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OVER THE COUNTER DRUG USE AMONG A
SAMPLE OF MICHIGAN'S ELDERLY CONSUMERS:
ITS RELATIONSHIP TO SOURCES OF INFORMATION

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OVER-THE-COUNTER DRUG USE AMONG A SAMPLE OF MICHIGAN'S ELDERLY CONSUMERS: ITS RELATIONSHIP TO SOURCES OF INFORMATION

By

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ABSTRACT

OVER-THE-COUNTER DRUG USE AMONG A
SAMPLE OF MICHIGAN'S ELDERLY CONSUMERS:
ITS RELATIONSHIP TO SOURCES OF INFORMATION

By

Susan M. Evonne Brown

This research examined relationships between the subjective importance placed on certain sources of over-the-counter (OTC) drug information and the extent of OTC drug use among a sample of Michigan's elderly consumers. The influence of selected demographic, attitudinal and behavioral characteristics on the observed relationships between the extent of OTC drug use and the importance of information sources was examined. The role of these variables in predicting over-the-counter drug use and discriminating between levels of drug use (non-users, moderate users and heavy users) was also assessed.

Data used in this research were drawn from a previous study, Senior Citizens' Substance Use Survey, sponsored by the State of Michigan Office of Services to the Aging and Office of Substance Abuse Services. The original study had a stratified cluster sample of 384 persons age 60 and older. Data was obtained through personal interviews during November, 1977 to March 1978. Funding for this research report was provided by the Office of Services to the Aging. Data in this research were drawn from the original sample and new variables were created to test some of the hypotheses.

One-way ANOVA revealed that importance placed on doctors, pharmacists and oneself as sources of OTC drug information were positively and significantly related to OTC drug use. Significant differences were found between OTC drug users and non-users with respect to the importance placed on sources of OTC drug information. Users placed significantly more importance on sources than did non-users.

Overall, the analyses revealed that, in general, the importance scores for all five OTC drug information sources were positively related to each other and to increased OTC drug use. A factor analysis of the importance scores revealed two underlying factors accounting for the observed interrelations of the original scores. These two factors were the importance of professional sources and the importance of non-professional sources of OTC drug information. Consequently, these two factors were used in place of the original scores for the five sources.

The importance placed on professional sources for OTC drug information increased with OTC drug use, while the importance placed on non-professional sources was significantly greater for users than for non-users of OTC drugs. The relationship between OTC drug use and the importance of non-professional sources was qualified by race and marital status. Whites placed greater importance on non-professional sources with increased OTC drug use. Among non-whites, moderate users placed greatest importance on non-professional sources. Increasing importance was placed on non-professional sources with increased OTC drug use among those who were married and living with their spouse. For those who were widowed, single, separated or divorced, the importance of non-professional sources did not vary significantly among non-users, moderate or heavy users of OTC drugs.

The relationship between OTC drug use and the importance of professional sources for OTC drug information was not qualified by other variables. However, the importance of professional sources was significantly related to several variables. Those who placed more importance on professional sources were found to be white, living in urban areas, between the ages 60 and 70, to have been engaged in a skilled occupation and were relatively more active.

OTC drug use was related to two demographic variables. The t-test revealed that OTC drug use was somewhat greater among whites than among non-whites, and that OTC drug use was significantly greater among rural residents than among urban residents. Sex, age and whether a person lived alone or with others were not significantly related to OTC drug use. OTC drug use was found to be negatively related to two attitudinal variables. Respondents who were less satisfied with the way they spend their time and those who ranked their life low on a scale from worst possible to best possible made more use of OTC drugs. Health status was not related to OTC drug use in this study.

Multiple regression and discriminant analysis produced basically the same set of predictor variables. The factors which were most predictive of increased OTC drug use in this elderly sample were increased age, widowed marital status, rural residential location, low ranking of life, and increased importance placed on both professional and non-professional sources for OTC drug information.

The discriminant analysis produced two significant discriminant functions. One dimension primarily discriminated between non-users and heavy users. Heavy users were found to be more likely than non-users to be of a marital status other than widowed, to give a low ranking to

their life, place greater importance on professional information sources, and to place greater importance on non-professional information sources.

The second dimension primarily discriminated between moderate and heavy users of OTC drugs. Heavy users, more than moderate users, were more likely to be non-white, older, widowed, separated, single or divorced, living alone, spending more time watching television, and to have been engaged in a white collar occupation.

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CHAPTER I

INTRODUCTION

The human organism is, philosophically speaking, constantly searching for a perfect balance of health, which today includes easing the pressures of the reality and stress of life (Post and McGrath, 1976, p. 17). Maintaining or achieving balance in health requires that corrective action be taken to restore, maintain or elaborate the health state in the human organism. Man has always had to cope with this because it essentially determines the viability of his existence (Post and McGrath, 1976).

Health care resources in the environment can be utilized to facilitate corrective action in one's health balance. In the United States, major users of health care are the elderly. The elderly outspend, both in absolute and relative terms, other age groups in the category of health care (Bureau of Labor Statistics, 1976). Certain ailments, especially chronic ones are more prevalent among the elderly. One or more chronic conditions is suffered by eighty-six percent of persons age 65 or older (HEW, 1972). Some of these chronic conditions, including heart disease, arthritis, high blood pressure and gastrointestinal disease, can be relieved or controlled through the proper use of drugs (Lenhart, 1976; Lofholm, 1978).

An increase in chronic diseases results in an increased consumption of drugs and, per capita, the elderly use more drugs than younger

people. In 1967, while constituting 10% of the population, the elderly received roughly one-fourth of all prescriptions written (HEW, 1968) and it is probably safe to assume that their share of the non-prescription drug market was at least as large (Lofholm, 1978; Petersen and Whittington, 1977). According to Brady (1978) the latter expenditure likely represents a larger number of single doses taken per dollar spent than the former.

Medication, whether prescribed by the physician or used directly by the layman, is important in the relief of suffering and in the prevention and cure of disease (Keefer, 1965). Those drugs used directly by the layman provide therapeutic benefits for minor self limiting illnesses, relieve medical practitioners of extra burden and can save the expense of a doctor's visit. This latter benefit is cited by Lenhart (1976) as a factor in over-the-counter (OTC) drug use among the non-institutionalized elderly, where the cost of a doctor or clinic visit may seem prohibitive when weighed against a small fixed income.

Part of this small fixed income is budgeted for health care, yet it has been estimated that 50% of the elderly consumer's total drug and health care budget is an unnecessary expenditure because of the over use of drugs and health related products (Brady, 1978). Over use and even normal use have been cited as producing medical complications in the elderly (Lenhart, 1976; Holloway, 1974; Wynne and Heller, 1973). Increased use of drugs also increases the potentiality of complex and little understood interactions (Wynne and Heller, 1973). While in the purchase and use of prescription drugs, the elderly

patient is complying with the physician's orders, in the case of non-prescribed drugs, the elderly patient is diagnosing his own ailment and prescribing. Lofholm (1978) says that these conditions for self-medication can be quite different from those leading to medication with prescribed drugs.

In looking at conditions for self-medication, the environment must be taken into account. The environment can foster or inhibit these conditions. In America, legal drug use is sanctioned for a variety of problems. Our society actually fosters conditions for self-medication. Medications are publicly available so that the slightest need for self-medication can be gratified at almost any time and in almost any place (Friend, 1964). The relatively easy access of the American public to the purchase and use of over-the-counter medications is not without risk. In a three-year study of adverse drug reaction hospitalizations at the University of Florida Hospital Medical Service, non-prescribed drugs were found to be the cause of eighteen percent of these hospitalizations (Caranasos, Stewart and Cluff, 1974). Rabin and Bush (1976) note that concommitant use of prescribed and non-prescribed drugs, which has the potential for adverse drug reactions, is common in the population. Concerns are being expressed regarding the safety of self directed use of certain medications (Friend, 1964; Mandel, 1965; Sunshine, 1965). These concerns exist in part because there is limited extant information concerning self-medicating behaviors (Johnson, Pope, Campbell, and Azevedo, 1976) or concerning the factors that influence the purchase of over-the-counter remedies (Mandel, 1965).

The orientation of our society towards drugs has come under criticism. Bernstein and Lennard (1973) point to what they term a "medicalization of the human condition." Such human conditions as rage, anxiety, insomnia, sadness and obesity are now "medical" problems and chemical cures are promoted for them. Along these lines, Bourne (1973) posits that the extensive use and potential for drug abuse in the aging has resulted from the creation of "chemical solutions" for the emotional problems and needs of the elderly. The role of mass media in society's orientation is noted by Coombs, Fry and Lewis (1976) in their book Socialization and Drug Abuse.

> Mass media are a significant part of the socialization process of every individual -- directly through what he consumes and indirectly through media influence on physicians or those who influence him; his 'gatekeepers' (p. 8).

Not only is mass media, e.g., advertising, influencing the individual consumer but also doctors, pharmacists, friends and relatives of that consumer. Encouragement to purchase and use non-prescription drugs is given by advertising as well as the retail marketing system. According to Wynne and Heller (1973), the level of drug advertising and promotion seems to encourage drug use among the elderly. Additionally, the elderly have been cited as being susceptible to this advertising of non-prescription drugs (Plant, 1977) as well as of assorted vitamins, health foods and over-the-counter remedies (Brady, 1978).

James (1979) surveyed professionals such as doctors, pharmacists, nurses, dentists, and those in the service of aging and substance abuse agencies in the State of Michigan regarding seniors' substance use problems. She found that seniors' lack of knowledge was perceived by professionals at the most significant factor contributing to seniors' medication problems. Current modes of advertising were perceived as one

of the second most influential factors contributing to seniors' medication problems. However, virtually nothing is known regarding seniors' information sources for gaining knowledge about OTC drugs. How influential are certain information sources in the use of OTC drugs? Are advertising or market-dominated sources very influential or important to the elderly? Is the importance of information sources significantly related to over-the-counter drug use? Is the importance of certain information sources predictive of over-the-counter drug use? Aging brings with it a loss of roles in society and a concurrent lessening of opportunities for obtaining information in conjunction with such roles. Any reduction in the information available to a consumer puts him or her at a disadvantage in the marketplace. It is therefore important to understand the information sources that are important in the use of OTC drugs if those who serve the aged are to facilitate the elderly OTC drug consumer's adaptability in the complex marketing environment.

Statement of the Problem

Despite the increased consumption of drugs among the elderly with the potential for adverse or untoward effects and the specious drain on a meger budget, virtually no information exists on the elderly drug consumer outside the institutional setting. With specific regard to OTC drug use, there is limited extant information on the population in general, and what was found on the elderly had to be extrapolated from broader studies. Further, sources of information and influence have not been explored with regard to the purchase and use of OTC drugs by the elderly consumer.

Realizing that the applicability of the scant information available on drug use among the elderly to an elderly population other than that

studied is questionable, the State of Michigan undertook its own study. Under the auspices of the Governor's Task Force on Seniors and Substance Abuse, James (1979) undertook the study in 1977. The extensive nature of the study and budget constraints allowed only for a broad and general analysis of the data gathered. The absence of further analysis of the data leaves the problem of a lack of information on Michigan's elderly OTC drug consumers and the sources of information and influence on their over-the-counter drug use.

Objectives of the Study

The purpose of this study was to further analyze the data gathered on OTC drug use in the Senior Citizen's Substance Use Survey (James, 1979), in order to further one of the objectives of the original study. This objective was "to assess the amount of information seniors possess about the substances they use and the sources of that information" (James, 1979, p. 2). The study attempted to identify sources of information and influence which were related to OTC drug use among a sample of Michigan's elderly population. It attempted to discover whether the sources of information and influence deemed important by the elderly differ significantly among subgroups of the sample classified by their drug use. Contextual variables of an attitudinal, behavioral and demographic nature were explored for their effect on differences and relationships found. Further, variables were explored for their importance in predicting OTC drug use and discriminating levels of OTC drug use.

Specific research objectives were:

1) To examine the relationship of the importance of information sources to over-the-counter drug use.

2) To examine the differences in the importance of information sources among subgroups of the sample classified by level of OTC drug use.

3) To examine the relationship of certain demographic and attitudinal characteristics to over-the-counter drug use.

4) To explore the effects of contextual variables on the relationships found between over-the-counter drug use and the importance of information sources.

5) To further explore the importance of both the contextual variables and variables of the importance of information sources in predicting OTC drug use and in discriminating OTC drug users.

Significance of the Research

Michigan's population of persons over age 60 is estimated to grow from 12% (1970 Census data) to 16% of the population by the year 2000. The rate of growth for this portion of the population is projected to be 20% more than that of the general population of Michigan (Verway, 1978). Faced with a growing elderly population, those concerned with helping the elderly are seeking to better understand the problems facing aging persons and how to best solve and hopefully alleviate or minimize such problems. The misuse and over use of over-the-counter drugs is one such problem.

This study provides a better understanding of the nature and extent of non-prescribed drug use among the elderly. Further, the role played by sources of information and influence in elderly consumers' purchase and use of OTC drugs may be better understood. This study can be of use in designing programs for disseminating information to elderly consumers in order for them to make informed non-prescription drug choices. It can be of potential use in helping providers of services to the aging to better understand the sources of influence on the aged and perhaps to utilize them. It can also serve as a guide to further research in the area of the non-institutionalized elderly OTC drug consumer.

Limitations of the Study

Any research done subsequent to the original study is limited by the original study as well as the choice of the research topic. The following limitations apply to this study:

1) The study will be limited to specific types of non-prescription drugs as specified in the original Seniors and Substance Abuse Study. These OTC drugs are: antitussives, internal analgesics, diarrhea remedies, antacids, laxatives, cold remedies, vitamins and tonics, decongestants and sleep aids.

2) The study will be limited to examining only certain sources of information and influence which may be important to the elderly in the purchase and use of over-the-counter medications. These sources are doctors, pharmacists, friends and relatives, self (stored information), and market-dominated sources.

3) The findings of the study are limited to the counties involved in the study and counties similar to those counties due to the non-randomness in selection of the counties.

Definitions

Elderly, elderly men and women, elderly consumer . . . non-institutionalized persons 60 years or older.

Non-institutionalized persons . . . persons not residing in an institution or hospital.

OTC drug . . . a drug which can be purchased over the counter without a prescription.

OTC drug use . . . the use of drugs purchased over the counter without a prescription.

OTC drug type . . . the specific category of non-prescription drug including antacids, antitussives, internal analgesics, diarrhea remedies, sleep aids, vitamins and tonics, cold remedies, decongestants, and laxatives.

Sources of OTC drug information . . . an individual or a communication organization (Schramm, 1955) which can provide OTC drug information, including doctors, pharmacists, market dominated sources, friends and relatives and oneself (stored information).

CHAPTER II

Review of Literature

The literature pertinent to this study is grouped into three categories: (1) research related to self-medication in the general population, (2) research related to the non-institutionalized elderly drug consumer, and (3) research related to sources of influence in self-medication and to sources of information used by the elderly consumer. Those unfamiliar with the pharmacological terms used may wish to review the Glossary of Terms.

Self-medication in the General Population

The history of self-medication dates back to earliest times (Leake, 1965). From home remedies and patent medicines to today's 'supermarket' of over-the-counter or non-prescription medicines, people have tried to relieve their minor ailments. Leake (1965) concludes that there is some psychological value in being able to do something to relieve illness, whether one's own or that of a family member. The widespread use of such therapeutic agents over the years indicates that sufficient relief of symptoms is obtained for their continued use (Grollman, 1965).

Indeed, self-medication has been and continues to be integral to American health care. Its necessity and benefits are recognized. As Burney (1965) notes:

> "There is a recognition that all the needs of the community cannot be fulfilled by existing or even projected health resources and that self-medication has a distinct contribution to make..." (p. 942).

Self-medication provides for management of relatively minor medical problems rapidly, cheaply and conveniently, without unnecessary visits to the doctor (Mandel, 1965). This in turn results in time, money and energy savings for the consumer. Additionally, it eliminates further burdening of the health care system. It is estimated that without self-medication, there would be a detrimental effect on the quality of health care. Ten to twenty times as many doctors would be needed and billions of dollars would be needed to put into the health care system (Hollis, 1965).

Self-medication has come to be viewed as an inherent right (Keefer, 1965) and legislation has developed to protect the consumer's right to, and safety in, self-medicating. Self-medicating is a frequent and widespread activity among the general population (Johnson, et. al., 1976). According to Pratt (1973) self-medicating will continue to be a widespread activity due to a variety of social forces fostering individual and family control over medication use in the United States. Self-medication is the essential means by which the typical ills of most persons are treated (Knapp and Knapp, 1972). This is reflected in the fact that public and private expenditures for non-prescription drugs by 1972 amounted to $3 billion (Social Security Administration, 1972). It is also reflected in the number of OTC drugs on hand in American households. Knapp and Knapp (1972) reported a mean of 17.2 non-prescribed drugs in the home, from the 234 households they surveyed. Roney and Hall (1966) reported a mean of 24.4 non-prescribed drugs in the 86 households they surveyed.

Rabin (1972), in his review of prescribed and non-prescribed medicine use, found the data available suggest that the nature and extent of non-prescribed drug use can vary with such factors as age, sex, race,

residential location, education and social class. Drawing on cross-national and national studies, he generalized that women consume more non-prescribed medicines than men, one-member families consume more than larger families, urban residents consume more than rural residents and that whites spend more on non-prescribed medicines than non-whites. Increasing age and educational level were associated with higher non-prescribed drug consumption. Also, individuals with chronic illnesses spend more for non-prescribed medicines than those without such illnesses.

It is interesting to note that findings in British studies are similar to U.S. studies on non-prescribed medicine use despite the British system of socialized medicine. Theoretically, monetary cost is not a prohibitive factor in visiting British doctors. However, as Hollis (1965) points out, there are other prohibitive factors, such as the long waiting periods and the extensive clerical work required. Jefferys, Brotherson, and Cartwright (1960) found 39% of the adults in their study had taken a non-prescription pain reliever during the previous four weeks and 16% had taken a non-prescription laxative. Two British studies (Wadsworth, Butterfield, and Blaney, 1971; Dunnell and Cartwright, 1972) found that as the number of symptoms increased, use of non-prescribed drugs increased. They also found race, age, sex and social class to be related to non-prescribed drug use.

Non-prescribed medicines have been the subject of few studies and the primary correlate generally used has been illness (Bush and Rabin, 1976). The relationship of non-prescribed medicine use to health status and health related activities was investigated by Johnson, Pope, Campbell and Azevedo (1976). Data from a 1970-1971 interview survey of a

sample of members of the Kaiser Foundation Health Plan of Oregon were used. Completed interviews (2,603) were obtained from subscribers and their enrolled spouses. Questions were asked concerning present health status, recent experience with symptoms, behavior when ill and customary health and health-related practices. Subjects were also asked if, for slight illnesses, they take medicines which do not require a prescription and if so how frequently.

Ninety percent of survey participants reported using medications which do not need a prescription. Almost one-half reported taking such medications occasionally or very often. Use of non-prescribed medicines was positively related to experiencing a number of self-limiting symptoms, specifically tiredness, aches/pains, headaches, upset stomach, depression, sore throat/runny nose and diarrhea/constipation. The taking of OTC drugs was related to the use of certain practitioners. About 30% of survey participants reported asking pharmacists for advice. This behavior had a moderately positive association with the use of OTC drugs.

Three measures of health status were derived from the survey data; perceived health status, physical health index and mental health index. For each of the measures, it was the dichotomy, poor health versus not poor health, rather than degree of impairment, that provided the stronger association with reported use of non-prescribed medicines.

This study included an analysis of types of behaviors involved in health seeking or health maintenance activities. Seeking knowledge or information through reading health-oriented articles had a low positive association with the use of OTC drugs, while reading medical or health-oriented books was not associated with OTC drug use.

Knapp and Knapp (1972) explored the decision-making process in self-medication in response to illness or injury. A longitudinal panel of Columbus, Ohio, residents, preselected to exclude most of the elderly population, was used. Two hundred and seventy-eight households that remained on the panel an average of 30 weeks of out of the 37-week period were included in the preliminary analysis. The wife was the primary source of data and was responsible for keeping behaviorial diaries. Illness and injury incidents were reported and at least one drug was reported used in over 90% of the cases. Non-prescribed medicines were used in over 70% of the cases and both prescribed and non-prescribed products were used in 11% of the incidents.

The number of OTC drugs on hand at the beginning of the diary reporting period showed large differences by social class. For OTC drugs purchased during the diary period, slight social class differences were found with upper class persons reporting more in both cases. The illnesses for which drugs were reported taken included colds, headaches, ear and throat problems and gastrointestinal problems. For their analysis, each illness situation was classified on the basis of the sequence of significant events reported in the diary. Illness sequences were classified into nine strategies of response to an illness situation. It was found that in a distribution of over 2,800 illnesses, 60% were categorized as 'non-prescribed drug exclusively' response strategy to illness.

Bush and Rabin (1976) undertook an analysis of data from the World Health Organization/International Collaborative Study of Medical Care Utilization, which was done in 1968-1969. The sample consisted of 3,481 non-institutionalized non-transient residents. Questionnaires were

completed on the use of health services, morbidity, content of recent physician visit, fiscal resources and social relationships and attitudes. Vitamins, although included in the questionnaires, were excluded from analysis, confining the analysis to morbidity-related medicines only. The information on the use of particular categories of drugs was based on a two-day rate of use; yesterday or the day before.

Substantial variation by age and sex were found among persons using morbidity related non-prescribed medication. While illness rates increased over age 44, use of OTC medicine declined. Females were found to have generally higher rates of OTC use than males; however, almost all of the sex related differences were accounted for by non-prescribed pain relievers. Cough and cold remedies and skin ointments varied little by age and sex while laxatives and stomach remedies were more likely to be used by adults. The categories, pain relief, vitamins, cough or cold remedies, skin ointment or salve and laxative or stomach remedies accounted for almost all non-prescribed drug use in the population studied.

They found that economic class alone appeared to have little effect on rates of use. Across economic classes, non-whites were less likely to be OTC drug users than whites. The healthy as well as those experiencing both mild acute illness and severe levels of illness were all likely to use OTC medicines. They concluded that persons may not perceive themselves as deviating from a state of health even when they seek relief from self-medication.

Research Related to the Elderly, Non-institutionalized Drug Consumer

Drug use has received a great deal of attention in American society due to widespread use and misuse of such substances. However, the

elderly drug user has been neglected in this area of study (Petersen and Whittington, 1977). While the medical literature is replete with information concerning drug problems and considerations, it deals primarily with the elderly as patients (Holloway, 1974). Petersen and Whittington (1977) reviewed drug use research on the elderly and found that most of the studies concerned alcohol use. They also noted that most of these studies used a patient population. The remaining studies that they found in their review dealt with elderly persons admitted as patients to hospitals for treatment of acute drug reactions.

Drug use among the elderly seems not to be a focus of research until the elderly drug user becomes a patient. Yet, ninety-five percent of the people over 65 in the United States live in varying degrees of self-sufficiency in the community and are generally responsible for their own medication (Plant, 1977). There is little that has been written on self-medication in the elderly population, although self-medication may be an important factor in the maintenance of an independent lifestyle (Lofholm, 1977). No research has been found that specifically deals with OTC medicine use among the non-institutionalized elderly. However, some data have been gathered along with prescribed drug and other substance use data.

Two studies were found which dealt with drug use in the general population. Data on the elderly have been extracted from them. Mellinger, Balter and Manheimer (1966) studied patterns of psychotherapeutic drug use among adults in San Francisco. Drug use was analyzed by age and by prescription and non-prescription usage. The use of over-the-counter drugs was found to be the same for both men and women over age 60, although prescription drug use was higher for women than men in

that age group. Chambers (1971), in a statewide survey of New York residents, assessed the incidence, prevalence and extent of use of 17 categories of psychoactive drugs. Several relationships between age and regular use of such drugs were found. The oldest age group (50 and over) was found to have the largest percentage of regular users of barbituate sedative-hypnotics, minor tranquilizers, non-barbituate sedative-hypnotics and major tranquilizers.

Since 1974, three significant studies have focused on legal drug use among the non-institutionalized elderly. In the first of these, Doyle (1976) carried out a study for the Cathedral Foundation of Jacksonville, Inc. The study concerned medication use and misuse among a large sample of older persons living in the community of Jacksonville, Florida. Data were collected on the respondents' relationships to their physician as well as information about drug use. Four hundred and five interviews were completed.

Doyle found that 62% of his respondents indicated that they use over-the-counter medications. Information was obtained on the type of OTC medication that they were using. Of those reporting, 25% reported using laxatives; 19% reported using internal analgesics, 17% reported using cold medicines, 10% reported using antitussives, 9% reported using vitamins and 21% reported using other OTC medicines. He went on to conclude that 84% of the population studied indicated that their pharmacist had no knowledge of the over-the-counter preparations that they were taking or the reasons for this use. Seventy percent of the population studied indicated that they do not question their pharmacist concerning cost, contents or side effects of medicines being prescribed or taken.

A secondary, informational instrument was administered by Doyle to a small volunteer sample of 15 elderly residents living in a retirement complex. Although the sample was very small, the in-depth information provided is valuable. It was found that 53% felt they did not know enough about their medications and 73% wished to know about their medication's side effects. However, for obtaining information, there was no statistically significant resource felt to be most helpful. Highest response for an information resource was for health journals while none responded "your doctor." Television, radio, newspaper and magazine advertisements were not mentioned as helpful information sources. This was collaborated by the fact that the majority of respondents felt that medication information in advertisements is either "not" or "definitely not" accurate.

Inferences could be made from the data that the elderly in the sample were largely left to their own devices for health and medical education. When a question or problem arose concerning medications, about half consulted their doctor and less than half consulted a friend, relative or used their own judgment. When buying an OTC drug for the first time, one-third responded that their choice was based on ads, two-fifths responded that choice was based on the druggist and over half responded "friends, relatives, or 'don't know'" as the basis for their choice. Price and packaging were not reported as influencing factors in choice. Among this sample, the category of OTC medication most frequently taken was pain relievers followed by antacids, antihistimines, joint and muscle preparations, hemorrhoidal preparations, and bowel stimulants. Sleep aids and diet aids were not mentioned as non-prescription drugs that were taken.

The second study since 1974 focusing on legal drug use among non-institutionalized elderly was done by Guttman (1977). This study was carried out in the Washington, D.C., Standard Metropolitan Statistical Area in 1976. Participation was voluntary for respondents and there was a high rate of refusal. A total of 447 out of a targeted sample of 1200 interviews were obtained from non-institutionalized, community living elderly persons. A relatively high educational level was the only major difference found between the study sample and the total elderly population in the United States.

A decision-making theoretical framework was used in the study. The study looked for the effects of knowledge, ability, needs, living arrangements and age on the drug use decisions of the elderly. Respondents were asked to report on drugs used within the 24-hour period preceding the interview. Sixty-two percent reported using prescription drugs. Use of prescription drugs was positively related to both age and knowledge of resources. Those using more prescription drugs tended to be less satisfied with their lives and tended to have a lower perception of themselves in terms of intelligence and capability. These people also tended to use more over-the-counter drugs.

Sixty-nine percent of the respondents reported using over-the-counter drugs. Over half of all OTC drugs reportedly used were identified as internal analgesics. Most OTC drugs were reported as obtained from a drugstore. One-sixth of the respondents said that they consulted a physician about their use of OTC medications and a small percentage sought advice from other professionals, spouses or friends. The majority, well over two-thirds, relied on their own judgments and thought they

knew the function of the OTC drugs used. Significant negative correlations were found between OTC drug use and health; age; and life satisfaction. The users of both OTC and prescription drugs tended to be less healthy and less satisfied with life than those reporting no drug use. There was no strong single predictor of OTC drug use in the elderly found in this study. Decision-making in resource utilization was not statistically related to drug taking behavior.

Guttman (1977) concluded the data lent support to the claim that non-institutionalized elderly persons are, as an aggregate, knowledgeable and responsible consumers of legal drugs. His conclusion, however, must be taken with caution. His sample has a relatively higher educational level than the nation's elderly in general and there was a high refusal rate among his sample. The specific data on which he bases his conclusions are self-reportive and therefore subject to bias.

The third and most recent of the studies focusing on legal substance use among the non-institutionalized elderly was carried out by James (1979) who sampled Michigan's senior citizens. Data for the present research were taken from this study, and sample specification and data collection procedures are elaborated in Chapter III. Primary information gathered from seniors included prescription medication practices, OTC medication practices, social drug usage and use of home remedies. Indirect information was gathered through mail surveys of individuals directly serving the aged, including physicians, nurses, dentists, pharmacists and those involved in the areas of substance abuse and aging. A questionnaire was developed for each of these seven target groups. Data from both the mail surveys and the interviews were discussed concurrently in the report.

James (1979) found that females were more likely to be taking prescription medicines than men and to be taking a greater number than men. She found that those in suburban areas were more likely to be taking prescription drugs and more of them than those from rural areas. Age was also found to be positively related to use and number of prescription medicines. Income and education were significantly related to the number of prescription drugs used. Those seniors with an annual income of under $6,000 and those with 10 or less years of formal education used more prescription medicines than those with 10 or more years of formal education and annual incomes of over $6,000.

In the area of OTC medication, 48% of the seniors reported using one or more OTC medications about once a week. The categories of non-prescription drugs most frequently used were antacids, internal analgesics, laxatives and decongestants. The seniors typically did not discuss their use of OTC drugs with either their doctor or pharmacist. Through comparison of the physician mail surveys and the senior interviews, a lack of communication was found which was apparently not remedied by information from other sources. Thirty percent of the seniors were not aware of the pharmacist's qualifications as a source of information. The physician was perceived as the person most qualified to give information on drugs by both the mail survey participants and the senior interview participants.

In seeking an OTC drug instead of a prescription drug, the suggestions of the doctor and the pharmacist were reported as influential. However, while the doctor was reportedly highly influential, the pharmacist was reported less influential than the respondent's own judgment that the ailment was not serious. For choosing the OTC drug in first

time buying situations, doctors again were at the top of the list as being 'very important.' The pharmacist was not considered important to the same degree as the doctor but was next in influence. James found that price seemed to be a somewhat influential factor in choice of an OTC drug for the first time. Packaging and advertising, although not considered as important as price, were slightly more important than friends and relatives in choosing an OTC drug for the first time.

James (1979) concluded that a significant proportion of seniors in Michigan encounter problems related to their use of prescription and over-the-counter medications and that they are not sufficiently well informed about the medications that they use.

Sources of Information Used by Elderly Consumers and Sources of Influence in Self-medication

Consumer behavior, in this case the purchase and use of non-prescription drugs, involves a decision-making process. Information is the basic ingredient of decision-making (Paolucci, Hall, and Axinn, 1977). It serves to reduce uncertainty in the decision-making process and provides a basis for making consumer decisions. The perception and use of information is critical to the individual's adaptability to the marketing environment.

Theoretically, the consumer needs complete information in order to make rational decisions. In reality, consumers function in the marketplace without complete information. Information may be unavailable, inadequate, inaccessible, incomplete or even incorrect. While information may be available, it may not be perceived by the consumer. If information is available and perceived by the consumer, the cost of obtaining the information may outweigh the perceived benefits that the

information may provide. Paolucci, et. al. (1977) also note that information, in complex environments, becomes increasingly difficult to assimilate because messages from many sources become mixed.

In order to sort out the messages, the importance or significance attached to the source of information by the consumer may play an important part. If the source of information or influence is deemed important or significant, especially in regard to the decision at hand, information from that source will likely be used. On the other hand, if the source is not deemed important, information from that source may be ignored. According to Schramm (1955), a source is the first of three elements required for communication, the others being a message (information) and a destination (receiver). Radio, television, magazines or newspapers are generally thought of as sources of information. However, as Dichter (1966) points out, several ways of influencing people coexist with or go beyond these sources. A variety of past and present factors influence consumers, including the environments with which they interact. These environments can in large part influence the kinds of decisions that an individual makes (Paolucci, et. al., 1977).

The process of aging brings with it changes which ultimately affect the individual's interaction with environments. Social, psychological and biological changes contribute to a contraction of life space and hence reduce opportunities for interaction. Role attrition, accompanied by a reduction in social involvement are catalyzed by declines in biological functioning and in physical energy (Rosen and Neugarten, 1960). The reduced activity level of older adults is of interest because it affects their information exposure patterns (Phillips and Sternthal, 1977).

Contracted life space and reduced activity level would seem to result in greater exposure to and reliance on mass media sources of information. A limited number of gerontological studies lend support to this contention. Graney and Graney (1974) conducted a longitudinal study among a group of elderly women (age 62 to 83 at first contact). The data on communication activities substitution suggest that television viewing and reading serve as substitutes for declining social participation in other areas. Schramm (1969) observed that media consumption activities composed 45% of leisure time for persons over age 65, while significantly less time was spent in this pursuit by younger adults. He also found that exposure to television and newspapers showed a marked increase beyond age 60. Evidence also exists that older people (age 60 and over) consider information as the most important criterion in their selection of media. This group ranks newspapers as the most important medium (Steiner, 1963).

Other changes occur in the selection of personal and informal information sources. For the elderly, members of the extended family constitute a very substantial portion of interpersonal contacts, and therefore can serve as important sources of information for the elderly (Phillips and Sternthal, 1977). In the gerontology literature, the limited information that exists suggests that the extended family serves as a major source of advice and support for a variety of decisions faced by adults over age 60 (Fredrick, 1973; Payne, 1960).

Besides the family, friends constitute an important reference group. According to Rosow (1970; 1967), people over age 65 tend to develop friendship patterns with persons of similar age, sex, marital status and social class. He found the development of friendships and

interaction patterns depends on the local concentration of peers, given the reduced mobility of this age group. Hence, the deficit in information brought about by problems and conditions associated with aging is at least partially compensated for by increased mass media exposure and maintained contact with extended family.

While mass media, friends and relatives are important sources of information for the elderly, the source deemed important in purchase decisions depends to some extent on the product involved. Decisions involving products with high perceived risk generate relatively more information seeking, generally from 'expert' sources of information. Over-the-counter drug products are of this type where the advice of or information from a doctor or pharmacist may be sought to reduce the perceived risk involved in their purchase. Information sources utilized in choosing over-the-counter medications can be of significant importance, yet surprisingly, advertisers and marketers have not gathered data on consumers' self-medication decisions (Engel, Knapp, and Knapp, 1966).

An exploratory study was conducted by Engel, et. al. in 1966 to look at sources of influence in the acceptance of new products for self-medication among a sample of housewives. They found respondents to be quite cautious in pursuing new self-medication strategies and to show a tendency to search for additional information. The findings verified the risk-reducing role of 'brand' names in OTC drug acceptance. Clearly, respondents placed greatest confidence in a doctor's recommendation. This seems to be consistent with James' findings of the importance given to the doctor's suggestion. While drug advertising was not regarded as a good source, as was the case in both Doyle's (1976) and James' (1979)

findings, the mention and usage of 'branded products' seems to attest to the impact of advertising.

Engel, et al. noted that the consumer apparently values the informal channel of communication with friends and relatives as a source of information, although with precautions. The impetus apparently came from those seeking the information rather than from the source simply 'volunteering' information. The pharmacist was considered by the respondents to be an expert in his field and was frequently mentioned as a source of information. Respondents expressed concern that the pharmacists are becoming increasingly unavailable to the public as a source of information. This is probably due to the demise of the 'friendly neighborhood corner drugstore pharmacist' and the rise of the discount pharmacy with clerks to serve the public. The need for more authoritative information was found to increase with the seriousness of the ailment.

No specific information on elderly OTC drug consumers and their sources for information on OTC drugs is indicated in the literature. This is despite the fact that the elderly appear to be a significant market for OTC drugs. In fact, there is limited information on elderly consumers in general and little research available. Most of the research on elderly consumers has focused on their share of aggregate expenditures, the implications of their increasing numbers and the type and sizes of products purchased (Reinecke, 1964; Goldstein, 1968; Media Decisions, 1973; Business Week, 1971).

Mason and Smith (1974) explored the shopping behavior of low-income senior citizens. One of their objectives was to determine the basic sources utilized in obtaining information about selected products and services. For all items except food and beverages physical search was

relied on as the primary source of product information in making a purchase. This factor was listed first as an information source for purchasing medical and personal care items in more than 47% of the cases. Newspapers ranked a distant second as an information source for most items, except food purchases, followed by word-of-mouth. This differs from other segments of the population where physical search is not as important as it is for this segment. They concluded that it might indicate that, relative to the general population, the information sources available to the elderly are of such a limited nature that physical search is necessary to assure an informed purchasing decision.

Klippel and Sweeny (1974) investigated the relationship between formal (newspapers, television and radio advertisements) and informal (friends, neighbors and family and retail sales representatives) information sources. The study was conducted with 101 participants 55 or older in the St. Petersburg, Florida, area on opinions relative to the importance of information sources about the headache remedy now used and the television set now owned. The implications drawn from the findings indicated to Klippel and Sweeny that utilization of informal information sources in communicating with the elderly can be a useful marketing strategy. They suggested product or service sampling, in-store demonstrations, or donations to a large aged organization could be used to facilitate informal (word-of-mouth) information sources.

Schiffman (1971; 1972) conducted a study in an apartment house community in Queens, New York, which produced two reports. One report (1972) explored the social interaction patterns of the elderly consumer. The evidence suggested to him that product related social interaction

relates closely, and may be part of, more general forms of social involvement. Television watching was negatively related to social interaction, while exposure to radio and magazines was positively related to the extent of social interaction. He notes that social reciprocators (those more involved socially) may rely on magazines and radio as sources of information.

The other report explored the impact of external and internal sources of information on the new product trial behavior of the elderly (1971). Both external sources of information (letter and coupon and informal product-related conversations) and internal sources of information (past experience) seem to affect a decision to try a new product. He notes four possible reasons for the small number of persons engaged in informal product-related conversation: social isolation, product importance, brevity of promotion and consumption experience. The generalized experience that comes with age and the experience of consuming may exhibit itself in more reliance on past experience. The evidence indicated to Schiffman that it lends initial support to the concept that past experience may rightfully be viewed as an internal source of information.

Summary

In summary, the literature available in the three areas reviewed is minimal and the need for further information is evident. Although studies were found with data on both non-prescription drug use and sources of information in non-prescription drug use, no research was found which focused on the relationship between the two. This study provides new data on the relationship between non-prescription drug use and sources of information and influence in over-the-counter drug use.

CHAPTER III

Methodology

This chapter includes a description of the study from which this analysis is derived and a discussion of the variables used in the present study, the data reduction and score construction for the OTC drug use measures and the importance of information source measures, the hypotheses and the statistical techniques chosen to analyze the data. It also includes a discussion of the sample and the procedures used in the original Senior Citizen's Substance Use Survey.

Description of Original Study

Data used in this study were gathered as part of a larger study, Senior Citizens' Substance Use Survey. The survey was commissioned by the Task Force on Seniors and Substance Abuse, appointed by the Governor of the State of Michigan. This study, to gather direct and indirect information on substance use among Michigan's seniors, was jointly funded by the Office of Services to the Aging and the Office of Substance Abuse Services.

Direct information was obtained from personal interviews with 384 non-institutionalized seniors in 13 counties in Michigan. Indirect information was obtained through mail questionnaires sent to a sample of physicians, nurses, dentists, pharmacists and substance abuse and aging

service providers throughout Michigan. Only the data from the interviews with seniors were used in the present study. These data were collected from senior persons, defined as individuals age 60 or older, during the period of November, 1977, to March, 1978. The present study was developed subsequent to, and draws on the data collected for, the Senior Citizens' Substance Use Survey.

Procedures for Senior Citizen's Substance Use Survey (SCSUS)*

Sampling

The interview sample selected for the SCSU Survey was a representative sample of Michigan's elderly population. It was not possible to obtain a truly random sample of persons age 60 and older in the state; consequently, a stratified cluster approach was used. This stratified cluster was based on a total sample of 600 respondents and used 1970 census data as a baseline. Thirteen counties were randomly selected from each of the five geographical Standard Metropolitan Statistical Areas (SMSA) in the state. In cases where participation by a county was not feasible, another county was chosen from the SMSA area. The counties involved in the study were Wayne, Oakland, Kent, Ingham, Jackson, Eaton, Van Buren, Alpena, Benzie, Grand Traverse, Newaygo, Delta and Clare.

Within the counties, urban and rural communities were defined using school district population as the primary criterion. As school district

* Complete information on sampling procedures and data collection is available in Mary James, Substance Abuse Among Michigan's Senior Citizens: Patterns of Use and Provider Perspectives, Michigan Office of Services to the Aging and Michigan Office of Substance Abuse Services, Research Report, 1979.

data is gathered yearly, it was felt that it would reflect more accurately the present population of the counties. At least one urban community (school districts with enrollments of 3,500 students or more in grades K-12) and one rural community (school districts with enrollments of less than 3,500 in grades K-12) were randomly selected. The next stratification criteria were race and income level within the urban/rural classification. Minimum numbers of individuals were targeted for below the poverty line subgroups and for above the poverty line subgroups within both rural and urban clusters. Minimum numbers were targeted for white and non-white subgroups within both rural and urban clusters. Randomly selected census tracts were drawn within each of the urban and suburban communities. Maps were created identifying the blocks in a given census tract where interviews were to be obtained. Interviewers were assigned one or more of the tracts within which to work. They were told to start the interviews with a corner house of the census tract map. Interviewers were then instructed to approach every other home. In areas of large apartment complexes, no more than ten interviews were to be obtained from a given building.

Each interviewer was assigned a minimum quota of five interviews. For every interviewer, some of the questionnaires were coded for race (white and non-white) and for income (above poverty and below poverty) with the remainder being 'free' questionnaires. The obtained sample at the start of data analysis was 371 interviewed seniors, with 285 reporting urban/suburban location of residence, 80 reporting rural location of residence and six not reporting.

Description of the Sample

The description of the sample presented here includes thirteen respondent questionnaires which were not received by the start of data analysis for the original study. (See James, 1979, p. 13.) Some of the basic demographic characteristics are presented in Tables 1 through 10. The Michigan Statistical Abstract (MSA) (Verway, 1978) was used for comparison with census data on Michigan's population age 60 and older.

The age of the respondents ranged from a designated 60, up to 94 years of age. Thirty percent of the sample were 60 to 65 years old. The mean age was 71.27 years and the median age was 70 years. The sample was bi-modal at 65 and 66 years of age. Age categories, their numbers and reporting percentage appear in Table 1. Although MSA data is not directly comparable because of differing age breakdowns, it is notable that the percentages for the present sample are quite close to the census data, with the present sample being somewhat older.

Table 1

Age of Respondents

Age	Number	Percent Reporting	Elderly Population of Michigan*
60-65	111	30%	31% (60-64)
66-70	83	22%	24% (65-69)
71-75	68	18%	19% (70-74)
76-80	59	15%	13% (75-79)
81-94	55	15%	13% (80+)
	376	100%	100%

* Formulated from MSA, Table 33, p. 108.

Respondents reporting their location of dwelling were predominantly urban dwellers as is the case with the general population. Of the sample, 79% reported living in an urban/suburban location and 21% reported living in a rural area. The 1970 census data on the population over age 60 reports less urban dwellers and more rural dwellers than the present study. It is possible that recent trends of the population away from rural areas into urban areas are now being reflected in the population over age 60. The urban/rural breakdowns are presented in Table 2.

Table 2

Respondents' Location of Dwelling

Location	Number	Percent	Elderly Pop. of Michigan*	Total Pop. of Michigan*
Urban/Suburban	297	79%	74%	74%
Rural	81	21%	26%	26%
	378	100%	100%	100%

* MSA, Table I-14, p. 64.

The sample was predominantly white with 331, or 89%, in this category. The subgroups of race, the majority of which were black#, were grouped together for this study into the category non-white. There were 41 respondents, or 11% of the sample, with this designation. This is similar to the census data on the population of Michigan as a whole where whites comprise 88% of the total population and non-whites comprise 12% (Verway, 1978, Table I-10, p. 53). Males comprised 39% of the sample with 147 in the sample. The majority of the respondents were female. The 230 female respondents comprised 61% of this sample. According to census data on Michigan's seniors of age 60 or older, the

One Spanish-American respondent and one Oriental respondent were surveyed.

present sample has an overrepresentation of females. Females over age 60 made up 55% of the population over 60 in Michigan while males made up 45% of that population (Verway, Ibid.).

Respondents reported living in single family homes in the majority of cases (65%). This is slightly more than reported by the general population (60%) for living in single family homes (Zuiches, Morrison, Keith, and Boyde, 1978). The next most frequently reported (15.4%) living location was a large apartment complex with predominantly senior residents (Table 3).

Table 3

Respondents' Type of Dwelling

Type of Dwelling	Number	% Reporting
Single Family Home	247	65.5%
Mobile Home	9	2.4%
Boarding Home	3	.8%
Large Apartment Complex predominantly seniors	58	15.4%
Small Apartment Complex predominantly seniors	10	2.7%
Large Apartment Complex not predominantly seniors	26	6.9%
Small Apartment Complex not predominantly seniors	17	4.5%
Other	7	1.9%
	367	100.0%

Married, living with spouse and widowed accounted for the marital status of 86% of the sample. The two groups were almost evenly divided. Although a code was included in the study for cohabitation without marriage, none of the respondents reported this as the situation. It is

doubtful that this age group would admit to cohabitation. It is a fairly recent phenomenon which has not gained wide acceptance among older Americans. Respondents' marital status is presented in Table 4.

Table 4

Marital Status of Respondents

Marital Status	Number	% Reporting
Married, living with spouse	165	43.7%
Married, living separately	5	1.3%
Separated	2	.5%
Divorced	23	6.1%
Widowed	160	42.3%
Single	23	6.1%
	368	100.0%

When asked who were other members of their household, excluding boarders, 55.2% reported none, 33.7% reported their spouse, and 5.4% reported their children (Table 5).

Table 5

Members of Respondents' Household, Excluding Boarders

Household Members	Number	% Reporting
None	203	55.2%
Spouse	124	33.7%
Children	20	5.4%
Grandchildren	5	1.4%
Other Relatives	8	2.2%
Friends	6	1.6%
Other	2	.5%
	368	100.0%

The number of household members ranged from just the respondent to eleven household members, including the respondent. However, the response categories 1 (respondent only) and 2 household members accounted for 91% of the responses (Table 6).

Table 6

Number of Members of Respondents' Household

Household Number	Number	% Reporting
1	192	50.0%
2	157	41.0%
3	27	7.0%
4	2	.5%
5	4	1.0%
11	2	.5%
	384	100.0%

The primary wage earner in the family was the respondent in 57.5% of the cases reporting and was the spouse in 42.5%. Two hundred eighty-seven (83%) reported that the wage earner was retired, and sixty (17%) reported that the wage earner was not retired. If retired, respondents were asked how long the primary wage earner had been retired. The number of years reported ranges from less than a year to 37 years of retirement. The mean number of retirement years for the sample was 8.69. The median number of retirement years was 7, while generally the sample had been retired 2, 5, or 8 years (Table 7).

Table 7

Years of Retirement for Primary Wage Earner

Years of Retirement	Number	% Reporting
0 - 5	101	37%
6 - 10	86	32%
11 - 15	46	17%
16 - 20	27	10%
21 - 37	12	4%
	272	100%

Respondents were also asked, if retired, whether their retirement was compulsory. One hundred seventy-six reported that it was not and one hundred three reported that it was.

The occupation or former occupation of the primary wage earner is given below in Table 8. Generally, the primary wage earner was or had been in a skilled or semi-skilled occupation. These two categories accounted for 50% of the sample responses.

Table 8

Occupation or Former Occupation of Primary Wage Earner

Occupation	Number	% Reporting
Unemployed, welfare	2	.5%
Unskilled, farm workers	42	11.3%
Semi-skilled	82	22.0%
Skilled/Foreman	106	28.5%
Clerical	40	10.8%
Proprietor/Manager	48	12.9%
Professional	28	7.5%
Other	24	6.5%
	372	100.0%

Of those reporting their annual family incomes, the most frequent response category was $2,000 to $3,999. This category and below is one person poverty; 33.5% of the sample were in this area. The next most frequent response category was $4,000 to $5,999. This category and below is two person poverty; 55.4% of the sample reported their incomes in this area (Table 9).

Table 9

Respondents' Annual Family Income

Annual Family Income	Number	% Reporting
$ 0 - 1,999	12	3.5%
$ 2,000 - 3,999	103	30.0%
$ 4,000 - 5,999	75	21.9%
$ 6,000 - 7,999	62	19.1%
$ 8,000 - 9,999	39	11.4%
$10,000 - 11,999	15	4.4%
$12,000 - 13,999	10	2.9%
$14,000 - 15,999	9	2.6%
$16,000 - 17,999	3	.9%
$18,000 - 19,999	4	1.0%
$20,000 & over	11	3.2%
	343	100.0%

The educational level of the sample was below the mean educational level of 12 for persons age 25 or older in the state. The sample had a mean number of years of formal education of 10.43; however, the mode for the sample was 12 years. The responses ranged from no formal education to 20 years of formal education. Nearly half of the respondents had from 9 to 12 years of formal education (Table 10).

Table 10

Respondents' Years of Education

Years of Education	Number	% Reporting
0 - 8 years	119	33.7%
9 - 12 years	175	49.6%
13 or more years	59	16.7%
	353	100.0%

Summary

The majority of seniors in the sample were white and female. The proportions of white and non-white in the sample are almost identical to 1970 census data on Michigan's population age 60 and over. The number

of females in the sample exceed 1970 census data by 6%. The over-representativeness of females may reflect the growing proportion of women to men that is characteristic of the elderly population. While the present sample reported more urban and less rural dwellers, it may be that former general urbanization trends in the total population are now being manifested in the elderly population. Another factor may be the increase in retirement complexes and senior housing projects which are generally located in urban areas.

The proportions of respondents in various age categories generally corresponds to the proportions found in similar age categories for 1970 census data on those age 60 or older in Michigan. The mean age for the sample was 71 years with the mean number of years of formal education for the sample at 10.43. Respondents tended to be either widowed or married and living with their spouse. They generally resided in single family homes and over half reported living alone. The majority (83%) of respondents or their spouses were retired with a mean of approximately 8½ years since retirement. Respondents or their spouses generally were or had been in a skilled or semi-skilled occupation.

Generalizability

Comparisons of the major demographic characteristics of the interview sample were made with available population estimates and the comparisons indicated that, as far as can be ascertained, the obtained sample was fairly representative of the elderly population of Michigan. Minor biases may have been introduced due to seasonal factors at the time of data collection. Interviews were conducted during the winter season. Severity of winter conditions, as well as holiday visits or

vacations, may have excluded potential respondents. Interviewer bias is a major consideration in this type of study, but as far as can be determined, it was minimal.

Data Collection

A 98-item, 26-page structured "Health Practices Questionnaire" was used to collect the data. The initial questionnaire was based on an instrument developed by the Cathedral Foundation (Doyle, 1976) for a study of medication use among seniors residing in the Jacksonville, Florida, area. The design of the instrument was based on the specific informational needs of the Seniors and Substance Abuse Task Force. Items from the Cathedral Foundation instrument were revised to make them more appropriate for the Michigan study, and additional items were included to reflect the concerns of the Task Force.

A preliminary questionnaire was pretested on a sample of seniors living in the Lansing, Michigan, area. Subsequent to this, several items were revised to eliminate confused wording and/or include additional response categories. The final questionnaire included four major sections: 1) prescription medication practices; 2) over-the-counter (OTC) medication practices; 3) social drug use (i.e., alcohol, nicotine, caffeine); and 4) home remedy use. Additionally, two sections for obtaining demographic information were included. All information, except prescription drug use, was obtained through self-report. Prescription drug information was obtained directly from medicine containers.

Interviewers were recruited on a voluntary basis among local senior groups in the counties where interviewing was to take place. During the latter stages of interviewing, some volunteers were paid as an incentive

to continue. The project team members periodically checked on the progress and problems of the interviewers.

Validity and Reliability

Extensive validity and reliability checks on the instrument were not possible due to budget and time constraints. However, the use of questions from a tested instrument and checks through comparisons with the mail survey data and interviewer ratings of respondents contribute to confidence in the reliability and validity of the findings.

Data Reduction and Score Construction

Variables

Drug Use Index -- Eighteen items from the interview questionnaire were used. Nine concerned the number of OTC drugs taken during the past year for nine categories of OTC drugs. The remaining items were based on a multiple choice question regarding how often OTC drugs are taken per week for each of the nine categories of OTC drugs. (See Appendix A for questionnaire items.) The measures of central tendency for these items are presented in Appendix B.

Responses to the items concerning the number of OTC drugs taken were recoded by zero and non-zero responses. Since the number of drugs taken in any one category for the period of a year would not necessarily be taken concurrently, values of one or more were given a value of one, while values of zero remained at zero. Responses to frequency of use (how often taken during the week) were recoded by adding a value of one to the existing values in order to create non-zero values.

The value of the number of OTC drugs (either 0 or 1) was multiplied by the value for the frequency of use (1 through 5) for each category of

drug. The result was then squared and the squared values for all nine categories were added together. The square root was taken of the additive result to obtain the final score. The maximum score possible was 25. The highest score obtained from the sample was 10.77. A score of zero indicated non-use; almost one-third of the sample fell into this category. A score from one up to and including four accounted for 38% of the sample. The scores of four or above (to 10.77) accounted for the remaining 30% of the sample.

Levels of Drug Use -- The sample was divided into non-users, those with a score of zero; low to moderate users, those with a score from 1 through 4; and heavy users, those with a score higher than 4.

Sources of Information and Influence -- Twenty-four items from the interview questionnaire were selected (see Appendix A). The 'other' categories were not used because preliminary figures showed few responses were given. The source of information categories used in this study were not exclusive or exhaustive, but they did reflect the general sources of information and influence in OTC drug use. The sources are doctors, pharmacists, friends and relatives, self (stored information), and market dominated. The frequency distributions for these items are given in Appendix C.

For each of the five sources of information or influence there were from two to six items in the questionnaire which were indicators of the importance respondents placed on that source. Each of these items was first categorized into a simple dichotomy of not important (with a value of 1) and important (with a value of 2). Details of the procedures used in dichotomizing are given in Appendix D. Then, for each source of

information or influence, a ratio was constructed of the 'important' (values of 2) responses to the total number of valid responses. Thus, an importance ratio, ranging from 0.0 to 1.0, was obtained. Frequency distributions of the scores for each source are given in Appendix E.

Contextual Variables

Three types of variables, demographic, attitudinal and behavioral were used as the contextual variables in this study.

Demographic -- The variables of a demographic nature used include: age, race, sex, location of dwelling (urban/rural), income, education, marital status, retirement status, length of retirement, type of dwelling, household members, number in household and occupation (current or former). The following demographic variables were modified for the purposes of reporting in the tables: race and education. The frequency distributions of these variables were presented in the description of the sample (Tables 1 through 10). Income is presented below (Table 11) in a modified form, based on below two person poverty or above two person poverty.

Table 11

Annual Family Income of Respondents (Modified)

Annual Family Income	Number	% Reporting
$ 0 - 5,999	190	55%
$ 6,000 and over	153	45%

Attitudinal -- The contextual variables of an attitudinal nature include: health status, rating of life, activity level and satisfaction with how one's time is spent. The variables concerning rating of life

and activity level were modified for reporting purposes in the tables of this study. The frequency distributions for these variables are presented in Tables 12 through 15.

Table 12

Respondents' Health Status

Health Status	Number	% Reporting
Very healthy	90	24%
Moderately healthy	145	38%
Pretty healthy	83	22%
Losing health or Not well	63	16%
	379	100%

Table 13

Respondents' Satisfaction with the Way Their Time is Spent

Satisfaction	Number	% Reporting
Completely satisfied	122	33%
Moderately satisfied	163	44%
Somewhat satisfied	45	12%
Not very satisfied or Not at all satisfied	43	12%
	384	100%

Table 14

Respondents' Ranking of Life on a Scale of 1 to 10
(Worst Possible to Best Possible)

Ranking	Number	% Reporting
1 - 5	61	17%
6 - 8	156	44%
9 - 10	136	39%
	353	100%

Table 15

Number of Activities in Which Respondents are Actively* Engaged

Number of Activities	Number	% Reporting
0 - 2	80	23%
3 - 4	153	43%
5 - 9	120	34%
	353	100%

* The responses of 4 or 5 given for an activity according to the following scale:

1 - Never or hardly ever
2 - 1 to 5 times a year
3 - 6 to 12 times a year
4 - Every two or three weeks
5 - Once a week or more

Behavioral -- The contextual variables of a behavioral nature are the number of hours spent per day watching television, the number of hours spent per day listening to the radio and the number of hours spent per day reading newspapers or magazines. The frequency distributions for these variables are given in Tables 16 through 18.

Table 16

Number of Hours Per Day Respondents Spent Watching Television

Hours Spent Per Day	Number	% Reporting
0 - 1 hour	49	13%
1 - 2 hours	98	26%
2 - 5 hours	176	46%
5 or more hours	55	15%
	378	100%

Table 17

Number of Hours Per Day Respondents Spent Listening to the Radio

Hours Spent Per Day	Number	% Reporting
0 - 1 hour	169	44%
1 - 2 hours	80	21%
2 - 5 hours	71	19%
5 or more hours	61	16%
	381	100%

Table 18

Number of Hours Per Day Respondents Spent Reading Newspapers or Magazines

Hours Spent Per Day	Number	% Reporting
0 - 1 hour	124	33%
1 - 2 hours	163	43%
2 - 5 hours	82	22%
5 or more hours	10	2%
	379	100%

All variables of the study are presented in Figure 1.

Hypotheses

The hypotheses fell into three major categories. The research hypotheses are presented below.

Group 1

The extent of OTC drug use among the elderly sample is positively related to the importance of certain sources of OTC drug information.

1.1 There is a positive relationship between the extent of OTC drug use and the importance of doctors as a source of OTC drug information.

1.2 There is a positive relationship between the extent of OTC drug use and the importance of pharmacists as a source of OTC drug information.

1.3 There is a positive relationship between the extent of OTC drug use and the importance of self as a source of OTC drug information.

1.4 There are differences between users and non-users in the importance placed on various sources of OTC drug information.

Group 2

The extent of OTC drug use is related to certain demographic contextual variables.

2.1 There is a negative relationship between the extent of OTC drug use and age.

2.2 The extent of OTC drug use is greater for women than for men.

2.3 The extent of OTC drug use is greater for whites than for non-whites.

2.4 The extent of OTC drug use is greater for urban residents than for rural residents.

2.5 The extent of OTC drug use is greater for those in single member families than those residing in larger families.

Group 3

The extent of OTC drug use is negatively related to attitudinal contextual factors.

3.1 There is a negative relationship between the extent of OTC drug use and satisfaction with the way one's time is spent.

3.2 There is a negative relationship between the extent of OTC drug use and the ranking of one's life (from worst possible to best possible).

3.3 There is a negative relationship between the extent of OTC drug use and the number of activities the individual engages in.

3.4 There is a negative relationship between the extent of OTC drug use and perceived health status.

The literature produced no testable hypotheses on any relationship between the sources of information and influence and the contextual variables. Depending on how the contextual variables are related to the

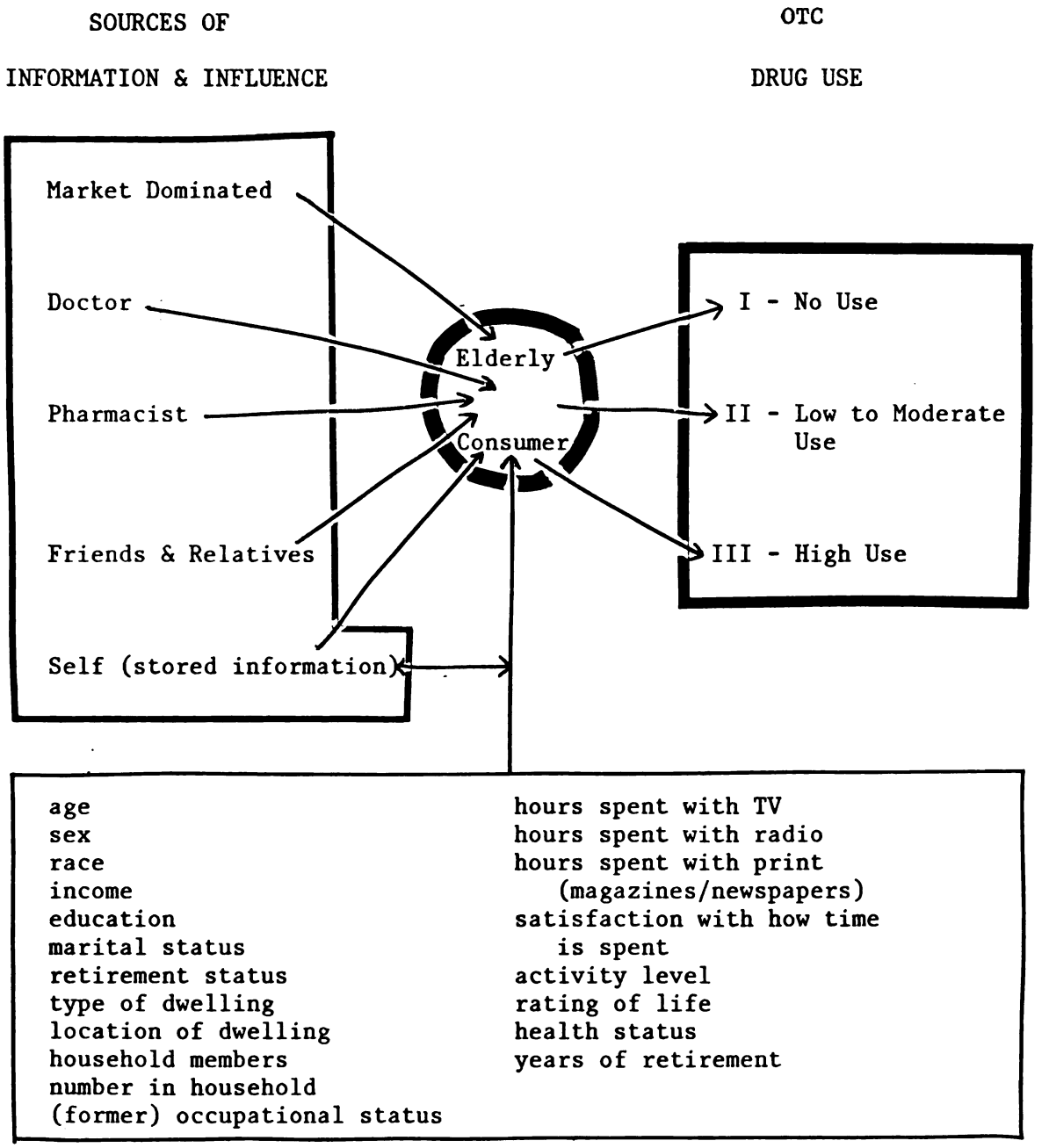

FIGURE 1

VARIABLES OF THE STUDY

information sources scores, contextual variables will be used to elaborate the relationship between the importance of information sources and the extent of drug use. Additionally, all variables will be explored for their importance in predicting OTC drug use.

Analysis of the Data

Statistical Methods

The statistical tests used for testing the hypotheses and for elaborating the relationships found by hypotheses testing are discussed below. All hypotheses testing used one-tail tests.

Pearson's Product Moment Correlation Coefficient

Correlation provides a technique for measuring the linear relationship between two variables and produces a single summary statistic describing the strength of the association (Nie, et. al., 1978). The coefficient of correlation ranges from perfect negative correlation (-1), to perfect positive correlation (+1). Zero indicates that no correlation exists. This test was used to test the significance of relationships between the extent of OTC drug use and the importance of information sources. This test was also used to test the significance of the relationship between the extent of OTC drug use and one demographic contextual variable, age; and all attitudinal contextual variables.

T-Test for Independent Samples Between Groups

The t-test establishes whether or not a difference between two samples is significant. The significance of the t is indicative of a true difference between the two populations (Nie, et. al., 1978). The t statistic depends on the number of groups and the degrees of freedom. It must be outside the -1 to +1 range to be significant. This test was

used to test for the relationships between the extent of OTC drug use and the demographic contextual variables excluding age. These included sex, race, residential location, and family status.

One-Way Analysis of Variance

This test assesses the effects of one categorical independent variable measured at any level upon a continuous variable. Differences between the means of categories on the dependent variables are tested for statistical significance using a general-linear hypothesis approach (Nie, et. al., 1978). The differences between users and non-users of OTC drugs were tested for significance with respect to the importance of information sources using the Scheffe multiple range test. The independent variable for the one way analyses was level of OTC drug use. The dependent variables for this test were the importance of sources of information; doctors, pharmacists, friends and relatives, self and market-dominated sources.

Two-Way Analysis of Variance

While SPSS (Nie, et. al., 1978) allows for unequal subgroups in ANOVA procedures, it produces results which would lead to the same conclusion with respect to various effects no matter which approach was used. Consequently, an approximated procedure, unweighted means ANOVA (Myers, 1972), was used. This procedure uses only the means for estimating all effects except the error term where subjects within cells is used. The formula used is presented on pages 116-118 in J.L. Myers' (1972) Fundamentals of Experimental Design. This test was used to test for interactive and main effect relationships between all contextual variables and the extent of OTC drug use on the importance of information sources. The dependent variables for the two way analyses were

the importance of professional and of non-professional sources of OTC drug information. (These two factors emerged out of analysis of the importance scores for the original five sources. See page 61.) The independent variables used in these analyses were the levels of OTC drug use and the contextual variables.

Scheffe Multiple Comparison Tests

Overall F reveals only that one linear combination differs from another linear combination. The Scheffe multiple comparison (Myers, 1972) is a post hoc comparison test of subgroup means. This test is the appropriate simple effects test for unequal numbers. It reveals which of the subgroups differs significantly from which of the other subgroups. All interactive relationships found through the unweighted means ANOVA were subjected to this test. The formula used is found in Myers (op. cit.) on pages 363-366.

Multiple Regression Analysis

Multiple regression allows for the study of the linear relationship between a set of independent variables and a dependent variable while taking into account the interrelationships among the independent variables. It produces a linear combination of independent variables which will correlate as highly as possible with the dependent variable. This linear combination can be used to 'predict' values of the dependent variable and the importance of each of the independent variables in that prediction can be assessed (Nie, et. al., 1978). The set of independent variables used included all contextual variables, the importance of professional information sources and the importance of non-professional information sources. The dependent variable used in the multiple regression analysis was the extent of OTC drug use.

Discriminant Analysis

Discriminant analysis allows for the calculation of the effects of independent variables on a categorical dependent variable. Linear combinations of independent variables that best distinguish between the categories of the dependent variable are found. The independent variables used in the discriminant analysis included all contextual variables, the importance of professional information sources and the importance of non-professional information sources. The categorical dependent variable was the level of OTC drug use.

Computer Programs

Analysis was done by Control Data Corporation 6500 model computer using version 7 of the Statistical Package for the Social Sciences (SPSS). All computer computations were implemented at the Computer Laboratory at Michigan State University.

CHAPTER IV

Results

This chapter presents the findings relevant to evaluating the hypotheses presented in Chapter III, as well as additional findings concerning the influence of contextual variables on the relationship between over-the-counter (OTC) drug use and the importance placed on sources of OTC drug information. In addition, multiple regression and discriminant function analyses are presented which identify a set of variables most predictive of OTC drug use. The contextual variables were reduced, in some cases, to facilitate analysis and interpretation of the data. The results of the hypotheses testing for the second and third group of hypotheses will be presented first. The results relating to relationships between OTC drug use and the importance of information sources will then be presented together.

Relationships Between the Extent of OTC Drug Use and Demographic Contextual Variables

The second group of hypotheses concern the relationships between extent of OTC drug use and certain demographic variables.

2.1 There is a negative relationship between the extent of OTC drug use and age.

Age was not significantly correlated with the extent of OTC drug use. The Pearson coefficient was .04 (n.s.); therefore, the null hypothesis was not rejected.

2.2 The extent of OTC drug use is greater for women than for men.

Table 19 presents the results of a t-test of the difference between men and women in mean extent of OTC drug use. Men and women did not differ significantly in OTC drug use, nor was the mean difference in the predicted direction. Rather, men had a somewhat higher mean for drug use in this sample. Therefore, the null hypothesis was not rejected.

Table 19

Mean Differences in OTC Drug Use by Sex

Group (N)	Mean	S.D.	$\underline{t}^a$
Male (147)	2.76	2.57	.72 (n.s.)
Female (230)	2.57	2.53	

[a]one-tail test

2.3 The extent of OTC drug use is greater for whites than for non-whites.

The extent of OTC drug use was not significantly greater for whites than for non-whites (Table 20). While the mean extent of OTC drug use was higher for whites than non-whites, as predicted, the difference was only significant at the .10 level. Therefore, the null hypothesis cannot be rejected.

Table 20

Mean Differences in the Extent of OTC Drug Use by Race

Group (N)	Mean	S.D.	t^a
White (331)	2.71	2.52	1.28#
Non-White (41)	2.17	2.78	

[a]one-tail test
#p $\leq$ .10

2.4 The extent of OTC drug use is greater for urban residents than for rural residents.

A significant difference was found between urban and rural residents with regard to the extent of OTC use. However, this difference was in the opposite direction of that hypothesized. As shown in Table 21, rural residents were significantly higher than urban residents in OTC drug use. The null hypothesis was rejected; however, the research hypothesis is not supported.

Table 21

Mean Differences in the Extent of OTC Drug Use Between Urban and Rural Residents

Group (N)	Mean	S.D.	t^a
Urban (297)	2.46	2.55	- 2.72*
Rural (81)	3.29	2.42	

[a]one-tail test
*p $\leq$ .005

2.5 The extent of OTC drug use is greater for those residing in single member families than for those residing in larger families.

As shown in Table 22, the extent of OTC drug use was not significantly greater for those residing in single member families. Therefore, the null hypothesis was not rejected.

Table 22

Mean Differences in the Extent of OTC Drug Use Between Single Member Families and Larger Families

Group (N)	Mean	S.D.	t[a]
Single Member Families (203)	2.75	2.59	.89 (n.s.)
Larger Families (165)	2.51	2.49	

[a]one-tail test

Relationships Between the Extent of OTC Drug Use and Attitudinal Contextual Variables

The third group of hypotheses concern the relationships between attitudinal characteristics and the extent of OTC drug use.

3.1 There is a negative relationship between the extent of OTC drug use and satisfaction with the way one's time is spent.

A significant negative relationship was found between the extent of OTC drug use and satisfaction with the way one's time is spent. The Pearson coefficient was -.114 which is significant at the .05 level. The research hypothesis is supported.

3.2 There is a negative relationship between the extent of OTC drug use and the ranking of one's life (from worst possible to best possible).

The relationship between the extent of OTC drug use and the ranking of one's life was negative (-.194) and significant ($p < .001$). The research hypothesis is therefore supported.

3.3 There is a negative relationship between the extent of OTC drug use and the number of activities the individual engages in.

No significant relationship was found between the extent of OTC drug use and the number of activities engaged in. The Pearson correlation coefficient of .057 between these measures is not significant at the .05 level. Therefore, the null hypothesis was not rejected.

3.4 There is a negative relationship between the extent of OTC drug use and perceived health status.

Perceived health status was not significantly related to the extent of OTC drug use. The Pearson correlation coefficient was .001 and was not significant at the .05 level. The null hypothesis was not rejected.

Relationships Between The Extent Of OTC Drug Use And The Importance Of Information Sources

The first group of hypotheses concern relationships between the extent of a person's OTC drug use and the importance placed on various sources of OTC drug information.

1.1 There is a positive relationship between the extent of OTC drug use and the importance of doctors as a source of OTC drug information.

The extent of over-the-counter drug use was significantly related to the importance placed on the doctor as a source of information. The Pearson correlation coefficient between scores on the OTC drug use index and the measure of the importance of doctors is .31, $p < .001$. Therefore, the research hypothesis is supported.

1.2 There is a positive relationship between the extent of OTC drug use and the importance of pharmacists as a source of OTC drug information.

Scores of the extent of OTC drug use were also found to be significantly related to the scores of the importance placed on pharmacists as a source of OTC drug information. The Pearson correlation coefficient between the indices of extent of OTC drug use and the importance of pharmacists is .18 ($p < .001$). Therefore, the research hypothesis is supported.

1.3 There is a positive relationship between the extent of OTC drug use and the importance of self as a source of OTC drug information.

Increasing OTC drug use was significantly associated with the importance placed on self as a source of information. The Pearson correlation was .20 ($p < .001$), supporting the research hypothesis.

The Pearson correlation reveals only that there is a significant linear relationship between OTC drug use and the importance of information sources. While the correlations between the OTC drug use indices and the importance measures are significant statistically, they are modest. An increase in importance may occur primarily between users and non-users, between moderate and high users or between non-users and high users. Also, the relationship between the extent of OTC drug use and the importance of information sources may differ for different sources. Therefore, one-way ANOVA was used to examine these relationships. Subjects were separated into groups based on their level of OTC drug use (see Chapter III for a description of levels of drug use), and the differences between groups in the importance placed on each of the various sources were examined.

1.4 There are differences between users and non-users in the importance placed on various sources of OTC drug information.

As shown in Table 23, significant differences were found between OTC drug use groups in the importance placed on each of the five information sources. The F ratios were significant at the .001 level for each source of OTC drug information. Scheffe post hoc comparisons revealed that non-users and users differed significantly ($p < .05$) in the importance placed on each source of information except friends and relatives. Non-users and moderate users were similar to each other, but differed significantly from heavy users in the importance placed on friends and relatives as a source of information. Moderate and high users of over-the-counter drugs were similar with respect to the importance placed on pharmacists, self and market-dominated sources. However, all three groups differed significantly with respect to the importance placed on doctors as a source of information. Heavy users placed the most importance on doctors, moderate users were intermediate, and non-users placed the least importance on doctors as a source of information.

Table 23

Mean Differences in Importance of Sources of Information by Extent of OTC Drug Use

Source	Nonuser	Moderate User	Heavy User	F (2, 380)
Doctor	$.576_a$	$.678_b$	$.800_c$	19.45*
Pharmacist	$.371_a$	$.479_b$	$.501_b$	8.06*
Self	$.404_a$	$.579_b$	$.596_b$	19.45*
Friends and Relatives	$.112_a$	$.156_a$	$.256_b$	8.56*
Market Dominated	$.163_a$	$.262_b$	$.292_b$	9.44*

Note: Means not sharing subscripts differ at the .05 level or beyond, Scheffe exact test.

* $p < .001$

Elaboration of Relationships between the Extent of OTC Drug Use and the Importance of Information Sources

Interrelationships of Importance Placed on Information Sources

The research hypotheses on the relationships between the extent of OTC drug use and the importance placed on three of the information sources were supported. Although relationships with other sources were not hypothesized, the importance placed on friends and relatives and on market-dominated sources were also significantly related to the extent of OTC drug use. Since all scores for importance placed on information sources were significantly related to the extent of OTC drug use, relationships between the importance an individual places on each of the five sources of information were examined to determine if the importance placed on the specific sources of OTC drug information were independent or related to each other. The Pearson correlations between these variables are presented in Table 24.

Table 24

Intercorrelations of Information Source Importance Scores

	Doctors	Pharmacists	Self	Friends/ Relatives	Market-Dominated
Doctors	--	--	--	--	--
Pharmacists	.2727*	--	--	--	--
Self	.1879*	.2737*	--	--	--
Friends/ Relatives	.0215	.1268**	.1985*	--	--
Market-Dominated	-.0302	.2729*	.2193*	.3016*	--

*$p < .001$
**$p < .05$

The majority of information source scores were significantly and positively correlated, with two exceptions: the importance placed on doctors with that placed on friends and relatives, and the importance placed on doctors with that placed on market-dominated sources. In general then, the importance placed on one source of information is directly related to the importance placed on another source. A question arises as to whether these distinctions between sources of information are meaningful. For example, increasing OTC drug use may be associated with a general increase in the desire for OTC drug information from any source, rather than only certain sources.

A principal components factor analysis of the correlation matrix, presented in Table 24, yielded two reliable factors (i.e., eigenvalues $\geq$ 1.00) accounting for 58.2% of the variance in source importance ratings. These two factors can be taken as "source variables" accounting for the observed interrelations in the original importance scores for information sources (Nie, et. al., 1978, p. 469). The two factors were rotated to a varimax criterion to obtain the simplest factor structure (Harman, 1967, pp. 98-99). The results of the factor analysis are presented in Table 25.

Table 25

Varimax Rotated Principal Components Factor Matrix of Information Source Importance Scores

Information Source	FACTOR 1 (Non-Professional)	FACTOR 2 (Professional)
Doctors	- .07267	.60866 *
Pharmacists	.32036	.46239 *
Self	.32030	.35282
Friends/Relatives	.41728 *	.07027
Market-Dominated	.71264 *	.04334
Relative Percent of Variance	68%	32%

* Highest factor loading for variable.

The two factors basically distinguish between the importance placed on non-professional sources, such as market-dominated sources and friends and relatives (Factor 1), and the importance placed on professional sources, such as the doctor and pharmacist (Factor 2). The importance of self as a source of information loaded highly on both factors as, to a lesser extent, did the importance of the pharmacist. The importance scores for the five information sources (doctors, pharmacists, friends and relatives, self, and market-dominated) were all significantly related to the extent of OTC drug use. To determine if a significant relationship existed between an individual's OTC drug use and the two factors (importance of professional sources of OTC drug information and importance of non-professional sources of OTC drug information), one-way analyses of variance were used.

A linear relationship was found between the importance of professional information sources and OTC drug use (Table 26). Increasing

importance is placed on professional sources as OTC drug use increased. However, the importance placed on non-professional sources differed significantly between non-users and users, as shown in Table 27. The difference between moderate and heavy OTC drug users was not significant.

Table 26

Analysis of Variance in Importance of Professional Information Sources by Level of OTC Drug Use

Source	DF	SS	MS	F
Between Groups	2	23.78	11.89	26.30*
Within Groups	381	172.31	.452	
Total	383	196.10		

Means

Non-Users	Moderate Users	Heavy Users
$-.341_a$	$.059_b$	$.281_c$

Note: Means not sharing subscripts differ at the .05 level or beyond, Scheffe exact test.

* $p < .001$

Table 27

Analysis of Variance in Importance of Non-Professional Information Sources by Level of OTC Drug Use

Source	DF	SS	MS	F
Between Groups	2	14.37	7.19	12.85*
Within Groups	381	213.11	.56	
Total	383	227.49		

Means

Non-Users	Moderate Users	Heavy Users
-280_a	$.088_b$	$.180_b$

Note: Means not sharing subscripts differ at the .05 level or beyond, Scheffe exact test.

* $p < .001$

Elaboration of the Relationships Between the Extent of OTC Drug Use and the Importance of Professional and Non-Professional Information Sources

Two-way analysis of variance was used to test for interactive relationships between contextual variables and the extent of OTC drug use on the importance placed on professional and non-professional sources of OTC drug information. It was also used to test for main effects of the contextual variables on the importance of information sources. However, since the differences in cell frequencies were unequal and nonproportional, the unweighted means ANOVA procedure (Myers, 1972) was used.

Since these effects were not hypothesized, a posteriori contrasts were used to compare subgroup means using the Scheffe multiple comparison test. This is an exact probability test for unequal subgroups and is one of the most conservative simple effects tests. The results of these tests are presented below with discussion.

Effects of Demographic Contextual Variables

Two demographic variables, race and marital status, were found to have an interactive effect with OTC drug use on the importance placed on non-professional sources of OTC drug information. Additionally, three demographic variables demonstrated main effects on the importance of professional sources of OTC drug information. These were age, urban/rural residential location and occupational status.

Race - As shown in Table 28, race was not significantly related to importance placed on non-professional sources, while OTC drug use was significantly related to the importance of non-professional information sources. The interactive relationship between race and OTC drug use on the importance of non-professional information sources, although not strong, was significant ($p < .10$).

Table 28

Summary of Analysis of Variance in Importance of Non-professional Information Sources by Race and Level of OTC Drug Use

Source of Variation	Degrees of Freedom (DF)	Sum of Squares (SS)	Mean of Squares (MS)	F Value
Race (R)	1	.064	.064	1.00
OTC Drug Use (D)	2	7.41	3.704	6.53*
R x D	2	3.14	1.570	2.77#
Within Subjects	366	207.73	.567	

* $p < .05$
# $p < .10$

Race seems to have a moderate effect on the relationship between the importance of non-professional information sources and the extent of OTC drug use. The effect is revealed in the mean differences presented in Table 29.

Table 29

Mean Differences in Non-Professional Information Sources by Race and Level of OTC Drug Use

Drug Use Level	Race	
	White	Non-White
Non Use	$-.234_{ab}$	$-.407_{a}$
Moderate Use	$.065_{bcd}$	$.447_{d}$
Heavy Use	$.213_{cd}$	$-.129_{abc}$

Note: Means not sharing subscripts differ at the .05 level or beyond, Scheffe Multiple Comparison Test.

The relationship of the importance of non-professional sources to the extent of OTC drug use for whites was linearly related. Importance placed on non-professional sources increased with OTC drug use. However, the significant difference here was between non-users and heavy users of OTC drugs. For non-whites the importance of non-professional sources was curvilinearly related to OTC drug use. Importance of non-professional sources was significantly greater for moderate users than either non-users or heavy users of OTC drugs. Means for use groups, however, do not differ significantly between whites and non-whites as shown in Figure 2. Thus, the importance of such information sources as friends, relatives and market-dominated increased with OTC drug use for whites, while the importance of these sources was greatest for moderate users and less for non-users and heavy-users among non-whites.

Race demonstrated a main effect on the importance of professional information sources. Whites and non-whites differed significantly in the importance placed on professional sources of information. White elderly persons had a mean of .113 and non-white elderly persons had a mean of -.684. The F value (1, 366) was 4.44 with a probability of less than .05. While whites placed some importance on professional information sources, non-whites placed significantly less importance on professional information sources, regardless of their level of OTC use. Thus, the importance of such sources as doctors and pharmacists was greater for whites than for non-whites.

Marital Status - The importance of non-professional information sources was not significantly related to either marital status or OTC drug use. However, the importance of non-professional sources of OTC drug information was significant for the interaction of marital status and OTC drug use, as shown in Table 30.

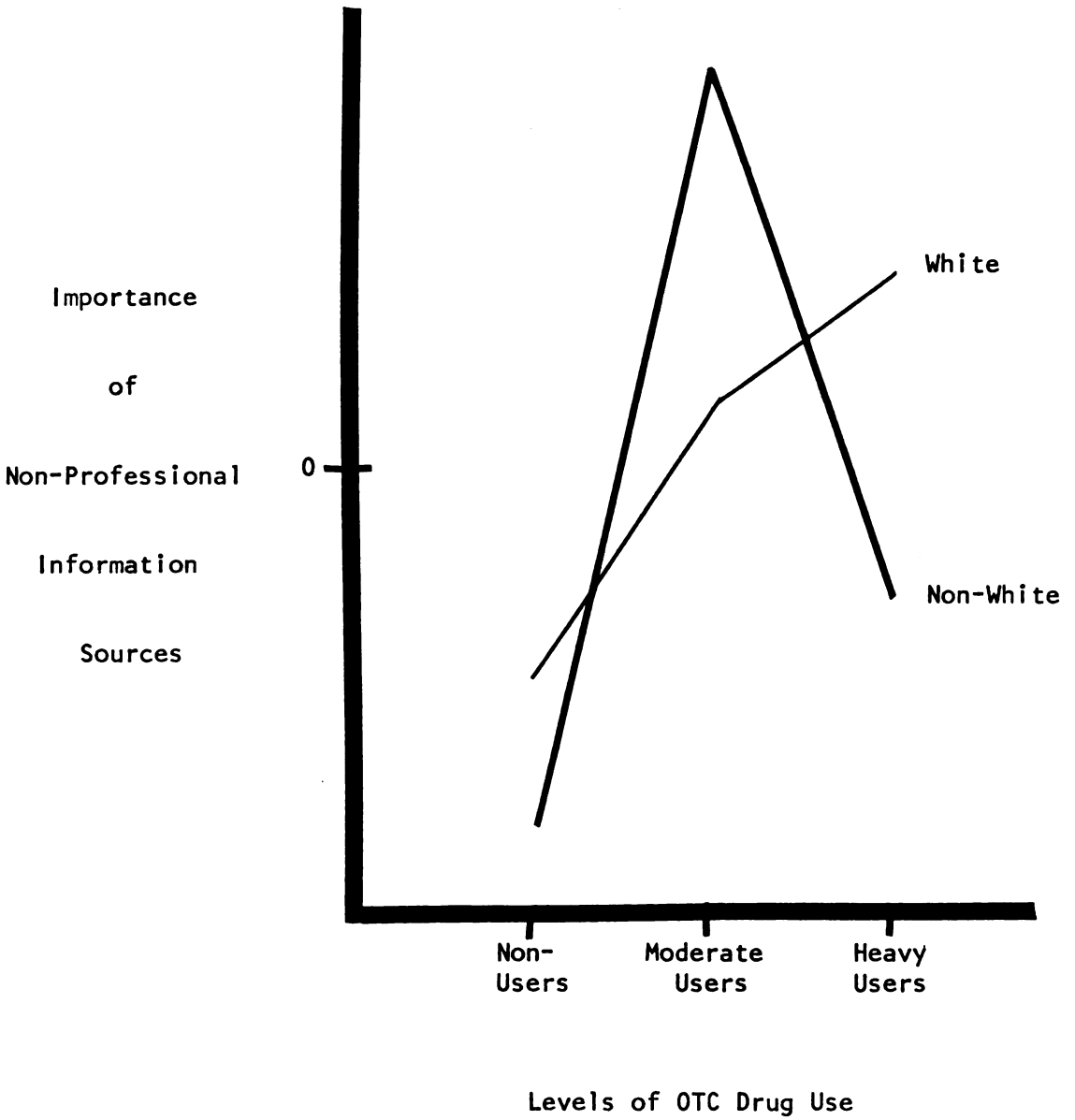

FIGURE 2

Interactive Relationship Between Race, the Importance of Non-Professional Information Sources and Level of OTC Drug Use

The relationship between the importance placed on non-professional sources of OTC drug information and the level of OTC drug use is linear for persons who are married and living with their spouse (Table 31). Importance placed on non-professional sources increased with higher levels of OTC drug use. Significant differences were found between non-users and heavy users. However, for widowed persons and those of other marital statuses the importance of non-professional sources of information was not related to OTC drug use. Virtually no variation occurred among users in the importance placed on non-professional information sources as a consequence of widowed or 'other' marital statuses, such as single, divorced, or separated. Thus, the relationship between the extent of OTC drug use and the importance of market-dominated sources and friends and relatives differs between persons who are married and living with their spouse and persons who are widowed and of 'other' marital statuses (Figure 3).

Table 30

Summary of Analysis of Variance in Importance of Non-Professional Information Sources by Marital Status and Level of OTC Drug Use

Source of Variation	D.F.	S.S.	M.S.	F
Marital Status (M)	2	.061	.030	1.00
OTC Drug Use (D)	2	.762	.371	1.00
M x D	4	9.867	2.467	4.43*
Within Subjects	369	205.42	.557	

* $p < .05$

Table 31

Mean Differences in Importance of Non-Professional Information Sources by Marital Status and Level of OTC Drug Use

Drug Use Level	Married Living with Spouse	Widowed	Other Marital Status
Non Use	$-.274_{a}$	$-.327_{a}$	$-.083_{ab}$
Moderate Use	$.021_{ab}$	$.188_{ab}$	$.046_{ab}$
High Use	$.310_{b}$	$.150_{ab}$	$-.016_{ab}$

Note: Means not sharing subscripts differ at the .05 level or beyond Scheffe Multiple Comparison tests.

Age - Although no interactive relationship was found for age, it was significantly related to the importance of professional sources of OTC drug information. Persons above the median age of 70 differed significantly from those age 60 to 70 in the importance placed on professional information sources. Those persons age 60 to 70 placed considerably more importance on professional sources than those older than the median age of 70. The mean for the younger age group was .303 and for the older age group, it was -.234. The F value (1, 370), 6.903, was significant at the .05 level.

Location of Dwelling - The area in which respondents resided was related to the importance placed on professional sources of OTC drug information. Urban residents placed more importance on professional information sources than did rural residents. Urban residents had a mean of .061 while rural residents had a mean of -.375. The F value (1, 372) was 2.90, which was significant at the .10 level.

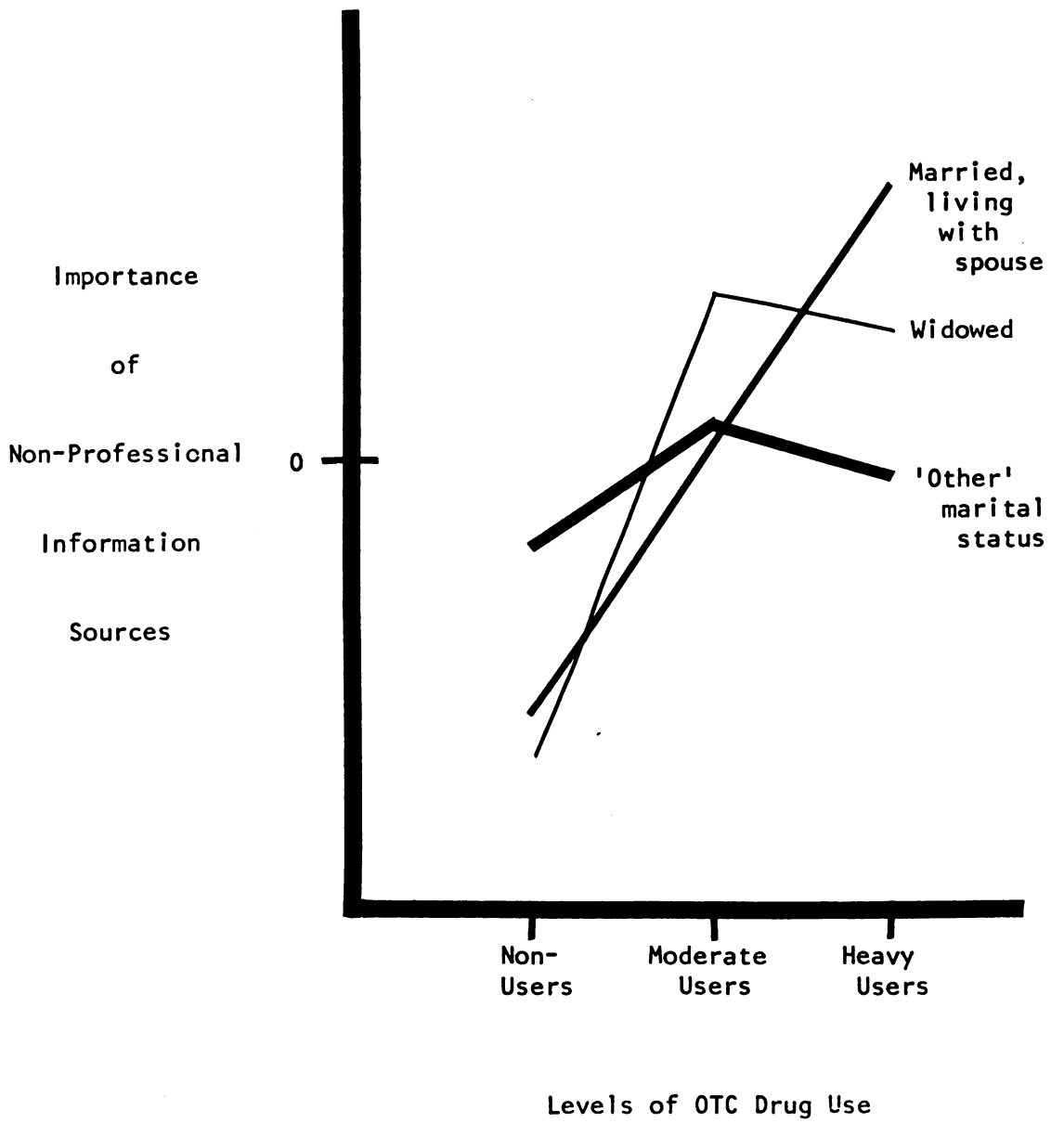

FIGURE 3

Interactive Relationship Between Marital Status, the Importance of Non-Professional Information Sources and Level of OTC Drug Use

Occupational Status - The importance of professional information sources for OTC drug information was curvilinearly related to occupational status. Unskilled or semi-skilled workers placed the least importance on these sources, with a mean of -.455. Skilled workers placed the most importance on professional sources with a mean of .254. White collar workers were intermediate in the importance placed on professional sources with a mean of .100. The F value (2, 351) was 3.79 which is significant at the .10 level.

Effects of Attitudinal Contextual Variables

Only one contextual variable of an attitudinal nature was significant in the two-way analysis of variance. The number of activities in which an individual is actively engaged was significantly related to the importance the individual places on professional information sources.

Activity Level - Those persons who were relatively more active, that is they were actively engaged in five or more social activities, differed significantly from those persons who were engaged in less than five social activities in the importance placed on professional information sources. Those who were actively engaged in fewer social activities placed less importance on professional information sources, while those who were actively engaged in many social activities placed more importance on professional information sources. The mean for the less actively engaged was -.185 and for those more actively engaged it was .769. The F value (1, 378) was 11.62 with a probability of less than .001.

Effects of Behavioral Contextual Variables

The one contextual variable of a behavioral nature that was significant in two-way analysis was time spent reading newspapers or magazines. It demonstrated an interactive relationship with level of OTC drug use on the importance of non-professional information sources.

Time Spent with Print Media - Means for all subgroups did not differ significantly except between those who spend 5 hours or less with newspapers and magazines and those who spend 5 or more hours, among non-users of OTC drugs (Table 33). The extreme mean for those who spend 5 or more hours with print media must be viewed with caution because of the small number (2) in this subgroup. In general, subgroups did not differ significantly in the importance placed on non-professional information sources (Figure 4). The interactive effect of time spent with media, when closely examined demonstrates that in essence the linear relationship does not exist because the extreme mean accounting for the linear relationship is produced from a very small number in the subgroup.

Table 32

Summary of Analysis of Variance in Importance of Non-Professional Information Sources by Time Spent with Print Media and Level of OTC Drug Use

Source of Variation	D.F.	S.S.	M.S.	F
Print Media (P)	3	1.707	.569	1.00
OTC Drug Use (D)	2	.651	.325	1.00
P x D	6	10.948	1.825	3.185#
Within Subjects	367	210.18	.573	

# $p < .10$

Table 33

Mean Differences in Importance of Non-Professional Information Sources by Time Spent with Print Media and Level of OTC Drug Use

Drug Use Level	0 - 1 Hour	1 - 2 Hours	2 - 5 Hours	5 or More Hours
Non Use	$-.212_{a}$	$-.340_{a}$	$-.320_{a}$	$.947_{b}$
Moderate Use	$-.168_{ab}$	$.245_{ab}$	$.168_{ab}$	$-.242_{a}$
High Use	$.173_{ab}$	$.200_{ab}$	$.218_{ab}$	$.088_{ab}$

Note: Means not sharing subscripts differ at the .05 level or beyond Scheffe Multiple Comparison test.

Predictive Analysis of Over-the-Counter Drug Use

While the importance of information sources was significantly related to over-the-counter drug use, its relative importance in predicting over-the-counter drug use has not yet been ascertained. In order to determine those variables of importance in predicting over-the-counter drug use among the elderly population studied, multiple regression and discriminant analyses were performed on the data. These approaches are complementary. Both are a means of deriving a linear combination of variables that maximize predictability. The difference is that multiple regression is designed for predicting scores along a continuum while discriminant analysis is designed to maximize discrimination between a set of discrete groups.

Multiple Regression Analysis

The multiple regression analysis produced five variables which accounted for most of the 23 percent of precitable variance in OTC drug use. The importance placed on professional information sources, the

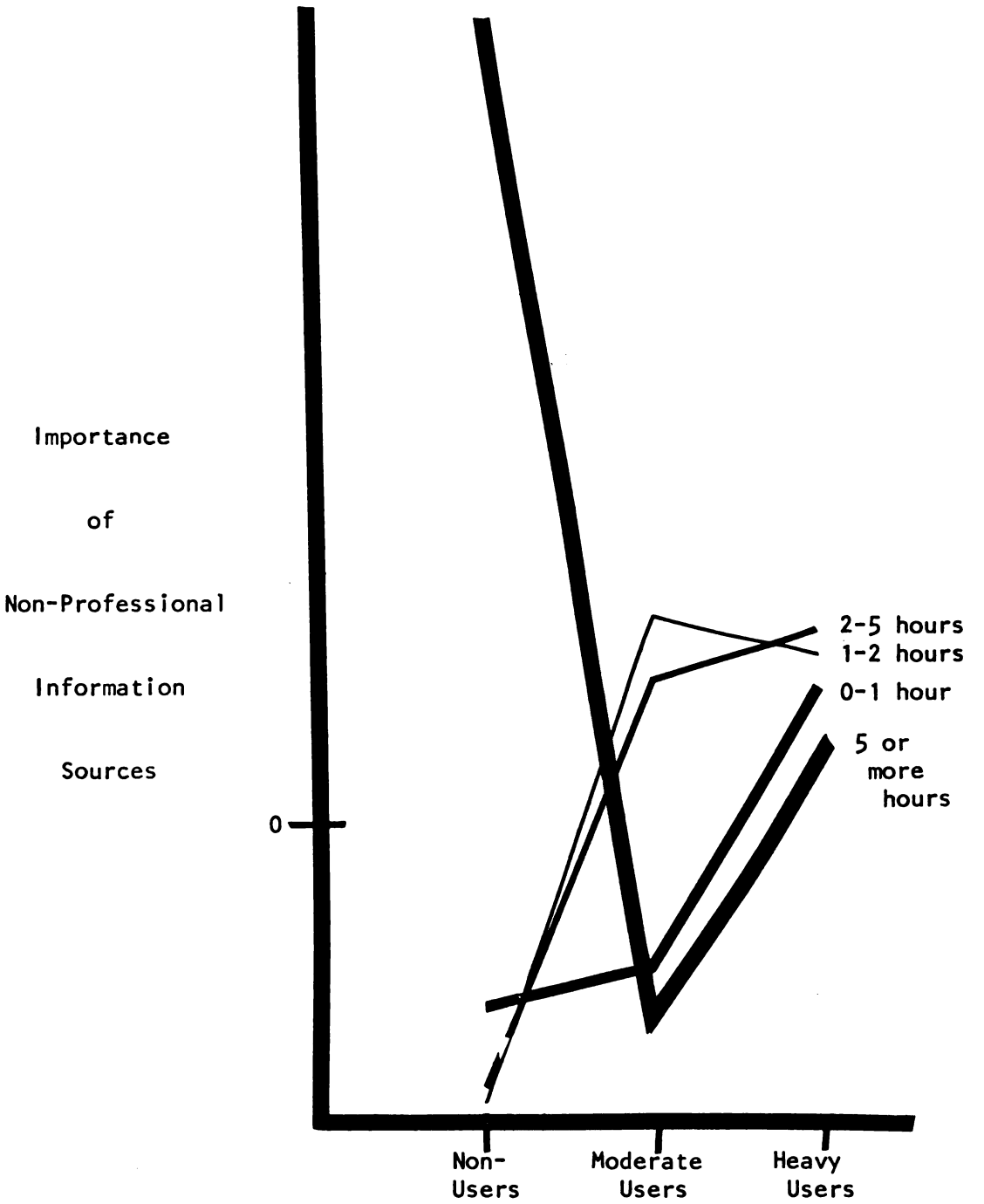

FIGURE 4

Interactive Relationship Between Time Spent Reading Newspapers or Magazines, Importance of Non-Professional Information Sources and Level of OTC Drug Use

importance placed on non-professional information sources, ranking of one's life, rural residential location, and age were the most important predictors of the extent of OTC drug use. The importance placed on professional sources alone accounted for 11% of the variance in OTC drug use, which amounts to almost half of the variance accounted for by the regression equation. Contextual variables, other than the three already mentioned, account for very little of the variance. The multiple regression summary is presented in Table 34.

Table 34

Summary of Multiple Regression
by Extent of OTC Drug Use

Variables	Correlation	Standardized Regression Coefficient (Beta)
Professional sources	.33977	.325 *
Non-professional sources	.25514	.181
Ranking of life	-.17146	-.178
Location of dwelling	.13525	.131
Age	.02186	.114
Time spent with radio	.12344	.075
White collar occupation	-.07038	-.068
Widowed	-.06260	-.123
Family status	-.02808	-.068
Education	-.05861	-.072
Income	.01571	.056
Activity level	.07033	.037
Time spent with print	.04144	.030
Married living with spouse	.02332	-.057
Satisfaction with how time is spent	-.09792	.020
Health	.00930	.014
Forced retirement	-.00815	-.007
Race	-.08142	.005

$R = .486$ $R^2 = .236$ $F\ (18, 354) = 6.09$ $p < .001$

* Regression coefficient $\geq .30$.

Discriminant Analysis

The results of the discriminant analysis are presented in Tables 33 through 36. Those variables with significant univariate F ratios were the importance of professional information sources, the importance of non-professional information sources, age, whether one is widowed or not widowed, and the ranking of one's life from worst possible to best possible. These discriminant analysis predictor variables do not differ from the highest multiple regression predictor variables other than in one case. While residential location is one of the best predictor variables in multiple regression, it is replaced in the discriminant analysis by widowed or non-widowed marital status.

Two dimensions of discrimination were found in the analysis. Dimension 1 primarily discriminates between non-users and heavy users of OTC drugs, while Dimension 2 primarily discriminates between moderate users and heavy users of OTC drugs (Table 36). The variables which best discriminate (discriminant coefficient $\geq .30$) between non-users and heavy users of OTC drugs are the importance of professional and non-professional information sources, whether an individual is widowed or not, and the ranking by individuals of their life from worst possible to best possible. The importance of professional sources had the largest coefficient, followed by the ranking of an individual's life, the importance of non-professional sources and whether the individual is widowed or not widowed.

For discriminating between moderate and heavy users of OTC drugs, there were seven variables with coefficients greater than or equal to .30 (Table 37). The variables, in order from largest coefficient to smallest coefficient are age, whether the individual is married and

living with their spouse or the individual is widowed or of 'other' marital status, whether one resided in a single member family or in a larger member family, the number of hours spent watching television, whether an individual is widowed or not widowed, whether the individual is/was in a white collar occupation or the individual is/was in a skilled or unskilled/semi-skilled occupation, and race.

Predictive ability of the analysis was very good with 57 percent of the known cases correctly classified (Table 38). Each of the groups were also predicted about equally well. The Chi Square was 53.776 with a probability of less than .001.

Table 35

Summary of Discriminant Analysis
by Level of OTC Drug Use

Variable	Means Non-Users	Moderate Users	Heavy Users	Pooled Standard Deviations	Univariate F Ratio (2, 209)
Non-professional sources	- .244	.086	.152	.753	5.25**
Professional sources	- .357	.163	.245	.692	16.14***
Sex	1.633	1.576	1.552	.494	.44
Race	1.183	1.070	1.075	.306	2.89
Time spent with TV	1.162	1.541	1.776	.905	1.28
Education	11.100	10.470	10.269	3.061	1.27
Family status	1.433	1.494	1.418	.499	.50
Time spent with radio	1.083	1.035	1.149	1.124	.19
Time spent with print	.867	.953	.925	.808	.20
Location of dwelling	1.183	1.200	1.269	.413	.79
Married/with spouse	.367	.482	.433	.497	.95
Widowed	.517	.318	.433	.493	3.02*
White collar occupation	.867	.518	.716	1.695	.77
Skilled occupation	.783	.506	.657	1.699	.48
Income	3.467	3.541	3.552	1.807	.04
Age	72.767	69.141	73.134	7.955	6.12**
Activity level	3.617	4.129	4.045	1.858	1.45
Satisfaction with how time is spent	4.050	4.106	3.746	1.028	2.54
Health status	2.533	2.741	2.657	1.002	.75
Ranking of life	7.917	7.847	7.000	2.187	3.79*
Forced retirement	1.400	1.353	1.269	.475	1.27

Table 35 (Cont'd)

Discriminant Function Removed	Eigenvalue	Percent of Trace	Wilks Lamboa	Chi Square	D.F.	SIG.
0	.30354	65.3	.661	82.456	42	.001
1	.16099	34.7	.861	29.705	20	.08

* p $\leq$ .05
** p $\leq$ .01
*** p $\leq$ .001

Table 36

Centroids of Groups in Discriminant Space

Group	Dimension 1	Dimension 2
Non-Users	- .85329	.12608
Moderate Users	.22278	- .45914
Heavy Users	.48151	.46958

Table 37

Standardized Discriminant Function Coefficients

Variable	Dimension 1	Dimension 2
Non-professional	.368*	-.014
Professional	.817*	.088
Sex	.019	-.054
Race	-.197	.311*
Time spent with TV	-.058	.381*
Education	-.171	.153
Family status	-.083	-.437*
Time spent with radio	-.077	.233
Time spent with print	.069	-.035
Location of dwelling	.127	.178
Married, living with spouse	-.159	.555*
Widowed	-.338*	.320*
White collar occupation	-.078	.318*
Skilled occupation	-.126	-.085
Income	-.001	.293
Age	.093	.880*
Activity level	.125	.016
Satisfaction with how time is spent	.092	-.226
Health status	.108	.002
Ranking of life	-.440*	-.241
Forced retirement	-.151	-.215

* coefficient $\geq$ .30

Table 38

Multiple Classification Analysis of Levels of OTC Drug Use

Group Name	N of Cases	Predicted Group Membership		
		Non-Users	Mod. Users	High Users
Non-users	60	32 (53%)	17 (28%)	11 (18%)
Moderate users	85	15 (18%)	47 (55%)	23 (27%)
Heavy users	67	10 (15%)	15 (22%)	42 (63%)

57.1% of known cases correctly classified

$X^2 = 53.776$ $p < .001$

CHAPTER V

Summary, Conclusions and Implications

This chapter presents a summary of the findings as well as conclusions and implications of the research. The first part presents a summary of the findings preceded by a brief overview of the research. The second part includes conclusions and implications that can be drawn from the research. In the last part, recommendations and suggestions for research and policy are made.

Summary of Findings

This research examined relationships between the subjective importance placed on certain sources of over-the-counter drug information and the extent of OTC drug use among a sample of Michigan's elderly consumers. Further, the influence of certain contextual variables (e.g., demographic, attitudinal and behavioral characteristics) on the observed relationships between the extent of OTC drug use and the importance of information sources was examined. Finally, the utility of these variables in predicting over-the-counter drug use and discriminating between levels of drug use (non-users, moderate users and heavy users) among Michigan's elderly consumers was assessed.

Data from the Senior Citizens' Substance Use Survey, conducted by the State of Michigan Office of Services to the Aging and Office of Substance Abuse Services, were used. Indices of importance of information sources and of the extent of OTC drug use were created from

variables in the original study. It was hypothesized that the importance an individual placed on doctors, pharmacists and self (an individual's own stored information) as sources of OTC drug information would be positively related to the extent of over-the-counter drug use for the individual. These hypotheses were supported. An additional hypothesis that there would be significant differences between users and non-users of OTC drugs in the importance placed on various sources of OTC drug information was also largely supported. The importance placed on doctors, pharmacists, self, and market-dominated sources as sources of OTC drug information was significantly greater among users than non-users. Further, the importance of doctors was also significantly greater among heavy OTC drug users than among moderate users. The importance of friends and relatives as a source of OTC drug information, however, did not differ significantly between moderate users and non-users, although heavy users placed significantly more importance on this source than either moderate or non-users.

Relationships between the extent of OTC drug use and certain contextual variables of a demographic and attitudinal nature were also hypothesized. The hypotheses concerning relationships of the demographic contextual variables to the extent of over-the-counter drug use were generally not supported. However, race was found to be marginally related in the predicted direction to the extent of over-the-counter drug use, with whites' OTC drug use being somewhat greater than non-whites'. Also, urban/rural residential location was significantly related to the extent of OTC drug use, but in the opposite direction of that predicted. Elderly rural residents made significantly more extensive use of OTC drugs than elderly urban residents.

Two of four hypothesized relationships between extent of OTC drug use and attitudinal contextual variables were statistically significant. An individual's satisfaction with the way his/her time is spent and an individual's ranking of his/her life on a scale from worst possible to best possible were both negatively related to the extent of OTC drug use.

Overall, the analyses revealed that the importance scores for all five information sources were significantly related to increased OTC drug use and that the importance scores for individual information sources were generally significantly and positively related to each other. As a consequence, a principal components factor analysis of the importance scores for the various information sources was performed. This analysis produced two factors: the importance of professional information sources (doctors and pharmacists), and the importance of non-professional information sources (market-dominated and friends and relatives). The importance of professional information sources was linearly related to the extent of OTC drug use (i.e., increased significantly between non-users and moderate users, and between moderate and heavy users), while the importance of non-professional information sources only differed significantly between non-users and users of OTC drugs, with moderate and heavy users not differing from each other.

The influences of contextual variables on these relationships were also explored. Significant interactive effects were observed between the level of OTC drug use and the factors of race, marital status, and time spent reading newspapers or magazines on the importance of non-professional information sources. Whites placed increasing importance on non-professional information sources with increased drug use. For

non-whites, moderate users placed the most importance on non-professional information sources. Elderly persons who were married and living with their spouse placed increasing importance on non-professional information sources with increased drug use. However, for widowed persons or those of another marital status, the importance of non-professional information sources did not vary significantly among non-users, moderate users, or heavy users. The interactive effect of time spent reading newspapers or magazines was found to come from one group with only two members, hence the interactive effect was discounted. Main effects on the importance of professional sources were found for race, age, urban/rural residential location, occupational status and activity level. Whites, urban residents, those age 60 to 70, those who were in skilled occupations and those who were relatively more active placed more importance on professional information sources than non-whites, rural residents, those age 71 or older, those who were relatively less active and those in semi-skilled, unskilled or white collar occupations.

Multiple regression and discriminant analysis were used to determine the best set of predictor variables for an individual's extent and level of OTC drug use. Each of these analyses produced basically the same set of predictor variables: the importance of professional information sources, the importance of non-professional information sources, age, and an individual's ranking of his/her life from worst possible to best possible. However, the multiple regression also showed urban/rural residential location as a predictor, while discriminant analysis showed widowed marital status (whether one is widowed or not) as a predictor variable. Thus, those factors which were most predictive of OTC drug

use in this elderly sample were increased age, widowed marital status, rural residential location, low ranking of life, and increased importance placed on both professional and non-professional sources for OTC drug information.

The discriminant analysis produced two significant discriminant functions. One dimension primarily discriminated between non-users and heavy users with four variables: the importance of professional information sources; the importance of non-professional information sources; whether an individual was widowed or not; and an individual's ranking of his/her life from worst possible to best possible. Thus, heavy users are more likely than non-users to be of a marital status other than widowed, place a low ranking of their life, place greater importance on professional information sources, and place greater importance on non-professional information sources.

The second dimension primarily discriminated between moderate and heavy users of OTC drugs. There were seven variables which best discriminated between these two groups: age; whether the individual was married and living with their spouse or not; whether an individual resided in a single member family or in a larger family; the number of hours spent watching television; whether an individual was widowed or not widowed; whether an individual was in a white collar occupation or not; and race. Thus, heavy users, more than moderate users were more likely to be non-white, older, widowed, separated, single or divorced, living alone, spending more time watching television, and to have been engaged in a white collar occupation.

Conclusions and Implications

Clearly the importance elderly persons place on sources of OTC drug information increases with their use of non-prescription drugs. This is particularly true of the importance placed on professional information sources such as doctors and pharmacists. The importance of these sources increases with increased OTC drug use. With regard to such non-professional sources as friends and relatives and market dominated sources, elderly persons who are OTC drug users place more importance on these sources than those who are non-users. The importance placed on both professional and non-professional sources for OTC drug information were the two best predictor variables of over-the-counter drug use among the factors examined. These variables were also important in discriminating non-users from heavy users of OTC drugs, while factors other than these were important in discriminating moderate from heavy OTC drug users.

The importance of professional sources, which alone was highly predictive of OTC drug use, was significantly associated with several contextual variables. White respondents placed more importance on professional information sources than non-whites. White elderly persons may have had relatively more interaction and/or positive experiences with doctors or pharmacists, perhaps because the cost of doctors or clinic visits may have prevented and may continue to prevent non-whites from contacting doctors or pharmacists as much as whites. Also, since professionals, for the most part, are white, it may be that non-whites have not felt at ease to interact with professionals. This may explain white elderly placing more importance on professional sources of OTC drug information than non-white elderly persons.

Respondents age 60 through 70 placed more importance on professional information sources than those age 71 or older. It is possible that relatively younger elderly persons are experiencing a transition from middle age accompanied by aging processes, which older persons have already experienced, and therefore place more importance on doctors and pharmacists for advice and information on OTC drugs to cope with these transitional processes. Relatively older elderly persons may not perceive professional sources as important for OTC drug information due to severity of health problems, and may perceive these sources as more important for prescription drug information. Older persons may be hesitant to 'bother' doctors for information about non-prescription drugs while relatively younger older persons may perceive this 'bother' as part of what the doctor is paid for.

Elderly urban residents placed more importance on professional information sources than their rural counterparts. The fact that there are generally more professionals available from which to obtain OTC drug information in urban areas than in rural areas may in part account for this phenomenon. Urban residents may be more used to making use of professionals than rural residents. Rural residents may be more used to medicating themselves, perhaps through tradition, and hence may not place as much importance on professional sources.

Elderly persons who were engaged in skilled occupations placed more importance on professional OTC drug information sources than those who were engaged in unskilled or semi-skilled occupations. Those who were engaged in white collar occupations placed intermediate importance on professional information sources. Elderly persons who were engaged in

unskilled or semi-skilled occupations may not feel comfortable in communicating their need for OTC drug information to 'professionals' perhaps because of a lack of money, education or status. Elderly persons who were white collar workers may place an intermediate amount of importance on these sources because they understand the value of professional information but perceive themselves as comparable to professionals in terms of money, education or status. Elderly who were engaged in skilled occupations may feel comfortable in communicating with professionals and place a great deal of weight on information professionals give because professionals have relatively more education, money or status.

The importance of professional information sources was also greater for persons who were engaged in five or more activities every two to three weeks than for those engaged in less than five activities every two to three weeks. It is likely that those actively engaged in many pursuits have a desire to remain active and seek information from doctors and pharmacists to remain that way. Also, those who are less actively engaged may be experiencing more, or greater, chronic conditions which keep them from activities. These persons may be more concerned with doctors and pharmacists as prescription drug information sources.

Thus, those who place the greatest importance on professional information sources concerning OTC drugs tend to be white, urban residents age 60-70, who were engaged in a skilled occupation, and who were actively engaged in a number of pursuits.

The relationship between the importance of non-professional sources of OTC drug information and the extent of OTC drug use was qualified by

two variables; race and marital status. The observed relationship was that the importance of these sources was significantly different for users and non-users regardless of race or marital status. However, the relationship between the importance of non-professional information sources and moderate and heavy OTC use exhibited different patterns for whites and non-whites. Non-white elderly persons differed primarily in the importance placed on non-professional sources between non-users and moderate users, while white elderly differed primarily between non-users and heavy users. Additionally, the interaction of marital status and over-the-counter drug use affected the importance placed on non-professional sources of information. Elderly persons who were married and living with their spouse placed increasing importance on non-professional information sources with increased drug use. For widowed persons and those of 'other' marital statuses the importance of non-professional sources differed significantly between users and non-users.

While the literature provided some testable hypotheses between drug use and demographic variables, interestingly, none of the hypothesized relationships between the extent of OTC drug use and demographic variables in this study were supported. Although age was hypothesized to be negatively related to the extent of OTC drug use, this relationship was not found; the correlation between age and the extent of OTC drug use was .04. However, both multiple regression and discriminant analysis revealed that age was associated with OTC drug use, albeit at a weak level. Thus, the present study indicates a weak relationship between increasing age and the extent of OTC drug use. The findings do not support Guttman's (1977) findings among elderly respondents that age is negatively related to OTC drug use.

The James study (1979), among the same population as the present study, showed age to be associated with increased prescription drug use. Thus, age, in the present sample, is associated with an increased consumption of both OTC and prescription drugs. An increase in chronic conditions associated with aging may have lead to the observed increased use of drugs.

No significant relationship was found between sex and OTC drug use. The hypothesized relationship was that women consume more OTC drugs than men. This relationship was found by two previous researchers among general populations (Bush and Rabin, 1976; Rabin, 1972). The relationship does not appear in the present elderly population, and the present data, in fact, lean toward the opposite direction. It may be that men do not or will not perceive illness as seriously as women do, and take OTC medications as an alternative to prescription medications. Conversely, women may be taking more prescription medicines rather than more OTC drugs because they perceive problems associated with aging to be more serious. This contention receives some support from James (1979), in her study of the same population. She found women more likely to be currently taking prescription medicines and more of them than men.

White elderly persons did tend to consume somewhat ($p < .10$) more OTC drugs than non-whites. This finding lends some support to the same finding in general populations (Bush and Rabin, 1976; Rabin, 1972). Lesser use of OTC drugs among non-whites likely reflects past and present economic conditions for elderly non-whites. Due to economic conditions, non-white elderly may have relied on other means than those provided by the market place, such as home remedies, and they may be

continuing this pattern. Also, because of economic conditions, they may be more likely to be recipients of Medicaid, which provides for payment of prescription drugs. Problems associated with aging may make the difference in patterns of OTC drug use for white and non-white elderly less significant than those found in general populations.

Respondents in urban areas were hypothesized to use more OTC drugs than their rural counterparts. The elderly respondents in the present sample demonstrated the opposite pattern: rural residents used significantly more OTC drugs than urban residents. Rural residential location was also significant in the multiple regression as predictive of OTC drug use. These findings concerning OTC drug use among elderly urban and rural residents differ from Rabin's (1972) summary of OTC drug use findings in the general population, which found urban residents to be heavier users than rural residents. It is possible that rural residents have less contact with doctors to obtain prescription medications than do urban residents. Also, the availability of places to purchase drugs is much greater in urban areas, both in numbers and proximity. Rural areas provide fewer of such places with relatively less proximity. It may be that rural consumers use more OTC drugs because they can be purchased in numbers so that many trips are not necessary to obtain refills as is the case with prescription medications. A substitution of types of drugs also may be indicated. Among the same population as the present study, James (1979) found elderly urban residents more likely to be taking prescription medications and more of them than elderly rural residents.

Respondents who lived alone (in single member families) did not use significantly more OTC drugs than those who lived with others (in larger

families). Although the hypothesis was not supported, the results were in the direction predicted. This variable was somewhat important in discriminating heavy users from moderate users, with heavy OTC drug users more likely than moderate users to be living alone. Findings in general population studies (Rabin, 1972) that one member families consume more than larger families were somewhat supported, although not strongly, in this study among the elderly.

The hypotheses of relationships between OTC drug use and attitudinal contextual variables were supported in two cases and not supported in two cases. The less satisfied respondents were with the way they spend their time, the more OTC drugs they used. Also, respondents who used more OTC drugs gave lower ranking to their life, i.e., that it was the worst possible or close to the worst possible life one could have. Lower ranking of one's life was a significant predictor variable in both multiple regression and discriminant analyses. It was also significant in distinguishing heavy users from non-users of OTC drugs. These findings lend support to Guttman's (1977) findings that elderly OTC drug users tended to be less satisfied with life than non-users. It may be that OTC drugs play a role in helping dissatisfied elderly persons to cope with life.

The number of activities that are often (every 2 to 3 weeks) engaged in was not related to OTC drug use. It was hypothesized that more active individuals would be less likely to use OTC drugs. It may be recalled, however, that more active individuals placed more importance on professional sources than less active individuals for information about OTC drugs. Active persons would be less likely to have complications to hinder them and potentially less use for OTC drugs. However,

it may be that OTC drugs are used only for minor ailments which do not affect one's level of activity.

A significant negative relationship was not found between the extent of OTC drug use and perceived health status. Those who perceived themselves as less healthy were not more likely to take OTC drugs than those who perceived themselves as healthy. The finding by Guttman (1977) that elderly OTC drug users tend, by self-report, to be less healthy was not supported. However, this study used only one self-report question on health while Guttman used several. Thus, his findings may be more reliable. The absence of a relationship does tend to lend support to the conclusion, made by Knapp and Knapp (1972) in a study among the general population, that persons may not perceive themselves as deviating from a state of health even when they seek relief from non-prescribed medication.

In general, then, elderly persons who made more extensive use of OTC drugs in this sample were rural residents, those who were dissatisfied with their life, and those who were dissatisfied with the way they are spending their time. The predictive analyses in this study also revealed that older, widowed, rural residents who are dissatisfied with their lives and who place importance on both professional and non-professional sources of OTC drug information are likely to use OTC drugs extensively.

Heavy users of OTC drugs can be discriminated from both non-users and moderate users, although by different factors. Heavy users placed greater importance on both professional and non-professional sources for OTC drug information than non-users. Heavy users in the present sample were also generally married and living with their spouse or of a marital

status other than widowed, and were not satisfied with their lives, ranking their lives low on a worst to best possible scale. Non-users were generally widowed and were more satisfied with their lives. Between heavy users and moderate users, different discriminating variables were found. Heavy users tended to be non-white, older, widowed, living alone, were engaged in a white collar occupation, and spend a considerable amount of time watching television. Moderate users tended to be white, younger, married and living with spouse, residing with others in larger families, were in other than a white collar occupation and spend little time watching television.

Limitations

This study used a group of OTC drug information sources which are not exhaustive or exclusive. Friends and relatives as well as the individual (self) could get information about OTC drugs from doctors, pharmacists or market dominated sources. Also, the creation of importance scores for these sources using different variables or a different method could yield other results.

The variables of OTC drug use, used in another way than creating an OTC drug index, could have produced different and more specific results. The use of OTC drug types rather than overall OTC drug use could be assessed. Also, another method of creating the index could have yielded different overall results. The questions of the original study on OTC drug use were somewhat difficult to interpret. Number of OTC drugs taken in a category (see Appendix A; question 78) was asked for the period of a year. However, the frequency of use of a category of a drug was asked for the period of a week. A person could have taken five different types of OTC cold remedies in a year, but these would not

necessarily be taken concurrently. The question regarding frequency of use of an OTC drug could have had different response categories. For instance, persons may only take cold remedies twice a year for each of their colds. So, on the average, they take cold remedies less than once a week. However, a question arises as to how many and with what frequency the cold remedies are taken during the period they are consumed. More precise questions on OTC drug use might have produced a more precise interpretation of OTC drug use itself as well as of relationships between OTC drug use and other factors.

Very few of the demographic variables were found to be related to OTC drug use. Perhaps measures of socio-economic status and of family typology (marital status, family members and number in household) might have proven more relevant in this study.

Also, since OTC drugs are generally taken for health-related reasons, and health was not a factor found to be significant in this study, it may be that a different, more detailed question or additional questions about health would have yielded different results. Such questions clarifying health status might have been useful in producing significant results.

Recommendations

This study supports the conclusion of James (1979, p. 62) that educational and treatment efforts directed toward OTC drug use among the elderly should focus on a different population than efforts directed toward prescription medication usage. Elderly populations in urban areas should receive different emphasis than those in rural areas. Education and treatment programs in urban areas should put an emphasis

on prescription drug usage and those in rural areas should put an emphasis on OTC drug usage. Health care providers in rural areas should be alerted to the more extensive use their senior clientele make of non-prescription drugs.

In general, this study supports recommendations that educational programs be directed at the total elderly population. Educational programs aimed at the general elderly population should make use of doctors and pharmacists for presenting factual OTC drug information. One method for presenting information could be through a program on community public television. This method might better reach rural residents and those who are not able to participate in programs that might be offered by local agencies. However, the focus could be different for whites and non-whites due to their differing OTC drug use patterns and differing importance placed on information sources. Representatives of minority organizations could be contacted to hold informational programs on self-medication for their senior members or for senior minority groups.

Doctors and pharmacists should be made aware of the importance placed by senior OTC drug users on the OTC drug information that doctors and pharmacists provide. It is clear that seniors value doctors and, to a lesser extent, pharmacists as sources of OTC drug information. Yet there is a need for seniors to be educated in making use of these sources, especially pharmacists, and for professionals to be educated in providing information to seniors. Educational programs should focus on the role of the pharmacist and doctor in fulfilling seniors' needs for information about medications. Programs for seniors should also provide information on alternative sources of OTC drug information. Although it

was not assessed, it is doubtful that seniors are aware of the role of local agencies in providing information and educational programs or materials.

Elderly consumers of OTC drugs should be educated to be better consumers of health care and to utilize their doctors and pharmacists as sources of drug information. Elderly consumers should demand and receive better or more information on OTC drugs. Such information should be available from packaging and advertising as well as from doctors and pharmacists. Efforts should be made on the part of doctors and pharmacists to alert their senior clientele about the availability of OTC drug information from them. Efforts should be made from marketing to include information on decreased dosages for older persons and potential drug interactions. It might be worthwhile to include a statement on packages such as "If you have questions about this drug, ask your pharmacist."

Treatment programs for elderly OTC drug users must take into account that heavy users are likely dissatisfied with their past and present life. Efforts might be directed towards helping aging individuals to cope with their lives. Seniors may be using chemical cures for emotional problems. It may be that treatment programs would do well to focus on aspects that provide a fuller life for seniors. Providing programs which intergrate seniors into the mainstream of life, giving them a sense of worth and self-esteem might provide more long-term benefits than educating seniors in OTC use.

Research and Policy

Future research is needed on the role information sources play in over-the-counter drug use. The present study looked at the importance placed on information sources and the extent of OTC drug use. Actual

use of information sources and its relationship to OTC drug use needs to be explored. Measures of use of information sources may provide more differentiation among information sources than did measures of the importance of information sources.

Future research on self-medication among non-white populations is indicated. Medicating oneself may be more significant for a number of reasons to non-whites, and especially to non-white elderly. Is the more extensive use of OTC drugs related to the lesser importance placed on professional information sources? Are there obstacles between professionals and non-whites which prevent communication about medication?

Research into characteristics of life satisfaction which might contribute to over-the-counter drug use should be explored. Are there certain psychological satisfactions with life which contribute to an elderly individual's use of OTC drugs? What roles do lifestyle and personality play in the elderly's use of OTC medications? What role do support systems, such as families, religious organizations, local agencies and local aging programs play in the extent of OTC use or in the lack of OTC use? The lack of research on the elderly in general presents many aspects for exploration in their relationship to the extent of OTC drug use.

In sum, self-medication is integral to American health care, but also integral to this is the protection of the consumer. Protection of elderly consumers in the area of non-prescription drugs must be a concerted effort on the part of business, government and health care service policy makers. Policy makers concerned with the area of non-prescription drugs should involve seniors in planning and implementing policy. Policy must be sensitive not only to seniors' economic and

physical health needs, but also to their psychological health needs. It should be directed at the needs of the whole person, not isolated parts.

The concerns of the elderly will soon be the concerns of greater and greater numbers and proportions of the American population. Those who make policy must take this into consideration and plan for the health of our aging nation. By realizing the implications and implementing changes now, policy can move toward benefiting present and future generations of older Americans.

Time -- it waits for no one.

REFERENCES

REFERENCES

Bernstein, A., and Lennard, H.L. Drugs, doctors and junkies. Society, 1973, 10(4), 14-25.

Brady, E. S. Drugs and the elderly. In Kayne (Ed.), Drugs and the elderly (2nd ed.). Los Angeles, Calif.: Andrus Gerontology Center, University of Southern California, 1978.

Bourne, P.G. Drug abuse in the aging. Perspective on Aging, 1973, 2(3), 18-20.

Burney, L.E. Self-medication and community health. Ann. N.Y. Acad. Sci., 1965, 120, 942-947.

Bush, P.J., and Rabin, D.L. Who's using non-prescribed medicines? Medical Care, 1976, 14, 1014-1023.

The power of the aging in the marketplace. Business Week, November 20, 1971, pp. 52-58.

Caranasos, G.J., Stewart, R.B., and Cluff, L.E. Drug induced illness leading to hospitalization. Journal of the American Medical Association, 1974, 228, 713-717.

Chambers, C.D. An assessment of drug use in the general population. New York: New York State Narcotic Addiction Control Commission, 1971.

Coombs, R.H., Fry, L.J., and Lewis, P.G. (Eds.). Socialization in drug abuse. Cambridge, Mass.: Schenkman Pub. Co., Inc., 1976.

Dichter, E. How work-of-mouth advertising works. Harvard Business Review, 1966, 44(6), 147-166.

Doyle, J.P. Medication use and misuse study among older persons: Final report. Jacksonville, Florida: Cathedral Foundation of Jacksonville, Inc., 1976.

Dunnel, K., and Cartwright, A. Medicine takers, prescribers and hoarders. London: Routledge and Kegan Paul, 1972.

Engel, J.F., Knapp, D.A., and Knapp, D.E. Sources of influence in the acceptance of new products for self-medication: Preliminary findings. In Proceedings, american marketing association conference, series 24. Washington, D.C.: September, 1966, 776-782.

Fredrick, K. The aged consumer: Socialization and integration of the aged into the servicing social structures. Unpublished doctoral dissertation, University of Pennsylvania, 1973.

Friend, D.G. Self-medication: An increasing public health problem. Clin. Pharmacol. Ther., 1964, 5(4), 533-536.

Goldstein, S. The aged segment of the market, 1950 and 1960. Journal of Marketing, 1968, 32(2), 62-68.

Graney, M.J., and Graney, E.E. Communications activity substitutions in aging. Journal of Communication, 1974, 24(4), 88-96.

Grollman, A. The efficacy and therapeutic utility of home remedies. Ann. N.Y. Acad. Sci., 1965, 120, 911-930.

Guttman, D. A study of legal drug use by older americans. (National Institute on Drug Abuse Services Research Report.) Washington, D.C.: Department of Health, Education and Welfare, 1977.

Harman, H.H. Modern factor analysis. Chicago: University of Chicago Press, 1967.

Hollis, W.G. Home remedies in the United Kingdom and Western Europe: An assessment of their value to the community and as a supplement to state health services. Ann. N.Y. Acad. Sci., 1965, 120, 855-863.

Holloway, D.A. Drug problems in the geriatric patient. Drug Intell. and Clin. Pharm., 1974, 8, 632-642.

James, M. Substance abuse among Michigan's senior citizens: Patterns of use and provider perspectives. Lansing, Michigan: Michigan Office of Services to the Aging and Michigan Office of Substance Abuse Services Research Report, 1979.

Jefferys, M., Brotherson, J.H.F., and Cartwright, A. Consumption of medicines on a working-class housing estate. British Journal of Preventitive and Social Medicine, 1960, 14, 64-76.

Johnson, R.E., Pope, C.R., Campbell, W.J., and Azevedo, D.J. Reported use of non-prescribed drugs in health maintenance. American Journal of Hospital Pharmacy, 1975, 33, 1249-1254.

Keefer, C.S. Home medication and public welfare: Introductory remarks. Ann. N.Y. Acad. Sci., 1965, 120, 809-810.

Klippel, R.E., and Sweeny, T.W. The use of information sources by the aged consumer. The Gerontologist, 1974, 14(2), 163-66.

Knapp, D.A., and Knapp, D.E. Decision-making and self-medication: Preliminary findings. American Journal of Hospital Pharmacy, 1972, 29, 1004-1012.

Leake, C.D. The history of self-medication. Ann. N.Y. Acad. Sci., 1965, 120, 815-822.

Lenhart, D.G. The use of medications in the elderly population. Nursing Clinics of North America, 1976, 11(1), 135-143.

Lofholm, P. Self-medication by the elderly. In Kayne (Ed.), Drugs and the elderly (2nd ed.). Los Angeles, California: Andrus Gerontology Center, University of Southern California, 1978.

Mandel, H.G. Therapeutic range and extent of use of home remedies. Ann. N.Y. Acad. Sci., 1965, 120, 902-910.

Mason, J.B., and Smith, B.E. An exploratory note on the shopping behavior of the low income senior citizen. Journal of Consumer Affairs, 1974, 8(2), 204-209.

Don't Write Off the Senior Citizen Market. Media Decisions, 1973, 8(7), 64-67; 112-116.

Mellinger, G.D., Balter, M.B., and Manheimer, D.I. Patterns of psychotherapeutic drug use among adults in San Francisco. Archives of General Psychiatry, 1971, 25(5), 385-394.

Myers, J.L. Fundamentals of experimental design (2nd ed.). Boston: Allyn and Bacon, Inc., 1972.

Nie, N.H., Hull, C.H., Jenkins, J.J., Steinbrenner, K., and Bent, D.H. Statistical package for the social sciences (2nd ed.). New York: McGraw-Hill Book Company, 1975.

Paolucci, B., Hall, O.A., and Axinn, N. Family decision-making: An ecosystem approach. New York: John Wiley and Sons, 1977.

Payne, R. Some theoretical approaches to the sociology of aging. Social Forces, 1960, 38, 359-362.

Petersen, D.M., and Whittington, F.J. Drug use among the elderly: A review. Journal of Psychadelic Drugs, 1977, 9(1), 25-37.

Phillips, L.W., and Sternthal, B. Age differences in information processing: A perspective on the aged consumer. Journal of Marketing Research, 1977, 14(4), 444-457.

Plant, J. Educating the elderly in safe medication use. Hospitals J.A.H.A., 1977, 51(8), 97-102.

Post, W.J., and McGrath, J.H. Patent and potents - Precursors to modern drug use and abuse. In Coombs, Fry and Lewis (Eds.), Socialization in drug abuse. Cambridge, Mass.: Schenkman Publishing Company, Inc., 1976.

Pratt, L. The significance of the family in medication. Comp. Family Studies, 1973, 4(1), 13-35.

Rabin, D.L. Use of medicines: A review of prescribed and non-prescribed medicine use. Medical Care Review, 1972, 29, 668-699.

Reinecke, J. The older market -- fact or fiction? Journal of Marketing, 1964, 28(1), 60-64.

Roney, J.G., and Hall, M.L. Medication practices in a community: An exploratory study. Menlo Park, California: Stanford Research Institute, 1966.

Rosen, J., and Neugarten, B. Ego functions in the middle and later years: A thematic apperception study of normal adults. Journal of Gerontology, 1960, 4(1), 62-69.

Rosow, I. Social integration of the aged. New York: Free Press, 1967.

_____. Old people: Their friends and neighbors. American Behavioral Scientist, 1970, 13(7), 59-69.

Schiffman, L.G. Sources of information for the elderly. Journal of Advertising Research, 1971, 11(5), 33-37.

_____. Social interaction patterns of the elderly consumer. In Combined proceedings, american marketing association, 1972, 445-51.

Schramm, W. How communication works. In W. Schramm (Ed.), The process and effects of mass communication. Urbana, Ill: University of Illinois Press, 1955.

_____. Aging and mass communication. In M. Riley and J. Riley (Eds.), Aging and society. New York: Russell Sage Foundation, 1969.

Steiner, G. The people look at television. New York: Alfred Knopf, Inc., 1963.

Sunshine, L. Use and misuse of self-medication. Ann. N.Y. Acad. Sci., 1965, 120, 931-941.

U.S. Bureau of Labor Statistics. Consumer expenditure survey series: Interview survey, 1972 and 1973. Washington, D.C.: U.S. Government Printing Office, 1976.

U.S. Department of Health, Education and Welfare. Perspectives: In working with older people, volume II, Biological, psychological and sociological aspects of aging (Public Health Service Publication), Washington, D.C.: U.S. Government Printing Office, 1972.

U.S. Department of Health, Education and Welfare Task Force on Prescription Drugs. The drug users. Washington, D.C.: U.S. Government Printing Office, 1968.

U.S. Social Security Administration. Prescription drug data summary, (Office of Research and Statistics). U.S. Government Printing Office, May, 1972.

Verway, D.I. (Ed.). Michigan statistical abstract (13th ed.). East Lansing, Michigan: Division of Research, Graduate School of Business Administration, Michigan State University, September, 1978.

Wadsworth, M.E.J., Butterfield, W.S.J., and Blaney, R. Health and sickness: The choice of treatment. London: Tavistock, 1971.

Wynne, R.D., and Heller, F. Drug overuse among the elderly - a growing problem. Perspective on Aging, 1973, 2(2), 15-18.

Zuiches, J.J., Morrison, B.M., Keith, J., and Boyde, J. Final report on project "Conserve" phase I: Development and operation of a computerized residential energy audit. East Lansing, Michigan; Institute for Family and Child Study, Michigan State University, 1978.

GLOSSARY OF TERMS

GLOSSARY OF TERMS

Cardiovascular drugs: drugs which have an effect on the heart and circulatory system

Chronic ailment: persistent or frequently recurring pathological condition

Drug interactions: drugs interacting with various substances or phenomena producing untoward effects, i.e., drug-drug or drug-food interactions increase or decrease the effect of a drug or food, drug-lab interactions interfere with a lab test, and drug-disease interactions result in a worsening of the disease

Gastrointestinal drugs: drugs which have an effect on the stomach and intestines, i.e., the digestive system

Morbidity, morbidity related: disease state or illness, also typical of disease

Non-compliance: not following the advice and/or directions either for a drug regimen given by a health care professional, or for drug taking instructions on the label of OTC drugs

OTC, over-the-counter, non-prescribed drugs or medications: medications or drugs which can be purchased without a prescription

Psychotherapeutic drugs: drugs which have a medical effect on a person's mental state

Psychotrophic, psychoactive drugs: any drug which has an effect on the mind; these drugs include psychotherapeutic drugs

Self-medication, self-medicating: the selection and usage by an individual of a non-prescribed medicine. (It can also mean the administration of a prescription drug by a patient)

DRUG TYPES

Antacids: used to neutralize acidity in the stomach

Antitussives: used for cough suppression

Cold remedies: used to provide relief of the symptoms of a cold

Decongestants: used to prevent the formation of watery secretion in the nasal passages and promote drainage

Diarrhea remedies: used to decrease gastrointestinal motility and adsorb bowl irritants

Internal analgesics: used to provide relief from minor pain

Laxatives: used to promote stool formation and elimination; there are five different kinds: bulk type, surface active/stool softener, lubricant, saline and stimulant/irritant (the latter type is considered to be potentially addictive in the sense that if used often, the bowel will not respond to normal stimulation and will need the stimulation provided by these laxatives)

Sleep aids: primarily antihistimines, used to promote drowsiness

Vitamins and Tonics: vitamins are essential for the maintenance of normal metabolic function, used to ensure against vitamin deficiencies and for such ill-defined complaints as 'poor appetite' or 'lack of energy;' tonics frequently contain bitters, which are thought to improve appetite, vitamins and iron preparations

APPENDICES

APPENDIX A

Questionnaire
derived from original
Seniors and Substance Abuse Task Force
Health Practices Questionnaire

APPENDIX A

Questionnaire derived from original
Seniors and Substance Abuse Task Force
Health Practices Questionnaire

Items in the Questionnaire Used in Creation of the Variables of this Study

Items 78a and 78b, all nine categories of OTC drugs, were used to create the dependent variables in this study. Those items used for the creation of the independent variables included items 28 (2 alternatives), 60 (4 alternatives), 73 (all alternatives used except 'other'), 74 (all alternatives used except 'other'), 77 and 78c (all nine categories for response were used). Items 3-6, 12-20, 22, 23, 25, 29, 31, and 95-97 were used for the contextual variables.

QUESTIONNAIRE ITEMS

3) Race:
___ 1. White
___ 2. Black
___ 3. Spanish American
___ 4. American Indian
___ 5. Oriental
___ 6. Other

4) Sex:
___ 1. Male
___ 2. Female

5) Location of Dwelling:
___ 1. Urban and Suburban
___ 2. Rural

6) Type of Dwelling:

___ 1. Boarding Home

___ 2. Apartment Complex (more than four units); predominantly seniors

___ 3. Apartment Complex (four or fewer units); predominantly seniors

___ 4. Apartment Complex (more than four units); not predominantly seniors

___ 5. Apartment Complex (four or fewer units); not predominantly seniors

___ 6. Single Family Home

___ 7. Mobile Home

___ 8. Other, Specify _____

12) WHAT IS YOUR PRESENT AGE?: ___ ___ (years)

13) WHAT IS YOUR MARITAL STATUS?: ___ 1. Single

___ 2. Widowed

___ 3. Divorced

___ 4. Legally Separated

___ 5. Married, living with spouse

___ 6. Married, living separately

___ 7. Not married, cohabiting

14) WHO ARE THE OTHER MEMBERS OF YOUR HOUSEHOLD (excluding boarders):?

___ 1. None

___ 2. Husband/Wife

___ 3. Children

___ 4. Grandchildren

___ 5. Other Relatives

___ 6. Friends

___ 7. Other, specify _____

15) Number of Household Members ___ ___

16) WHO (IS/WAS) THE PRIMARY WAGE EARNER IN YOUR FAMILY?:

___ 1. Self

___ 2. Spouse

17) (Asked about primary wage earner) ARE YOU/IS YOUR SPOUSE RETIRED?:

___ 0. No

___ 1. Yes

18) If retired: HOW LONG (HAVE YOU/HAS YOUR SPOUSE) BEEN RETIRED?:

___ 99. N/A

___ (Years) (Code 00 for less than 1 year)

19) If retired: WAS RETIREMENT COMPULSORY?:

___ 9. N/A

___ 0. No

___ 1. Yes

20) (Asked about primary wage earner) WHAT (IS/WAS) (YOU/YOUR SPOUSE'S) PRIMARY OCCUPATION?:

___ 1. Unemployed, solely on welfare, allotment

___ 2. Unskilled (e.g., manual laborer, janitor, dishwasher, waitress, garbage collector)

___ 3. Semi-Skilled (e.g., assembly line worker, bus, cab or truck driver, housekeeper, bartender, hospital aide)

___ 4. Skilled/Foreman (e.g., heavy equipment operator, policeman, postman, beautician, baker, carpenter, chef, lumberjack)

___ 5. Clerk, etc. (e.g., bank teller, secretary, salesman, bookkeeper)

___ 6. Proprietor, Manager, etc. (including farmer, rancher, small business owner, real estate broker)

___ 7. Professional (e.g., doctor, lawyer, teacher, C.P.A., clergy)

___ 8. Other, specify: _____

22) WHAT IS YOUR CURRENT HOUSEHOLD INCOME?:

	Annual	Monthly
___ 1.	$ 0 - 1,999	$ 0 - 166.58
___ 2.	2,000 - 3,999	166.59 - 332.25

(1 person poverty)

___	3. 4,000 - 5,999		332.26 - 499.91

(2 person poverty)

___	4. 6,000 - 7,999		499.92 - 666.58
___	5. 8,000 - 9,999	OR	666.59 - 833.25
___	6. 10,000 - 11,999		833.26 - 999.99
___	7. 12,000 - 13,999		1,000.00 - 1,166.58
___	8. 14,000 - 15,999		1,166.69 - 1,333.25
___	9. 16,000 - 17,999		1,333.26 - 1,499.99
___	10. 18,000 - 19,999		1,500.00 - 1,666.58
___	11. 20,000 & Over		1,666.59 & Over

23) WHAT WAS THE HIGHEST GRADE OF FORMAL EDUCATION YOU COMPLETED?

_____

28) IN WHICH OF THE FOLLOWING AREAS ARE YOU SATISFIED WITH YOUR KNOWLEDGE, AND IN WHICH WOULD YOU LIKE TO LEARN MORE ABOUT MEDICATIONS?: (Code: 0=don't know/don't care; 1=satisfied with present knowledge; 2=would like to learn more)

(Read alternatives)

___ When to seek the help of a professional (e.g., doctor, pharmacist) about using over-the-counter medications

___ When to use over-the-counter medications

29) HOW MUCH TIME DO YOU SPEND A DAY (read alternatives)?: (Code: 0=0-1 hour; 1=1-2 hours; 2=2-5 hours; 3=5-8 hours; 4=over 8 hours)

___ Watching television

___ Listening to the radio

___ Reading newspapers and/or magazines

III CURRENT HEALTH AND MEDICAL ATTITUDES AND PRACTICES

31) GENERALLY SPEAKING, HOW WOULD YOU RATE YOUR CURRENT HEALTH?:

___ 1. Not well most of the time

___ 2. Losing your health

___ 3. Pretty healthy

___ 4. Moderately healthy

___ 5. Very healthy

IV OVER-THE-COUNTER MEDICATION INFORMATION AND PRACTICES

73) UNDER WHICH OF THE FOLLOWING CIRCUMSTANCES WOULD YOU BUY AN OVER-THE-COUNTER MEDICATION INSTEAD OF SEEKING A PRESCRIPTION?: (Code: 1=definitely not; 2=probably not; 3=don't know; 4=probably would; 5=definitely would) (Read responses; probe if necessary to clarify answer)

___ You feel your ailment isn't that serious

___ You can't reach your doctor and need a substitute

___ Your doctor suggested it

___ Your pharmacist suggested it

___ They are less expensive than prescription

___ They are cheaper than a visit to doctor

___ Other, specify: _____

74) WHEN BUYING AN OVER-THE-COUNTER MEDICATION FOR THE FIRST TIME, HOW IMPORTANT ARE EACH OF THE FOLLOWING IN HELPING YOU TO CHOOSE THE ONE YOU DO?: (Code: 4=very important; 3=moderately important; 2=somewhat important; 1=not important) (Read responses; probe if necessary to clarify answer)

___ Packaging

___ Advertisements you have seen

___ The price

___ The pharmacist

___ Your doctor

___ Friends or relatives

___ Other, specify: _____

77) DO YOU THINK YOUR PHARMACIST IS QUALIFIED TO GIVE YOU USEFUL INFORMATION ABOUT PRESCRIPTION MEDICATIONS, OVER-THE-COUNTER MEDICATIONS, OR BOTH?:

___ 0. Neither

___ 1. Over-the-counter only

___ 2. Prescription only

___ 3. Both prescription and over-the-counter

___ 9. Don't know

78) WHICH OF THE FOLLOWING OVER-THE-COUNTER MEDICATIONS HAVE YOU TAKEN IN THE LAST YEAR?: (Show list to respondent or read list to him/her: Record information requested below in chart)

(a) Number of OTC drugs taken in this category:

(b) How often taken: (Code: 00=less than once a week; 1=about once a week; 2=2-3 times a week; 3=4-5 times a week; 4=every or nearly every day)

(c) Taken at suggestion of: 1=self; 2=advertisement; 3=friend/relative; 4=pharmacist; 5=doctor

Antacids	Diarrhea Remedies
Antitussives	Laxatives
Cold Remedies	Vitamins & Tonics
Internal Analgesics	Decongestants
Sleep Aids	

95) HOW SATISFYING DO YOU FIND THE WAY YOU ARE SPENDING YOUR LIFE THESE DAYS?:

___ 5. Completely satisfied

___ 4. Moderately satisfied

___ 3. Somewhat satisfied

___ 2. Not very satisfied

___ 1. Not at all satisfied

96) SUPPOSE YOU HAD TO RATE YOUR CURRENT LIFE ON A SCALE OF 1 TO 10, WITH 10 REPRESENTING THE BEST POSSIBLE LIFE FOR YOU AND 1 REPRESENTING THE WORST POSSIBLE LIFE FOR YOU, HOW WOULD YOU RATE YOUR CURRENT LIFE?:

____1:____2:____3:____4:____5:____6:____7:____8:____9:____10

97) HOW OFTEN HAVE YOU ENGAGED IN EACH OF THE FOLLOWING ACTIVITIES DURING THE PAST YEAR?: (Code: 5=once a week or more; 4=every two or three weeks; 3=6-12 times a year; 2=1-5 times all year; 1=never or hardly ever) (Read alternatives)

___ A. Club meetings, activities (e.g., union, AARP, etc.)

___ B. Senior activities (e.g., senior center, congregate meals, etc.)

___ C. School activities (e.g., classes, lectures, continuing education)

___ D. Outdoor activities (e.g., walking, camping, gardening, etc.)

___ E. Playing active sports (e.g., golf, baseball, swimming, etc.)

___ F. Recreational and/or cultural events (e.g., dinner, nightclubs, concerts, plays, museums, fairs, sporting events)

___ G. Visiting friends, relatives, neighbors

___ H. Working on hobbies or pastimes (e.g., weaving, knitting, woodworking, painting or sculpture)

___ I. Housework including cooking

___ J. Other, specify: _____

(Note: Do not include sedentary activities such as watching TV or reading)

Number of activities rated 4 or higher above: _____

APPENDIX B

Measures of Central Tendency For OTC Drug Use Variables

APPENDIX B

TABLE 39

OTC Drug Use Variables - Measures of Central Tendency

Category	Number Taken in Past Year			Frequency of Use*					
	Mean	Mode	Range	0	1	2	3	4	Total
Antacids	1.317	1	0-10	50% (83)	20% (33)	12% (19)	3% (5)	15% (25)	100% (165)
Antitussives	.523	0	0-10	82% (64)	13% (10)	-- --	-- --	5% (4)	100% (78)
Cold Remedies	1.024	0	0-15	76% (76)	19% (19)	2% (2)	1% (1)	2% (2)	100% (100)
Internal Analgesics	1.502	1 (56%)	0-13	47% (97)	20% (41)	14% (29)	5% (11)	14% (27)	100% (205)
Sleep Aids	.367	0	0-10	83% (66)	12% (9)	5% (4)	-- --	-- --	100% (79)
Diarrhea Remedies	.314	0	0-10	94% (74)	4% (3)	1% (1)	1% (1)	-- --	100% (79)
Laxatives	.967	0	0-10	65% (82)	18% (23)	5% (6)	-- --	12% (16)	100% (127)

TABLE 39 (Cont'd)

Category	Number Taken in Past Year			Frequency of Use*					
	Mean	Mode	Range	0	1	2	3	4	Total
Vitamins & Tonics	1.388	0	0-11	33% (51)	9% (14)	3% (5)	1% (1)	54% (85)	100% (156)
Decongestants	.562	0	0-10	80% (60)	11% (8)	3% (2)	1% (1)	5% (4)	100% (75)

* 0 = less than once a week
1 = once a week
2 = 2 to 3 times a week
3 = 4 to 5 times a week
4 = daily

APPENDIX C

Measures of Central Tendency For Variables Used In Information Source Scores

APPENDIX C

Measures of Central Tendency for Variables
Used in Information Source Scores

TABLE 40

Respondents' Satisfaction with Their Knowledge
Regarding OTC Drugs

Knowledge Item	Don't Know/ Don't Care	Satisfied With Present Knowledge	Would Like To Know More	Total
When to seek the help of a professional about using OTC drugs	17% (61)	61% (224)	22% (81)	100% (366)
When to use OTC	15% (56)	61% (225)	24% (88)	100% (369)

TABLE 41

Respondents' Perception of Pharmacist's Qualifications

Pharmacist Qualified To Give Information	N	%
Both prescription and OTC drugs	252	71%
Prescription drugs only	16	4%
OTC drugs only	25	7%
Neither	13	4%
Don't know	49	14%
	384	100%

TABLE 42

Circumstances Under Which Respondents Seek an OTC Drug Instead of a Prescription

Degree of Agreement	Ailment Not Serious	Less Expensive Than Prescription	Doctor Not Available/ Substitute Needed	Doctor Suggested It	Pharmacist Suggested It	Cheaper Than a Visit To The Doctor	Other
Definitely Not	24% (88)	57% (192)	41% (141)	8% (27)	27% (93)	60% (203)	76% (73)
Probably Not	7% (26)	19% (64)	20% (69)	2% (6)	11% (38)	15% (50)	3% (3)
Don't Know	9% (32)	8% (28)	14% (48)	3% (12)	17% (57)	9% (32)	10% (9)
Probably Would	41% (144)	10% (32)	18% (61)	25% (89)	28% (96)	9% (31)	5% (5)
Definitely Would	19% (66)	5% (18)	6% (21)	62% (219)	17% (60)	6% (20)	6% (6)
	100% (353)	100% (334)	100% (340)	100% (353)	100% (344)	100% (336)	100% (96)

TABLE 43

Importance of Sources to Respondents in Choosing an OTC Drug for the First Time

Degree of Importance	Packaging	Advertising	Price	Pharmacist	Doctor	Friends/ Relatives	Other
Not important	72% (231)	66% (214)	48% (156)	32% (102)	10% (31)	69% (218)	85% (80)
Somewhat important	13% (41)	19% (62)	21% (69)	19% (61)	5% (18)	18% (58)	2% (2)
Moderately important	7% (22)	11% (37)	18% (59)	19% (62)	9% (30)	9% (27)	1% (1)
Very important	8% (27)	3% (10)	12% (38)	30% (96)	76% (249)	4% (12)	12% (11)
	100% (321)	100% (323)	100% (322)	100% (321)	100% (328)	100% (315)	100% (94)

TABLE 44

Categories of Drugs Taken at Suggestion of Certain Information Sources

Category of OTC Drug	Self	Doctor	Pharmacist	Friends/ Relatives	Advertisement	Total
Antacids	47% (69)	41% (60)	1% (2)	5% (7)	5% (8)	100% (146)
Antitussives	55% (21)	21% (8)	5% (2)	5% (2)	13% (5)	100% (38)
Cold Remedies	67% (48)	6% (4)	12% (9)	8% (6)	7% (5)	100% (72)
Internal Analgesics	61% (119)	31% (60)	1% (3)	3% (5)	4% (8)	100% (195)
Sleep Aids	81% (21)	8% (2)	-- --	-- --	11% (3)	100% (26)
Diarrhea Remedies	60% (18)	30% (9)	7% (2)	3% (1)	-- --	100% (30)
Laxatives	45% (42)	40% (37)	2% (2)	6.5% (6)	6.5% (6)	100% (93)
Vitamins & Tonics	42% (51)	37% (45)	2% (2)	13% (16)	6% (7)	100% (121)
Decongestants	69% (27)	15% (6)	5% (2)	8% (3)	3% (1)	100% (39)

APPENDIX D

Rationale and Procedures For Choosing and Dichotomizing Information Source Variables

APPENDIX D

Rationale and Procedures for Choosing and Dichotomizing Information Source Variables

The twenty-eight items chosen for creating the information source variables were obtained from various sections of the Health Practices Questionnaire, but predominantly from the section on over-the-counter medication information and practices. The specific questions selected dealt with information sources utilized in over-the-counter drug use. These items were selected because they facilitated an analysis of data that would carry out one of the objectives of the original study. The objective was to "assess the amount of information seniors possess about the substances they use and the sources of that information." (James, 1979; p. 2.)

Five different information sources were identified from the data. These were doctors, pharmacists, friends and relatives, market dominated and 'self' (stored information). Items 28, 73, 74, 77 and 78c from the questionnaire were identified as relating to the five sources. The procedures for dichotomizing the values of the items are discussed first, followed by the items or parts of items used for each of the sources. Finally the score construction for the sources is discussed.

Procedures for Dichtomizing Values

Values for all items except item 78c were dichotomized from the existing values of the items. All items were dichotomized on the basis of "not important" (1) and "important" (2).

Item 28 concerned respondent satisfaction with their knowledge about medications. Two questions which specifically concerned OTC medications were used. The three possible responses to these questions were "don't know/don't care" (coded 0), "satisfied with present knowledge" (coded as 1), and "would like to learn more" (coded as 2). Those who responded that they don't know/don't care (0) or that they wanted to know more (2) were considered to place less importance on themselves as sources of information, while those who were satisfied with their knowledge (1) were considered to place importance on themselves as sources of information. The values of 0 and 2 were recoded to 1 and values of 1 were recoded to 2.

Item 73 concerned circumstances of buying an OTC medication rather than seeking a prescription. All six questions were used. The five possible response categories were "definitely not" (coded as 1), "probably not" (coded as 2), "don't know" (coded as 3), "probably would" (coded as 4), and "definitely would" (coded as 5). For the purposes of this study the "don't know" responses were classified as "missing data." Those responding definitely not or probably not were considered to place less importance on that source, while those responding probably would or definitely would were considered to place importance on that source. The values 1 and 2 were recoded to 1 and values of 4 and 5 were recoded to 2.

Item 74 concerned the importance of sources in choosing an OTC drug for the first time. All six questions were used. The four possible response categories were "not important" (coded as 1), "somewhat important" (coded as 2), "moderately important" (coded as 3), and "very important" (coded as 4). Responses of "not important" (1) were left as

they were, while responses of "somewhat" to "very" important were considered to be "important." The values of 2, 3 and 4 were recoded to 2.

Item 77 had to do with the qualifications of the pharmacist. The possible responses to this item included "prescription drugs only" (coded as 2), "over-the-counter drugs only" (coded as 1), "neither" (coded as 0), "both prescription and over-the-counter" (coded as 3), and "don't know" (coded as 9). Since pharmacists are qualified to give information on both prescription and OTC drugs, those who responded with the correct answer were considered to place importance on the pharmacist as a source of information. 'Incorrect' responses were considered to be those who placed less importance on the pharmacist. Values of 0, 1, 2, and 9 were recoded to 1 and the value 3 was recoded to 2.

Item 78c could not be dichotomized from the existing values. The values for this item represented the sources themselves at whose suggestion each of nine categories of OTC drugs were taken. The number of times that the source was mentioned across the nine categories were counted. The possible range for each source was 0 to 9. The distribution formed the basis for dichotomizing. For all sources, values of 0 were recoded to 1 and values of 1 through 9 were recoded to 2.

Items Used for Each Information Source

Doctors: Three items were identified as relating to the doctor as a source of information; the variable for doctor that was created from 78c, one question from 73 and one from item 74.

Pharmacists: Four items were identified as relating to the pharmacist as a source of information; the variable for pharmacist that was created from item 78c, one question each from 73 and 74, and item 77.

Friends and Relatives: Two items relating to friends and relatives were identified: the variable for friends and relatives that was created from 78c and one question from item 74.

Market Dominated: Six items were identified as relating to market dominated sources of information. These items include those asked regarding pricing, packaging and advertisements, all of which are components of the marketing approach. The variable for advertisements that was created out of item 78c, three questions from item 74 and two questions from item 73 were used.

Self: The five items identified for this source include those which reflected the respondents' reliance on their own knowledge and judgment. Two questions from item 28 and the variable for self that was created from item 78c were used.

Score Construction for Information Sources

For each source, the number of times a 2 ("important") was given was divided by the number of valid responses (either a 1 or a 2) given for that source. This created a score for each source which had a range of 0.0 to 1.0. These scores are reported to the third decimal place. Thus, for each respondent a score was created indicating the importance of each source (doctors, pharmacists, friends and relatives, self and market dominated) of information or influence.

APPENDIX E

Importance Scores for Information Sources

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Importance Scores for Information Sources

TABLE 45

Importance Scores for Self (Stored Information) as Sources of Information

Score (384)	Number	Relative Frequency	Cumulative Frequency
0	37	9.6	9.6
.200	30	7.8	17.4
.250	16	4.2	21.6
.333	9	2.3	24.0
.400	70	18.2	42.2
.500	20	5.2	47.4
.600	65	16.9	64.3
.667	16	4.2	68.5
.750	19	4.9	73.4
.800	67	17.4	90.9
1.000	35	9.1	100.0
	384	100.0	

MEAN = .530 MEDIAN = .583 MODE = .400

TABLE 46

Importance Scores for Doctors as Sources of Information

Score (384)	Number	Relative Frequency	Cumulative Frequency
0	29	7.6	7.6
.333	26	6.8	14.3
.500	42	10.9	25.3
.667	163	42.4	67.7
1.000	124	32.3	100.0
	384	100.0	

MEAN = .683 MEDIAN = .680 MODE = .667

TABLE 47

Importance Scores for Pharmacists
as Sources of Information

Score (384)	Number	Relative Frequency	Cumulative Frequency
0	61	15.9	15.9
.250	61	15.9	31.8
.333	46	12.0	43.8
.500	74	19.3	63.0
.667	29	7.6	70.6
.750	104	27.1	97.7
1.000	9	2.3	100.0
	384	100.0	

MEAN = .453 MEDIAN = .485 MODE = .750

TABLE 48

Importance Scores for Friends and Relatives
as Sources of Information

Score (384)	Number	Relative Frequency	Cumulative Frequency
0	268	69.8	69.8
.500	99	25.8	95.6
1.000	17	4.4	100.0
	384	100.0	

MEAN = .173 MEDIAN = .108 MODE = 0

TABLE 49

Importance Scores for Market Dominated Sources as Sources of Information

Score (384)	Number	Relative Frequency	Cumulative Frequency
0	149	38.8	38.8
.167	55	14.3	53.1
.200	11	2.9	56.0
.250	9	2.3	58.3
.333	58	15.1	73.4
.400	8	2.1	75.5
.500	60	15.6	91.1
.600	5	1.3	92.4
.667	9	2.3	94.8
.750	5	1.3	96.1
.800	5	1.3	97.4
.833	6	1.6	99.0
1.000	4	1.0	100.0
	384	100.0	

MEAN = .239 MEDIAN = .176 MODE = 0