoir au sein d'une équipe et à l'association inégale entre les membres de l'équipe. Le «statut différentiel des disciplines» tient des différences de classe sociale, de l'évolution épistémologique des disciplines, des fondements philosophiques, des relations historiques entre les disciplines et des attributions sociétales de la valeur de chaque discipline. Jusqu'à ces derniers temps, les sciences infirmières étaient placées au bas de la structure hiérarchique des disciplines. On peut soutenir qu'une base de connaissances mal définie a participé à cet état de fait. Ainsi, de nombreuses infirmières pensaient que des études universitaires compenseraient ce déséquilibre dans la structure du pouvoir. Si seulement c'était vrai!

Beaucoup d'infirmières universitaires adhèrent à la croyance que le fait d'être membre d'une équipe de recherche interdisciplinaire équivaut à une véritable collaboration professionnelle. Pour elles et pour tout un chacun, cela signifie que les sciences infirmières sont parvenues à être membre à part entière de la communauté de la recherche. Néanmoins, au coeur du désir profond des sciences infirmières d'être acceptées comme partenaire à part entière, il y a encore des gens qui veulent définir la collaboration en termes de tradition, à savoir en assumant les rôles de coordinateur et d'âme charitable de l'équipe, se glissant dans les schémas familiers d'interaction déférente qui valident l'ordre ancien. Cette approche risque non seulement de compromettre les objectifs et les méthodologies de recherche nécessaires au développement des connaissances sur et par la discipline mais, bien pis, elle manque l'occasion de former des membres de l'équipe qui n'ont pas été exposés à la nouvelle réalité intellectuelle que sont les sciences infirmières d'aujourd'hui. Nous avons la responsabilité de non seulement approfondir les connaissances mais également d'aider autrui à désapprendre les espérances et les stéréotypes anciens qui servent à miner plutôt qu'à valider les contributions éventuelles uniques de tous les membres des différentes disciplines.

Le génie de la recherche interdisciplinaire est compatible avec l'esprit de collaboration des sciences infirmières. Pourtant, les sciences infirmières doivent agir avec prudence. Elles doivent faire la distinction entre la façon dont elles ont rendu la collaboration opérationnelle par le passé et la façon dont elles doivent la conceptualiser à l'avenir. Si elles ne prennent pas bien en considération le rôle qu'elles jouent dans ces associations, elles risquent d'aller à l'encontre de leurs propres capacités à participer entièrement au processus de recherche et donc, de ne pas donner le change à l'équipe. Ainsi, les sciences infirmières doivent entrer dans des associations qui se respectent mutuellement et qui partagent le pouvoir équitablement.

Laurie Gottlieb
Rédactrice en chef

Mary Grossman
Rédactrice adjointe

Référence

Luszki, M.B. (1958). *Interdisciplinary team research.* New York: New York University Press.

Predictors of Participation in a Peer-Led Exercise Program for Senior Women

Peggy MacLeod and Norma J. Stewart

Cette étude examine les variables sélectionnées en utilisant le modèle d'interaction des comportements de la santé du client (Cox, 1982), et leur poids dans la décision des personnes âgées à se joindre à un groupe d'exercice. L'échantillon (N = 75) a été obtenu à partir de deux immeubles semblables pour personnes âgées. L'âge des sujets allait de 65 à 88 ans (M = 75,91). Nous avons utilisé l'analyse de fonction discriminante pour tester le rapport entre les sept variables démographiques et de motivation et la décision de se joindre à un groupe d'exercice. D'après les hypothèses formulées, les éléments de prédiction importants pour toutes les femmes dans les deux immeubles étaient les suivants : le degré de compétence, le niveau de scolarité, le nombre de médicaments consommés, le bâtiment et l'âge. Deux variables, soit le revenu et la situation de famille, ne sont pas ressorties comme étant des éléments de prédiction. Le fait d'avoir une bonne compétence sur les questions de santé, niveau élevé de scolarité, une consommation peu élevée de médicaments, de vivre dans le bâtiment B et d'être moins âgées indiquait que les femmes avaient davantage de chances de se joindre à un groupe d'exercice. Dans leur interaction avec les personnes âgées, les infirmières animant les groupes d'exercice devraient être conscientes de l'impact possible de ces variables sur la décision de se joindre à ces groupes d'exercice.

This study explored variables selected using the Interaction Model of Client Health Behavior (Cox, 1982) and their relationship to exercise group participation in seniors. Seventy-five women were surveyed from from two similar senior apartment buildings. Subjects' ages ranged from 65 to 88 years (M = 75.91, SD = 6.12). Discriminant function analysis was used to test the relationship of seven demographic and motivational variables to choice of exercise group participation. As hypothesized, significant predictors for all the women in both buildings were: a measure of competence, education, number of medications, building, and age. Two variables, income and marital status, did not emerge as significant predictors. Women more likely to attend an exercise group had greater competence in health matters, higher education, a lower number of medications, were living in building B, and were lower in age. Nurses who facilitate exercise groups for seniors in the community should be aware of the impact these variables could have on attendance.

Exercise is recognized as a method of improving health status for seniors (Shephard, 1987), and health professionals often recommend that seniors increase their exercise level. Some communities have ongoing exercise programs, and exercise classes are now available in many senior apartment buildings, but not everyone chooses to attend. Nurses can encourage the establishment of an exercise class in a building and promote the benefits of exercise; however, many variables may impinge on the decision to follow this recommended activity.

Peggy MacLeod, RN, MN, is Assistant Professor; and Norma J. Stewart, RN, PhD, is Associate Professor in the College of Nursing at the University of Saskatchewan.

Literature Review

Much of the existing exercise research has focused on physiological or psychological changes during participation in an experimental exercise group. Substantial literature exists on the physical effects of exercise in older people. The cardiorespiratory benefits include an increase in maximum oxygen consumption (Adams & de Vries, 1973; Blumenthal et al., 1989; Dustman et al., 1984; Sidney & Shephard, 1978; Stevenson & Topp, 1990), improved efficiency of oxygen transport, lowering of systolic blood pressure (Amundsen, Devahl, & Ellingham (1989), and lowering diastolic blood pressure (Blumenthal et al., 1989; Emery & Gatz, 1990; McMurdo & Burnett 1992). Exercise in older adults was found to decrease total cholesterol levels (Blumenthal et. al., 1989; Morey et al., 1989), promote weight loss (Blumenthal et al., 1989; Morey et al., 1989; Sidney, Shephard & Harrison, 1977), and increase bone mineral content in women (Chow, Harrison, & Notarius, 1987; Rundgren, Aniansson, Ljungberg, Wetterqvist, 1984). Flexibility has been shown to improve after exercise, including shoulder-hip-knee (Bassett, McClamrock, & Schmelzer, 1982), hip (Morey et al., 1989), knee and spine flexibility (McMurdo & Burnett, 1992), as well as general flexibility and balance (Stacey, Kozma, & Stones, 1985).

Cognitive benefits that have been shown after an exercise program include improved reaction time and digit symbol performance (Dustman et al., 1984; Stacey et al., 1985). Logical memory test score and Mini-Mental State Examination improved after an exercise intervention study (Molloy, Beerschoten, Borrie, Crilly & Cape, 1988). Exercise was also shown to have a significant effect on short term memory function, attention-concentration, and cognitive function (Stevenson & Topp, 1990).

Other psychological effects that have been identified include improvements in mood, life satisfaction (Blumenthal et al., 1989; McMurdo & Burnett, 1992), self-concept (Perri & Templer, 1984-5), happiness, and decreased levels of trait anxiety (Stacey, et al., 1985). Stevenson and Topp (1990) reported that exercise group participants had less bedtime sleep latency and less trouble returning to sleep when awakened during the night. Exercise has been identified as having a positive effect on mood and has been used as a therapeutic treatment in depressed elderly individuals (Simons, McGowan, Epstein, Kupfer, & Robertson, 1985).

Personal and demographic factors can reduce the likelihood of participation in exercise. In general, activity decreases with age, which supports the disengagement theory of aging (Cumming & Henry, 1961), or activity may be limited by a chronic condition that restricts function. The older one gets the less likely one is to participate in exercise (McPhillips, Pellettera, Barrett-

Connor, Wingard, & Criqui, 1989). The link between socioeconomic status and education is well established: higher education is generally associated with higher income (Gunderson, 1989), and also with higher levels of physical activity (McPherson & Kozlik, 1987). The opportunity to socialize and be part of a group can promote participation; nonmarried seniors reported more involvement in physical activity than did married seniors (McPherson & Kozlik, 1987). The social support derived from a group positively affects health status (Minkler, & Langhauser, 1988; Schank & Lough, 1989). Women and men may exercise for different reasons. Certainly gender differences have been found in self-reported regular exercise (Firebaugh, 1989), and in self-perceived fitness level (McPherson & Kozlik, 1987). The examination of variables that relate to choice of exercise group activity could provide direction to facilitate participation and contribute to program design. The aim of the current study was to explore the relationship of selected variables to exercise group participation in senior apartment buildings with an established peer-led exercise group.

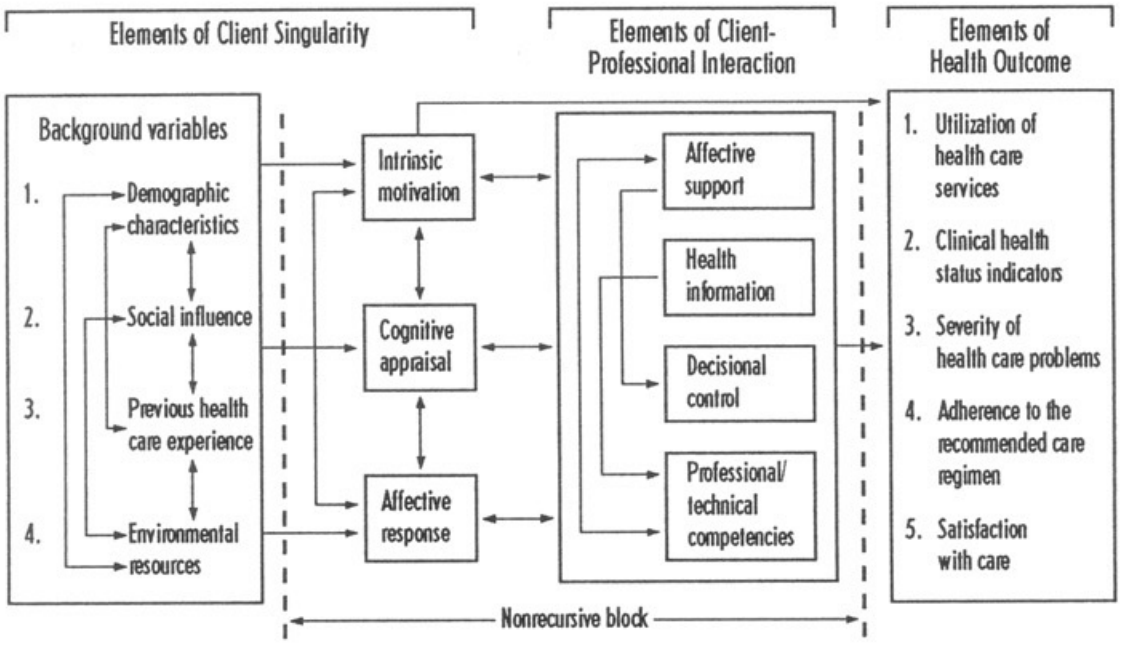
Conceptual Framework

Health behaviour is peculiar to the individual and therefore complex to study. Nurses purport to have influence on health behaviour and, thus, health outcome. The framework chosen for this study was the Interaction Model of Client Health Behaviour (Cox, 1982), which comprises aspects that are unique to each client, acknowledges interaction between nurse and client, and includes health outcome (Figure 1). This model has been used to examine acceptance or rejection of a recommended medical procedure (Cox, Sullivan & Roughmann, 1984), to study community-based seniors and their health, well-being, and self-care (Cox, 1986), to examine relationships of client singularity variables in a weight control program (Troumbley, & Lenz, 1992), and to study client-nurse interaction (Brown, 1992). According to Cox (1986) the model can be operationalized using one or more of the major elements. All factors within the elements may be operationalized or, depending on the study, one or more of the factors can be applied.

Within the model, intrinsic motivation is a key factor in determining behaviour. The theoretical underpinning of intrinsic motivation, as used by Cox (1982), is Deci's (1975) cognitive evaluation theory which comprises two motivational subsystems: intrinsic (depends on active choices) and extrinsic (individual exerts little decisional control). The intrinsic reward for behaviour is the feeling of competence and mastery as a direct result of a choice in conduct. Health promoting behaviour is dependent on choice so that an indication of the strength of the intrinsic motivation could be useful in the prediction of health actions. Motivation is viewed as situation-specific and not static so that intervention is possible in certain contexts.

Figure 1

Interaction model of client health behaviour



Reprinted from Cox C.L., An Interaction Model of Client Health Behavior, *Advances in Nursing Science,* Vol. 5:1, p. 47, with permission of Aspen Publishers Inc., ©1982.

Based on the Client Singularity element of the Cox model and the literature review, variables were selected for the present study as possible predictors of residents' choice for exercise participation in ongoing peer-led groups in two similar apartment buildings for seniors.

Hypotheses

The following hypotheses were tested:

1. Participation in an exercise group is associated with younger age, higher socioeconomic status, higher education level, living alone, higher intrinsic motivation (as measured by the competency subscale of the HSDI) and fewer medications.

2. There is no difference in participation in an exercise group between women who live in building A and those who live in building B.

Method

Hypotheses were tested in a multivariate design using interview data from seniors surveyed in two senior housing apartment dwellings in a city of approximately 180,000. Building A consisted of 147 units; 21 (14%) were subsidized and 70 (48%) were nonprofit rental units. A nurse was available for consultation once a week. Building B consisted of 108 units, 35 (32%) of

which were subsidized. Part-time staff in the building included an activity director and a nurse. Both complexes were less than five years old, had large meeting areas, and kitchen facilities for complete meals. There were numerous interest groups functioning in both facilities.

The Canadian Red Cross Society's Fun and Fitness program for seniors operated in both locations. The programs were led by building residents who had been trained by the Red Cross Society's Fun and Fitness teacher trainers. Low-intensity aerobic exercises were emphasized with concentration on stretching, flexibility, and general mobility (Myers & Hamilton, 1985).

Sample

Using systematic random sampling, 75 female subjects, aged 65 to 88 ($\underline{M}$ = 75.91, $\underline{SD}$ = 6.12), agreed to participate in the study. To increase the accessible sample, the occupants of two buildings that were similar in design and programming were included. Of the 75 subjects, 30 were participants in a peer-led Fun and Fitness group and 45 were not. Inclusion criteria were: age 65 or more in the year of the study, able to speak and read English, achieved a score of 24 or more on the Mini-Mental State (Teng & Chui, 1987) and attended the exercise class 20 times in 10 weeks. The males were excluded because one building did not include them in their exercise class. The proposal met the standards of a University Ethics Committee and the approval of the building managers.

Instrumentation

Cox (1985) developed the 17-item Health Self Determinism Index (HSDI) to measure intrinsic motivation toward health behaviour in the model (Figure 1). The HSDI addresses the multidimensional aspect of motivation with four subscales (self-determined health judgments, self-determined health behaviour, perceived competency in health matters, and internal-external cue responsiveness). Cox, Miller, and Mull (1987) found a four-factor solution, whereas Dukes (1990) reported factorial validity for the first three subscales only. Furthermore, Dukes found that only the competency subscale emerged as a significant discriminator of health in a survey of 331 well and ill subjects. The coefficient alpha for the total HSDI has been reported as between .78 and .87; and for the competency subscale, between .67 and .71.

For the current study, the three-item competency subscale of the HSDI was selected because it has both acceptable reliability and validity. A sample item is "I feel good about how I take care of my health," with responses on a 5-point Likert scale ranging from "strongly disagree" to "strongly agree".

Procedure

The interview took place in the subjects' apartments at the beginning of the study. Demographic information was collected on age, income, living by self or other, education level, total number of medications, and prescription and nonprescription drugs currently taken. The HSDI was administered. For analysis, income level was categorized from one (lowest) to six (highest) according to reported level. The four levels of education were: (1) partial completion of primary school; partial completion of secondary school; trade school; and university.

Analysis

The seven potential predictors of exercise group participation were examined using discriminant function analysis so that all seven could be tested with one multivariate analysis. Univariate descriptive statistics were performed on the data before conducting the multivariate statistical procedure (SPSS-X, 1988). Prior to analysis, dichotomous dummy variables were created for isolation and building. One missing value for education and the five missing values for income were replaced with the mean of that variable for the respective building (Tabachnick & Fidell, 1989). A search for multivariate outliers was done by computing Mahalanobis distance for each case and no cases were dropped. A tolerance test was performed so that redundant predictors were not entered in the discriminant function analysis. There was no violation of the assumption of homogeneity of group variance-covariance matrices (Box's $\underline{M} = 34.5$, NS).

Results

Discriminant function analysis was performed to distinguish between individuals who chose exercise group participation and those who did not based on the seven variables. One discriminant function was calculated X^2 (df=7) = 25.06, $\underline{p} < .01$. The canonical correlation was .55, indicating that the proportion of variance shared between the groups and predictors on this function is .30 (Tabachnick & Fidell, 1989). Seventy-three percent of the grouped cases were correctly classified using this function. The relative importance of the individual variables are reported by the standardized canonical discriminant function coefficients (Table 1). Any variable greater than .30 in the pooled within-groups correlations between discriminant variables and canonical discriminant functions is meaningful (Tabachnick & Fidell, 1989).

As hypothesized, exercise group participation was related to intrinsic motivation (competency subscale of the HSDI), education, medications, and age. The exercise group participants reported greater competency ($\underline{M} = 11.90$

Table 1

Predictors of participation of senior women in an exercise program: Standardized canonical discriminant function coefficients and correlations between variables and discriminant function (structure coefficients) and univariate F ratios

Predictor variables	Standardized Coefficients	Structure Coefficients	Univariate F (df 1, 73)
Competency	–0.45	–0.51	8.29*
Education	–0.41	–0.45	6.35*
Medications	0.57	0.45	6.20*
Building	–0.35	–0.43	6.10*
Age	0.31	0.39	4.94*
Living Alone	0.34	0.27	2.29
Income	0.16	–0.19	1.16

*$p<0.05$

vs. 10.84), a higher education level (M = 2.57 vs. 1.96), took fewer medications (M = 1.20 vs. 1.98), and were younger (M = 74.03 vs. 77.16). There was no support found for the predictions that income or living alone would be related to participation in an exercise group. Contrary to expectation, it was found that building was a significant predictor of participation; women in building B chose to take part in the exercise program more than women in building A.

Although the two buildings were selected for similarity, there were differences in the characteristics of the senior population in each building which had not been apparent at the onset of the study. The subjects in building A had a lower income (M = 2.23, SD .93) than did subjects in building B (M = 3.11, SD 1.13, $t(73) = 3.52$, $p < .01$); a lower level of education (M = 1.53, SD .57 versus M = 2.64, SD 1.09, $t(73) = 5.12$, $p < .01$); and attended fewer group activities (M = 2.60, SD 1.77 versus M = 4.96, SD 1.65, $t(73) = 5.88$, $p < .01$).

Discussion

Intrinsic Motivation

Competency was the best predictor of exercise group participation (structure coefficient of .51 in Table 1). This measure is a subscale of intrinsic motivation (the HSDI). Competency and self-determinism are integral to intrinsic motivation in Deci's theory of motivation (Deci, 1975). An examination of the items in the competency subscale shows that feeling positive about

one's ability, and taking responsibility for managing one's own health contribute to competence. It would seem plausible to suggest that exercise group participation was an indicator of accepting responsibility for one's health.

A recent study by Mobily et al. (1993) examined competence as one predictor of exercise and physical activity in an elderly sample. They found that those in the sample who participated in more physical activities with a cardiovascular or musculoskeletal potential benefit perceived themselves as more competent. A competent older person is more willing to consider engaging in a variety of activities.

Client Singularity

Elsewhere it has been reported that education is positively related to physical activity and exercise (Dishman, Sallis & Orenstein, 1985). Thus, in the current study since the women from building B had a higher education level than did those from building A, the difference in choice of exercise group participation may have been partially due to the between-building differences in educational level. None of the other significant predictors were related to differences between the buildings.

The exercise group took fewer medications than did the no-exercise group. If medications are taken *a priori* as an indication of poor health, this supports data from the Canada Fitness Survey (Canada Fitness Survey, 1983) which showed a positive correlation between health and activity. Increasing age as a predictor of declining exercise group participation is in keeping with the observation that activity declines with age (Harvey & Singleton, 1989; McPhillips, et al., 1989). Although exercise differs from activity in that it is planned and has some structure (Caspersen, Powell & Christenson, 1985), both involve choice and can be affected by health and age.

Isolation (living alone) and income were not significant predictors of exercise group participation. The income variable was chosen to examine whether or not those with subsidized housing were choosing their activities differently than those who had more income. Results indicated, however, that those who lived in subsidized housing attended the exercise group as often as those who did not live in subsidized housing.

Theoretical Issues

The Interaction Model of Client Health Behaviour was useful for guiding selection of variables and examining their relationship to exercise group participation. The model supports client control and includes antecedent conditions, human response, and interactions. However, the very complexity of the

model, which is justified given the factors that impinge on health behaviour, makes it more difficult to test. This study lends support for elements of the client singularity section of the model, but other studies will be necessary to test the complete model.

The Health Self Determinism Index was developed to fit the theory of the Interaction Model of Client Health Behaviour. The results of the current study suggest that intrinsic motivation may be a valuable concept for future study in this population.

Methodological Issues

The results of this study might not be applicable to all seniors because individuals who choose to live in a segregated building might not be representative of the total senior population. As well, differences between the leaders of the exercise groups in the two buildings could affect attendance, and differences between the people in the two buildings may have been reflected in the leaders because they were volunteers from within each building.

Of all the variables in the discriminant function analysis, the competence subscale of the HSDI provided the best separation of those who chose to attend the exercise group from those who did not. The subscale was small, and perhaps expansion of this portion of the scale should be considered.

Those who participate in an exercise program may also feel more able to manage their health matters because of the exercise program. A measure of competence before and after an exercise program could test this concept further (i.e., a pretest/posttest control group design).

Implications for Nursing Practice

The results of the current study suggest that there are a number of important background variables for nurses to consider when interacting with clients who make choices about exercise groups. Since increasing age was a significant predictor of decreasing participation in a peer-led exercise program, perhaps a distinct exercise group for those over 75 could be established to accommodate their physical limitations. Choosing an exercise group option would be in keeping with self-determining action, and theoretically linked to intrinsic motivation.

Medications, which could be an indicator of health limitations, were also a significant predictor of exercise group participation; the more medications a subject took, the less likely they were to participate. In an independently-living population, there are very few health conditions that prevent participa-

tion in all forms of exercise. Therefore, medications and health status should be carefully reviewed by the nurse to help the client choose the appropriate exercise options.

Culture and education are two confounding variables that could have contributed to the observed difference between residents of building A and building B in exercise group participation. Most of the subjects in one building were from a Mennonite background and had either immigrated to Canada with some education or attended German schools in Canada. Consequently, many had not had the opportunity to be educated in English or to attend school long enough to attain a high school level. Health behaviour is based on a synthesis of all the contributors, including culture, to the singularity of the client. Therefore, program planners working with people from either diverse backgrounds or a dominant other culture must acknowledge the influence this variable might have on willingness to participate in programs.

Nursing actions which support self-determining behaviour and feelings of competency encourage active choice. It has been shown that clients who feel good about how they are managing their health and take unilateral action to decide on a health behaviour are more likely to join an exercise group. Nurses can therefore help other clients to adopt this outlook.

Hawkes and Holm (1993) found that male gender, social influences to exercise, and health self-determinism were were significant predictors of leisure time physical activity. The sample they used had a wider age span than did the sample in the current study; this could account for the observed differences in predictors of physical activity.

Information from the Canada Health Promotion Survey showed that more than one in three adults over 65 believed that additional exercise would not improve their health (Health and Welfare Canada, 1989). In the current study women with more education were more willing to participate in an exercise group. Nurses may have to, therefore, educate clients as to the benefits of physical activity.

Activity and exercise can have a beneficial effect at any age. Exercise as a form of treatment is recommended to seniors for such reasons as cardiovascular function, nutritional status, functional status, or to aid sleep. Involvement in exercise groups also provides opportunity for social interaction. It is important to recognize the special needs of women, different age groups, and cultural variations (O'Brien & Vertinsky, 1991). The accessibility of an exercise group is an important first step in encouraging exercise, but other variables that improve attendance are important for nurse-client interactions and for program planning.

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Correlates of Well-Being Among Caregivers of Cognitively Impaired Relatives

Carolyn Milne, Cathryn Sacco, Gertrude Cetinski, Gina Browne, and Jacqueline Roberts

Les caractéristiques et l'utilisation des services de relève de soixante-quatre soignants s'occupant de clients qui ont de graves troubles d'apprentissage ont été mises en corrélation avec le pointage des objectifs de vie et celui des conséquences de ce fardeau pour les soignants. Le bien-être des soignants était identique pour les utilisateurs de divers services de relève. Les corrélats du bien-être des soignants, malgré leur fardeau, étaient la vigueur et la perception positive qu'ils avaient ou non de la maladie. L'objectif de vie du soignant a été modifié par sa perception de la reconnaissance sociale de son activité, mais l'influence des deux variables cognitives était prépondérante.

The characteristics and use of respite services of 64 caregivers of severely cognitively impaired clients were correlated with the caregivers' purposes-in-life and burden outcome scores. Caregiver well-being was similar across users of a variety of respite service packages. Correlates of caregiver well-being, in spite of their burdens, were caregiver hardiness and favourable meaning given illness. Both of these cognitive variables exceeded the importance of perceived social support in explaining the variation in caregiver purpose-in-life.

The prevalence of cognitive impairment among seniors living in the community ranges between 4.2% and 6.7% (Cetinski, 1991; Chambers, 1991; Ellis, 1991; Jorm, Korten, & Henderson, 1987). These figures increase with age, and in every country the rate of growth in cognitive impairment outstrips the growth of the population (Jorm, 1990). Family members are now important caregivers for impaired older adults. Family caregiving is often stressful and the level of well-being among caregivers is not well documented (Biegel, Sales, & Schultz, 1991). There is a need to identify high-risk caregivers who could benefit from interventions designed to increase their well-being, and to evaluate the interventions themselves.

Thus, the objective of this study was to describe the characteristics of individuals who care for cognitively impaired relatives in their homes, and to determine variables associated with their well-being, including their choice of

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a range of community services. More specifically, the current study addressed two questions: firstly, among the caregiving relatives of cognitively impaired adults, what characteristics distinguish those who make use of the Seniors' Day Program from those who use other services? Secondly, what variables correlate with the variability in caregivers' purpose-in-life inspite of their relatives' severe cognitive impairment?

Literature Review

Chronically ill and disabled elders are cared for primarily by their families (Chambers, 1991), with some members finding caregiving to be burdensome and stressful and others deriving a sense of satisfaction. Previous studies on the correlates of caregiver burden and depression have multiple methodologies, small and non-representative sample sizes (e.g., Biegel et al., 1991 used samples from hospitals), and single outcome measures of, usually, negative mood states. Most examined only the negative features of caring – its burden, distress, and associated depression (Mohide et al., 1990; Neundorfer, 1991), and failed to acknowledge the existence of divergent and competing views about this stressful situation. Without an adequate knowledge of both the correlates of burden and well-being, and a full understanding of the different contexts of additional services used by caregivers, neither the nature nor the level of service strategies can be designed or targeted (Montgomery, Gonyea, & Hooyman, 1985). Studies are needed to assess the burden as well as the well-being of carers.

Nevertheless, some generalizations can be made from these studies. The relative's level of disability, severity of dementia (in husbands), and duration and characteristics of the illness are not related to caregiver depression or burden (Boss, Caron, Horbal, & Mortimer, 1990; Gwyther & George, 1986; Zarit, Reeves, & Bach-Peterson, 1980; Zarit, Todd, & Zarit, 1986) with one exception. Fitting, Robins, Lucas, and Eastham, (1986) identified some gender differences in caregiver tolerance, with women reporting more depressive symptoms than men. This gender difference was not supported by findings from other longitudinal studies (Zarit et al., 1986). Further, the amount of day care received and number of other services used appeared to have only a small impact on caregiver distress (Lawton, Brody, & Saperstein, 1989; Wells, Jorm, Jordan, & LeFroy, 1990). This finding was attributed to the small amount of relief in light of the degree of stress, and the possibility that caregivers wait too long before obtaining help (Wells et al., 1990).

The ability of caregivers to tolerate problem behaviours is quite variable and can change from day to day. Caregiver tolerance is related to the favourable meaning or positive attributions given the problem behaviours (Boss et al., 1990), and increases with time (Zarit et al., 1986). It appears that

the caregivers' perception of the situation (Boss et al., 1990; Hayley, Levine, Brown, Bartolucci, 1987; Zarit et al., 1980), that is, its negative meaning and appraised stressfulness, is attenuated by caregivers' perceived social support (Boss et al., 1990; Gilleard, 1985; Gilleard, Gilleard, & Whittick, 1984; Hayley et al., 1987; Montgomery et al., 1985; Wells et al., 1990; Zarit et al., 1986). This appraised stressfulness and supportiveness coupled with the caregivers' sense of freedom (Montgomery et al., 1985), mastery (Boss et al., 1990), control (Hayley et al., 1987), and other forms of meaning given illness (Browne et al., 1988) are more fruitful avenues of research (Hayley et al., 1987) in explaining caregiver well-being (purpose-in-life) in the face of distress and/or burden.

A community sample of referrals to a day program was thought to be representative of all caregivers. In addition, measures of the well-being of carers could then be compared to those of other individuals in the population, and thereby provide an estimate of the relative burden imposed by caring.

The positive response to the stress of caring for a cognitively impaired relative has rarely been addressed even in recent studies (Neundorfer, 1991) or critical reviews (Kuhlman, Wilson, Hutchinson, & Wallhagen, 1991). Caregivers with better adaptational skills and life satisfaction or well-being outcomes were those who had better problem-solving and coping strategies, higher perceived adequacy of social supports (Hayley et al., 1987), and used day programs (George & Gwyther, 1986). There is some preliminary evidence about caregiver well-being, hardiness, and purpose in the face of the burden which accompanies caring for a cognitively impaired relative. The multidimensional nature of caregivers' appraisal of their situation is rarely captured. The current study distinguishes burden from well-being, an important oversight of previous studies (Biegel et al., 1991).

Conceptual Framework

Based on Lazarus and Folkman's (1984) theory of stress and coping, it was postulated that the meaning given the illness would be related to purpose and correlated with a caregiver's resilience (hardiness) and perceived social support. These perceptions play a role in promoting well-being even when chronic stress is apparent. Thus, it was hypothesized that these variables would explain a large proportion of the variability in caregivers' purpose in life.

Method

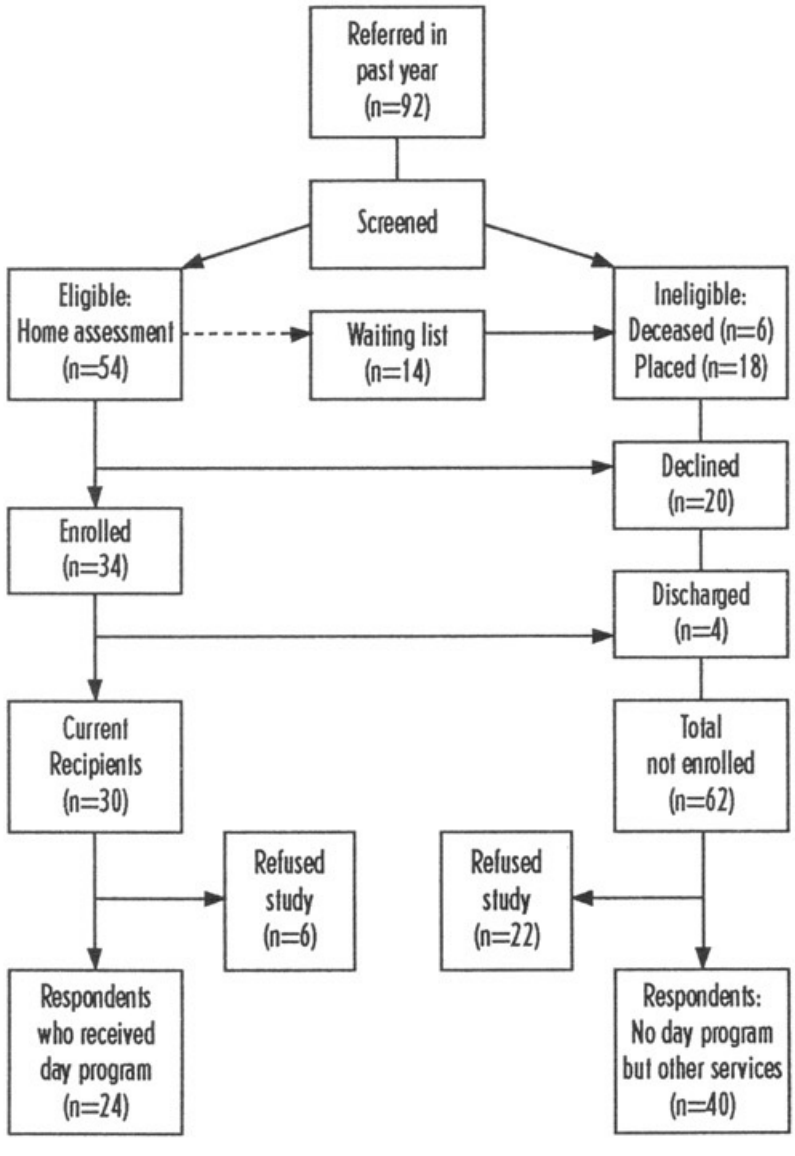
A Seniors' Day Program for mobile elderly individuals who had moderate to severe cognitive impairment, served as the site of investigation. Cognitively impaired seniors attended the program for a half day or full day weekly. Over the preceding three years 60 to 75% of eligible participants had enrolled

in the program. At the time of the current study (June, 1991) four new participants were being admitted per month from a waiting list of 14 participants after waiting approximately six weeks from the time of referral.

All caregivers of eligible participants referred to the Seniors' Day Program in the preceding year (N=92) received a letter announcing the study (Figure 1).

Figure 1

Study flow diagram, April 1990–1991



Caregivers were phoned by the research assistant and asked for their consent to participate in this study. Approximately 80% of caregivers with relatives enrolled in the program and 66% of those whose relative were not enrolled participated in the study. Study participants included caregivers with relatives who were currently enrolled (N=24), no longer enrolled and in an institution (N=18), on the waiting list (N=14), or had declined enrollment (N=8) (Table 1). Home visits were arranged to obtain caregivers' consent and to administer questionnaires in a semi-structured format.

A historic cohort analytic study design was used (Hennekens & Buring, 1987), where exposure to the program or not preceded the outcome assessment, as in Figure 1. Here the characteristics and outcomes of those who received the day program can be compared to those who did not (i.e., waiting, declined, or no longer participating).

Measurements

The main outcome variable was purpose-in-life. Other measures included positive and negative beliefs and attitudes (explanatory variables) which were thought to influence the caregiver's purpose-in-life.

The Purpose-in-life questionnaire is a 20-item, seven-point scale (1 to 7) designed by Crumbaugh & Maholick (1969, 1981) that measures the degree to which a caregiver experiences a sense of meaning or purpose-in-life. A sample question includes the choices "In thinking of my life I often wonder why I exist" versus "I always see a reason for being here." The split-half correlation coefficient was .85 to .92. Test-retest ranges were between .68 and .83 (Crumbaugh & Maholick, 1969, 1981) and construct validity was assessed on seniors by its relationship to a recent measure of the meaning in life (r=.77) and affect balance scale (r=.63) (Warner & Williams, 1987). The score ranges between 20 and 140. Scores less than 92 indicate lack of a clear purpose; between 92 and 111 indicate indecisiveness; and greater than 111 indicate definite purpose and meaning in life (Crumbaugh & Maholick, 1981).

The Caregiver Burden interview is a 22-item, 5-point scale (0 to 4) designed to evaluate the subjective impact of caregiving (Zarit et al., 1986). A sample question is "Do you feel (_____) asks for more help than s/he needs?" The internal consistency was estimated as .88 using Chronbach's alpha. Test-retest reliability was .71. Validity was assessed by correlating the total score with a single burden item (r=.71) and with the Derogatis (1982) Brief Symptom Inventory (BSI), (r=.41) (Butt, 1989).

The "direct service" component of the Browne, Arpin, Corey, Fitch, Gafni (1990) Health and Social Service Utilization Inventory was used to

assess the caregivers' Use of Services for their cognitively impaired relatives. Caregivers in all user groups were asked to list the number and type of community services they had received in the preceding year (e.g., Visiting Nursing, Day Program, Meals-On-Wheels, Friendly Visitors, Red Cross Homemakers).

The Meaning-Given-Illness Questionnaire is a second-generation, 23-item, seven-point measure (on a scale of 0 to 6) of meaning given illness. It was designed to quantify the degree to which individuals apply a mix of primary appraisals to illness: the number, type, seriousness, stability, desirability, expectancy, controllability, and uncertainty (Browne et al., 1988; Lazarus & Folkman, 1984). Test-retest reliability was .60 to .77. Validity was assessed by its ability to distinguish the adjustment patterns of persons with chronic illness. Sixty percent of the variance in poor adjustment to chronic illness can be explained by unfavourable meaning given the illness (Browne, Byrne, Roberts, et. al, 1988). The questionnaire was broken down into five independent types of meaning given illness where the higher the score, the more favourable the meaning: level of adverse impact, harm/disability, stress, challenge and vulnerability.

Hardiness (Commitment-Control-Challenge) is a 50-item, four-point (scale of 0 to 3) third-generation measure of the caregiver's resilience or hardiness. It consisted of three distinct constructs of commitment: belief in the value or importance of what one is doing (caring); control or tendency to believe one can influence the course of events; and challenge where change is viewed as an opportunity or incentive (Kobasa, Maddi, Kahn, 1982; Kobasa, personal communication, 1990). Control and challenge can be summed up as courage. The extensive reliability and validity of the Hardiness measure have been documented (Orr & Westman, 1990) and it has been widely accepted as a moderator of stress across ages, occupations, and genders.

The Personal Resource Questionnaire (Weinert, 1987), is a second-generation multidimensional, 25-item, seven-point measure (on a scale 1 to 7) of social support, consisting of five dimensions of support: intimacy, social integration, nurturance, worth, and assistance/guidance. It has been tested on older persons, has a test-retest reliability of .72, and distinguishes anxious and depressed populations in predicted directions (Weinert, 1987).

The Reisberg (1984) Stages of Cognitive Decline Scale measured global deterioration. This scale expands the seven-point Global Deterioration Scale (Reisburg, Ferris, DeLeon, & Crook, 1982) and provides descriptors of functional capacity related to activities of daily living. The scale ranges from 1=normal to 7=late dementia, and correlates significantly with 25 of 26 other measures of memory and cognitive decline (Reisburg et al., 1982).

Sociodemographic Variables: Caregivers were described in terms of age, gender, education, culture, residence, income characteristics, and length of time having lived with the cognitively impaired person.

Data Analysis

Caregiver characteristics were described with descriptive statistics in order to compare caregivers of relatives using the day program to others whose relatives were not. They are identified as Enrolled, Refusers, Institutionalized, and Waiting. The four different groups of caregivers were compared using analysis of variance. The order and importance of variables used to predict caregiver well-being was examined through forward stepwise regression. Pearson correlation coefficients were used to determine the relationships of caregiver psychosocial variables to purpose-in-life.

Results

The 64 caregivers in all four groups were, on average, high school graduates approximately 57 to 63 years of age, caring for severely cognitively impaired relatives (5.0 to 5.7 on a 7-point scale) indicating some current difficulty with toileting, dressing, bathing, and eating (Table 1). Caregivers had been caring for these relatives on average for 3 to 5.4 years and perceived their income as "so-so" on a scale from "Poor to Wealthy." Fifty-seven to 78% of caregivers were female and 75 to 79% were living with their relative at home. Fifty to 58% of caregivers were spouses and the remainder were mostly adult children of the impaired relative. In addition to the day program, community dwelling caregivers used, on average one to two other services three times per week. The refusers and Institutionalized groups of caregivers had relatives with more severe cognitive impairment and functional disability ($F_{3,60} = 3.89$, $p < .01$).

Some of the caregivers lived with their cognitively impaired relative (N=37), while others did not (N=27). Of the 18 relatives who were in institutions, two were in an acute care hospital awaiting placement and their relatives still considered themselves to be living with them. Caregivers who lived with their relatives were less "hardy" and particularly had less challenge in their lives (r = -.24), perceived more burden (r = .24,) and reported more adverse impact of the illness on their lives (r = -.38) than did those who did not live with their relatives. While these relationships are not strongly correlated, it is possible that the study failed to capture, qualitatively, the level of burden that may have been experienced by caregivers recently separated from their relatives as a result of institutional placement.

Table 1

The characteristics of caregivers and their cognitively impaired relatives across service user groups

		Enrolled in day program (N=24)		Waiting for day program (N=14)		Refused day program: In-home service only (N=8)		Institution-alized (N=18)			
		Mean	(SD)	Mean	(SD)	Mean	(SD)	Mean	(SD)	$F_{3,60}$	P
RELATIVE	Severity of illness	5.1	(0.8)	5.0	(0.5)	5.5	(0.6)	5.7	(0.4)	3.89	0.01
	Years/Educ	12.3	(3)	13.4	(3)	12.9	(3)	12.4	(3)	0.50	0.69
	Age	59.0	(14)	57.0	(17)	61.0	(15)	63.0	(17)	0.41	0.75
	Duration/Yrs with illness	5.0	(3)	3.1	(2)	5.4	(3)	4.8	(3)	1.56	0.21
	Perceived income	3.0	(.5)	3.0	(1)	3.0	(4)	3.0	(1)	0.57	0.64
	Community services used	1.1	(1)	1.5	(1)	1.5	(1)	0.3	(0.7)	5.29	0.003
	Frequency services used in 2 weeks	6.0	(5.6)	7.4	(6.4)	7.4	(6.0)	0.44	(1.4)	6.70	0.001
		N	(%)	N	(%)	N	(%)	N	(%)	X^2	DF	P
CAREGIVER	Female sex	17	(71)	8	(57)	6	(75)	14	(78)	1.7	3	0.63
	Living with	18	(75)	11	(79)	6	(75)	2	(11)	22.5	3	0.0001
	Spouse	14	(58)	7	(50)	4	(50)	10	(56)	0.32	3	0.95
	Daughters/ sons	7	(29)	5	(36)	3	(38)	4	(22)	0.96	3	0.81
	Others	3	(13)	2	(14)	1	(12)	4	(22)	0.85	3	0.84
	English-speaking Canadians	11	(46)	8	(57)	6	(75)	10	(56)	2.1	3	0.55

The mean scores for hardiness, social support, favourable meaning, perceived burden, and purpose are displayed in Table 2. The higher the score, the greater the perception in the group.

Uniformly, caregivers in all groups revealed that they had high levels of social support and purpose, and moderate levels of hardiness, favourable meaning, and perceived burden. In total there were 13 caregivers (20%) who lacked a clear purpose (score below 92), 28 caregivers (44%) who demonstrated indecisiveness (score 92-112), and 23 caregivers (36%) could be classified as having definite purpose (score $\geq$ 113). There was no statistically or substantively important difference in caregiver characteristics between user groups on any variable except two of the types of meaning-given-illness.

Table 2

Characteristics of caregivers of cognitively impaired relatives in four service user groups

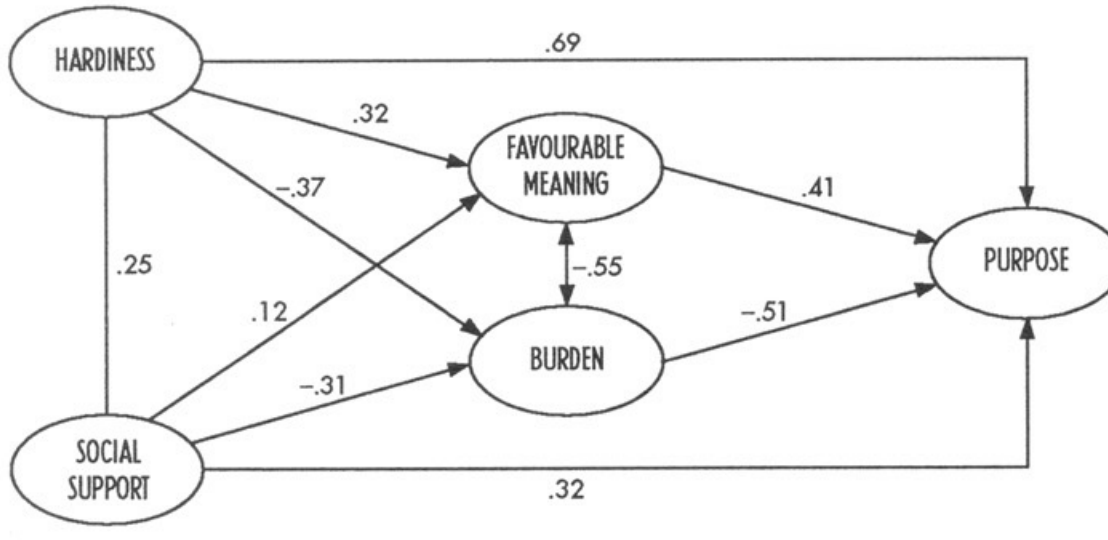
Variables	Score range	Enrolled in day program (N = 24)		Waiting for day program (N = 14)		Refused day program – in-home services only (N = 8)		Institution-alized (N = 18)			
Explanatory	**N**	**x̄**	**(SD)**	**x̄**	**(SD)**	**x̄**	**(SD)**	**x̄**	**(SD)**	**$F_{3,60}$**	**P**
Hardiness Total	0–150	69	(1.4)	69	(11)	64	(11)	72	(10)	0.84	0.48
• Challenge		0.54	(0.15)	0.56	(0.15)	0.53	(0.20)	0.57	(0.17)	0.16	0.92
• Commitment		0.76	(0.18)	0.77	(0.11)	0.73	(0.12)	0.82	(0.09)	1.15	0.34
• Control		0.77	(0.16)	0.74	(0.12)	0.67	(0.08)	0.77	(0.12)	1.34	0.27
Social Support Total	25–175	139	(21)	130	(20)	133	(22)	141	(28)	0.78	0.51
• Intimacy		29	(6)	27	(5)	29	(7)	29	(8)	0.35	0.79
• Social integration		26	(6)	25	(7)	23	(9)	28	(6)	0.79	0.50
• Nurturance		28	(5)	29	(4)	27	(4)	29	(5)	0.24	0.86
• Worth		30	(8)	27	(5)	27	(5)	29	(6)	1.30	0.28
• Assistance		27	(8)	23	(7)	27	(5)	28	(8)	1.20	0.39
Favourable meaning given to illness	0–30	15.25	(3.4)	16.1	(2.6)	17.4	(3.0)	17.5	(3.8)	1.90	0.14
• No negative impact	0–6	2.5	(1.3)	2.8	(1.2)	3.1	(0.8)	3.8	(1.9)	2.70	0.05
• Less harm/disability	0–6	1.9	(1.2)	2.7	(1.4)	3.3	(0.8)	2.7	(1.2)	3.40	0.02
• Less stress	0–6	3.2	(1.3)	3.1	(0.9)	3.2	(1.0)	3.6	(1.0)	0.88	0.46
• Challenge	0–6	2.7	(1.0)	3.0	(0.9)	3.1	(1.1)	2.6	(0.7)	0.80	0.50
• Less vulnerability	0–6	4.9	(1.1)	4.4	(1.3)	4.7	(1.2)	4.8	(1.2)	0.55	0.65
Perceived burden	0–4	1.8	(0.66)	1.9	(.54)	1.8	(0.61)	1.4	(0.79)	2.10	0.11
Outcome											
Purpose-in-life	20–140	103	(19)	102	(14)	99	(13)	109	(14)	0.95	0.43

Enrolled and waiting-for-the-day-program caregivers exhibited more unfavourable meaning-given-illness ($F_{3,60}$ = 2.7 to 3.4, p = .05 to < .02) in terms of adverse impact, harm, and disability, compared to caregivers who refused the day program or whose relatives were institutionalized. This finding, however, could be due to chance which occurs in a situation of multiple testing. The findings of no difference in caregiver status for most variables suggests that the four types of caregivers were able to meet most of their needs through different types of service, and thus able to achieve a similar amount of relief.

Using stepwise regression, hardiness was the most important variable (r=.69, r^2 = .48, p < .00001) explaining the caregiver's purpose-in-life, and meaning of stressfulness of illness (r^2=.59, p < .0001) added an additional 11% of the variance. Greater hardiness and less stressful meaning given illness were the important variables that explained the variance in purpose-in-life; together they explained 59% of the variability.

Figure 2

Correlates among variables that explain caregiver wellbeing (N=64) when the severity and duration of the illness is held constant



The attributes of the caregiver which correlate with each other in a statistically significant fashion (p < .05, 2-Tailed Pearson correlation coefficient of .25 or greater) and well-being or purpose are displayed in Figure 2. There were no relationships between the severity or duration of illness, income or use of health services. In this study of people referred to the day program, the severity and duration of illness was uniformly extreme and can be viewed as controlled for by the study design. Caregiver hardiness (commitment, challenge, control) was somewhat independent of social support (r = .25) and these two variables may make a distinct contribution to purpose-in-life. There was a strong correlation between favourable meaning and burden (r =.55) but the correlations between burden and purpose was slightly higher.

Discussion

Caregivers of relatives enrolled and waiting for the day program were similar to other caregivers not using the day program in exhibiting moderate to high levels of social support, purpose-in-life, and realistic views of the moderate to high level of burden imposed by caring for their relative. Caregivers of relatives enrolled in the Seniors' Day Program differed from the other groups by giving less favourable meaning to illness. There are several possible explanations for the lack of differences observed between groups. Well-being can be maintained in a variety of additional ways, and one day a week in a day program may provide an insufficient amount of respite for the caregiver to produce significant outcomes compared to other services.

Further, 60% of the caregivers' purpose-in-life could be explained by a general sense of control, commitment, and challenge (hardiness) with a more favourable meaning of less stressfulness of the illness. The goal for those who counsel caregivers should therefore be to increase their sense of control (hardiness) and find commitments and challenges in life in spite of the burden of caring for their relatives. Caregivers should also be helped to re-examine their unfavourable conceptions of illness. A cognitive-behavioural counselling approach would be best suited to the goal of fostering outside interests, favourable cognitions, and coping efforts.

These findings corroborate the theoretical relationships regarding the role that perceptions, attitudes, and meaning given illness play in promoting resilience and well-being in the face of chronic strain (Lazarus & Folkman, 1984). Caregiver well-being was sometimes high in spite of moderate to high levels of burden. Hardiness and favourable meaning given illness were fairly independent of perceived social support in explaining purpose in the face of burden. Practitioners should be encouraged to assess these characteristics of caregivers in order to determine which interventions are appropriate.

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Développement d'un programme de recherche basé sur une conception de la discipline infirmière

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The purpose of this article was to illustrate the development of a team's research program based on a conceptual model for the nursing discipline: Roy's Adaptation Model. The ongoing research program includes studies of psychosocial factors, theoretically known for their potential for explaining health. Four groups of people are the focus of these studies: aged spouses in the community, family caregivers of ill elderly people, family caregivers of mentally ill people, and nurses as professional caregivers for elderly people in institutions. The studies are articulated using the three-level structure proposed by Fawcett & Downs (1986) and Fawcett (1991): conceptual-theoretical-empirical.

This research program aims to renew understanding of the person's adaptation processes to various environmental stimuli, adaptive responses that influence health, and nursing interventions that promote health (i.e., biopsychosocial integrity). In order to specify the research variables and relations to be studied between these variables in the first phase of the program, each research project is also guided by a middle-range theory compatible with Roy's Adaptation Model. Elaborated within related disciplines, these theories are variations of the Stress and Coping theory of Lazarus & Folkman (1984). The results of these studies will be compared and articulated in a model that integrates the patterns of relations between the variables. The resulting empirical model together with Roy's conceptual model will be used to guide the development of nursing interventions intended to promote adaptive responses and biopsychosocial integrity. The second phase of the research program includes the implementation and evaluation of nursing strategies that promote adaptation among the four groups of people. This research program is a nursing contribution to certain social issues recognized as priorities by the governments of Canada and Québec. This article is an illustration of one of the various ways of developing nursing knowledge.

Cet article vise à illustrer le développement d'un programme de recherche basé sur un modèle conceptuel de la discipline infirmière, celui de l'adaptation de Roy. Élaboré par une équipe, ce programme suppose l'articulation, sur les plans conceptuel, théorique et empirique, d'études de déterminants psychosociaux reconnus théoriquement pour leur potentiel explicatif de la santé. Quatre groupes cibles sont l'objet des études : les conjoints âgés dans la communauté, les soignants naturels de malades âgés, les soignants naturels de malades souffrant de troubles psychiatriques et les infirmières en tant que soignantes professionnelles oeuvrant en établissements gériatriques. À partir du modèle conceptuel de Roy, les recherches tendent vers une compréhension renouvelée des processus d'adaptation de la personne aux stimuli de son environnement, des stratégies d'adaptation qui affectent la santé et des interventions infirmières qui promeuvent l'adaptation et la santé. Chaque projet de recherche s'inspire d'une théorie de niveau

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intermédiaire, compatible avec le modèle de Roy, qui guide le choix des variables et le type de relations faisant l'objet d'études empiriques. Empruntées de disciplines connexes, ces théories sont des variantes de la théorie du stress et de l'adaptation de Lazarus et Folkman (1984). Les résultats de ces études empiriques seront comparés et intégrés sous la forme d'un modèle pour l'intervention infirmière qui visera à promouvoir des réponses adaptées et la santé des groupes cibles. Le programme de recherche inclut aussi l'implantation et l'évaluation des stratégies d'intervention proposées. Les retombées de nos travaux sont pertinentes sur le plan social du fait que les interventions mises de l'avant visent ultimement la promotion de la santé en regard de problématiques reconnues comme prioritaires dans la communauté.

Développement d'un programme de recherche basé sur une conception de la discipline infirmière[1]

Faisant partie d'une discipline en émergence, la majorité des chercheures dans le domaine des sciences infirmières ont travaillé de manière individuelle (Gortner, 1980) et ont conçu, jusqu'à tout récemment, des projets de recherche indépendants d'une trame conceptuelle leur permettant de situer leurs résultats dans le cadre du développement des connaissances en sciences infirmières (Murphy et Freston, 1991). Ces chercheures ont souvent travaillé à diverses problématiques touchant des domaines connexes sans pour autant allier leurs efforts en vue du développement de cadres empiriques et théoriques permettant de sous-tendre l'intervention infirmière. Tout en reconnaissant l'existence d'autres approches pour le développement de la connaissance en sciences infirmières (Avant, 1991; Carper, 1978; Jacobs-Kramer et Chinn, 1988; Morse, 1992), cet article a pour but d'illustrer le développement d'un programme de recherche basé sur un modèle conceptuel de la discipline infirmière, celui de l'adaptation de Roy.

Même si, au cours des vingt-cinq dernières années, les infirmières chercheures ont démontré une constante détermination à développer des connaissances propres à leur discipline par l'investigation scientifique et qu'elles ont ainsi contribué à la science infirmière, la profession ne peut encore s'appuyer sur une longue tradition de recherche. La discipline infirmière a été, jusqu'à tout récemment, centrée sur le développement d'une pratique clinique sans une contrepartie scientifique aussi importante qui aurait permis l'élaboration de modèles théoriques à la base de l'intervention. Ainsi, les sciences infirmières sont encore considérées par nombre de chercheurs provenant des disciplines connexes comme étant une discipline en émergence.

Plusieurs auteurs (Donaldson et Crowley, 1978; Fawcett, 1978, 1979; Gortner, 1983; Meleis, 1988; Roy, 1988; Schlotfeldt, 1975) sont d'avis que la science infirmière ne se développe que par le lien entre conception/théorie et

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recherche. Or, les premières recherches menées par des infirmières étaient conçues davantage à partir de l'expérience des chercheures qu'à partir de bases conceptuelles et théoriques (Gortner, 1983), et leurs conclusions ne conduisaient pas nécessairement à l'élaboration d'une théorie. Il en est encore ainsi pour la majorité des recherches plus récentes où la phase d'interprétation des résultats présente peu de liens avec le développement de la connaissance en sciences infirmières (Murphy et Freston, 1991).

Pourtant, depuis plus d'une décennie, le centre d'intérêt de la science infirmière est spécifié par quatre concepts principaux – la personne, la santé, l'environnement et le soin – (Donaldson et Crowley, 1978; Flaskerud et Halloran, 1980) reconnus comme étant le métaparadigme infirmier (Fawcett, 1984). Séparément, ces concepts ne sont pas spécifiques à la science infirmière. C'est plutôt la façon dont ils sont interreliés qui précise le champ d'intérêt de la discipline infirmière. En fait, l'énoncé des concepts centraux et de leur relation représente le premier niveau de spécificité de la discipline infirmière (Fawcett, 1984). Par exemple, selon Roy (Roy et Andrews, 1991), la science infirmière constitue un domaine de connaissances qui s'intéresse à l'adaptation des individus et des groupes, aux environnements qui influencent leur santé et aux interventions thérapeutiques qui promeuvent la santé.

Selon plusieurs auteurs (Adam, 1991; Fawcett, 1989; Frederickson, 1992; Smith, 1992), il importe que de plus en plus d'infirmières élaborent leurs recherches à partir d'une conception précise de leur discipline et de théories compatibles avec cette conception (Fawcett, 1991; Fawcett et Downs, 1986) afin qu'elles contribuent à l'avancement de la science infirmière et au développement d'un savoir infirmier. Ce lien entre conception/théorie et recherche permet une continuité dans le développement de la connaissance plutôt qu'un éparpillement (Fawcett, 1978). Fawcett et Downs (1986) et Fawcett (1991) suggèrent alors une structure à trois niveaux de conceptualisation : conceptuel-théorique-empirique. L'objet de la recherche est précisé par le premier niveau de la structure, soit le niveau conceptuel. En s'appliquant à développer des connaissances à partir d'une conception précise de la discipline infirmière liée à une ou des théorie(s) compatible(s) avec cette conception, les chercheures font avancer la science infirmière. Un modèle conceptuel pour la discipline infirmière est une conception précise qui guide la recherche en suggérant l'objet de l'étude, c'est-à-dire en cernant les phénomènes ou variables à investiguer (Adam, 1991; Fawcett, 1989; Fawcett et Downs, 1986; Meleis, 1988). En se centrant sur certains concepts particuliers, un modèle conceptuel précise aussi la direction du développement de nouvelles théories; il est précurseur de théories (Adam, 1987; Fawcett, 1989; Newman, 1979; Roy, 1988).

C'est dans cette perspective qu'un programme de recherche basé sur un modèle conceptuel de la discipline infirmière, celui de l'adaptation de Roy, a été développé. Élaboré par une équipe, ce programme se concrétise par l'articulation, sur les plans conceptuel, théorique et empirique, de projets de recherche en science infirmière effectués auprès de diverses populations et concernant certains déterminants psychosociaux reconnus théoriquement pour leur potentiel explicatif de la santé. L'équipe, subventionnée par le FRSQ dans le cadre du programme "Équipe de recherche d'une discipline en émergence", en est à sa deuxième année d'activités.

Le modèle de l'adaptation de Roy et la recherche

Basé sur la théorie générale des systèmes (von Bertalanffy, 1968) et sur la théorie des niveaux d'adaptation de Helson (1964), le modèle de l'adaptation de Calista Roy se distingue par la promotion du processus dynamique qu'est l'adaptation des individus et des groupes (familles, communautés) à leur environnement, dans l'objectif de favoriser la santé et la qualité de vie. Selon Roy (Roy et Andrews, 1991), la personne est un être biopsychosocial en interaction constante avec un milieu changeant et exposé à des stimuli de nature focale (facteurs agissant directement sur la situation), des stimuli contextuels (autres facteurs présents dans la situation) et résiduels (facteurs dont l'effet est indéterminé). L'adaptation s'effectue dans quatre modes interreliés, un mode biologique (mode physiologique) et trois modes psychosociaux (modes concept de soi, fonctionnement dans les rôles et interdépendance). La personne peut présenter des réponses adaptées contribuant à la santé, c'est-à-dire à l'intégrité biopsychosociale, ou des réponses inefficaces qui ne contribuent pas à cette intégrité. Les réponses de la personne résultent des processus cognitifs (perceptions, émotions, apprentissage, jugement et processus d'information) et régulateurs (neurochimique et endocrinien) que Roy (Roy et Andrews, 1991) nomme mécanismes d'adaptation ou de coping. Le modèle de Roy guide aussi bien la recherche que l'intervention infirmière dont l'objet est d'agir sur les stimuli dans le but d'obtenir des réponses adaptées des individus et des groupes.

Le but des recherches élaborées à partir du modèle conceptuel de Roy est d'améliorer notre compréhension des processus suivants : comment les personnes s'adaptent aux stimuli de leur environnement, comment les mécanismes d'adaptation affectent la santé et comment des interventions infirmières peuvent promouvoir l'adaptation, les processus de vie et de bien-être (Fawcett et Tulman, 1990; Roy, 1987, 1988). L'équipe privilégie ce modèle conceptuel en raison de l'importance qu'il accorde aux déterminants psychosociaux de la santé, dimensions actuellement priorisées en sciences infirmières en regard de diverses populations.

Le contexte du programme de recherche

Le but du programme de recherche est de contribuer à l'avancement des connaissances en sciences infirmières qui se situent dans la perspective des priorités socio-sanitaires et des politiques de santé des gouvernements du Québec et du Canada en ce que a trait à la promotion de la santé. En effet, dans son document d'orientation politique *La santé pour tous* (Epp, 1986), le gouvernement canadien accorde une grande importance aux déterminants psychosociaux qui influencent la santé.

Le choix des groupes cibles du programme de recherche repose sur des problématiques socio-sanitaires prioritaires dans le cadre desquelles les infirmières contribuent à promouvoir l'adaptation des individus et des groupes. Ces problématiques ont été décrites, entre autres, par la Commission Rochon (Rochon, 1988). Elles concernent le vieillissement de la population, la santé mentale, la priorité accordée au maintien à domicile des personnes âgées et des malades atteints de troubles psychiatriques, plus particulièrement le rôle de partenaire des familles agissant en tant que soignants naturels. S'y ajoute la problématique de l'épuisement des soignants professionnels dans le système de santé actuel. Notre programme de recherche concerne plus précisément quatre groupes cibles, soit les conjoints âgés dans la communauté, les soignants naturels de malades âgés, les soignants naturels de malades souffrant de troubles psychiatriques et les infirmières en tant que soignantes professionnelles oeuvrant en établissement gériatrique. Ces groupes sont considérés à risque quant à la détérioration de leur état de santé en raison, d'une part, des exigences élevées inhérentes à leur rôle de soignant naturel (Maheu, Guberman et Dorvil, 1989; Schulz, Visintainer et Williamson, 1990; Zarit, Orr et Zarit, 1985) ou professionnel (Hare, Pratt et Andrews, 1988; Saucier et Tilquin, 1989; Stull et Vernon, 1986) et, d'autre part, du peu de ressources socio-sanitaires appropriées et actuellement accessibles dans le système de distribution de soins (Therrien, 1989; Walker, 1991).

Ces problématiques intéressent plusieurs professionnels de la santé. Des chercheurs provenant d'autres disciplines ont mis l'accent sur l'étude des relations existant entre les stresseurs, le soutien social, les stratégies adaptatives et la santé (Cohen, 1988; Cwikel, Dielman, Kirscht et Israel, 1988; Lazarus et Folkman, 1984; Fry, 1989; Rohde, Lewinsohn, Tilson et Seely, 1990; Thoits, 1985; Wheaton, 1983; 1985). Toutefois, les résultats de ces recherches empiriques demeurent encore équivoques. De plus, peu d'études ont examiné ces relations en fonction des spécificités des groupes cibles retenus dans le cadre de notre programme de recherche. Des études empiriques basées sur le modèle d'adaptation de Roy, propre à la discipline infirmière, permettront de mieux comprendre les déterminants de la santé de ces groupes en termes de stimuli focaux et contextuels et de réponses adaptées ou inefficaces et de

développer des interventions infirmières basées sur les résultats de ces études. La recherche infirmière contribuera au développement, à l'implantation et à l'évaluation d'interventions appropriées à ces diverses clientèles, compte tenu de la position stratégique qu'occupent les infirmières dans le système des soins de santé et du contact étroit qu'elles ont avec les individus et les groupes.

Dans un premier temps, le programme de recherche s'intéresse plus particulièrement à identifier les stresseurs (stimuli focaux) auxquels sont exposés les groupes cibles retenus et à comprendre le mécanisme d'action de certains facteurs médiateurs (stimuli contextuels et réponses d'adaptation) entre ces stresseurs et la santé. Dans un deuxième temps, l'étude de facteurs médiateurs, principalement du soutien social, de la hardiesse et des stratégies adaptatives susceptibles de diminuer la vulnérabilité aux problèmes de santé, devrait nous permettre d'élaborer des stratégies d'intervention infirmière dans une perspective de promotion de la santé.

La conceptualisation du programme

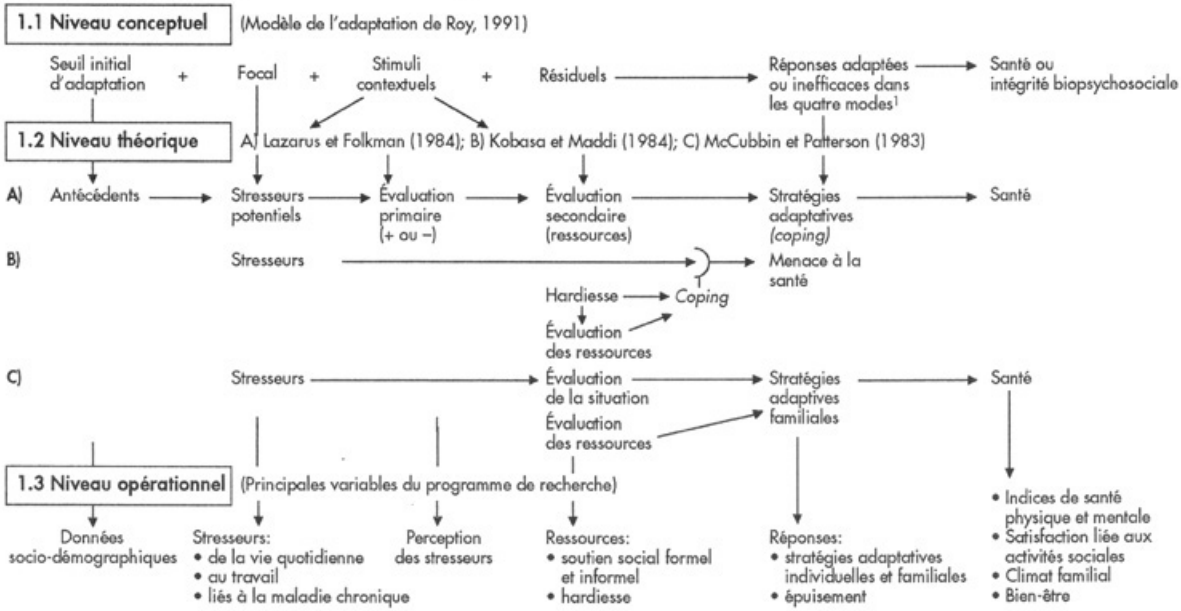
Tel que suggéré par Fawcett et Downs (1986) et Fawcett (1991), le programme de recherche de l'équipe a été élaboré selon une structure à trois niveaux de conceptualisation. La figure 1 illustre les relations existant entre les niveaux conceptuel, théorique et opérationnel de ce programme.

Le modèle conceptuel de l'adaptation de Roy (Roy et Andrews, 1991) pour la discipline infirmière (voir la section 1.1 de la figure 1) a d'abord guidé le choix des concepts principaux du programme de recherche. Promouvoir l'adaptation des individus et des groupes à leur environnement nécessite de considérer les stimuli focaux, contextuels et résiduels en vue d'obtenir des réponses adaptées et de favoriser l'intégrité biopsychosociale. Ces concepts généraux et propositions offrent un cadre de référence distinctif ou une perspective d'étude pour les phénomènes d'intérêt d'une discipline (Fawcett, 1991; Fawcett et Downs, 1986; Roy, 1988). Ainsi, le modèle de Roy a permis de délimiter la perspective infirmière dont les recherches du programme s'inspirent et de retenir des concepts pertinents à notre discipline. Il s'agit du niveau le plus abstrait de conceptualisation de ce programme. Les concepts faisant partie d'un modèle conceptuel sont toutefois trop abstraits pour offrir des définitions opérationnelles, et les propositions qui y sont énoncées, trop générales pour pouvoir être mesurées. Un modèle conceptuel ne peut être testé (Fawcett, 1991; Fawcett et Downs, 1986).

Conséquemment, chaque projet faisant partie du programme de recherche s'inspire également de théories de niveau intermédiaire *(middle range theories)* compatibles avec le modèle de Roy qui ont été sélectionnées dans le but de préciser le choix des variables et de suggérer des relations entre ces

Figure 1

Niveaux de conceptualisation du programme de recherche



1. Les réponses adaptées ou inefficaces selon les quatre modes (physiologique, concept de soi, interdépendance, fonction de rôle) sont considérées sous l'angle de stratégies adaptatives.

variables pouvant faire l'objet d'études empiriques. Il s'agit du deuxième niveau de conceptualisation du programme (voir la section 1.2 de la figure 1). Ces théories sont empruntées de disciplines connexes, soit la psychologie et la sociologie, et concernent la théorie du stress et de l'adaptation de Lazarus et Folkman (1984) et ses variantes.

Le cadre théorique de Lazarus et Folkman (1984) accorde un rôle central à l'évaluation cognitive et aux stratégies adaptatives en tant que facteurs médiateurs de la réaction au stress. À cet effet, il postule que ce n'est pas tant la nature du stresseur qui peut avoir un effet sur la santé, mais bien la façon dont un individu juge la situation potentiellement stressante (évaluation cognitive primaire) et ses ressources pour y faire face, entre autres, le soutien social (évaluation cognitive secondaire).

Deux projets du programme de recherche, soit les projets touchant les déterminants psychosociaux de la santé des soignants naturels de personnes âgées et de malades atteints de troubles psychiatriques, s'inspirent de cette théorie du stress et de l'adaptation de Lazarus et Folkman (1984). Les projets concernant les déterminants psychosociaux de la santé des soignants professionnels et de la santé des couples âgés s'inspirent de théories de niveau intermédiaire plus pertinentes pour l'étude de ces problématiques puisqu'elles apportent à la fois une diversité et une complémentarité théorique. Il s'agit de la théorie de la hardiesse de Kobasa (Kobasa, 1979; Kobasa et Maddi, 1984) et de la théorie de l'adaptation familiale de McCubbin et Patterson (1983).

Ainsi, dans le contexte de travaux visant à cerner diverses réponses au stress du travail, Kobasa (1979; Kobasa et Maddi, 1984) a particulièrement mis l'accent sur une des ressources individuelles permettant d'affronter le stress, soit la hardiesse. Selon le cadre théorique proposé par cette auteure, les personnes dites hardies cherchent à réduire les effets délétères du stress, à minimiser la tension et, par conséquent, leur vulnérabilité à la maladie. La hardiesse réfère plus précisément aux caractéristiques personnelles qui rendent l'individu apte à demeurer en santé, et ce, même sous l'influence d'événements générateurs de stress. La personne dotée de ces caractéristiques est capable de décider (maîtrise), de contribuer significativement à l'action des autres (engagement) et perçoit le changement comme un élément bénéfique au développement personnel (défi). Les personnes dites hardies mettent l'accent sur des stratégies adaptatives actives et recherchent le soutien de personnes portées à utiliser ces mêmes types de stratégies. Selon Kobasa et Maddi (1984), le soutien social a un effet médiateur valable dans la mesure où il encourage une appréciation cognitive et optimiste du stresseur ainsi qu'une décision éclairée en vue d'y faire face. Ce cadre théorique a été retenu pour l'étude des déterminants psychosociaux de la santé des soignants professionnels.

Enfin, les déterminants psychosociaux de la santé des couples âgés ont été examinés plus particulièrement à partir du modèle de l'adaptation familiale de McCubbin et Patterson (1983). Selon ce modèle, l'unité familiale ou, en l'occurrence la dyade conjugale, réagit aux différents stresseurs aigus et chroniques auxquels elle est confrontée par une évaluation cognitive simultanée de la situation stressante et de ses ressources de résistance au stress. Cette évaluation est suivie du choix de stratégies adaptatives internes (transactions à l'intérieur du système familial) ou externes (transactions entre le système familial et la communauté) qui sont associées au bien-être et à la santé familiale.

C'est donc à partir du modèle de Roy, offrant une perspective infirmière à l'étude des déterminants psychosociaux de la santé, en conjonction avec des théories de niveau intermédiaire compatibles avec ce modèle conceptuel, que les variables de notre programme de recherche ont été sélectionnées. Le troisième niveau de conceptualisation du programme de recherche, plus concret, soit le niveau opérationnel (voir la section 1.3 de la figure 1), détermine les indicateurs empiriques retenus dans le cadre du programme. La plupart de ces indicateurs sont communs aux diverses études du programme, alors que certains sont spécifiques aux groupes cibles. Par exemple, tous les groupes sont confrontés à des stresseurs aigus et chroniques, identifiés comme étant, dans la perspective du modèle conceptuel de Roy, des stimuli focaux. Ces stresseurs sont reliés à la vie quotidienne (couples âgés), au travail (soignants professionnels), ou encore à la maladie chronique d'un membre de la famille (soignants naturels). Les perceptions de ces stresseurs, de même que les ressources contextuelles et personnelles permettant de les affronter, plus particulièrement le soutien social formel et informel, sont des variables communes aux études, alors que la hardiesse est considérée seulement dans l'étude auprès des soignants professionnels. Ces variables sont identifiées comme des stimuli contextuels. Les stratégies adaptatives individuelles et familiales, identifiées comme étant les réponses adaptées ou inefficaces des sujets dans les quatre modes d'adaptation, sont aussi communes aux diverses études, alors que l'épuisement est une réponse d'adaptation étudiée chez les soignants professionnels seulement. Enfin, les indices de santé et de bien-être sont identifiés comme étant des indicateurs d'intégrité biopsychosociale dans toutes les études, alors que la satisfaction liée aux activités sociales et le climat familial sont des indicateurs pour une étude auprès des soignants naturels.

Le programme de recherche s'oriente vers l'examen de problématiques liées à l'adaptation de groupes cibles exposés à divers stimuli de l'environnement. Les projets réalisés visent une meilleure compréhension de l'adaptation de ces groupes aux stimuli de leur environnement, des processus qui affectent leur santé et de la contribution de l'intervention infirmière vis-à-vis de ces processus d'adaptation. Par exemple, l'objectif d'un des projets était de vérifier, dans une perspective longitudinale, un modèle de relation entre les

variables soutien conjugal, stratégies adaptatives et bien-être des conjoints âgés de plus de 65 ans habitant à domicile à partir de la théorie du stress et de l'adaptation familiale de McCubbin et Patterson (1983). Ce modèle théorique accorde un rôle prépondérant aux ressources familiales (dont fait partie le soutien conjugal) et aux stratégies adaptatives utilisées par les familles en réponse à des stress quotidiens, en tant que facteurs médiateurs de la réponse au stress et favorisant le bien-être (voir la section 1.2 C de la figure 1). Les principaux résultats de cette étude ont permis de démontrer que la disponibilité et la réciprocité du soutien conjugal (ressources familiales), ainsi que les stratégies adaptatives d'ordre cognitif étaient des facteurs associés au bien-être physique et psychologique des conjoints âgés et, plus précisément, des médiateurs de leur réaction aux stresseurs chroniques ou existentiels.

La contribution du programme de recherche

Tel que souligné précédemment, ce programme de recherche vise ultimement le développement et l'évaluation de stratégies d'intervention infirmière appuyées sur un modèle empirique, issu des résultats des recherches du programme. Pour ce faire, des objectifs à court et à moyen terme ont été formulés. Les objectifs à court terme sont de deux ordres soit : 1) préciser la nature des relations entre des stimuli focaux (stresseurs), des stimuli contextuels (perceptions des stresseurs, ressources environnementales et personnelles), des réponses d'adaptation (stratégies adaptatives) et la santé des quatres groupes cibles retenus, et 2) comparer et articuler ces résultats en vue de proposer un modèle qui permettrait l'intégration des structures de relations entre les déterminants psychosociaux associés à la santé. Quant aux objectifs à long terme, ils concernent plus particulièrement l'intervention. À partir du modèle empirique qui sera élaboré et en s'inspirant du modèle conceptuel de l'adaptation de Roy, il s'agira de mettre au point des stratégies d'intervention infirmière visant à modifier les stimuli, à promouvoir des réponses adaptées et à contrer les réponses inefficaces auprès de ces mêmes groupes. Le programme vise aussi l'implantation et l'évaluation de ces stratégies d'intervention.

L'originalité de ce programme de recherche d'équipe provient du fait qu'il s'inspire d'un modèle conceptuel propre à la discipline infirmière (Roy et Andrews, 1991). La complémentarité théorique entre les divers projets de recherche permettra d'identifier des structures de relations entre les déterminants étudiés conduisant à l'élaboration d'un modèle empirique. La comparaison des résultats des études du programme servira, d'une part, à examiner si des aspects propres aux problématiques de chacun des groupes cibles se dégagent et, d'autre part, à identifier certains points communs à ces groupes cibles. Les diverses études contribueront donc à élargir les connaissances en ce qui a trait aux problématiques étudiées et ainsi à renforcer les assises théoriques et empiriques de l'intervention infirmière. Les retombées du programme

de recherche seront également pertinentes sur le plan social puisque les chercheurs proposeront et évalueront des stratégies d'intervention en soins infirmiers nécessaires à la promotion de la santé de la population et particulièrement de groupes vulnérables.

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Energy Balance of Nutrition and Activity in a Group of Nursing Students

Kathy L. Rush and James R. Sexsmith

La présente étude descriptive présente une esquisse des éléments de l'équilibre énergétique, de la nutrition et de l'activité chez un groupe d'étudiants en sciences infirmières du niveau baccalauréat (n = 21). Les outils de collecte de données comprenaient les rapports individuels remplis par chaque répondant, le relevé de la nourriture et des exercices physiques pendant trois jours consécutifs, ainsi qu'un questionnaire sur les antécédents de la personne. Les résultats obtenus révélèrent que les apports énergétiques étaient suffisants pour satisfaire à l'apport des éléments nutritifs recommandés, sauf pour les hydrates de carbone qui ne suffisaient pas pour satisfaire aux niveaux de dépense d'énergie. L'engagement des étudiants dans diverses activités exigeant une dépense d'énergie substantielle ajouté à la perte de poids suite à un régime qu'ont fait plusieurs étudiants semble expliquer ce déséquilibre énergétique. On recommande à ce groupe d'étudiants en sciences infirmières d'accroître leur consommation d'hydrates de carbone et de diminuer celle de matières grasses.

This descriptive study presents a profile of energy balance, nutrition, and activity in a group of baccalaureate nursing students (N=21). Self-reported, consecutive, three-day food and physical activity records as well as a background questionnaire served as the instruments for data collection. Findings revealed that energy intakes were adequate to meet recommended nutrient intakes for all nutrients except carbohydrate, but insufficient to meet their levels of energy expenditure. Student involvement in a range of activities that required substantial energy expenditure, coupled with weight-loss dieting by several students appear to explain this observed energy imbalance. Increased carbohydrate intake and decreased fat intake would seem to be recommended nutritional modifications warranted for this group of nursing students.

Nursing students, as future health care professionals, receive education in wellness and health promotion. Therefore, it is often assumed that they practice healthy lifestyles. The wellness and health-related behaviors and practices of nursing students have been studied very generally (Boyd, 1988; Dittmar, Haughey, O'Shea & Brasure, 1989; MacDonald & Faulkner, 1988; Sabina-McVety, Booth, Orban & Richards, 1988; Viar & Urey, 1988), typically addressing topics such as smoking, alcohol consumption, breast self-examination, and sleep, as well as nutrition and physical activity. Findings have shown that nursing students do not always apply their knowledge of personal health behaviours. For example, Sabina-McVety et al. (1988) reported that although their group of undergraduate nursing students valued exercise, they did not regularly participate in it.

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Literature Review

Research into the nutritional and physical activity practices of nursing students has been limited and very qualitative in nature. Survey research has consistently revealed a number of poor dietary practices including breakfast-skipping, between-meal snacking, vending machine usage, and heavy alcohol consumption (Dittmar et al., 1989; Viar & Urey, 1988). However, dietary analysis of nursing students has not been reported. Analysis of the nutritional status of female college students (Gottschalk, MacAulay, Sawyer, & Miles, 1977; Hernon, Skinner, Andrews, & Penfield, 1986) has found that mean energy intakes were below recommended amounts, with associated sub-optimal intakes of iron (Gottschalk et al 1977; Jakobovits, Halstead, Kelley, Roe, & Young, 1977), calcium (Hernon et al., 1986; Hoffman, 1989; Ostrom & Labuza, 1977), thiamine, riboflavin, and niacin (Hernon et al., 1986). It is unknown whether these trends apply to nursing students, although their reported dietary practices would appear to put them at risk for nutritional deficiencies.

Qualitative assessment of the activity practices of nursing students has indicated low participation in aerobic activities (Boyd, 1988; Viar & Urey, 1988). The one study that provided quantitative data found that from the first to the fourth year of their nursing program, baccalaureate nursing students experienced an increase in maximal oxygen consumption from 33 to 36 ml/kg/min (MacDonald & Faulkner, 1988). Though statistically significant, this increase does not reflect a physiological difference with the final value being classified as below average and suggestive of a sedentary lifestyle (Fitness Canada, 1986).

Additionally, although it has been suggested that the low energy intakes observed among female university students may be related to low activity levels, only one study of British physical-education students has measured both energy expenditure and activity levels (Watson & Jennings-White, 1974). In fact, several studies noted that interpretation of their caloric and nutrient intake findings was limited by the lack of concurrent energy expenditure information (Gottschalk et al., 1977; Hernon et al., 1986; Jakobovits et al., 1977). Without examining both the nutritional and physical activity status of nursing students, it is not possible to determine whether any relationship exists between these two parameters for this population. Thus, the purposes of this study were to quantitatively assess the caloric energy intake and energy expenditure (i.e., energy balance) of nursing students as well as their nutrient status, and to compare these findings with the Canadian Nutrition Recommendations.

Method

Study Population

A third-year undergraduate nursing class (N=45) was approached during a mid-winter semester. Upper level students were chosen because it was felt that there would be less influence of the home environment and fewer students living in residence so that a more representative picture of eating and activity patterns could be obtained. Also, there was an increased likelihood that these subjects would have completed an elective course in nutrition. Twenty-seven students initially volunteered to participate, four dropped out, possibly due to a heavy student workload, and 23 completed the study.

Instruments

A review of the literature revealed that the three-day food and activity record was the most appropriate method for assessing nutrient intake and energy balance in a university student population (Barr, 1987; Karkeck, 1987; Underwood, 1986). The three-day food record for this study, designed in consultation with a nutritionist, consisted of four columns for recording a description of the food or fluid item consumed, the amount of the item eaten, and the time and place where it was eaten. All food records were analyzed for energy and nutrient intakes using the Canadian version of the Nutripractor 6000 Program (Practocare, Inc.).

To assess energy expenditure, the three-day activity record developed by Bouchard, Tremblay, Leblanc, Lortie, Savard & Theriault (1983) was chosen, since the authors reported intraclass reliability correlations ranging from .86 to .96 ($p < .01$). This activity record broke the day into 96 fifteen-minute blocks; participants recorded a categorical value representing the dominant physical activity during each period (refer to Table 3). Categories ranged from a value of 1, representing activities with the lowest energy expenditure (.26 kcal/kg/15 min), to a value of 10, representing activities with the highest energy expenditure (2.40 kcal/kg/15 min). The categorical values recorded by students on their activity records were translated into energy expenditures using the median energy costs and then summed for the day.

The background questionnaire, developed by the researchers in collaboration with the nutritionist, elicited information related to the students' food- and activity-related practices. The specific information obtained included the students' living arrangements, nature of meal preparation, eating-out patterns, dieting practices, use of dietary and/or vitamin supplements, as well as body weight and physical activity patterns over the previous month.

Pilot testing of the data collection instruments and procedures was done for one day using 16 undergraduate students who were not participants in the final study. Their recorded food intake was cross-validated with, and compared favourably to, a 24-hour recall procedure. Modifications and additions were made to the activity record to make the categories more representative of typical undergraduate student activities. For example, physical activities that student nurses would be performing in the course of providing patient care as well as common recreational activities were included. For these adaptations, cross-referencing of energy expenditures for the added activities were obtained from Shephard (1986) and McArdle, Katch & Katch (1991). Subsequently, a video was made of the detailed procedures for accurately completing the activity and food records, paying particular attention to food item descriptions, preparation, and portion-size estimations.

Procedures

A three-stage study protocol was utilized: practice data collection, review, and actual data collection. All potential subjects were introduced to the study protocol and procedures and viewed the video during a regularly scheduled nursing class. Each student received a packet that included: an information and consent form; a background questionnaire; a practice one-day food and activity record; instructions for completing the records; a physical activity guide with the energy expenditure categories (1-10), together with corresponding examples of typical activites; and a completed example of a meal recording and an activity recording. Students wishing to participate in the study were asked to complete the informed consent, background questionnaire, and 24-hour food and activity record, and return these to the researchers within 48 hours. The researchers reviewed the practice 24-hour food and activity records to identify problems in the recording process, then met with students to present feedback. Students received both written feedback on their individual records, and verbal feedback that addressed problems common to the group as a whole. Participants then received their consecutive three-day (Thursday, Friday, Saturday) food and activity records and were given final instructions. They were asked to keep complete and accurate records of all fluids and foods consumed and to not make any unusual changes in their food and activity patterns for the duration of the study period. Students had telephone access to the researchers for assistance if difficulties were encountered. Completed forms returned to the researchers were reviewed immediately for completeness and accuracy, with any questionable entries being verified or clarified. Of the 27 volunteers, 4 did not return their forms, and data from an additional two were dropped – one because of illness, and the other because it was incomplete.

Statistical analyses were completed using the Statistical Analysis Systems software package (Schlotzhauer & Littell, 1987) with alpha set at $p \leq .05$. Values were reported as means with standard deviations ($M \pm$ S.D.). A two-way repeated measures ANOVA was used to assess energy intake and energy expenditure across days. A one-way repeated measures ANOVA was used to compare macronutrient intake across days. When appropriate, differences between means were assessed using the orthogonal contrast post-hoc procedure. Pearson product-moment correlation coefficients were determined between energy intake, energy expenditure, and all macronutrients.

Results

Twenty-one third year nursing students (21.5 ± 1.8 years old; 162.7 ± 10.8 cm average height; 62.2 ± 7.6 kg average weight) completed the study. The Body Mass Index (BMI), computed from the students' self-reported heights and weights, was 22.6. The students' self-reported food and activity related practices over the month preceding the study are outlined in Table 1.

The groups' mean daily energy expenditure was 2705 kilocalories compared to a mean daily energy intake of 2094 kilocalories, reflecting a negative energy balance for the group as a whole. As shown in Table 2, there was wide individual variation in energy balance, from a deficit of –2340 kcals to a surplus of +868 kcals. Only two students approximated an energy balance.

Table 1

Self-reported food and activity related practices of the nursing students (N=21) in the month preceding study

Food/Activity Related Practices	Student Responses	
	% Yes	% No
Living off campus	95.2	4.8
Living at home or with relative	33.3	66.7
Self-prepared meals	71.4	28.6
Use of fast food restaurants (1–2/wk)	47.6	52.4
Breakfast skipping (>2/wk)	47.6	52.4
Use of vitamin/mineral supplements	23.8	76.2
Weight loss dieting	33.3	66.7
Weight change (±5 lbs or >)	33.3	66.7
Taken/ing university nutrition course	23.8	76.2
Activity level: ≥30–60 minutes of exercise 3 times per week	42.9	57.1

Table 2

Nursing students' (N=21) daily energy balance

Subject	M Energy intake (kcal)	M Energy expenditure (kcal)	Difference (kcal)
1	2547	2042	+505
2	2178	2129	+49
3	1384	2307	–923
4	2203	4142	–1939
5	1537	2598	–1061
6	1680	2859	–1179
7	1971	2597	–626
8	2164	2518	–354
9	2920	2526	+394
10	1735	2716	–981
11	2693	2231	+462
12	1004	2853	–1849
13	2070	2312	–242
14	1296	3636	–2340
15	1938	2196	–258
16	2524	2452	+72
17	2758	3471	–713
18	2072	2912	–840
19	3554	2686	+868
20	1613	3320	–1707
21	2144	2311	–167
M±S.D.	2095±602	2705±541	–611±875

For each of the three days, energy intake was significantly less than energy expenditure ($r \leq .05$), but the day-to-day differences in energy balance were not significant (Figure 1). Furthermore, no significant relationship was observed between energy intake and energy expenditure on Thursday, Friday or Saturday ($r = -.23, -.02$, and $.10$, respectively).

Looking specifically at self-reported physical activity over the three days, the mean minutes per day that students spent in each energy expenditure category are listed in Table 3. Activities in which students participated ranged from light to heavy physical intensity, with proportionately more time spent in physical activities of low (.57 to .84 kcal/kg/15 min) median energy cost; 71.1% of their day was spent sleeping and in sitting activities. Light intensity activities comprised 24.4% of the students daily time, and moderate to heavy intensity activities, 4.5% (Figure 2).

Comparison of the students' mean three-day macronutrient and micronutrient intake with the Canadian Recommended Nutrient Intakes is presented in Table 4. Except for carbohydrate, on a per gram basis, the study group exceeded the mean recommended nutrient intakes for all micronutrients and

Figure 1

Comparison of mean energy intake and mean energy expenditure across the three days for nursing students (N=21)

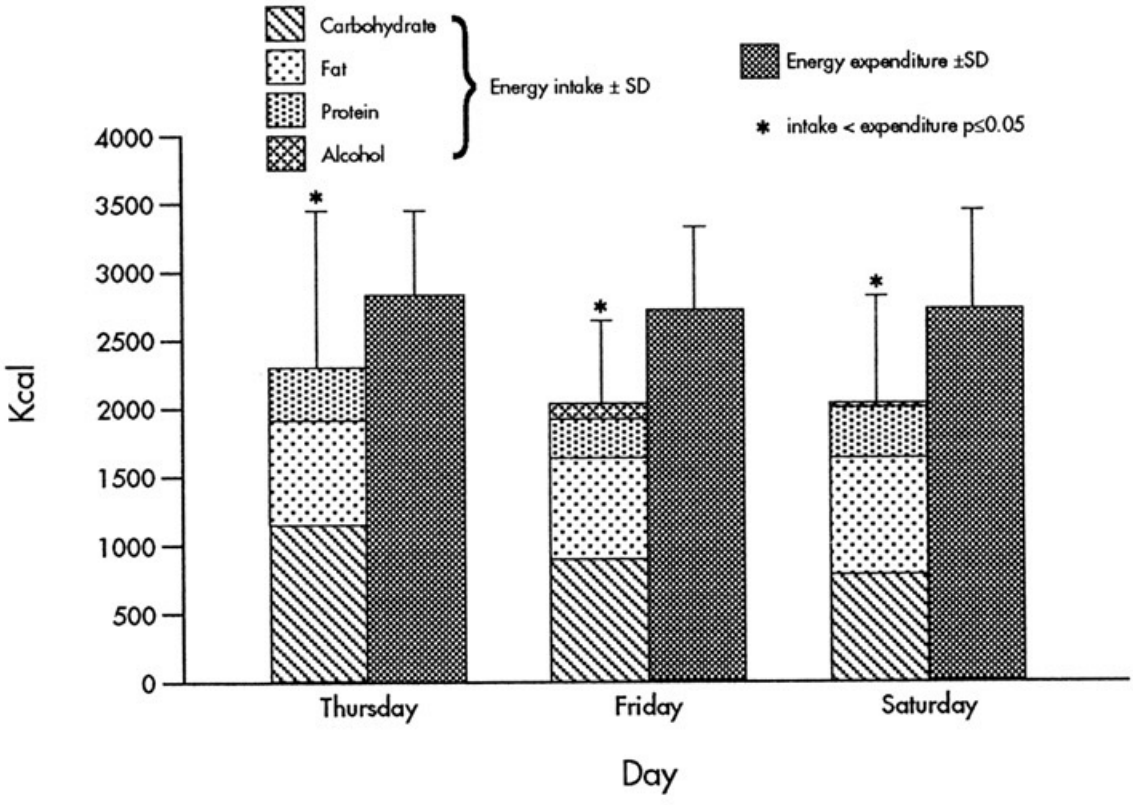

Figure 2

Self-reported mean daily physical activity of nursing students (N=21) expressed relative to (a) time (24 hours) and (b) total energy expenditure (kilocalories·day^{-1})

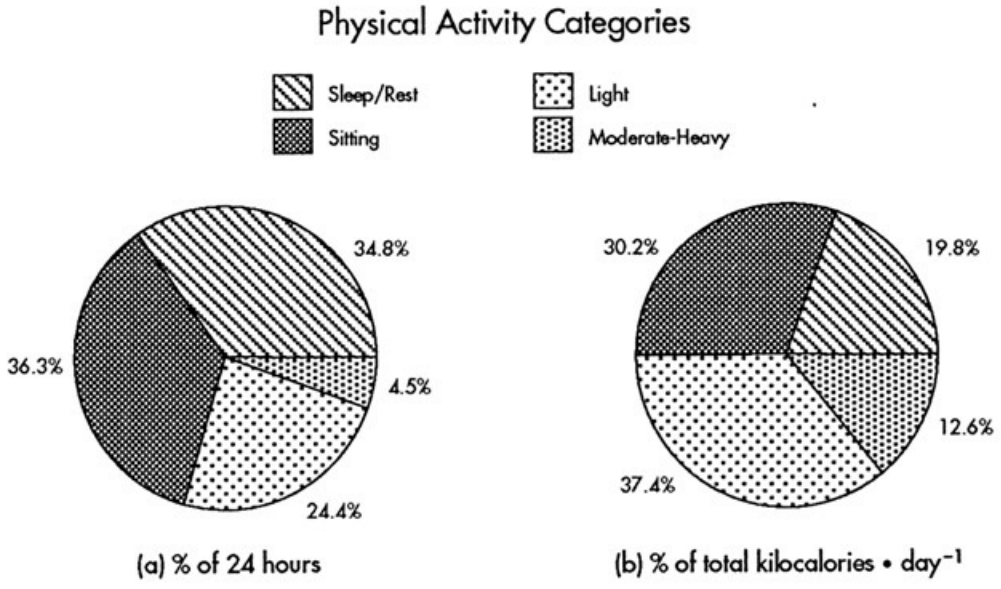

Table 3

Self-reported physical activity of the nursing students

Energy Expenditure Categories*			Physical Activity (mean minutes per day)		
Categorical value	Example activities	Median energy cost (kcal/kg/15 min)	Thu	Fri	Sat
1	Sleeping or resting in bed	0.26	479	470	554
2	Sitting: eating, studying, watching TV, listening, writing, etc.	0.38	534	579	456
3	Light activity standing: washing, ironing, shaving, combing, cooking, etc.	0.57	92	101	128
4	Slow walking, driving, dressing, showering, playing musical instruments, etc.	0.69	100	158	148
5	Light manual work: sweep floor, rake leaves, waiting on tables, house chores, classroom presentation, general nursing care, etc.	0.84	159	68	100
6	Leisure activities and sports in recreational environment: golf, easy cycling, curling, bowling, baseball, weightlifting, walking at normal pace, warm-up/cool-down activities.	1.20	47	41	32
7	Manual work at moderate pace: snow shoveling, carpentry, nursing care (moving and lifting patients), walking uphill, scrubbing floors	1.40	11	4	16
8	Leisure sport activities of higher intensity (not competitive): skiing, canoeing, swimming, tennis, walking at brisk pace, jogging, cycling quickly, dancing, circuit weight training, etc.	1.50	19	16	6
9	Intense manual work, high intensity sport activity or leisure sport competition: running, skipping rope, aerobic dance (stimulus phase), racquetball, hiking with pack, swimming, carrying heavy loads, etc.	2.00	0	2	0
10	Intense training for competitive sport activities: cross-country running, cycling, basketball, field hockey, rowing, wrestling, swimming, soccer, etc.	2.40	0	0	0

*Adapted from Bouchard et al., 1983

macronutrients. When macronutrient intakes were expressed as a percentage of total energy intake, nursing students had a diet consisting of 44.2% carbohydrate, 38.2% fat, and 15.3% protein. Alcohol comprised the remaining 2.3% of energy intake. There were no significant differences in fat or protein intake across days, but carbohydrate intake was significantly lower on day three (Saturday) than on day one (Thursday). As expected, significant rela-

Table 4

Mean energy and nutrient intakes of nursing students (N=21) as assessed by a three-day food record

Energy/Nutrient	Nursing Intakes (X±S.D.)	Recommended intakes*
Energy (Kcal)	2094.5±601.7	2100
Carbohydrate (g)	234.9±76.1	290 (min)
Fat (g)	91.2±34.0	70 (max)
Protein (g)	80.3±24.2	43
Iron (mg)	13.6±5.4	13
Calcium (mg)	914.2±365.0	700
Vitamin A (mg)	9944.3±8431.3	4000–5000
Vitamin C (mg)	112.9±52.7	30–60
Niacin (NE)	20.6±8.4	15
Thiamin (mg)	1.47±0.8	0.8
Riboflavin (mg)	1.68±0.7	1.1
Alcohol (g)	6.22±12.6	—

*Canadian recommended nutrient intakes, 1990

tionships were observed between energy intake and the intake of carbohydrate, fat, and protein (r= .78; r= .90; r= .78, respectively) but no significant relationships were found between intake of these macronutrients and energy expenditure (r=–.01; r= –.13; r= –.16, respectively).

Discussion

Overall, this group of health profession students experienced a negative energy balance, with energy intake being significantly less than self-reported energy expenditure over the three day study period. Although the magnitude of the imbalance was greater in the current study (–611 kcals/day), negative energy balances have also been observed by others: –86 kcals/day over seven days (Watson & Jennings-White; 1974), –287 kcals/day over 14 days (Drougas, Reed, & Hill, 1992), and –336 kcals/day over a four week period (Kalkwarf, Haas, Belko, Roach, & Roe, 1989). In contrast, other investigations have reported that energy intake and expenditure balanced well over the study period (Saris, van Erp-Baart, Brouns, Westerterp, & ten Hoor, 1989; Smoak, Singh, Day, Norton, Kyle, Pepper, & Deuster, 1988). However, these investigations utilized highly trained male subjects whose energy expenditures and intakes were approximately 6000 kcals/day.

At 2705 kcals, nursing students' mean daily energy expenditure was higher than the 2300 to 2500 kcals previously reported for the typical university female (Kalkwarf et al., 1989; Passmore & Durnin, 1955; Watson & Jennings-

White, 1974) or non-obese female (Meijer, Westerterp, van Hulsel, & ten Hoor, 1992). According to the categorization provided by the Canadian Nutrition Recommendations (Canada Health and Welfare, 1990), the nursing students, with an energy expenditure exceeding 2500 kcals, would be classified as having a heavy activity level. At first glance, the student's energy expenditures might appear inflated: they spent almost three-quarters of their time sleeping (category 1) and in sedentary activities (category 2). The time spent in these activities represents a sedentary daily energy expenditure of 1363 kcals, which approximates the 1660 kcals predicted from the students heights and weights according to the regression formula of Webb & Sangal (1991) and compares favourably to basal or sedentary energy expenditures (1300–1800 kcals) reported in other female groups (Canada Health & Welfare, 1990; Meijer et al., 1992; Staten, 1991; Watson & Jennings-White, 1974; Webb & Sangal, 1991). This sedentary activity, though comprising a substantial proportion (71.1%) of the students' day, accounts for only 50% of their total energy expenditure. Activities of moderate to high intensity comprised 12.6% of the students' energy expenditure, which, translated into an energy expenditure of 344 kcals, is the equivalent of a typical 45-minute to one-hour exercise session (McArdle et al., 1991). Light intensity activities, consuming an average of 1020 kcals over a 24-hour period, accounted for the greatest percentage of the nursing students' active energy expenditure; they appeared to differentiate nursing students' energy expenditures from those reported previously by other female students. This suggests that energy expenditures were at the magnitude reported by students.

As a group, the nursing students matched the recommended energy intake of 2100 kcals for females 19 to 24 years of age engaged in light activity (Canada Health and Welfare, 1990). Previous studies of female university students have tended to report lower energy intakes (1013 to 1930 kcals) (Bailey & Goldberg, 1989; Driskell, Keith, & Tangney, 1979; Gottschalk et al., 1977; Hernon et al., 1986; Jakobovits et al.,1977). The nursing student intakes were similar to the values reported by Kalkwarf, et al., (1989) for free-living female college students and staff (2163 kcals), but lower than the physical education students (2346 kcals) studied by Watson & Jennings-White (1974). Furthermore, both the inter- and intra-individual variation in energy intake was comparable to previous studies (Jakobovits et al.,1977; Kalkwarf et al., 1989; Tarasuk & Beaton, 1991; Watson & Jennings-White, 1974). A trend of declining intake across successive days (Thursday, Friday, Saturday) was noted, which was the reverse of that typically reported (Basiotis, Thomas, Kelsay, & Mertz, 1989; Watson & Jennings-White, 1974).

The large variations in energy balance for individual students may reflect a general trend towards overestimation of energy expenditure and underestimation in energy intake. Large individual variations in energy balance both

over the duration of the reporting period and on a daily basis, while consistent with previous studies (Drougas et al., 1992; Durnin, 1957; Durnin, 1961; Watson & Jennings-White, 1974), may be due to inaccuracies in self-reporting. There may be a discrepancy between actual and reported energy expenditures (Ainsworth, Haskell, Leon, Jacobs, Montoye, Sallis, & Paffenbarger, 1993; Bouchard et al., 1983) or the amount of time actually spent in any given activity may be inaccurately estimated (Bouchard et al., 1983). With the self-recording of food intake, underestimation of energy intake may occur as a result of omitting small-quantity food items (Krall & Dwyer, 1987), altering food intake to make recording easier, or reducing food intake because of heightened awareness from the recording of what is being eaten (Barr, 1987). Drougas et al. (1992) attributed their negative energy balance to under-reporting, with the lowest differences between intake and expenditure appearing in the subgroup (dietitians) that was most highly trained in the food-recording process. In the current study, the nursing students had been fairly well trained, were highly motivated, and extremely interested in obtaining a profile of their nutritional and activity status. Although there was no way to check that students recorded accurately, food records have been shown to reflect actual intake (Bergman, Boyungs, & Erickson, 1990; Karvetti, & Knuts; Krall & Dwyer, 1987). Furthermore, the possibility of under-reporting may be offset by some overestimation of food portion sizes and certain food items (Rapp, Dubbert, Burkett, & Buttross, 1986; Webb & Yuhas, 1988).

A more likely explanation for the large energy deficits is that several of the students had reduced their energy intake to achieve a net negative energy balance; in fact, a third of the students were dieting and had been successful in losing weight during the previous month. The concern women have with their weight and the prevalence of eating disorders especially among college women have been well documented (Crockett & Littrell, 1985). Studies have shown that the numbers of college women on weight loss diets has ranged from 11% (Jakobovits et al., 1977) to 62% (Bailey & Goldberg, 1989), with the present group falling within this range. In the current study it was noted that anthropometrically the nursing students were similar to the Canadian norms (Fitness Canada, 1986) for height (50th %ile), weight (75th %ile), and body mass index (30th %ile). Only four students had BMI that fell outside the desirable weight range; two were classified as underweight and none were considered to be at a health risk (Fitness Canada, 1986).

It might be expected that a substantial proportion of the student's energy intake would be comprised of carbohydrates, to reflect their high energy expenditure. However, the carbohydrate contribution, which averaged 44% of energy intake, was not only below the 55% recommended Canadian standard (Canada Health and Welfare, 1990), but proportionately below that required for the demands of heavy activity. At 38% of energy intake, fat was

well above the 30% recommended and rose to as high as 42% on day three; protein ranged from 14% to 16% of energy intake, representing the upper limit of normal (Canada Health and Welfare, 1990). These trends are consistent with findings observed in non-athletic cohort groups but contrary to the higher carbohydrate and lower fat intakes observed in female runners (Manore, Besenfelder, Wells, Carroll, & Hooker, 1989; Pate, Sargent, Baldwin, & Burgess, 1990) and other female college athletes (Welch, Zager, Endres, & Poon, 1987), groups with whom the nursing students shared similar energy expenditures. Unlike this active but non-athletic group of nursing students, athletic individuals are perhaps better able to regulate macronutrient intake. The high fat intake reported by study participants compared to other student groups (Hernon et al., 1986; Manore et al., 1989; Ostrom & Labuza, 1977) may have resulted from their more frequent use of fast food restaurants (Shields & Young, 1990); 61% purchased fast foods once or twice weekly compared to a reported 45% use by the general population of one to three times per week (Shields & Young, 1990). Furthermore, the common misconception that carbohydrate-dense foods are high in calories may have led some nursing students to avoid these foods (Hernon et al., 1986). Except for unusually high fat and abnormally low carbohydrate intakes on day three (Saturday), however, macronutrient intakes in this study appeared typical and reasonably close to recommended nutrient values. Over three-quarters of the nursing students had not yet taken a university nutrition course, and might benefit from education focused on lowering the dietary fat content and raising the carbohydrate content. Welch, Zager, Endres, & Poon, (1987) found that a group of female college athletes who receiving nutritional counselling increased their intake of foods containing carbohydrates and fiber and decreased their intake of foods high in fat and cholesterol.

Despite a negative energy balance micronutrient intakes were not compromised in this group of nursing students; 77% of the students exceeded the recommended minimum daily energy intake of 1800 kcals and none of the remaining 23% were receiving less than 1200 kcals which is considered to be the cut-off point to ensure an adequate nutrient intake (Hernon et al., 1986). Consequently, all mean micronutrient intakes approximated or exceeded recommended Canadian values (Canada Health and Welfare, 1990); contrary to earlier studies, (Beerman, 1991; Gottschalk et al., 1977; Hernon et al., 1986; Hoffman, 1989; Ostrom & Labuza, 1977), the majority of nursing students were found to be at, or well above, the recommended nutrient intakes for calcium, iron, and vitamins. When mean individual intakes were calculated for the three days, two-thirds of the group had greater than 75% of the recommended nutrient intakes for iron and 90% of the group had greater than 75% of the recommended nutrient intakes for calcium. Few nursing students had vitamin intakes less than that recommended, with low intakes appearing for vitamins A and B only. More noteworthy are the excessive intakes of vitamins

A, B, and C; 52% to 71% of students were taking greater than 125% of Recommended Nutrient Intakes for all three vitamins. Since only one-quarter of the group consumed vitamin/mineral supplements, it would appear that diet alone was sufficient for the majority of nursing students to meet their daily requirement. This contrasts with Jakobovits et al. (1977) who found that only when their group of college women used iron supplements were they able to reach their recommended iron intake.

In summary, this is the first study to quantitatively assess the energy intake, energy expenditure, and nutrient status in a group of nursing students. The findings suggest that the nursing students had an adequate nutrient status even though energy intakes were inadequate to meet their high energy expenditures. Half of the students' total energy expenditure was comprised of physical activity, with light intensity activities making the largest contribution and activities of moderate to high intensity being only modestly represented. The significant contribution that daily personal and household activities make to energy expenditure should not be underestimated. While these findings indicate that macronutrient and micronutrient needs can be met when the daily energy intake is 1800 kcals or more, it is recommended that carbohydrate intake be increased to achieve energy balance, and fat intake be reduced to achieve a healthier nutritional status.

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Energy and Nutrient Intakes of Independently-Living, Elderly Women

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Trente-quatre femmes âgées, vivant de façon autonome, ont été les sujets d'une étude descriptive afin de déterminer les apports énergétiques et en éléments nutritifs. On a recueilli les données en utilisant la méthode du rappel de vingt-quatre heures et on a comparé les résultats aux *Apports nutritionnels recommandés* (1990) pour les femmes âgées au Canada. Concernant l'échantillon global, les apports moyens en énergie, en calcium et en zinc étaient au-dessous des niveaux recommandés. Pour les femmes âgées entre soixante-cinq et soixante-quatorze ans, l'apport moyen en acide folique se situait au-dessous du niveau recommandé. Tous les autres apports diététiques correspondaient ou excédaient les niveaux recommandés. Pour ce qui concerne les apports énergétique ou en éléments nutritifs sélectionnés selon l'âge (65–74 ans par opposition à 75–83 ans) ou selon le mode de vie (seules par opposition à celles vivant avec d'autres personnes), on n'a pas observé statistiquement de différence significative. La nutrition est un important volet de la santé et la plupart des interventions en soins infirmiers peuvent aider les femmes âgées à choisir une alimentation qui leur permettra de garder une bonne santé. Pour établir une connaissance pertinente, des études plus avancées et globales sur la nutrition sont nécessaires.

A descriptive study was conducted to determine the energy and nutrient intakes of 34 independently-living, elderly women. Data were collected using the 24-hour recall method, and compared to the 1990 Canadian Recommended Nutrient Intakes (RNI) for elderly women. Mean intakes of energy, calcium, and zinc were below recommended levels for the sample as a whole. The mean intake of folate was below recommendation for women in the age group 65 to 74 years. All other dietary intakes met or exceeded recommended amounts. No statistically significant differences were observed for energy or selected nutrient intakes by age (65 to 74 years old versus 75 to 83) or living arrangement (alone versus with other). Nutrition is an important aspect of health, and more nursing interventions can help elderly women to choose diets that support optimal health. Further comprehensive nutrition studies are needed to provide the relevant knowledge base.

The elderly, arbitrarily defined as people aged 65 and more, constitute the fastest growing segment of the population (Gauthier, 1991). In Canada approximately 11.6% of the population is elderly, and in Newfoundland, approximately 9.7% (Statistics Canada, 1992c). By the year 2031, the proportion of elderly in the Canadian population is expected to have increased to 23.8% (Statistics Canada, 1990a). Among the elderly, women outnumber men by almost three to two and the ratio increases with age (Statistics Canada, 1992a).

Nutrition influences the health status of the elderly (Bidlack, 1990; Posner, Fanelli, Krachenfels & Saffel-Shrier, 1987), and inadequate dietary intake is associated with increased morbidity and mortality (Chandra, Imbach, Moore,

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Skelton & Woolcott, 1991). Appropriate nutrition is fundamental to health promotion, disease prevention, and ultimately to quality of life (Chandra et al., 1991; Posner et al., 1987).

Literature Review

Data suggest that the dietary intakes of elderly women fall below current recommended levels for a number of nutrients. In particular, low intakes of vitamin A and calcium were found for both the national and Newfoundland samples of elderly women (Nutrition Canada, 1975). In other Canadian studies, independently-living, elderly women had low intakes of calcium (Leichter, Angel & Lee, 1978; Payette & Gray-Donald, 1991; Scythes, Zimmerman, Pennell & Yeung, 1989), vitamin D (Bourn, Gibson, & MacDonald, 1990; Payette & Gray-Donald, 1991; Scythes et al., 1989), zinc and folate (Payette & Gray-Donald, 1991), and thiamin and niacin (Leichter et al., 1978). As well, studies have demonstrated that the diet of this population is low in energy (Bourne et al., 1990; Lee, Olson & Friel, 1984; Leichter et al., 1978; Nutrition Canada, 1977; Payette & Gray-Donald, 1991; Scythes et al., 1989), relatively low in carbohydrate (Leichter et al., 1978; Nutrition Canada, 1977; Scythes et al., 1989), and high in fat (Bourn et al., 1990; Lee et al., 1984; Leichter et al., 1978; Nutrition Canada, 1977; Scythes et al., 1989).

Differences in study findings may be due, in part, to diverse data collection methods. Several studies used the single 24-hour recall method to assess dietary intake (Lee et al., 1984; Leichter et al., 1978; Nutrition Canada, 1975); other more rigorous studies used three-day food records (Bourn et al., 1990; Scythes et al., 1989) or a combination of the 24-hour recall and six-day food records (Payette & Gray-Donald, 1991). Weekend effects on dietary intake were taken into consideration in two of these studies by examining one (Scythes et al., 1989) or both (Payette & Gray-Donald, 1991) weekend days. Other studies used only weekdays (Bourn et al., 1990; Lee et al., 1984), or did not specify on which days dietary information was collected (Leichter et al., 1978; Nutrition Canada, 1975).

The extent to which the findings of previous studies can be applied to elderly women is limited. The Nutrition Canada National Survey was conducted on a randomized sample of 2,131 elderly women, including 108 in Newfoundland (Nutrition Canada, 1975). The sample was stratified by region, population type, and income. However, the study was carried out from 1970 to 1972 and may not accurately reflect current dietary intakes. Another randomized study collected data on 290 women, but was confined to the city of Toronto (Scythes et al., 1989). The remaining studies were carried out in Vancouver (Leichter et al., 1978), Guelph (Bourn et al., 1990), Saskatoon (Lee et al., 1984), and Sherbrooke (Payette & Gray-Donald, 1991), and

were based on convenience samples of 44 to 94 subjects. Most of the studies (Lee et al., 1984; Nutrition Canada, 1975; Payette & Gray-Donald, 1991; Scythes et al., 1989) examined subjects who were 65 years of age or more, but in two studies where the mean ages were greater than 65 years, women as young as 58 (Bourn et al., 1990) and 60 (Leichter et al., 1978) were included.

It has been suggested in the literature that age and living arrangement influence dietary intake of the elderly. Individuals may compensate for a progressive decline in basal metabolism and activity by gradually consuming less food, whicn in turn may result in an inadequate intake of specific nutrients (Bidlack, 1990). It has been proposed that people who live alone are also at risk for inadequate nutrient intake because of the negative impact of loneliness on appetite (Bidlack & Smith, 1988; Silver, 1988). However, the available findings do not support a relationship between dietary intake and age (McGandy et al., 1986) or living arrangement (Davis, Randall, Forthofer, Lee & Marger, 1985; Ryan & Bower, 1989).

No recent studies were found that addressed the dietary intakes of elderly Newfoundlanders. The purpose of the current study, therefore, was to determine the energy and nutrient intakes of elderly women living independently in St. John's, Newfoundland and to compare their intakes with the Canadian Recommended Nutrient Intakes for elderly women (Health and Welfare Canada, 1990). A better understanding of dietary intakes in the elderly would be useful for the develpment of nursing interventions to improve nutrition and, ultimately, health and quality of life in that population. This research was part of a larger project that involved a comprehensive health assessment of independently-living seniors.

Method

Subjects

Included in the study were independently-living, elderly women who attended either a blood pressure clinic or a seniors' friendship group, two services offered by a seniors' resource centre. The study purpose, procedures, and voluntary participation were explained to all prospective subjects and consent was obtained. The convenience sample consisted of 34 subjects identified by a code number, and all data were group analyzed.

Characteristics of the sample are presented in Table 1. The subjects ranged in age from 65 to 83 years with a mean of 74 years ($\underline{SD}$ = 5.6). Only 7 subjects were married, 2 were single, and 25 were widowed. Eighteen of 33 subjects had completed a minimum of high school. Twenty-two of 33 subjects lived alone.

Table 1

Characteristics of the sample of independently-living elderly women (N=34)

Characteristic	Frequency (%)
Age (years)	
65–69	9 (26.5)
70–74	10 (29.4)
75–79	7 (20.6)
80–84	8 (23.5)
Marital status	
Single	2 (5.9)
Married	7 (20.6)
Widowed	25 (73.5)
Educational level*	
Some college/university	7 (23.2)
High school graduate	11 (33.3)
Some high school	5 (15.2)
Less than high school	10 (30.3)
Living arrangements*	
Alone	22 (66.7)
With spouse	7 (21.2)
With relative	3 (9.1)
With friend	1 (3.0)

Note: *N=33

The subjects' weights ranged from 48.1 kg to 90.3 kg with a mean of 65.3 kg (SD = 10.0). Their heights ranged from 150 cm to 178 cm with a mean of 161 cm (SD = 7.0).

Twenty-four Hour Recall

Little work has been done to determine the best methods of dietary assessment to be used with the elderly. The single 24-hour recall was chosen for this study as it is simple and rapid, has a high rate of participation (Gibson, 1990), and has been widely used in nutrition investigations of the elderly (e.g., Lee et al., 1984; Leichter et al., 1978; Nutrition Canada, 1975).

Studies suggest the single 24-hour recall method is not reliable for estimating the usual intakes of individuals because of day-to-day variation in diet, but is relatively reliable for estimating the average usual intakes of groups (Beaton et al., 1979; Fanelli & Stevenhagen, 1986; Gersovitz, Madden & Smiciklas-Wright, 1978). Reliability of the 24-hour recall is improved when measurement errors are minimized. Underestimated intake, due to memory lapse, can be reduced by probing questions, and inaccurate estimation of portion size can be lessened by using household measures to specify food

portions (Gibson, 1990). A day-of-the-week effect was demonstrated in two studies of young women; their intakes on weekend days differed from that on weekdays (Beaton et al., 1979; Gibson, Gibson & Kitching, 1985), but no such studies were found on elderly women.

Internal validity of the 24-hour recall was examined by comparing the actual observed intake in two groups of noninstitutionalized elderly. The recalled energy was less (Madden, Goodman & Guthrie, 1976) and the recalled protein was more (Gersovitz, et al., 1978) than the mean actual intakes. The group mean values for the intakes of all other dietary components were similar by the two methods. In general, both studies revealed that the 24-hour recall yields a relatively valid estimate of the mean intake of groups of elderly subjects.

The 24-hour recall has also been examined for relative validity, by evaluating it against a comparable reference method. Dietary intake determined by the 24-hour recall was consistent with that determined by a one-day food record for a group of noninstitutionalized elderly (Fanelli & Stevenhagen, 1986).

Procedure

The subjects were interviewed in their homes to allow easy access to food labels and information about quantities of foods eaten. The 24-hour period preceding the interview was reviewed with each subject, beginning with the first food or drink consumed and progressing systematically through the day to include all meals and snacks. Probing questions were used to facilitate recall. Eight subjects recalled their 24-hour intakes for the preceding Sunday, 12 for the Monday, 7 for the Tuesday, 5 for the Wednesday, and 2 for the Thursday. Quantities were reported in standard household measures (e.g., cup, tablespoon, teaspoon). Information on the use of vitamin and mineral supplements was not obtained. The food items were analyzed for energy and nutrient composition using a computer program based on the 1991 Canadian Nutrient File and the 1988 Condensed File (Warwick, 1991).

Results

The means and medians for the intake of energy and 20 nutrients and, where applicable, means as percentages of recommended intakes are shown in Table 2. Since the recommended nutrient intake (RNI) values for energy, protein, and folate are different for women in the age groups of 50 to 74 years and 75 years or greater, results for these dietary components are presented separately for the two age groups.

Table 2

Energy and nutrient intakes of elderly women (N=34) compared with recommended nutrient intakes (RNI)

Energy and Nutrients	Mean	SD	Median	Mean as % of RNI
Energy (kcal)				
65–74 years	1541	684	1467	86
75–83 years	1562	371	1526	92
Protein (g)				
65–74 years	62.8	24.8	69.0	116
75–83 years	59.0	11.1	62.0	107
Folate (µg)				
65–74 years	181	87	152	93
75–83 years	229	87	218	114
Fat (g)	54.4	34.6	48.5	–
Cholesterol (mg)	208	140	148	–
Carbohydrate (g)	210.5	74.0	200.00	–
Total fibre (g)	15	10	13	–
Calcium (mg)	687	400	648	86
Zinc (mg)	7.8	6.1	6.7	87
Phosphorus (mg)	1033	452	987	122
Iron (mg)	12.23	6.15	10.40	153
Magnesium (mg)	226	136	202	108
Vitamin D (µg)	6.3	13.9	3.6	126
Vitamin A (RE)	1380	1170	956	172
Vitamin C (mg)	106	68	99	353
Thiamin (mg)	1.28	0.74	1.10	160
Riboflavin (mg)	1.36	0.52	1.32	136
Niacin (NE)	27.7	8.6	28.9	198
B_{12} (µg)	2.86	2.61	1.75	286
Sodium (mg)	2005	999	1865	—
Potassium (mg)	2743	998	2662	—

The Mann Whitney U Test for independent groups was used to determine whether differences existed between subgroups of the sample with respect to energy and selected nutrient intakes. The nutrients examined were the three that contributed to energy – namely protein, fat, and carbohydrate; and the three for which intake was below the recommended nutrient intakes – namely calcium, zinc, and folate. The sample was divided by: (a) age, either less than 75 years ($\underline{N} = 19$) or greater than or equal to 75 years ($\underline{N} = 15$); and (b) living arrangement, either alone ($\underline{N} = 22$) or with someone ($\underline{N} = 11$). These age groups are the two generally used in the literature, and are groups for which recommended nutrient intakes have been determined (Health and

Welfare Canada, 1990). No statistically significant differences, at $p < .05$, were observed in energy or nutrient intakes by age or living arrangement.

Discussion

The subjects in this study had a low mean energy intake, which is consistent with the findings of several other investigations of elderly Canadian women (Bourn et al., 1990; Lee et al., 1984; Leichter et al., 1978; Nutrition Canada, 1977; Payette & Gray-Donald, 1991; Scythes et al., 1989). The mean intakes of 1541 kcal for women less than 75 years of age, and 1562 kcal for women 75 years and over were below the current recommendations of 1800 kcal and 1700 kcal for these age groups, respectively (Health and Welfare Canada, 1990).

Protein intake was within recommended guidelines (Health and Welfare Canada, 1990) at 15.5% of total energy. This is similar to the findings of other recent Canadian studies of elderly women (Bourn et al., 1990; Payette & Gray-Donald, 1991; Scythes et al., 1989).

It has been suggested that fat should provide no more than 30% of total dietary energy (Health and Welfare Canada, 1990). The fat content of the subjects' diets furnished 31.1% of the energy intake, compared with 33% to 40% found in previous studies (Bourn et al., 1990; Lee et al., 1984; Leichter et al., 1978; Nutrition Canada, 1977; Payette & Gray-Donald, 1991; Scythes et al., 1989). Nevertheless, the mean cholesterol intake of 208 mg was satisfactory. There is no recommended nutrient intake for cholesterol, but Canadians have been advised to reduce their intake towards 300 mg per day or less (Health & Welfare Canada, 1990).

Carbohydrates supplied 53.4% of the subjects' total dietary energy, which is comparable to the recommended 55% (Health and Welfare Canada, 1990). In previous studies this figure varied from 47% to 53% (Leichter et al., 1978; Nutrition Canada, 1977; Payette & Gray-Donald, 1991; Scythes et al., 1989). Despite a satisfactory carbohydrate intake, the subjects' mean total dietary fibre intake of 15 gm was low. There is no Canadian recommendation for dietary fibre, but the World Health Organization (1990) recommends 27 to 40 gm daily.

The low calcium intake observed among the elderly women in the current study is consonant with previous observations (Leichter et al., 1978; Nutrition Canada, 1975; Payette & Gray-Donald, 1991; Scythes et al., 1989). The present research is in agreement with one other study in finding that the mean intake of zinc was low (Payette & Gray-Donald, 1991), but other studies of elderly women have reported that intakes were sufficient (Gibson, Marti-

nez & MacDonald, 1985; Scythes et al., 1989). Little information is available on folate consumption in elderly women. One study that spanned ages 65 to 89 years found a low intake (Payette & Gray-Donald, 1991), but in the current study, a low intake was evident only for women 65 to 74 years of age.

The means of all other nutrients met or exceeded recommended amounts; intakes of vitamins C, niacin and B_{12} were well above recommended levels. A high mean intake of vitamin C has been consistently found among elderly Canadian women (Bourn et al., 1990; Lee et al., 1984; Leichter et al., 1978; Nutrition Canada, 1977; Payette & Gray-Donald, 1991; Scythes et al., 1989). On the other hand, some (Bourn et al., 1990; Nutrition Canada, 1977; Payette & Gray-Donald, 1991; Scythes et al., 1989), but not all studies (Leichter et al., 1978) reported high niacin intakes. The finding of a high intake of vitamin B_{12} is congruent with other research (Payette & Gray-Donald, 1991) and lends support to the contention that a dietary deficiency of that vitamin is rare (Bidlack, 1990).

Requirements for sodium and potassium are not well defined and recommended nutrient intakes have not been determined (Health and Welfare Canada, 1990). The intake of sodium in this study reflects only that found in foods and does not take added salt into account. Therefore, although the mean intake appears to be at an acceptable level, the subjects' actual sodium intake was probably higher. In general, Canadians consume too much sodium and it has been recommended that reduced consumption might lead to lower blood pressure (Health and Welfare Canada, 1990). The mean potassium intake was adequate (Health and Welfare Canada, 1990), and corresponds to that reported for elderly women in another Canadian study (Scythes et al., 1989).

No statistically significant differences in dietary intakes were found between the two age groups. This is consistent with a previous report of no age-related declines in energy and nutrient intakes in elderly women (McGandy et al., 1986). As well, there were no statistically significant differences between the dietary intakes of elderly women who lived alone and those who lived with someone. Two other studies reported similar findings (Davis et al., 1985; Ryan & Bower, 1989). In Newfoundland 25% (Statistics Canada, 1992b) and in Canada 34% (Statistics Canada, 1990a) of women aged 65 or older live alone, and these figures are expected to rise as longevity increases (Statistics Canada, 1990b). However, the influence of living arrangement on dietary intake, a little-studied subject, requires further research.

Limitations of the Study

The findings of this study should be interpreted with caution because a small sample size, and convenience sample were used, and the single 24-hour

recall method of dietary assessment has limitations. There were no data available on the demographic characteristics of elderly women who frequented the seniors' resource centre utilized in this study, nor on women who attend seniors' resource centres in Canada at large. Thus, it was not possible to determine whether the former population was representative of the latter one. It may be possible that women who receive services from seniors' centres have dietary intakes different from elderly women in the general population.

Recommendations

Overall, the women in this study had less than the recommended intake for each of energy, calcium and zinc. Women aged 65 to 74 had less than the recommended level for folate. While a dietary intake that is less than the recommended nutrient intake does not necessarily constitute a nutritional inadequacy, the greater the discrepancy between the two, the higher the probability of a deficiency (Health and Welfare Canada, 1990). As people age, their energy requirements decrease but it is believed that their nutrient requirements remain unchanged (Bidlack, 1990). Thus, it is important to consume nutrient-dense foods that are low in fat and high in complex carbohydrates. Nurses can help improve the dietary intake of elderly people by promoting these foods and encouraging the consumption of foods that are rich in such nutrients as calcium, zinc, and folate. As well, regular physical activity should be promoted as it not only improves mobility and general health, but it increases energy requirements, and therefore is likely to raise total energy and nutrient intakes without encouraging obesity (Health and Welfare Canada, 1990).

Although few studies are reported in the literature, available findings indicate that elderly Canadian men also consume less than the recommended nutrient intakes for energy and certain nutrients including carbohydrate, calcium, vitamins A and D, zinc, niacin and folate, and consume excessive fat (Leichter et al., 1978; Nutrition Canada, 1975, 1977; Payette and Gray-Donald, 1991; Scythes et al., 1989). Nutritional status is an important aspect of health. Clearly, more comprehensive nutrition studies need to be carried out in Canada on the elderly population.

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