

Predictors of Family Physician Use Among Older Residents of Ontario and An Analysis of the Andersen-Newman Behavior Model

Linda G. Houle, Alan W. Salmoni, Raymond W. Pong, Simon Laflamme, and Gloria A. Viverais-Dresler, *Laurentian University*

RÉSUMÉ

Les données sur l'utilisation des médecins de famille par les personnes âgées (65 ans et plus) de l'Enquête sur la santé en Ontario (1990) nous ont permis d'examiner les variables prédictives de leur utilisation selon les groupes d'âge et le sexe. À l'instar des études antérieures, les variables prédictives les plus importantes étaient le nombre de problèmes de santé et la perception de l'état de santé. Toutefois, en dépit des efforts en vue d'améliorer la force prédictive du modèle de comportement Andersen-Newman, ces variables n'ont expliqué que 29 pour cent de la variation de l'utilisation des médecins de famille lorsque le modèle a été appliqué aux personnes âgées interrogées dans le cadre de cette enquête. En outre, le niveau de variation expliqué est demeuré relativement bas lorsque des analyses ont été effectuées selon les groupes d'âge et le sexe. Bien que ce modèle de comportement soit le cadre conceptuel le plus fréquemment utilisé, la présente étude suggère qu'il n'est peut-être pas le plus approprié pour l'examen de l'utilisation des médecins de famille par les personnes âgées au Canada.

ABSTRACT

Using data on physician use by older adults (≥ 65 years) from the 1990 Ontario Health Survey (OHS), the present research investigated the predictors of family physician utilization across age and gender groups. Consistent with previous studies, number of health problems and self-rated health emerged as the most important predictors of family physician use. However, despite an effort to enhance the predictability of the Andersen-Newman Behavioral Model, the predictors explained only 29 per cent of the variance in family physician use when applied to the entire OHS older population. Furthermore, the level of explained variance remained consistently low when analyses were performed across age and gender

Key Words: Physician Utilization, Older Adults, Predictors.

Mots clés: Utilisation des médecins, personnes âgées, prédicteurs.

Manuscript received February 17, 1998; manuscrit reçu le 17 février 1998.

Manuscript accepted June 6, 2000; manuscrit accepté le 6 juin 2000.

Requests for offprints should be sent to: Les demandes de tirés-à-part doivent être adressées à:

Alan Salmoni

School of Human Kinetics

Laurentian University

Sudbury, ON

P3E 2C6

(asalmoni@nickel.laurentian.ca)

groups. Although the Andersen-Newman Behavioral Model has been the most widely used conceptual framework in the field, the present study suggests that this model may not be appropriate to study family physician use among older Canadians.

All levels of government in Canada are struggling with issues concerning the affordability of our health care system and solutions for its restructuring (e.g., National Advisory Council on Aging, 1989; Northcott, 1992; Ontario Ministry of Health, 1991; Roos, 1989). Although not an identical system, these same issues are being debated in the United States (e.g., Binstock, 1999). While there is no consensus on how to change the health care system, there is agreement that more effective and efficient use of services is essential. In Canada, one critical dimension of these services is the usage made of family physicians. As Chappell (1990) pointed out, Canadian physicians control approximately 80 per cent of insured health care costs. Using data from the Ontario Health Survey, 1990 (1992), the present research focussed on the reported utilization of family physicians by older adults. This age group is particularly important because it is the fastest growing segment of our population (Health and Welfare Canada, 1993b) and because older Canadians account for a disproportionately large percentage of our health care expenditures (Carrière & Pelletier, 1995; Roos, Shapiro, & Roos, 1984; Roos, Shapiro, & Tate, 1989). A study by Connidis and McMullin (1992) of seniors living in London, Ontario is revealing. Not only did (in this case community) service (e.g., home care) utilization increase with age, but in approximately 55 per cent of the cases, it was the physician's idea to access community care and 42 per cent of the time they arranged for the service used. Thus, utilization of physicians is significant because family physicians contribute significantly both directly and indirectly to system costs. It has also been shown that a significant predictor of future hospitalization of seniors is increased physician utilization (Wolinsky, Culler, Callahan, & Johnson, 1994).

The conceptual framework most commonly used by researchers to identify predictors of service utilization is the Behavioral Model developed by Andersen in 1968, and subsequently revised with his colleagues (Andersen & Newman, 1973; Andersen, 1995). In this model, utilization is conceptualized as a function of *predisposing* factors (e.g., demographic characteristics, attitudes and beliefs about health and illness, and health habits), *enabling* factors (e.g., availability of manpower and facilities, and accessibility of services), and *need for care* factors (e.g., perceived health status and number of health problems). In general, need factors have consistently emerged as the most powerful predictors of family physician use by older adults (Arling, 1985; Branch et al., 1981; Coulton and Frost, 1982; Cox, 1986; Evashwich, Rowe, Diehr, & Branch, 1984; Strain, 1990; Strain, 1991; Wan & Arling, 1983; Wan & Odell, 1981; Wolinsky, 1990; Wolinsky & Coe, 1984; Wolinsky et al., 1983; Wolinsky & Johnson, 1991),

with enabling and predisposing variables playing a much smaller role. Despite its prominent position, the Andersen-Newman Behavioral Model has been found to explain a relatively modest proportion of the total variance in service use. The amount of variance explained by studies using the Andersen-Newman model has ranged from 4 to 27 per cent (see Wan, 1989). The exceptions are Chappell and Blandford (1987) who were able to account for 37 per cent of the variance among their selected sample and Cox (1986) whose data explained 44 per cent of the variance among a particular ethnic group (Portuguese). Clearly, a large portion of the variation remains to be explained.

Notably absent in the utilization literature are Canadian studies that are based on a large representative sample of the older population. With the exception of one study by Chappell and Blandford (1987) and two studies by Strain (1990, 1991), all of the variables that have been cited as important factors influencing family physician use are based on American data. This makes results limited in their generalizability particularly because in Canada, universal medical coverage, including physician and hospital services, as well as coverage for prescription drugs and aides for daily living are available to all residents aged 65 and over. Thus, although the overall picture on the predictors of family physician use among older Americans is relatively well-established, further research based on a large representative sample of older Canadians seems warranted.

Using data on reported family physician utilization by older adults from the 1990 Ontario Health Survey (OHS), the purpose of the present research was to examine the predictors of family physician use among older Canadians. Because this research used a secondary data source, it was understood that the variables collected in the OHS might not be conceptually identical to those suggested in the Andersen-Newman model. This limitation was deemed acceptable for several reasons. First, in gerontological research in particular, it is very difficult to access a large, randomly selected, representative sample. The OHS, which cost the Ontario Government in excess of \$5 million, provides such a sample. Thus, the power of the statistical analyses and the generalizability of the results are optimal. Second, even if the variables provided by the OHS do not match those suggested by Andersen-Newman perfectly, the variables provided are consistent with most other studies completed to date in both Canada and the United States.

The primary objective of the present research was to predict physician utilization by older Canadians and a second objective was to test the adequacy of the Andersen-Newman model when applied to the OHS data. Consistent with past studies, it was hypothesized that need variables would emerge as the most powerful predictors of utilization, particularly since older Canadians are covered by universal medical care. In addition, it was hypothesized that the relative importance of factors would differ between males and females. It is known that females of all ages have more

illnesses than males (Arking, 1998; Ontario Ministry of Health, 1992; Trypuc, 1994). Several studies have shown that males and females exhibit different health care behaviours (Kart & Engler, 1995; McEachreon, Salmoni, Pong, Garg, & Viverais-Dresler, 2000; Mutchler & Bullers, 1994). Since the life expectancy of Canadian females is considerably greater than that of Canadian males and since males and females often suffer from different health problems (Elliot, 1996; Trypuc, 1994), understanding gender differences is critical in any restructuring attempt.

Methodology

Ontario Health Survey

The 1990 Ontario Health Survey (OHS) is a population-based health survey designed to be representative of each of the province's 42 Public Health Units (PHUs). Statistics Canada was contracted by the Ontario Ministry of Health to design, select the PHU samples based on population numbers from the 1986 Census, and to conduct the survey. The target population within the PHUs consisted of all Ontarians who were residents of non-institutional dwellings during the survey period from January through December 1990, but did not include foreign service personnel, people in institutions, such as hospitals and correction facilities, residents of Indian reserves, and residents of extremely remote locations.

The OHS was conducted in two stages. The first stage of the survey, a 22-page questionnaire, was completed by interviewing one member of a sampled household who was knowledgeable enough to answer questions pertaining to everyone in the household. Questions dealt with demographic characteristics, recent or current health status, disability days, accidents and injuries, health status, chronic health problems, and the use of health services. The second stage of the survey was a 26-page self-completed questionnaire administered within each sampled household to each member 12 years and older. Included in the self-completed questionnaire were questions on self-rated health, family relationships and social supports, use of medications and drugs, smoking, alcohol use, physical activities, and nutrition. A more detailed description of the survey can be found in the *Ontario Health Survey 1990: User's Guide Volume 1: Documentation* (Ontario Ministry of Health, 1992b). Overall response rate was 87 per cent for the personal interview portion and 77 per cent for the self-completed questionnaire portion.

Because the sample was stratified by health unit, the probabilities of inclusion in the OHS differed among households and individuals across the province. Therefore, each respondent was assigned a weight reflecting the number of people in the entire province that that person represented. In addition, weights were adjusted to reflect household and individual non-responses to the interview portion of the survey and household- and person-level non-response to the self-completed questionnaire. Since the conclusions to be drawn from this research were to reflect the Ontario-wide

population, the weighting factor was applied to all data. For example, the OHS dataset includes responses from a total of 61,239 individuals, weighted to an effective size of 9,743,720 people in Ontario.

Participants for the Present Research

This research focussed on the health data obtained from those Ontario residents of private dwellings aged 65 years and older. This means that the results of the present study can be generalized to community dwelling seniors, but not to those living in institutions. A total of 7,112 older adults participated in this survey (4,034 women and 3,078 men), weighted to an effective size representing 1,124,599 older adults in Ontario (659,075 women and 465,524 men).

The average age for the entire sample was 72.69 years. Over one-half (58.6%) were females. Almost one third (28%) of the subjects lived alone, whereas 72 per cent lived with others, most often a spouse. Relatively few (21.7%) had more than a Grade 12 education, with half reporting having completed primary education.

Measures

Dependent Variables

In this study, family physician utilization was defined as the total number of visits to a general practitioner (GP), which included visits to a family physician (FP), during a one-year period. The number of visits to a GP/FP per year ranged from 0 to 98, with a mean of 5.7 and a standard deviation of 7.3. In most studies, the actual number of visits to a family physician has been used for the analyses. However, a test of linearity indicated that this dependent variable was not normally distributed. Since some (Wolinsky & Coe, 1984) have suggested that truncating the dependent variable corrects for the positive skew of the distribution, the measure of utilization was truncated such that 13 or more visits in one year were statistically treated as 13 visits.

Independent Variables

Using the Andersen-Newman model, the determinants of family physician utilization which were selected for this study were grouped into predisposing, enabling, and need categories. The operational definitions of the independent variables are summarized in Table 1. As noted in the introduction, not all of the variables provided by the OHS are completely identical to those suggested in the Andersen-Newman model. The operationalizations differ most notably from the original model because of an absence in the OHS of measures representing the community component (i.e. ratios of health personnel and facilities to the population) in the enabling category, and the absence of evaluated symptoms or diagnoses in the need category. However, none of these variables emerged as important predictors in previous studies.

Table 1

Operational definitions of variables used in examining family physician use

Predisposing Characteristics

| | |
|--------------------|--|
| Age | Number of years |
| Gender | 1 = female, 0 = male |
| Education | 1 = primary to 5 = completed post |
| Living Arrangement | 1 = living with others, 0 = living alone |
| Physical Activity | 1 = participant, 0 = non-participant |
| Health Worries | 1 = worries, 0 = no worries |

Enabling Characteristics

| | |
|-------------------------|---|
| Family Functioning | 1 = healthy, 0 = dysfunctional |
| Household Income Status | 1 = <20,000, 2 = 20,000–50,000, 3 = >50,000 |
| Medical Coverage | 1 = yes, 0 = no |
| Ability to Drive | 1 = yes, 0 = no |
| Size of Community | 1 = rural, 0 = not rural |

Need Characteristics

| | |
|------------------------------|---------------------------------------|
| Self-rated Health Status | 1 = excellent to 5 = poor |
| General Activity Limitations | 1 = yes, 0 = no |
| Functional Disability | 1 = limited, 0 = not limited |
| Number of Health Problems | ranges from 0 to 8 |
| Sum of Disability Days | ranges from 0 to 14 |
| Loneliness | 1 = lonely, 0 = not lonely |
| Emotional State | 1 = interest in life, 0 = no interest |

Predisposing Characteristics

Variables in the predisposing category included both socio-demographic and health belief measures: age, gender, education, living arrangement, health worries, and participation in physical activity. Although many of these variables are straightforward indicators that need little discussion, others are not. For instance, for the health worries variable, respondents were asked whether their health for the past 12 months had caused them a great deal of worry most of the time, more than half of the time, less than half of the time, or hardly ever. To maximize the difference involved, the respondent's answers were dichotomized into those expressing health worries versus not expressing health worries.

A shortcoming in prior studies on family physician utilization has been the absence of measures on whether or not an individual participated in physical activity. Since physical activity is generally expected to be a healthy behaviour and has also been found to be positively associated with emotional well-being (Health and Welfare Canada, 1993a), it is reasonable to assume that family physician use would be less frequent among those who exercise. A list of various activities was presented to the respondent in the self-completed questionnaire and based on their responses, persons were classified as being a participant or non-participant in some physical

activity. A "yes" response to any activity defined a person as a participant, while a "no" response indicated a non-participant.

Enabling Characteristics

Five enabling variables were used in this study. Two of these were household income status and whether the respondent had any kind of government or private insurance plan which paid for all or part of the cost of prescribed medication or other health services (not including OHIP). A measure of whether or not the respondent was able to drive was also included. Size of community was included as an enabling variable because it was assumed that access to care improved as the size of the community in which the respondent resides increases, since bigger communities are likely to have more health resources. A variable on family functioning was also included as an enabling variable. This variable was derived from a 12-item scale which leads to one single score (see Byles, Byrne, Boyle, & Offord, 1988). It included questions on whether or not the respondent felt that he or she could turn to family for support, whether or not the family got along, and if the family members confided in each other. Scores less than 2.17 were categorized as functional, while scores greater than or equal to 2.17 were categorized as dysfunctional. The cut-off point marking functional and dysfunctional families has been identified as the best criterion in distinguishing families seeking clinical help from those in the general population. Since the influence of family and friends on an individual's health is now well recognized, the inclusion of this measure in the model will make it possible to determine if the overall health or pathology of the family has an effect on family physician use.

Need Characteristics

Seven need variables were used: self-rated health, functional disability, general activity limitations, the total number of self-reported health problems, the number of disability days in the past 14 days, feelings of loneliness, and emotional state. Self-rated health status was assessed by asking respondents: "In general, compared to other persons your age, would you say your health is excellent, very good, good, fair or poor?". Functional disability was determined by combining two questions which identified those persons who needed the help of another person in such daily activities as eating, bathing, shopping and household chores. General activity limitation was measured by asking the respondents: "Compared to other people of the same age in good health, are you limited in the kind or amount of activity you can do because of a long-term physical or mental condition or health problem?".

Although the Ontario Health Survey did not focus on mental health, because the Ontario Mental Health Foundation sponsored a separate survey on mental health, there were two measures in the OHS that could be used as important markers of psychological needs. First, respondents

were asked whether they had felt lonely for the past 12 months: most of the time, more than half of the time, less than half of the time, or hardly ever. To maximize the contrast involved, the responses were dichotomized as lonely versus not lonely. Based on prior studies (e.g., Berg, Mellstrom, Persson, & Svanborg, 1981), it was expected that those who reported a higher level of loneliness would likely make more family physician visits. Another measure used in the OHS to tap an individual's emotional state was the question on how respondents usually felt: happy and interested in life, somewhat happy, somewhat unhappy, unhappy with little interest in life, or so unhappy that life is not worthwhile. Responses were dichotomized as interested in life versus not interested in life.

Statistical Analysis

Separate stepwise multiple regression analyses were conducted to determine which independent variables emerge as the best predictors of family physician utilization. A first regression analysis was performed with the entire older population and then with age and gender groups. It should be noted that because of the very large sample size in the OHS, most variables were significant for all regression analyses. The working rule that was adopted then for all of the regression analyses was that those variables that produced standardized regression coefficients greater than the cut-off value of $\pm .10$ (Heise, 1969) and that contributed at least 1 per cent to the explained variance in family physician use were considered as important predictors.

Tests of linearity and homogeneity of variance (using scattergrams) revealed that no regression model assumptions were violated. Additional analyses were also performed to assess multicollinearity problems by regressing each independent variable on all of the other independent variables. Only two independent variables (marital status and living arrangement, $r = .76$) exceeded the suggested cut-off level (i.e. $r = .60$), indicative of collinearity problems (Eastman, 1984). This suggested that respondents who reported living with others were either married, living in common law, or living with family/friends. Thus, to maximize the differences involved between those living alone and those living with others, the results presented here include only living arrangement.

Lastly, a factor analysis was performed to test the goodness of fit of the Andersen-Newman Behavioral model to the older adult OHS data. Since previous studies have consistently found that the Andersen-Newman Behavioral model explains a relatively modest proportion of the total variance in family physician use among older adults, there were reasons to believe that the overall conceptual view of this model may not be appropriate. Thus, a factor analysis was used to determine whether or not the underlying constructs that explain the correlations among the OHS variables would be similar to the three sets of categories defined by Andersen and Newman (1973).

Table 2Predictors of family physician utilization for the entire OHS sample ($n = 455, 628$)

| Predictor Variables | <i>r</i> | <i>Beta</i> | <i>R</i> ² |
|-------------------------------------|----------|-------------|-----------------------|
| <i>Predisposing Characteristics</i> | | | |
| Age | .111 | .04 | .001 |
| Gender | .069 | .04 | .001 |
| Education | -.172 | -.09 | .012 |
| Living Arrangement | -.004 | .04 | .006 |
| Health Worries | .277 | .10 | .010 |
| Physical Activity | -.142 | -.05 | .003 |
| <i>Enabling Characteristics</i> | | | |
| Family Functioning | -.089 | -.03 | .001 |
| Household Income | -.154 | -.06 | .003 |
| Medical Coverage | -.021 | -.006 | .00004 |
| Ability to Drive | -.128 | .02 | .0002 |
| Size of Community | .030 | .02 | .0005 |
| <i>Need Characteristics</i> | | | |
| General Activity Limitations | .232 | -.01 | .0001 |
| Functional Disability | .178 | .03 | .008 |
| Number of Health Problems | .464 | .35 | .215 |
| Self-rated Health | .360 | .15 | .040 |
| Sum of Disability Days | .211 | .04 | .002 |
| Feelings of Loneliness | .153 | .03 | .0006 |
| Emotional State | -.148 | .03 | .001 |
| Overall $R^2 = .29$ | | | |

Note. All variables were significant at $p < .0001$.

Results

One-tenth of the OHS older adult population (10.8%) did not visit a family physician at all during the 12-month period prior to the survey, while 22.5 per cent made only one to two visits per year. In addition, 21.7 per cent reported between seven and 13 visits per year, while only 5.2 per cent reported visiting the family physician more than once a month. Consistent with previous studies (e.g., Roos & Shapiro, 1981), these findings show that a small segment of the older population accounts for a large proportion of family physician utilization.

Predictors of Family Physician Use Among Older Adults Related to Andersen-Newman's Model

Table 2 contains the correlation coefficients, the standardized coefficients, and the unique contribution to the overall variance for family physician utilization of the predisposing, enabling, and need variables. The most important results concern the overall fit of the Andersen-Newman Behavioral Model when applied to the entire older OHS sample. In these data, the model explained 29 per cent of the variance in family physician visits. For the most part, the level of explained variance achieved herein is

consistent with past research. For example, Wolinsky and Coe (1984) were able to explain 20 per cent of the variance in physician visits and Strain (1991) was able to explain 21 per cent of the variance.

The second important aspect of the results was the predictive strength of the individual variables. All of the variables were significant at $p < .0001$. However, only four variables – the number of health problems, self-rated health, education, and health worries – had standardized coefficients greater than the suggested cut-off value of $\pm .10$ and contributed at least 1 per cent to the explained variance. As indicated by the data, the two measures of need combined to explain 26 per cent of the variance, while the two predisposing variables added 2 per cent to the explained variance. Although the enabling variables were statistically significant, none of them contributed at least 1 per cent to the explained variance.

With the very large sample size in the present study it was possible to run separate regression analyses for different age groups. While not the primary focus of this study, this additional analysis seemed warranted because of the inherent interest in aging and because few other studies have had sufficient sample sizes to permit such age analyses. Therefore, we ran separate regression analyses for the following four age groups: 65–69 years, 70–74 years, 75–79 years, and 80 years and above (these age groups made up approximately 39%, 26%, 20%, and 15% of the sample, respectively). These separate analyses differed very little from the overall analyses, since most of the variance in physician utilization was explained by need factors. Three age-specific findings are of note. In the 80 years and over age group ability to drive and being physically active predicted more physician use. In the two 70 year-old age groups, having less education was associated with greater physician use. Finally, in the 70–74 year-old age group, being female and less physically active was associated with greater physician use. All of these age-specific factors had R^2 values between 1.2 and 2.4 per cent except physical activity in the 80 years and over age group ($R^2 = 3.4\%$).

Predictors of Family Physician Use for Older Males and Females

Regarding the factors associated with use for males, Table 3 indicates that only four variables contributed at least 1 per cent to the explained variance. These were the total number of health problems (19%), self-rated health (4%), education (2%) and levels of loneliness (1%). The most important predictors of use among females were the number of health problems (21%), self-rated health (4%) and health worries (1%). Again, both regressions explain approximately the same amount of variance ($R^2 = 28\%$ for males and $R^2 = 31\%$ for females). Contrary to our expectations, neither the type of predictor nor the relative importance of each varied much between older males and females.

Table 3

Predictors of family physician utilization for males and females

| Predictor Variables | Males | | Females | |
|-------------------------------------|-------|----------------|---------|----------------|
| | Beta | R ² | Beta | R ² |
| <i>Predisposing Characteristics</i> | | | | |
| Age | -.01 | .0005 | .06 | .003 |
| Education | -.12 | (.023) | -.04 | .001 |
| Living Arrangement | .03 | .0006 | .06 | .003 |
| Health Worries | .07 | .006 | .11 | (.010) |
| Physical Activity | -.02 | .0007 | -.07 | .007 |
| <i>Enabling Characteristics</i> | | | | |
| Family Functioning | -.04 | .001 | -.02 | .0004 |
| Household Income | -.05 | .002 | -.07 | .004 |
| Medical Coverage | .04 | .001 | -.05 | .003 |
| Ability to Drive | -.01 | .0001 | .03 | .0008 |
| Size of Community | .02 | .0005 | .02 | .0003 |
| <i>Need Characteristics</i> | | | | |
| General Activity Limitations | NS | NS | -.02 | .0002 |
| Functional Disability | NS | NS | .05 | .001 |
| Number of Health Problems | .32 | (.191) | .37 | (.231) |
| Self-rated Health | .15 | (.038) | .16 | (.043) |
| Sum of Disability Days | .04 | .001 | .04 | .002 |
| Loneliness | .10 | (.012) | -.008 | .00006 |
| Emotional State | .02 | .0004 | .054 | .002 |
| Overall R ² | | .28 | | .31 |

Note: All variables were significant at $p < .0001$. R² coefficients enclosed in parentheses represent those variables that contributed at least one percent to the explained variance. NS = Not significant.

Testing the Categories of the Andersen-Newman Behavioral Model

The first factor analysis using only the meaningful predictors from the regression analysis (i.e. number of health problems, self-rated health, education and health worries) indicated that all variables loaded significantly on one factor (Eigenvalue = 1.800). Furthermore, unlike the three sets of categories identified by the Andersen-Newman Behavioral Model, a second factor analysis using all variables included in this data set (both significant and nonsignificant predictors) produced seven factors which explained 58.9 per cent of the variance. As shown in Table 4, the first factor (Eigenvalue = 3.130) was positively correlated with general activity limitations, the number of self-reported health problems, the sum of disability days, functional disability, and self-rated health. Aside from this factor which could be interpreted as describing the need characteristics of older individuals, no other factors comparable to that of the Andersen-Newman Behavioral Model were revealed. Thus, although the model seems conceptually defensible, these findings suggest that there are no statistical reasons to support the model based on the older adult OHS data.

Table 4
Factor matrix describing the relationships between the family physician utilization variables

| <i>Variables</i> | <i>Factor 1</i> | <i>Factor 2</i> | <i>Factor 3</i> | <i>Factor 4</i> | <i>Factor 5</i> | <i>Factor 6</i> | <i>Factor 7</i> |
|------------------------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| General Activity Limitations | .72610 | | | | | | |
| Number of Health Problems | .72567 | | | | | | |
| Sum of Disability Days | .64744 | | | | | | |
| Functional Limitations | .52284 | | | | | | |
| Self-rated Health | .50283 | | | | | | |
| Loneliness | | .71234 | | | | | |
| Emotional State | | -.68814 | | | | | |
| Family Functioning | | -.55369 | | | | | |
| Health Worries | | .54860 | | | | | |
| Household Income | | | .77299 | | | | |
| Education | | | .72221 | | | | |
| Gender | | | | -.82737 | | | |
| Ability to Drive | | | | .71983 | | | |
| Age | | | | | -.67563 | | |
| Physical Activity | | | | | .64103 | | |
| Living Arrangements | | | | | | .82434 | |
| Size of Community | | | | | | | -.72093 |
| Medical Coverage | | | | | | | .62909 |

Discussion

Predictors of Family Physician Use Among Older Residents of Ontario

As noted earlier, most research using the Andersen-Newman Behavioral Model has found that need factors are the most powerful predictors of family physician use among older adults (Evashwick et al., 1984; Strain, 1991; Wolinsky, 1990; Wolinsky & Johnson, 1991). Consistent with these studies, the present results indicated that those who experienced a greater number of health problems and had lower levels of self-rated health were more likely to use family physician services. Given that older adults generally enter the medical system based upon their need for health care, steps could be taken to educate them on how to define "need". For instance, information on how to identify the different types of problems most commonly experienced by older adults, as well as information on how to interpret different symptoms could be provided to help them understand the problem and decide on the actions that should be taken. To further support this idea, the present study also revealed that worrying about one's health resulted in greater levels of utilization. According to Wolinsky and Johnson (1991), "in the presence of repetitive measures of health status, this provides further evidence that both the worried well and the worried ill place greater demands on the system than the need characteristics alone would indicate" (p. 355). Thus, if older adults are educated on how to define the problem(s) they are experiencing, this will help them to decide whether or not family physician services are indeed needed. For effective decision making and efficient use of services, older adults must be well informed on matters that are critical for day-to-day living.

Critique of the Andersen-Newman Behavioral Model

Overall, it is evident that these data are consistent with past research. However, although the Andersen-Newman framework has been the most widely used conceptual model in the field, the present research suggests that this model may have limited utility in studying family physician use among older adults. Theoretically, Andersen and Newman (1973) argued that the important determinants of health service utilization had been identified and that improvements in the model's predictability would be enhanced by further refinement of the different measures. Yet studies to date have not provided any clearer portrayal of family physician utilization, despite many attempts to enhance the model by using different predictors.

One explanation as to why the Andersen-Newman Behavioral Model may be limited in examining family physician use among older adults involves the overall conceptual view of the traditional measures of predisposing, enabling, and need characteristics. In other words, does the Andersen-Newman Behavioral Model define the proper concepts? The present research found that when only the significant predictors (e.g., the number of health problems, self-rated health, education, and health worries) were

factor analysed, all variables loaded significantly on one factor. It is evident that these findings go against Andersen's and Newman's groupings since education and health worries were not grouped on a separate factor which would have been representative of predisposing factors. A second factor analysis using all variables in this data set (both significant and nonsignificant) revealed that there were seven factors as opposed to the three sets of characteristics identified in the model. Although one of these factors could be interpreted as describing need characteristics, no other factors comparable to those proposed by the Andersen-Newman Behavioral Model were revealed. Theoretically, this shows that while Andersen and Newman may have appropriately defined the need characteristics, the groupings among the enabling and predisposing variables are questionable. Thus, these findings suggest that the overall components of the model may need to be redefined before re-applying the model to older adults.

Another explanation for the limited utility of the Andersen-Newman Behavioral Model may be that the variables are inappropriate for the prediction of family physician utilization. For example, Wolinsky (1990) argued that the predisposing and enabling characteristics may no longer be important in the older adult's use of family physician services. Interestingly, the present research found that relatively few enabling factors contributed to the explanation of family physician utilization. However, an alternative explanation is that perhaps the lack of salience in the traditional enabling variables stems from faulty operationalization of variables. For instance, although income is generally considered to be an important enabling factor, it has been suggested by Strain (1990) that a difference in physician use according to income likely reflects inequities in health rather than inequities in access. This is particularly evident within the Canadian health care system where universal medical coverage, as well as coverage for prescription drugs and aides for daily living, are available to all residents. Thus, perhaps the enabling variables defined in the Andersen-Newman Behavioral Model are not the appropriate measures, particularly for older Canadians, in a universal health care system. This suggests once again that if further understanding of family physician use is to be gained, different predictors need to be identified.

Lastly, the fact that the same results emerge from a host of studies with different samples, measurements, and comparison groups from different health care systems suggests that consideration of a new research strategy is warranted. In support of this idea, Chappell (1994) has suggested that "it is time for researchers examining utilization to broaden their models . . . When only one theoretical approach is used, any biases within that approach are repeated from study to study" (p. 118). The Andersen-Newman Behavioral Model may be limiting our understanding of why older adults visit family physicians by assuming that the predictors of utilization are known. Based on present research this does not seem to be the case. Thus, it is suggested that substantial improvements in the proportions of

variance explained will not likely result from further research using this model. An alternative approach is required.

Rather than relying on large scale surveys, one possibility would be to obtain qualitative data on family physician utilization by conducting in-depth interviews with older adults, with no preconceived notion as to why they would seek medical care. Since the Andersen-Newman Behavioral Model relied on cross-sectional data, a shift is also necessary to capture the sequential decisions and actions that lead to utilization. This aspect is totally ignored in the Behavioral Model despite Andersen's and Newman's argument that the use of health services can be seen as a sequential and conditional function of the individual's predisposition to use health services, their ability to obtain them, and their need to consume them. Therefore, rather than attempting to conceptualize or understand family physician utilization statically, the concept of family physician utilization should be viewed as a series of steps leading to a decision to visit a family physician.

Two different research strategies seem promising. The first involves interviewing older adults as they come for their family physician visit. Meaningful information could be gained by asking in retrospect what had led him/her to visit a family physician. Although it is possible that the succession of variables may differ between individuals, this strategy would identify a host of variables which lead to family physician use. For instance, these variables might include whether the visit was patient-, family-, or physician-induced; whether use was for preventive health measures or responses to symptoms (acute or chronic); whether the visit was for drug prescriptions; or whether the visit was to ask a question regarding one's health or the health of a spouse. There are undoubtedly a wide range of other reasons which would be identified by the older adult themselves. Having identified key variables retrospectively, a second strategy would consist of constructing a questionnaire, and then randomly time sampling older adults (e.g., each having a personal beeper) at different times prior to a visit. It is believed that by examining the succession of variables that consequently lead to the decision to visit a physician, a more comprehensive understanding of physician utilization will begin to unfold.

References

- Andersen, R.M. (1995). Revisiting the behavioral model and access to medical care: Does it matter? *Journal of Health and Social Behavior*, 36, 1-10.
- Andersen, R.M., & Newman, J.F. (1973). Societal and individual determinants of medical care utilization in the United States. *Millbank Memorial Fund Quarterly*, 51, 95-124.
- Arking, R. (1998). *Biology of aging: Observations and principles*. Sunderland, MA: Sinauer Associates Inc.
- Arling, G. (1985). Interaction effects in a multivariate model of physician visits by older people. *Medical Care*, 23(4), 361-371.

- Berg, S., Mellstrom, D., Persson, G., & Svanborg, A. (1981). Loneliness in the Swedish aged. *Journal of Gerontology*, 36(3), 342-349.
- Binstock, R.H. (1999). Challenges to United States policies on aging in the new millennium. *Hallym International Journal of Aging*, 1(1), 3-13.
- Branch, L., Jette, A., Evashwich, C., Polansky, M., Rower, G., & Diehr, P. (1981). Towards understanding elder's health services utilization. *Journal of Community Health*, 7(4), 80-91.
- Byles, J., Byrne, C., Boyle, M.H., & Offord, D.R. (1988). Ontario child health study: Reliability and validity of the general functioning subscale of the McMaster Family Assessment Device. *Family Process*, 27, 97-104.
- Carrière, Y., & Pelletier, L. (1995). Factors underlying the institutionalization of elderly persons in Canada. *Journal of Gerontology: Social Sciences*, 50B, S164-S172.
- Chappell, N.L. (1990). *About Canada: The aging of the Canadian population*. Winnipeg, MB: Ministry of Supply and Services Canada.
- Chappell, N.L. (1994). Home care research: What does it tell us? *The Gerontologist*, 34(1), 116-120.
- Chappell, N.L., & Blandford, A.A. (1987). Health service utilization by elderly persons. *Canadian Journal of Sociology*, 12(3), 195-215.
- Connidis, I.A., & McMullin, J.A. (1992). Social support and service needs of older adults: Targeting groups at risk. Final report submitted to the Ministry of Community and Social Services, Toronto, ON.
- Coulton, C., & Frost, A. (1982). Use of social and health services by the elderly. *Journal of Health and Social Behavior*, 23, 330-339.
- Cox, C. (1986). Physician utilization by three groups of ethnic elderly. *Medical Care*, 24(8), 667-676.
- Eastman, B.D. (1984). *Interpreting mathematical economics and econometrics*. London: MacMillan Education Ltd.
- Elliot, G. (1996). *Facts on aging in Canada*. Hamilton, ON: The Office of Gerontological Studies, McMaster University.
- Evashwich, C., Rowe, G., Diehr, P., & Branch, L. (1984). Factors explaining the use of health care services by the elderly. *Health Service Research*, 19, 357-382.
- Health and Welfare Canada. (1993a). *Canada's health promotion survey 1990: Technical report*. Ottawa: Minister of Supply and Services Canada.
- Health and Welfare Canada. (1993b). *Ageing and independence: Overview of a national survey*. Ottawa: Minister of Supply and Services Canada.
- Heise, D. (1969). Problems in path analysis and causal inference. In E. Borgatta (Ed.), *Sociological methodology*. San Francisco: Jossey-Bass.
- Kart, C.S., & Engler, C.A. (1995). Self-health care among the elderly: A test of the Health Behavior Model. *Research on Aging*, 17(4), 434-458.
- McEachreon, S., Salmoni, A.W., Pong, R., Garg, R., & Viverais-Dresler, G. (2000). Anticipated choices among self-, informal, and formal care by older Canadians. *Journal of Health Psychology*, 5(4), 457-472.
- Mutchler, J.E., & Bullers, S. (1994). Gender differences in formal care use in later life. *Research on Aging*, 16(3), 235-250.
- National Advisory Council on Aging. (1989). *1989 and beyond - Challenges of an aging Canadian society*. Ottawa: Minister of Supply and Services Canada.
- Northcott, H.C. (1992). *Aging in Alberta: Rhetoric and reality*. Calgary, AB: Detlelig Enterprises Ltd.

- Ontario Ministry of Health. (1991). *Redirection of long-term care and support services in Ontario - A public consultation paper*. Ottawa: Minister of Supply and Services Canada.
- Ontario Ministry of Health. (1992a). *Ontario health survey 1990: Highlights*.
- Ontario Ministry of Health. (1992b). *Ontario health survey 1990: User's guide Volume 1, Documentation*.
- Ontario Ministry of Health. (1992c). *Ontario health survey 1990: User's guide Volume 2, Microtape*.
- Roos, N.P. (1989). How a universal health care system responds to an aging population. *Journal of Aging and Health*, 1(4), 411-429.
- Roos, N.P., & Shapiro, E. (1981). The Manitoba Longitudinal Study on aging. *Medical Care*, 19(6), 644-657.
- Roos, N.P., Shapiro, E., & Roos, L.L. (1984). Aging and the demand for health services: Which aged and whose demand? *The Gerontologist*, 24, 31-36.
- Roos, N.P., Shapiro, E., & Tate, R. (1980). Does a small minority of elderly account for a majority of health care expenditures? A sixteen-year perspective. *The Milbank Quarterly*, 67, 347-369.
- Strain, L.A. (1990). Physician visits by the elderly: Testing the Andersen-Newman framework. *Canadian Journal of Sociology*, 15(1), 19-35.
- Strain, L.A. (1991). Use of health services in later life: The influence of health beliefs. *Journal of Gerontology*, 46(3), S143-S150.
- Trypuc, J.M. (1994). Women's Health. In B.S. Bolaria & H.D. Dickinson (Eds.), *Health, illness, and health care in Canada*. Montreal, PQ: Harcourt Brace & Company.
- Wan, T. (1989). The behavioral model of health care utilization by older adults. In M.G. Ory & K. Bond (Eds.), *Aging and health care - Social science and policy perspectives*. New York: Routledge.
- Wan, T., & Arling, G. (1983). Differential use of health services among disabled elders. *Research on Aging*, 5(3), 411-431.
- Wan, T., & Odell, B. (1981). Factors affecting the use of social and health services for the elderly. *Aging and Society*, 1(1), 95-115.
- Wolinsky, F.D. (1990). *Health and health behavior among elderly Americans*. New York: Springer Publishing Company.
- Wolinsky, F.D., & Coe, R.M. (1984). Physician and hospital utilization among non-institutionalized elderly adults: An analysis of the Health Interview Survey. *Journal of Gerontology*, 39, 334-351.
- Wolinsky, F.D., Coe, R.M., Miller, D.R., Prendergast, J.M., Creek, M.J., & Chavez, M.N. (1983). Health service utilization among the non-institutionalized elderly. *Journal of Health and Social Behavior*, 24, 325-337.
- Wolinsky, F.D., Culler, S.D., Callahan, C.M., & Johnson, R.J. (1994). Hospital resource consumption among older adults: A prospective analysis of episodes, length of stay, and changes over a seven year period. *Journal of Gerontology: Social Sciences*, 49(5), S240-S252.
- Wolinsky, F.D., & Johnson, R.J. (1991). The use of health services by older adults. *Journal of Gerontology*, 46(6), S345-S357.