

AN ABSTRACT OF THE THESIS OF

Pamela Pratt for the degree of Master of Science in Health presented on May 5, 1993.

Title: A Behavioral Perspective to Determine Appropriate Prescription and Over-the-Counter Medication Utilization in a Selected Elderly Population.

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This study examined the behaviors relating to the utilization of prescription and over-the-counter medications in a small group of elderly subjects in the 65 years and over age range. This group was attending an Elderhostel at Western Oregon State College during the summer of 1991, when the information was obtained. The objectives of this study were to ascertain specific medication taking behaviors, and whether or not directions were adhered to as prescribed by physicians for this highly educated group, or if their behaviors were similar to those referred to in the literature for all elderly.

A sample of 38 elderly was obtained during an Elderhostel Wellness Vacation at Western Oregon State College in Monmouth, Oregon during July, 1991. Subjects completed questionnaires regarding medication-taking behaviors as part of a wellness class session regarding the safe use of medications. Questionnaires were filled out prior to the class discussion.

Data were assembled using one survey instrument with questions relating to medication usage. Descriptive statistics using histograms

showing frequency distributions were used for data analysis.

Sixty-five percent of this group were taking prescription medications and sixty-eight percent of this group were taking over-the-counter medications. Medications were being obtained from more than one physician and more than one pharmacy. The subjects took fewer doses of medications per day and less medication per dose than prescribed. Medications were discontinued prematurely if feeling better or worse. Leftover medications from previous prescriptions were being taken. Outdated or expired medications were being taken. Alcoholic beverages were being used in conjunction with the use of prescription medications. In some cases, prescriptions were not filled because they were considered to be unnecessary.

Recommendations for education and future research in the problematic area of drug use in the elderly include: 1) More time spent by health care professionals to educate the elderly in the correct and safe use of medications; 2) Community health promotion programs targeted at the well elderly; 3) Personalized "brown bag" medication counselling sessions; 4) Medication education programs at Elderhostels throughout the country; 5) Education programs through the American Association of Retired Persons; and 6) Further studies of larger groups of well-educated, healthy and active elderly.

A BEHAVIORAL PERSPECTIVE TO DETERMINE
APPROPRIATE PRESCRIPTION AND OVER-THE-COUNTER
MEDICATION UTILIZATION
IN A SELECTED ELDERLY POPULATION

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Redacted for Privacy

Head of Department of Public Health

Redacted for Privacy

Dean of College of Health and Human Performance

Redacted for Privacy

Dean of Graduate School

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A BEHAVIORAL PERSPECTIVE TO DETERMINE APPROPRIATE PRESCRIPTION AND OVER-THE-COUNTER MEDICATION UTILIZATION IN A SELECTED ELDERLY POPULATION

CHAPTER I INTRODUCTION

Background of the Problem

Our elderly population is now living longer due in part to advancing medical technology. At the turn of the century, the average life span was 47 years (Hooyman & Kiyak, 1988). Today the elderly are living into their seventies, eighties and sometimes even nineties, and those over 65 years comprise 12.6 percent of the United States population (Bureau of the Census Statistical Abstract of the U.S. 1992). As a person ages, it is more likely that they will have some form of chronic disease and often more than one. In order to be able to live with these diseases, treatment often consists of taking medications to prolong, maintain and possibly enhance their quality and length of life (Simonson, 1984). Often many medications are needed to treat a variety of disease states (Gordon & Preiksaitis, 1988) at the same time. Medication usage in the geriatric population however is very problematic for a number of reasons relating to:

- 1) the physiological changes of aging; 2) the ways that medications are prescribed by physicians; and 3) the ways the elderly comply with drug treatment programs.

When taken as prescribed, medications have the great propensity to enhance an elderly person's quality of life (Larratt, Taubman &

Wiley, 1990). When taken incorrectly however, consequences can range from no therapeutic effect from the medication to severe adverse reactions which may require hospitalization and may even result in death. It is important, therefore, that medications be taken as prescribed by a physician so that they will have beneficial rather than deleterious effects. Compliance with the taking of medications is a major health care concern (Beers et al., 1989; Helling et al., 1987; Parnell, 1986; Rehder, 1980; Smith, 1976; Smith, 1989). There are a number of patterns of misuse with the taking of medications. Noncompliance may be considered to be intentional or unintentional (Lundin, 1983). With intentional noncompliance, there may be a deliberate choice not to comply with a treatment plan. With unintentional noncompliance, an elderly person may fail to understand how they should be taking a medication, or the drug taking regimen may be so complex that an elderly person, who may also have some memory loss, may be unable rather than unwilling to comply. Multiple medications and frequent times of administration are not conducive to compliance (Blackwell, 1973). As many as one half of all geriatric patients are believed to not be taking their medications in the prescribed manner (Morrow, Leirer, & Sheikh, 1988; Stolley et al., 1991).

Noncompliance has been shown to increase with the number of drugs being taken and the frequency of the doses (Morrow et al., 1988; Vestal, 1982). The treatment outcomes of many chronic and acute diseases are affected by noncompliance (Cramer, Mattson, Prevey, Scheyer, & Oullette, 1989; Vestal, 1982), so the importance of compliance therefore cannot be understated to maintain health in the elderly. Compliance is a seemingly largely overlooked and forgotten

aspect of health promotion in the geriatric population. According to a geriatric nurse practitioner interviewed on the January 16, 1992 NBC "Today" Show with regard to a book she had written entitled "Care of the Elderly", it is believed that the biggest drug problem in the United States today is not on the streets of this nation, but in the homes of our elderly. There will be many more elderly by the next century and as more medications become available on a yearly basis, it is more important than ever that medications be used in the correct manner.

Objective of the Study

The objective of this study was to examine a small group of elderly in the 65 years and over age range and to try to ascertain their behaviors relating to the utilization of prescription and over-the-counter medications. The purpose was to look at whether or not they adhered to directions given to them by physicians. Behaviors examined included whether they self-medicated with leftover prescriptions, whether they used outdated or expired medications, whether they loaned or borrowed medications, whether alcoholic beverages were used in conjunction with prescription medications and various other medication taking behaviors of interest.

Research Questions

Based on Previous research with regard to compliance behaviors in medication taking, the following research questions were formulated:

- 1) Are prescription medications being taken, and if so, how many?
- 2) Are over-the-counter medications being taken, and if so, how many?

- 3) Is appropriate information being shared with physicians with regard to medication use?
- 4) Are prescription medications being obtained from more than one pharmacy?
- 5) Are prescription medication-taking behaviors in accordance with physician instructions?
- 6) Are over-the-counter medication-taking behaviors in accordance with label directions?
- 7) Are alcoholic beverages being taken in conjunction with prescription medications?

Study Population

The study population was selected to be an exploratory and therefore small group of caucasian, well and active elderly persons in the sixty-five and over age range attending an Elderhostel Seminar entitled "Wellness Mind/Body Relationship", at Western Oregon State College, Monmouth, Oregon the week of July 7 - 13, 1991.

Limitations of the Study

Being healthy, active elderly who were highly educated and in a high income bracket, this was a unique and special study group, but some limitations to this study were recognized. The primary limitation was the restricted size of the group surveyed, making it virtually impossible to generalize the results to other groups of elderly. Another limitation is the fact that this survey group was highly educated and most were in a high income class, so conclusions drawn from this study might not be pertinent to all other elderly. The final limitation was the fact that these were healthy elderly

interested in healthy lifestyles, so behaviors they displayed with regard to medication-taking behaviors, could be different from other groups of elderly.

Justification for the Study

Noncompliance with medication-taking regimens is a major health care concern in the geriatric population today (Beers et al., 1989; Helling et al., 1987; Parnell, 1986; Rehder, 1980; Smith, 1989; Smith, 1976). Much research has been done and there have been many studies done, in this area but the problem continues. However, many of the studies done have not addressed the healthy active elderly. This distinctive group were healthy, active, wellness oriented and highly educated and were therefore a very unique group of elderly. The benefit of studying new groups therefore is that it can always be hoped that with each new study done, helpful information will be found that will give insight into educational strategies to target elderly populations. If appropriate educational strategies could be developed and initiated, then possibly this would be an effective remedy for inappropriate medication taking behaviors so that drug therapy could become more safe and effective.

Definition of Terms

- 1) Behavioral - manner in which one acts. Reactions of individuals under specific circumstances.
- 2) Perspective - evaluation of events according to a particular way of looking at them.
- 3) Appropriate - in accordance with physician instructions or label directions.
- 4) Prescription medications - those that can be obtained

only with a prescription from a licensed physician and filled only by a licensed pharmacist.

- 5) Over-the-counter medications - those which can be obtained in a store without a prescription such as vitamins, laxatives, aspirin, Tylenol, antacids, antihistamines and cough suppressants.
- 6) Utilization - utilizing or being utilized; ways in which medications are being taken.
- 7) Compliance - in drug therapy, the act of carefully following physician prescription recommendations.
- 8) Noncompliance - "failure of the patient to use the specified drug in the specified manner" (Gryfe & Gryfe, 1984, p.304).
- 9) Polypharmacy - prescription of many drugs given at one time to treat one or more disease processes. (Taber's, 1981).
- 10) Iatrogenic - any adverse mental or physical condition induced in a patient by the effects of treatment by a physician or surgeon (Taber's, 1981).

Summary

Medication use is problematic for many reasons. One major reason is the area of compliance. If physician prescription recommendations are not adhered to, there may be no complications. On the other hand, disease processes may not be adequately treated and the potential for adverse reactions always exists. If this one area could be improved by education of the elderly in the appropriate

use of medications, then safety and efficacy of drugs could be increased and adverse drug reactions and hospitalization from such reactions could decrease and possibly be avoided in many cases. This applies to all groups of elderly including not only the frail elderly, but healthy active elderly such as this unique group who are also major drug users. As we are faced with a burgeoning aged society and more medications are introduced for a wide variety of disease states, we must find educational strategies and target the elderly population with these strategies. We must, in some ways increase consumer awareness in the area of health care and medication use for our senior citizens. This is important to make the elderly's later years satisfying, so that they may lead healthy, productive and active lives for as long as possible, where the quality of life is not diminished by iatrogenic illness.

CHAPTER II

REVIEW OF LITERATURE

"All substances are poisons; there is none which is not a poison. The right dose differentiates a poison from a remedy."
(Paracelsus (1493-1541) In Jernigan, 1984, p.238).

This chapter reviews the literature which pertains to medication use in the geriatric population who are sixty-five years and older. An overview of demographics, chronic disease, medication use in the elderly and the three major reasons why drug use is so problematic in the elderly - physician and patient factors together with physiological and behavioral aspects - are presented. A section on adverse reactions is also included.

The following figures are presented for review. Figure one shows those over age sixty-five years as a percent of the present population and projected population in the year 2010. Figure two shows the percent of elderly who have some type of chronic diseases. Figure three shows prescription drug use now and projections for the year 2020. Figure four shows the percent of elderly over sixty-five years who take prescription medications. Figure five shows the percent of elderly over sixty-five years who take over-the-counter medications.

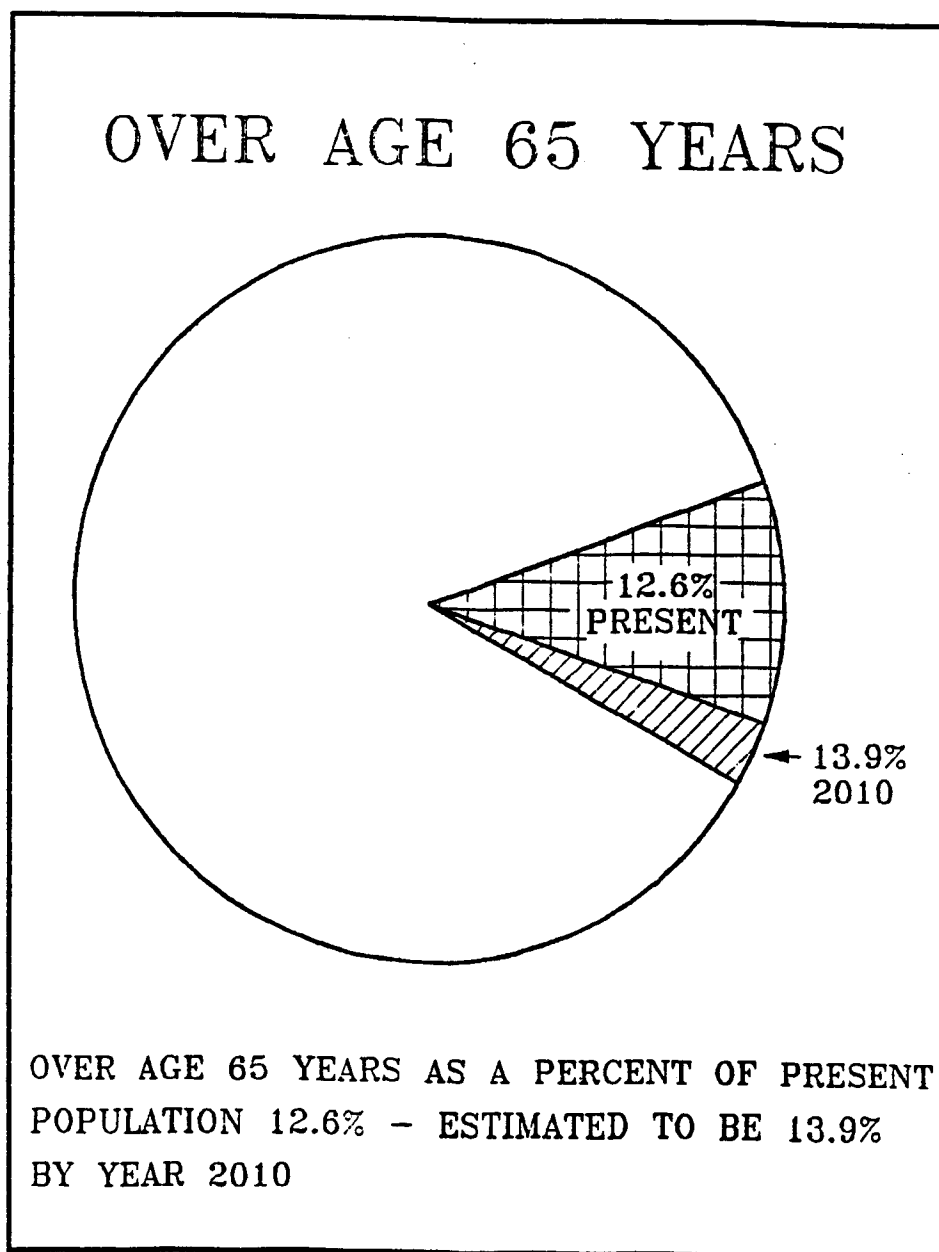


Figure 1. Over Age 65 Years as a Percent of the Present Population
Source: (Bureau of Census - Statistical Abstract of the U.S. 1992)

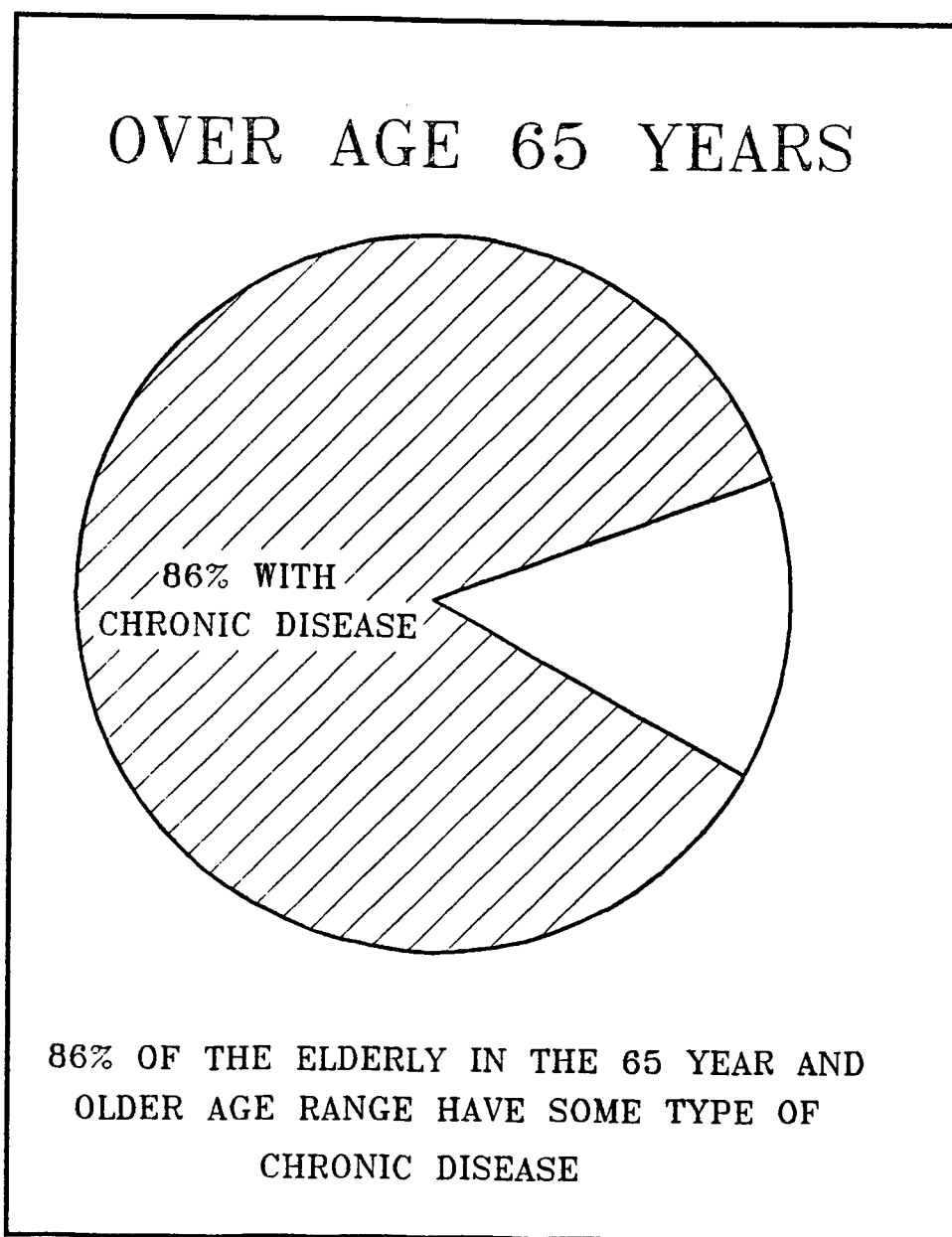


Figure 2. Percentage of Elderly with Some Type of Chronic Disease

Source: (Fried, 1990; German, 1982)

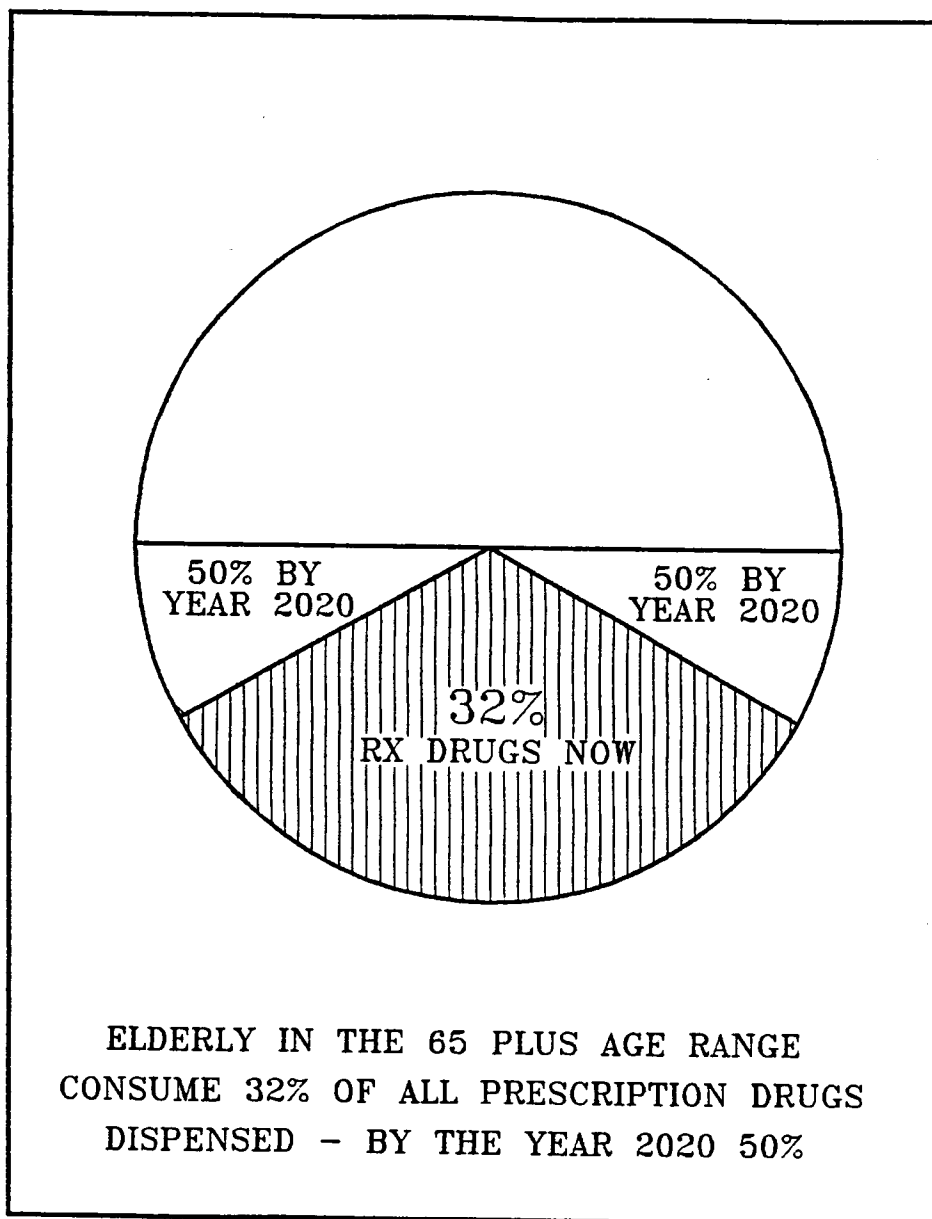
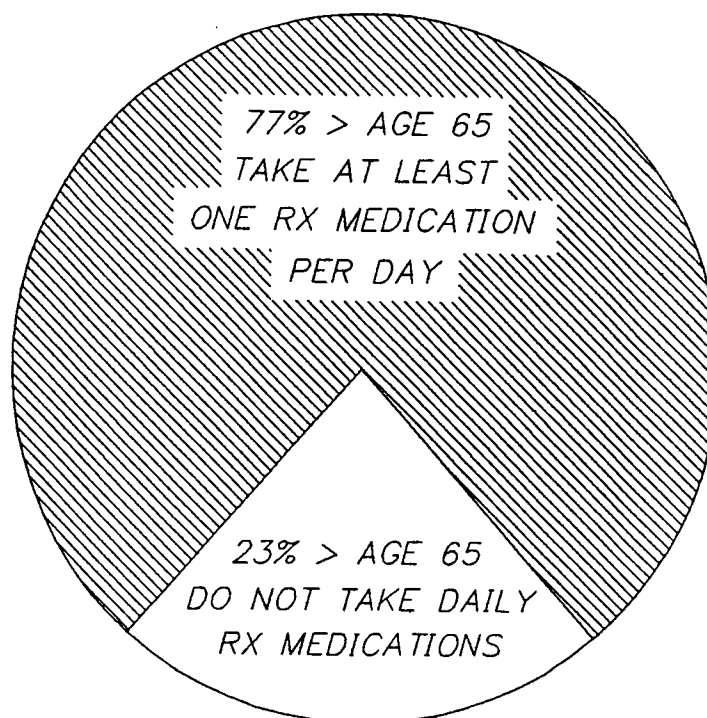


Figure 3. Prescription Drug Use Now and Projections for the Year 2020

Source: (Elioupoulos, 1990; Teague, 1987)



77% OF ALL ELDERLY IN THE 65 PLUS AGE RANGE CONSUME AT LEAST ONE PRESCRIPTION MEDICATION ON A DAILY BASIS

Figure 4. Percentage of Elderly over 65 Years who Take Prescription Medications
Source: (Stolley et al., 1991; Teague, 1987)

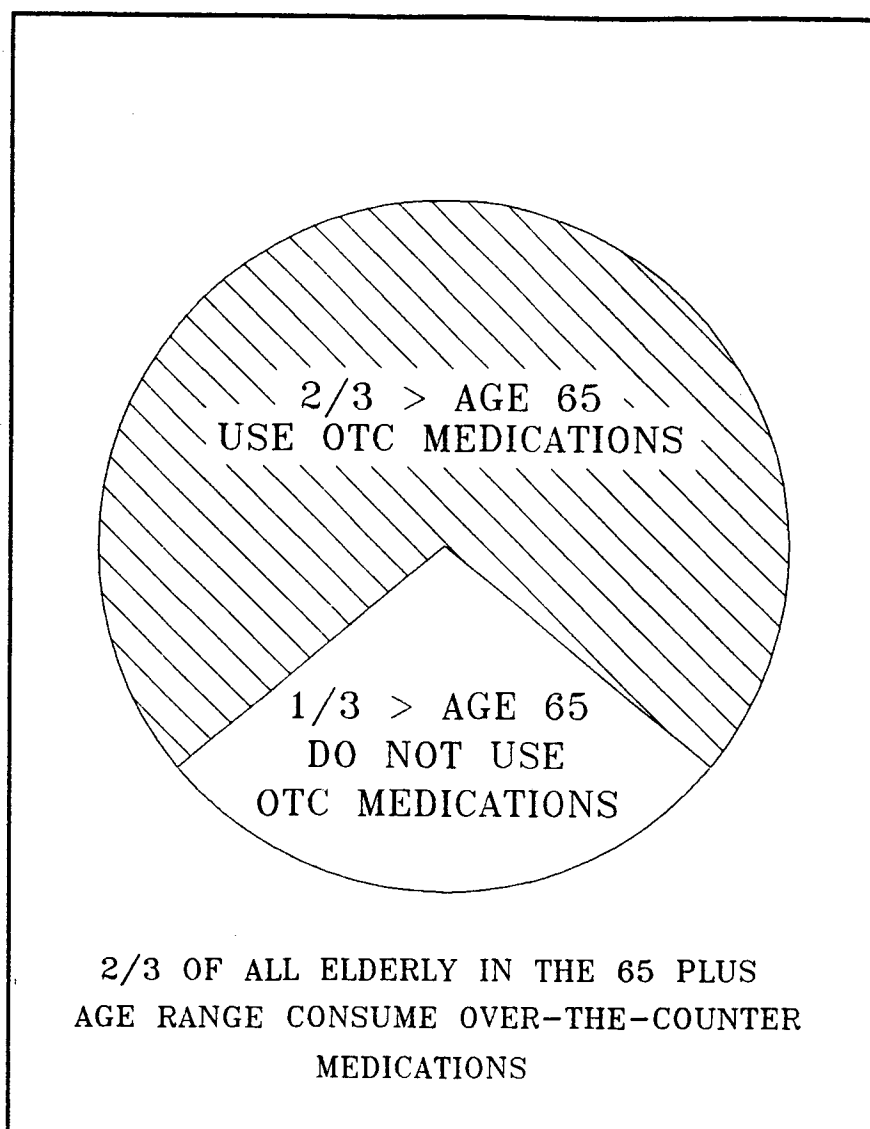


Figure 5. Percentage of Elderly over 65 Years who Take Over-the-Counter Medications
Source: (Lamy, 1989; Teague, 1987)

Demographics

The age distribution of the United States population has changed dramatically since the beginning of this century. There are many more elderly today in the sixty-five plus age bracket and this group will continue to increase into the next century. In 1900, the average life expectancy was forty-seven years (Hooyman & Kiyak, 1988). Today, due in part to advancing medical technology, public health measures and an increasing awareness of the need for lifestyle changes at a younger age to prevent or limit chronic diseases, many elderly are living into their seventies, eighties and sometimes even nineties. According to current statistics (Statistical Abstract of the U.S. 1992), the average life expectancy now stands at 72.1 years for males and 79.0 years for females and the proportion of elderly in the sixty-five year and older range now stands at 12.6 percent of the population. Projections are that by the year 2000, the elderly will comprise 13 percent of the population and by the year 2010, 13.9 percent of the population.

Only approximately 5 percent of the elderly live in nursing homes at the present time. Most continue to live in the community independently in various settings (Sloan, 1986), such as independent, planned and congregate housing (Hooyman & Kiyak, 1988). According to Sloan (1986)

"Contrary to popular opinion, the elderly are not by and large mentally impaired, despondent, or physically disabled. The majority are vigorous, self-sufficient individuals who constitute a formidable social and political force" (p.3).

Chronic Disease

Modern medicine has conquered and cured many of the acute infectious diseases which numerous people used to succumb to in the first half of this century, prior to the advent of vaccinations, antibiotics and public health sanitation measures (Simonson, 1984). Today, chronic disease is the most likely cause of morbidity and mortality in the elderly (Sloan, 1986). Unlike acute diseases, there generally is no cure for chronic diseases and often the best that can be hoped for is a mitigation of the symptoms that are associated with these disease processes (Sloan, 1986) and a possible improvement of an elderly person's capacity to function in everyday life. Most chronic conditions require some type of drug therapy as part of the treatment plan. As a person ages, the likelihood of having some type of chronic condition increases substantially (Fried, 1990). It is believed that eighty-six percent or four out of every five people over the age of sixty-five years, have one or more chronic condition (Fried, 1990; German, 1982). These chronic diseases of aging are generally considered to be time-related disorders (Bierman & Hazzard, 1990). If a person lives a long enough life, the likelihood increases that they will be affected by one of these disorders.

Chronic disease can bring symptoms ranging from limited degrees of incapacity to severe degrees of incapacitating disabilities (Simonson, 1984). Often the elderly experience more than one chronic condition and when they have periods of acute illness, they suffer

longer periods of disability compared to other age groups (Moritz & Ostfeld, 1990).

Such diseases of aging include cardiovascular problems such as peripheral vascular disease, congestive heart failure, ischemic heart disease and hypertension (Burdman, 1986). Hypertension is a very common problem in the elderly, affecting 35 percent of all males and 50 percent of all females (Moritz & Ostfeld, 1990). Other conditions include cerebrovascular disease, osteoarthritis, chronic lung diseases, osteoporosis, hip fractures, cancer, non-insulin dependent diabetes, renal failure and visual and hearing impairments. The ten major causes of death in the elderly over the age of sixty-five years are as follows (Moritz & Ostfeld, 1990):

- 1) Cardiovascular diseases
- 2) Malignant neoplasms
- 3) Cerebrovascular diseases
- 4) Chronic obstructive pulmonary disease
- 5) Pneumonia and influenza
- 6) Diabetes mellitus
- 7) Accidents
- 8) Atherosclerosis
- 9) Nephritis, nephrotic syndrome and nephrosis
- 10) Septicemia

Medication Use in the Elderly

With chronic disease comes some activity limitation in as many as 40 percent of those elderly living out in the community other than

in institutions (Fried, 1990). Medications are used to improve the quality and length of life and to maintain active and independent lifestyles which can maintain self-sufficiency in the elderly with chronic conditions. Multiple medications are used to treat multiple disease processes in the elderly population (Gordon & Preiksaitis, 1988). Although the elderly in the sixty-five plus age range comprise 12.6 percent of our present population, they are believed to consume 32 percent of all prescription medications dispensed (Eliopoulos 1990).

By the year 2020, it is estimated that 50 percent of all prescription drugs produced will be for consumption by the elderly (Teague, 1987). In addition to prescription medications, two-thirds of the present elderly population take over-the-counter medications (Lamy, 1989). So in addition to taking many prescription medications, the elderly also self-diagnose their own illnesses and take many over-the-counter preparations (Teague, 1987), which include laxatives, antacids, analgesics and vitamins (MacIsaac, Rivers & Adamson, 1989). When used prudently, these types of medications can be an adjunct to health care and help reduce medical costs. On the other hand, they can cause complications when used in addition to many prescription medications (Rock, 1985).

Statistics show that 77 percent of the geriatric population in the sixty-five plus age range take at least one prescription medication on a daily basis. Sixty-five percent of that population take two to three prescription medications daily and 20 percent of

that population take more than five prescription medications daily (Teague, 1987).

Multiple drug therapy is called polypharmacy, which is a term used to describe the use of excessive prescription medications (which may not always be necessary) to treat more than one chronic disorder at the same time (Simonson, 1984; Teague, 1987). Polypharmacy can be compounded by self-medication and the use of over-the-counter medications (Teague, 1987). The treatment of multiple morbidity in the elderly, leading to polypharmacy can lead to iatrogenic (physician caused) disease greatly compounding already serious conditions (Teague, 1987). Toxicity of certain medications can imitate other disease processes that may often be seen in the elderly population (Simonson, 1984). Sometimes this can lead to the use of even more drugs to treat adverse reactions from already prescribed drugs which can lead to even more drug reactions. Often hospitalization for acute episodes of illness in the elderly leads to an increase in the number of medications used (Beers, Daug, Hasegawa & Tamai, 1989), either for new problems or the exacerbation of chronic problems.

The consequences that relate to polypharmacy include adverse reactions, reduced patient compliance to treatment regimen, and ultimately increased health care related costs (Kroenke & Pinhott, 1990). The elderly have come to rely increasingly on medications to treat chronic conditions and to maintain health (Grymonpre, Mitenko, Sitar, Aoki & Montgomery, 1988). Unfortunately, medications are ineffective unless as Smith (1976) states that they are "...properly prescribed dispensed and accurately administered" (p. 392).

The categories of medications most commonly prescribed for the elderly over age sixty-five years are psychotropics which include sedatives, hypnotics and psychotics; cardiovascular drugs which include cardiotonics, antiarrhythmics and digitalis; diuretics; anticoagulants; antihypertensives; antibiotics and analgesics (McIntosh, 1988) and laxatives. Diuretics and antihypertensive drugs are the most commonly prescribed medications in this country (Kroenke & Pinhott, 1990). Psychotropic drugs affect psychic function, behavior or experience. Cardiovascular drugs improve or maintain cardiac function. Diuretics rid the body of excess fluid to ease the workload of the heart. Anticoagulants are used to prevent blood coagulation. Antihypertensives are used for the treatment of high blood pressure. Antibiotics are used extensively in the treatment of infections. Analgesics are used for the relief of pain and laxatives are used for the treatment of constipation. (Tabers, 1981).

Reasons Why Drug Use Is Problematic In The Elderly

The elderly, as noted, consume large amounts of medications. Medication use by the elderly will increase into the next century as there will be an increased number of people in this age group and there will be more drugs available due to ever advancing medical technology. There are three major reasons why medication use is so problematic in the geriatric population. These reasons are as follows:

- 1) The physiological aspects of aging.
- 2) The ways medications are prescribed by physicians.
- 3) Compliance by the elderly to treatment regimens.

Each reason will be discussed separately in the following sections.

Physiological Changes of Aging

Drug disposition in the elderly is affected by the physiological changes of aging (Nolan & O'Malley, 1988). The presence of multiple chronic diseases can also affect drug handling (Rock, 1985). As a person advances in years, there are a number of changes in body composition and declines in organ function. For body composition, specific body proportions of lean body mass and body water content tend to decline with age, whereas the proportion of body fat tends to increase (Kuhn, 1991). There are also a number of changes in organ function. Increasing age brings a decreased functional reserve capacity of vital organs (Kuhn, 1991).

D'Arcy (1982) states that:

"...geriatric patients can have a considerable reduction in the reserve capacity of many organs and, there is a narrowing of the safety margin between the therapeutic and the toxic dose of many drugs which can lead to an iatrogenic overdose and adverse reaction sequelae" (p.925).

The main organ changes which relate to drug disposition include changes in the cardiovascular system resulting in a decrease in cardiac output. There is a lowering of the heart rate and a decreased stroke volume resulting in less blood flow to all other organs. Changes in gastrointestinal function include decreases in the secretion of gastric acid and slower motility throughout the entire system. The liver decreases in size and there are changes in metabolic capability of this organ with age (Kuhn, 1991). An aging liver is unable to detoxify substances as efficiently as in younger years (Scott & Mitchell, 1988). There are also changes in renal function. Filtration rates are decreased which leads to a diminished ability of the kidneys to excrete metabolites. Sensory changes such as vision and hearing are affected leading to diminished visual acuity with age and changes in auditory function leading often to hearing impairments (Burdman, 1986; Kuhn, 1991).

Due to these age related physiological changes, components of pharmacokinetics (or drug handling in the body) are altered due to changes in absorption, distribution, biotransformation and excretion.

- A) Absorption is the process whereby a drug is assimilated into body fluids to be carried to its site of action (Reiss & Melick, 1984). Drug absorption is slowed in the elderly due to delayed gastric emptying, changes in

gastric PH and delayed gastric motility (Kuhn, 1991).

- B) Distribution is the process whereby a drug is transferred from its site of entry into the body to its site of action (Reiss & Melick, 1984). Due to changes in body composition in the elderly, drug distribution is affected in two ways. The first is due to the decrease in lean body tissue and body water content. There is therefore a smaller volume of distribution for drugs that are water soluble. Due to this, a given drug may be more concentrated and can lead to higher blood plasma concentrations and possibly a more toxic effect as less body water is available (Eliopoulos, 1990; Montamat, Cusack & Vestal, 1989). The second is due to an increase in body fat cells. This makes for a wider distribution area for drugs that are fat soluble. Due to this larger area of distribution, there may be a build-up and accumulation in the body of these types of drugs and therefore a prolonged duration of action of lipid soluble drugs as the drug half-life has a prolonged effect (Eliopoulos, 1990; Montamat et al., 1989). The half-life is the time it takes to eliminate half of the amount of the drug absorbed from the body (Yurick, Spier, Robb & Ebert, 1989). Another definition of the half-life is the time it takes for the drug concentration in blood plasma to be reduced by one-half (Westfall & Paulis, 1987).

- C) Biotransformation (or metabolism) is the process whereby drugs are changed into a more water soluble form in the liver, so they can be eliminated by the kidneys (Reiss & Melick, 1984). Due to changes with aging, there is a decrease in liver mass and a diminished blood flow through the liver along with a decreased enzyme activity. All these changes result in an increased time to metabolize drugs and also prolongs the half-life of some medications in the body (Simonson, 1984). Due to this there is the possibility of longer and more toxic pharmacological effects in the body (Kuhn, 1991). When the liver is further impaired by disease processes, the use of alcohol in conjunction with multiple drugs can affect the ability of the liver to metabolize all such compounds simultaneously (Lowenthal, 1987).
- D) Elimination is the process whereby drugs are excreted from the body (Reiss & Melick, 1984). There are a number of different ways that drugs can be eliminated but the main route is the kidneys. Excretion is contingent upon renal blood flow, the glomerular filtration rate and clearance of urea from the body (Kuhn, 1991). All of these are lessened in an elderly body. Due to the decreased rates of excretion by the kidneys, there is a potential for more toxic effects of medications which remain in the body for longer periods and an increased

possibility of adverse drug reactions (Kuhn, 1991).

Because of this, lower medication dosages may be necessary as a person ages (Lowenthal, 1987).

Ways Medications are Prescribed by Physicians

Vestal (1982) states

"...many elderly patients are, in fact, being overmedicated and improperly medicated. Medication has all too often become a substitute for individual medical treatment" (p. 192).

The use of excessive prescriptions can cause adverse reactions (Denham, 1990). In order to minimize iatrogenesis in the elderly, there are certain principles that should be adhered to when prescribing medications to geriatric patients (Carty & Everitt, 1989). If possible, a diagnosis should be made prior to the beginning of drug treatment in order to give correct therapy. A history of what medications are being taken should be noted since the elderly are sometimes visiting more than one physician, and any drugs prescribed for a current ailment or problem may interact and cause problems with other drugs already being taken (Vestal, 1990). It is important that physicians are familiar with the drugs they are prescribing (Vestal, 1990). Drugs should only be prescribed when absolutely necessary and not simply because a patient requests or expects a prescription to be written as part of the office visit (Simonson, 1984). It is more advantageous in geriatric drug prescribing to use smaller doses for shorter periods of time and as few drugs as possible so treatment programs are less complicated and compliance will be enhanced (Vestal, 1990). Careful communication is considered important to gain patient cooperation with drug therapy (Carty, 1989). Physicians need to enhance their communication skills

in their care of the elderly (Burns & Austin, 1990). Medications need to be reviewed frequently on a regular basis to see if they are still needed (Shaw, 1982) and see if there may be errors in medication administration. Unfortunately, these principles are not always adhered to by the physician.

This may be due in part to inadequate geriatric education which has been a neglected field in medical schools despite a growing elderly population (Avorn, 1987; Teague, 1987). Pfeiffer (1985) states

"Care of the elderly requires special training in geriatrics and gerontology. The vast majority of health and social service professionals now working with the elderly received little or no training relevant to aging as they trained to become physicians, nurses and social workers" (p. 46).

This writer can attest to very limited geriatric content encountered during nurses' training in the mid 1980's, even though the elderly account for the largest proportion of hospitalized patients and nursing home patients where the greatest nursing focus is. There is also inadequate information provided to students on geriatric pharmacology (Stahl, 1987). As recently as 1990, very few universities were providing pharmacy students with geriatric education and requiring courses with geriatric content (Small & Moherman, 1990). This is incomprehensible in light of pharmacological implications in the elderly due to physiological changes with aging (Small & Moherman, 1990) and the ways the elderly handle drugs in their bodies.

The elderly are at times being prescribed too many medications by physicians which can result in adverse reactions and toxic effects (Vestal, 1982). Seventy-five percent of all physician visits by the elderly result in a prescription being written (Gryfe & Gryfe, 1984). Occasionally similar medications are prescribed by different physicians.

Often medications are not reviewed appropriately by physicians and certain medications are continued even though a specific problem is long resolved (Vestal, 1982). With elderly patients, if they have been receiving a particular medication for a long period of time, a physician may give repeat prescriptions, sometimes without further evaluation (Gryfe & Gryfe, 1984), even though the condition may be under control and the need for further medication may no longer be required (Denham, 1990). Careful review is needed to decrease the number of adverse drug reactions. Diagnostic evaluation is of extreme importance to see if there is a disease present so that an additional drug is not prescribed to treat an adverse reaction of a drug already being taken instead of changing the original drug. This may result in problems with polypharmacy (Knapp et al., 1984; Larson, Kukul, Buchner & Reifler, 1987). Many medications used by the elderly can cause adverse reactions which can imitate certain disease processes, so diagnosis can be difficult (Hale, 1986).

Physicians in busy practices are often too busy to provide appropriate drug related education for drugs being prescribed. Other problems related to drug use include the fact that few drug trials have been conducted in the geriatric population and are usually performed on younger healthy subjects with no impaired physiological functioning (Shaw, 1982), so often the effects of medications are mostly unknown in the sixty-five plus age group. The need for more research is evident with an ever increasing number of drugs and ever increasing number of elderly (Avorn, 1987).

Another problem is that drug manuals list only adult and pediatric dosages and no special geriatric dosages are listed even though the elderly in general consume more medications per capita. This even includes medications that are used mainly by the elderly and cause the most problems for them (Avorn, 1987). Even though they often should be prescribed smaller amounts of medications, the elderly are often prescribed the normal adult dosages which may be an overdose when combined with physiological changes and use of other medications. This can cause adverse reactions (Rajda & Beluck, 1984).

In order to decrease problems with prescription of medications to the elderly, drugs should never be given except for a specific reason and then as few drugs as feasible should be used at any one time (Mullen & Granholm, 1981).

According to Alford (1982), the following are a listing of the Bill of Rights for the elderly on drug therapy. It is as appropriate today as it was ten years ago when written. Alford feels that an elderly person has the

- "1) Right to take or not to take medications.
- 2) Right to keep his faculties and not be chemically restrained.
- 3) Right to know what he is being medicated with and why.
- 4) Right to know the consequences of ingesting such chemicals into his body.
- 5) Right to express his subjective response to drugs.
- 6) Right to have prescribed just enough of the drug necessary for his ailment and not be made to buy more expensive drugs than necessary.
- 7) Right to use medicines he has purchased and not be coerced into buying a new supply of the same drug just because hospitalized or placed in a nursing home.
- 8) Right to take own medications as long as he is capable and competent to do so.

- 9) Right to quality medicines at least cost.
- 10) Right to nursing and medical caregivers getting to the root of his problems before medications are given.
- 11) Right to have medications prescribed, dispensed administered and evaluated by persons who have up-to-date, broad yet specific knowledge of geriatric pharmacology" (p. 282).

Compliance By The Elderly To Treatment Regimens

Noncompliance is considered to be "...the failure of patients to follow instructions provided regarding the use of medications" (Simonson, 1984, p. 65). Due to the fact that the elderly consume a greater number of medications than younger age groups, there is a far greater potential for noncompliance with medication taking.

The medical community - physicians, nurses and pharmacists - often make the assumption that patients will follow directions with regard to medications, but studies have shown as many as fifty percent of elderly patients do not administer their medications as prescribed by their physicians (Smith, 1989; Stolley et al., 1991). Blame for this cannot be attributed solely to the elderly (Stahl, 1987), as there may be a lack of communication or patient education between doctor and patient.

Many medications are taken inappropriately, sometimes in ways that can seriously jeopardize the health of an elderly individual (Stolley, et al., 1991). Noncompliance is a major therapeutic dilemma in health care and poses serious problems (Smith, 1976). Disease processes may not be alleviated, requiring repeat visits to physicians for additional alternative treatments (Hulka, 1976; Smith, 1989). Financial implications of prescription noncompliance are enormous. Treatment cannot be successful if medication prescriptions are not

filled (Lundin, 1983). Treatment also cannot be successful if prescriptions are filled, but are not taken in the correct manner (Smith, 1989).

Some of the most common behaviors related to noncompliance include the following. The elderly may neglect to have prescriptions filled as they believe treatment may be unnecessary or would not be of benefit. They may also believe the treatment may be too high a risk to take safely (Simonson, 1984) or they may sometimes be dissatisfied with their health care provider (German, 1982). They may also lack money as prescriptions are very expensive, especially when budgets are limited (Eliopoulous, 1990), or they may lack transportation to a pharmacy or they simply do not wish to comply with a treatment program (Smith, 1989).

At times, the elderly may take less of a medication to make it last longer (Eliopoulous, 1990). Sometimes they try to stretch their prescriptions to make them last longer by skipping doses when finances are a factor (Eliopoulous, 1990). Often incorrect dosages are taken. The elderly may take more or less medication per dose than prescribed by a physician. They may take more or less doses of a drug per day than prescribed. Underuse or use of less medication per dose is a very common practice among the elderly. As much as fifty percent of noncompliance may be due to the underuse of medications (Cooper, Love & Raffoul, 1982). Montamat et al.(1989) states "As many as 70 percent of the elderly alter their intake of prescribed medications intentionally for a variety of reasons" (p. 307).

The elderly may not take their medications at the time of day they were instructed to take them by their physician. They may take additional doses of medications to make up for missed dosages (Palmieri, 1991). They may omit medication doses or sometimes take extra doses to help alleviate the symptoms they may be experiencing (Sloan, 1986). They may at times forget to take medications if a treatment regimen is too complex (Gryfe & Gryfe, 1984; Yurick et al., 1989). Often there are complicated medication dosing schedules with the use of multiple medications and the elderly forget to take certain medications, sometimes the ones they may need the most (McIntosh, 1988).

Sometimes medications are discontinued prematurely by the elderly before the recommended time and before all medication is taken as they are feeling better (as in the case of antibiotics), (Teague, 1987) or they are feeling worse (as in the case of some antihypertensives or other drugs). Sometimes medications are hoarded for use in the future (MacIsaac, Rivers & Adamson, 1989; McIntosh, 1988). Another common practice among the elderly is the borrowing and loaning of medications intended for another person's use (MacIsaac et al., 1989; Yurick et al., 1989), to treat a similar type of illness as similar symptoms are experienced.

Another behavior is the use of medications leftover from prior illnesses to self-diagnose and treat another illness (McIntosh, 1988). This can cause problems as such medications may be used in an inappropriate manner (Simonson, 1984). Many elderly do not dispose of leftover prescription medications after a physician has discontinued

their use (McIntosh, 1988). Often the elderly use medications prescribed by more than one physician as their health care needs require different specialists (Hudson, 1984). Often physicians are not told of medications being taken which are prescribed by someone else. Often prescriptions are filled at more than one pharmacy, making it difficult to tell if one medication may interact with another and making it difficult to maintain a good medication profile for a particular client. Sometimes expired or outdated medications are used (McIntosh, 1988). Sometimes directions are misunderstood (Lundin, 1983) due to sensory deficits, as the elderly may not be able to read physician instructions or prescription labels due to poor vision (Elioupoulous, 1990), or may not have heard a physician or pharmacist's directions due to poor hearing.

With poor memory, an elderly person may not remember whether medication doses were taken or not (Eliopoulous, 1990). Self-medication with over-the-counter medication is a common practice (Palmieri, 1991). Often these are used without following label directions with regard to dosage and without safe knowledge of interactions with prescription medications.

Inadequate patient education with ambiguous directions which may be misunderstood or misinterpreted can contribute to noncompliance (Teague, 1987). Alcoholic beverages are consumed together with prescription medications without knowing the potential interactions (Cartwright, 1990; Scott & Mitchell, 1988). Medications are placed in unlabeled containers and sometimes mixed together with other drugs.

The outcome of various chronic conditions in the elderly as to whether therapy is a success or a failure is affected by noncompliance

to prescribed treatment regimens (Cramer et al., 1989; Morrell, Park & Poon, 1990).

Reasons Medications Are Not Taken As Prescribed

Noncompliance with prescribed treatment regimens is related to the success or failure of chronic or acute disease outcomes (Morrell et al., 1990). There seems to be two differing types of noncompliance. Those not able to comply for various reasons and those who are able to comply but choose not to (Cramer et al., 1989; O'Malley, Yan & Meagher, 1985). There are many reasons medications are not taken as prescribed by the elderly. Many can portend potential danger in an elderly person (Gibson, 1989). It has been hypothesized that the elderly, particularly those with less education and those with limited finances, are less compliant than those who have more education and are middle class who are considered to have a higher level of compliance (Blackwell, 1973; Olsen & Johnson, 1978; Teague, 1987). One reason for noncompliance is that the elderly may not be convinced that drug treatment will be beneficial to them (Kuhn, 1991).

A major reason for noncompliance is that treatment plans may be so complicated that the elderly may not be able to comply as opposed to not being willing to comply (Palmieri, 1991; Teague, 1987). When multiple medications and frequent dosing intervals are involved, this is not conducive to compliance. Noncompliance increases with the amount of medications taken (Morrow et al., 1988), (especially more than three medications at one time (Vestal, 1982)), and the number of dosage times per day (especially more than twice daily (Vestal, 1982)).

Also compliance is decreased in treatments of long duration (Eraker, Kirsch & Becker, 1984). Compliance has been shown to be related to the complexity of the treatment program (Teague, 1987). The number of medications prescribed has a direct relationship to the number of medications actually consumed (O'Malley et al., 1985). Another reason medications may not be taken as prescribed is that treatment plans need to be compatible with a patient's everyday living activities. It is not helpful for physicians to prescribe medications three times per day with meals if a patient only eats twice a day (Blackwell, 1973; Teague, 1987).

Inadequate patient education together with inadequate explanations regarding the correct usage of prescription medications and inadequate time spent with clients is an additional reason why drugs are taken in an inappropriate manner. Explanations are often given too rapidly by doctors, nurses and pharmacists to their elderly clients (Olsen & Johnson, 1978). Health care professionals are often too busy to provide appropriate drug related education and explain the need for medications.

There may be an inadequate understanding of the importance of taking the medication prescribed (Simonson, 1984). Eraker et al., (1984) state that "patients must both have knowledge and understand recommendations in order to comply" (p. 263), with medication treatment programs. There may be sensory deficits such as thought process impairment leading to forgetfulness or confusion or poor memory. Dosages of medications may therefore be missed or a dose taken but forgotten and then repeated at another time (Palmieri, 1991). Failing vision and impaired hearing may add to the inadequacy

of patient education (Ouslander, 1981). This may prevent elderly patients from following directions. Poor understanding of treatment plans may be due to vision problems. The patient may not be able to see to read a physician's written instructions or read pharmacy labels or written information (Palmieri, 1991), especially small warning labels on prescription bottles. With hearing impairments, patients may not hear instructions and therefore cannot comprehend adequately the directions given by a physician or a pharmacist (Ouslander, 1981).

Communication is an important part of a doctor/patient relationship but communication is not always carried out at an optimal level (Lamy, 1982). Building a trusting relationship is an important part of doctor/patient interaction also. Building such a relationship can contribute to the therapy directions being followed or carried out. Unfortunately, physicians are often so busy that enough time is not spent in doing this (Martin & Mead, 1982). Eraker et al. (1984) makes an interesting observation that there are

"...positive correlations between compliance and patient satisfaction with the visit including perceptions of convenience and waiting time. Conversely, impersonality and brevity of the encounter have been shown to negatively affect patient compliance. Satisfaction and resulting compliance are greater when patients feel their expectations have been fulfilled, the physician elicits and respects patients' concerns, responsive information about condition and progress are provided and sincere concern and sympathy are shown" (p.261).

Medication plans are often not reviewed by prescribing physicians, where regular reviews might reveal drug use errors (Carty & Everitt, 1989). Often cost is a factor where medication prescriptions are not

filled or if they are filled, dosages may be cut to make drugs go further in order to save money (Olsen & Johnson, 1978). Lack of transportation may be another factor related to noncompliance where elderly patients may be socially isolated, may not have access to or may have difficulty visiting a pharmacy or a physician (Ouslander, 1981). Another reason for not having a prescription filled is that an elderly person may feel that the medication is not really necessary or the risk in taking it may be felt to be too great (Simonson, 1984).

Medications are sometimes discontinued prematurely as a patient feels better and does not see the need to continue the treatment. In the case of antibiotic treatment, discontinuing medications prematurely can be particularly hazardous as there is the potential for an infection of increased severity occurring, which may be more difficult to treat (Simonson, 1984). This can also be a problem in the case of antihypertensive drugs used to treat high blood pressure (Cooper et al., 1982). Eliminating the use of these drugs for this asymptomatic disease can lead to dire consequences such as cerebrovascular, cardiovascular or renal problems. Sometimes medications are discontinued prematurely as an elderly patient feels worse (Sloan, 1986). Side effects may seem worse than the condition being treated so drugs are discontinued as there no longer seems to be a reason to continue with such a prescribed treatment plan (D'Arcy, 1982; Sloan, 1986), often without the benefit of medical advice.

Another major reason for noncompliance is the perception by the patient that a medication is either not required or not required in the prescribed dosage amount (Cooper et al., 1982; Helling, Lemke, Semla, Wallace & Lipson, 1987). This category represents a major area

of noncompliance. Cooper et al. (1982) feels this represents possibly 50 percent of all noncompliance, Montamat et al. (1989) claim that 70 percent of the elderly change the dosage amounts and Morrow et al. (1988) states that as much as "90 percent of nonadherence is due to under-medication" (p. 1147).

The concept of "intelligent" noncompliance has been introduced which is the conscious decision by the patient not to take medication, to omit doses or to take reduced amounts of medication for specific reasons (Simonson, 1984). This may on occasion be due to the fact that the patient feels that the physician has wrongly diagnosed or prescribed for their condition (Eraker et al., 1984). This may also be an effort to reduce the severity of adverse reactions from drugs taken (Simonson, 1984). Cooper et al. (1982) state that this may be an "adaptation by old people to compensate for the physiological changes of aging" (p. 332), taking dosage amounts into their own hands or to eliminate drugs they feel they do not need. Occasionally the elderly may take excessive doses of medication believing that if one pill is helpful, then taking two pills may have an even more beneficial effect (Sloan, 1986).

There appears to be many reasons why the elderly are non-compliant with treatment regimens. The ultimate decision as to whether to comply or not rests solely with the patient and they have the final choice whether to follow instructions or not (Ruffain, 1985). As Rehder, McCoy, Blackwell, Whitehead & Robinson (1980) aptly state "compliance lies within the patient" (p. 384).

Adverse Reactions

Adverse drug reactions are defined by Friesen (1983) as "any undesirable or unwanted consequence that occurs when drugs are used to diagnose or treat disease states" (p. 257). The possibility of adverse drug reactions increases with age and adverse reactions can be a direct result of the three foregoing problematic areas of medication use in the elderly: 1) physiological changes of aging; 2) incorrect prescription; and 3) incorrect administration. The elderly frequently experience adverse reactions due to multiple drug use including the fact that reactions can occur at a normal therapeutic dose (Yurick et al., 1989), and other reasons already noted. Poor drug compliance can contribute significantly to adverse reactions (Roberts & Tumer, 1988).

Medication categories causing the most hazards include antiarrhythmics, antimicrobials, digoxin and diuretics, antihypertensives, steroids, hypoglycemics, sedatives, hypnotics and antidepressants. These are commonly prescribed groups of medications in the elderly (Kuhn, 1991; Yurick et al., 1989). Occasionally adverse reactions or side effects may be mistakenly attributed to the aging process (Yurick et al., 1989). Certain medications may cause, or make worse, symptoms of confusion and an elderly person may appear forgetful, depressed and even drunk (Kuhn, 1991), but when the offending substance is discontinued, symptoms often disappear.

Freund (1987) states

"A large number of drugs can temporarily reduce intellectual function by inducing delirium (confusion) or emotional depression" (p. 95).

This is reversible if the offending drug is precluded. Gordon & Preiksaitis (1988) state that "the aging brain is particularly susceptible to the deleterious effects of certain drugs" (p.69). The possibility and risk of adverse reactions increases as a person ages and with the amount of medications that person must take (Everitt & Avorn, 1986; Vestal, 1982; Yurick et al., 1989).

When taking many medications, they have the potential to interact with each other and according to Gryfe & Gryfe (1984) there may be an "...enhancement of the desired effects of one or the other drugs or an exaggeration of toxic or undesired effects" (p.301). Adverse drug reactions have a direct correlation to the use of multiple medications (Montamet et al., 1989). Adverse reactions to medications can lead to serious consequences which can severely impair an elderly person. This may require hospitalization and may even cause death. It is believed that approximately 10 percent of all elderly admissions to hospitals are a direct result of medication misuse either by physicians or patients which result in adverse drug reactions (Burns & Austin, 1990; Rock, 1985).

Summary

There are many problems related to drug use in the elderly. The seriousness of all three problem related areas of drug use discussed in the foregoing chapter cannot be understated. Interventions are needed at the physician level as well as the patient level from prescribing to compliance. It is important therefore, that medical personnel and the elderly need to be educated in the cautious and appropriate use of medications. Until research formulates safer medications for use by the elderly population, those currently in use need to be taken with the utmost care and in accordance with directions given for their appropriate use.

CHAPTER III

METHODS AND PROCEDURES

This chapter describes the methods and procedures used to conduct the study relating to the appropriate use of medications in a selected group of elderly caucasian subjects who were surveyed during a summer Elderhostel conducted at Western Oregon State College in Monmouth, Oregon. These subjects were attending an Elderhostel seminar entitled "Wellness: Mind/Body Relationship" which was an interdisciplinary exploration of the relationship between attitudes and health. The seminar was conducted by faculty from the Schools of Philosophy, Human Development, Health and traditional and alternative fields of medicine. The hostel was held at Western Oregon State College in Monmouth, Oregon during the week of July 7 through July 13, 1991. Included in this chapter are a discussion of the survey instrument used, methods used for data collection, and procedures for data analysis.

Survey Instrument

Assistance with the format for this survey was obtained from the Oregon State University Survey Research Department. Questions asked related to researched behaviors. The survey instrument used to gather data is to be found in Appendix A. This was a prescription and over-the-counter medication questionnaire. The first section dealt with the number of prescription and over-the-counter medications being taken and general information concerning the use of such

medications. Questions 8A through 8Z concern behaviors associated with the use of prescription and over-the-counter medications.

Demographic information requested was included on the last two pages of this survey. Information was requested concerning what is shared regarding medication use with a physician and whether more than one physician or more than one pharmacy is used. Behavior questions related to medication usage included whether more or less medication per dose was taken than prescribed and whether more or less doses were taken per day than prescribed. Other questions asked were whether label directions were followed for over-the-counter drugs, whether medications were taken at the correct time of day prescribed, whether medications were discontinued prematurely when feeling better or worse and whether leftover or expired medications were being taken or disposed of properly. Also asked were questions relating to whether medications were taken that were not specifically prescribed for that person and whether medications were borrowed or loaned. Final questions related to whether prescription and over-the-counter medications were taken without knowledge of their interactions with prescription medications, whether alcoholic beverages were taken in conjunction with prescription medications, whether medications were kept in their original containers and the reasons why prescriptions may or may not be filled.

Prior to the administration of this survey at Western Oregon State College, a trial survey was conducted with a small group of senior citizens at the Albany Senior Center. This trial showed this survey was readily understandable to seniors, gave information needed for minor revisions and gave an approximate time needed to complete.

Data Collection

Prior to the collection of data for this study, approval was obtained from the Oregon State University Human Subjects Committee. Permission was also obtained from Dr. Norman Eburne, Associate Professor of Health at Western Oregon State College who was the facilitator for the health related topics at the "Wellness: Mind/Body Relationship" Elderhostel. Dr. Eburne in turn obtained permission from the Elderhostel organizers to administer this survey to participants. The afternoon of July 9, 1991 was the date chosen to administer this survey. Dr. Eburne's topic of discussion for this lecture period was the safe use of medications. The questionnaire was given out and completed prior to Dr. Eburne's discussion at the beginning of the afternoon session. Also participants were given no advance notification of the subject matter to be discussed, so that bias from topics raised during the discussion might be eliminated.

The face sheet of the survey was an informed consent letter which was discussed prior to the administration of this survey. Participation was also discussed, which was stated to be entirely voluntary and confidential. Surveys were handed out and the entire group of thirty-eight elders chose to participate. Surveys were completed and collected in approximately fifteen minutes at which time Dr. Eburne started his discussion on the safe use of medications.

Handouts were presented by the writer, along with the survey, concerning medication information. One handout was "Managing Your Medication" (see Appendix B). This was a resource obtained from Project Dare - a drug and alcohol resource program administered through the Ecumenical Ministries of Oregon. Other handouts presented to this group on this topic were from the Elder-Health Program, University of Maryland, School of Pharmacy, Baltimore, Maryland entitled as follows:

- 1) Aging and How it Affects Your Response to Medicine.
- 2) How to select your Pharmacy and Pharmacist.
- 3) What's Really Inside Those Pills.
- 4) OTC's - Over-the-Counter Medications.
- 5) Did You Remember to Ask - The Consumer's Quick Guide to Using Medications correctly.
- 6) You and Your Medicines.

Data Analysis

During formulation of the survey, a review was performed by the Oregon State University Department of Statistics. Subsequent discussion suggested that this behavioral data could be analyzed by the use of descriptive statistics and using histograms for frequency distributions to show how percentages of data were distributed and summarized.

Summary

This chapter has described the methods and procedures used to conduct the study into behaviors which related to the use of prescription and over-the-counter medications. Included in this chapter are 1) description of the survey instrument; 2) method used for data collection; and 3) an overview of data analysis used.

CHAPTER IV

DATA ANALYSIS

This study exemplifies behaviors which related to the use of prescription and over-the-counter medications. An overview of demographic findings is presented, followed by information regarding drug use and findings which relate specifically to behaviors.

Description of the Population - Demographics

Figures at the end of this section show demographic results. Demographic data requested in this study included gender, age range, educational level, income level, marital status, retirement and employment status, household composition and housing arrangements.

There were thirty-eight caucasian subjects in this study - eleven male and twenty-seven female participants. Twenty-nine percent of this sample were male and seventy-one percent were female. Of the total group, twenty-one percent (n=8) were aged 60 - 64 years, thirty seven percent (n=14) were aged 65 - 69 years, twenty-nine percent (n=11) were aged 70 - 74 years and thirteen percent (n=5) were over the age of 75 years. Figure six shows the percent of male and female participants. Figure seven shows the age range of all the participants in this study.

This group was highly educated. Eighty-four percent (n=32) of the entire group had had some formal college education. Fifty-eight percent (n=22) had degrees - of these twenty-one percent (n=8) had Bachelor's degrees and thirty-seven percent (n=14) had pursued

post-graduate work or degrees. Of the remaining sixteen percent of participants three percent (n=1) did not have a high school diploma and thirteen percent (n=5) had high school diplomas. This group had not pursued higher education. Figure eight shows the educational level of all the participants in this study.

This group also was in a comparatively high income range. Eighty-nine percent (n=34) of the entire group had incomes in excess of \$20,000 per year (18% (n=7) \$20,000 - \$29,999), (11% (n=4) \$30,000 - \$39,999), (29% (n=11) \$40,000 - \$49,999) and (31% (n=12) \$50,000 and over). Figure nine shows the income range of participants in this study. Marital status of this group was sixty-three percent (n=24) were married, five percent (n=2) were single, eleven percent (n=4) were widowed, eighteen percent (n=7) were divorced and three percent (n=1) were separated. Figure ten shows the marital status of all the participants.

Final demographic findings related to retirement, employment status, household composition and type of residence of this group. Ninety-two percent (n=35) of this group were retired. Sixty-eight percent (n=26) were no longer employed. Thirty-two percent (n=12) were employed and of these eight percent (n=1) were employed full time and ninety-two percent (n=11) were employed part time. Of those employed, forty-two percent (n=5) were involved with volunteer work, thirty-three percent (n=4) were employed for pay and twenty-five percent (n=3) were self employed. Household composition of this group were 32% (n=12) lived alone and 68% (n=26) lived with others.

Sixty four percent (n=24) continued to live in single family dwellings and eighteen percent (n=7) lived in a retirement community. Eighteen percent (n=7) lived in other types of housing such as apartment dwellings.

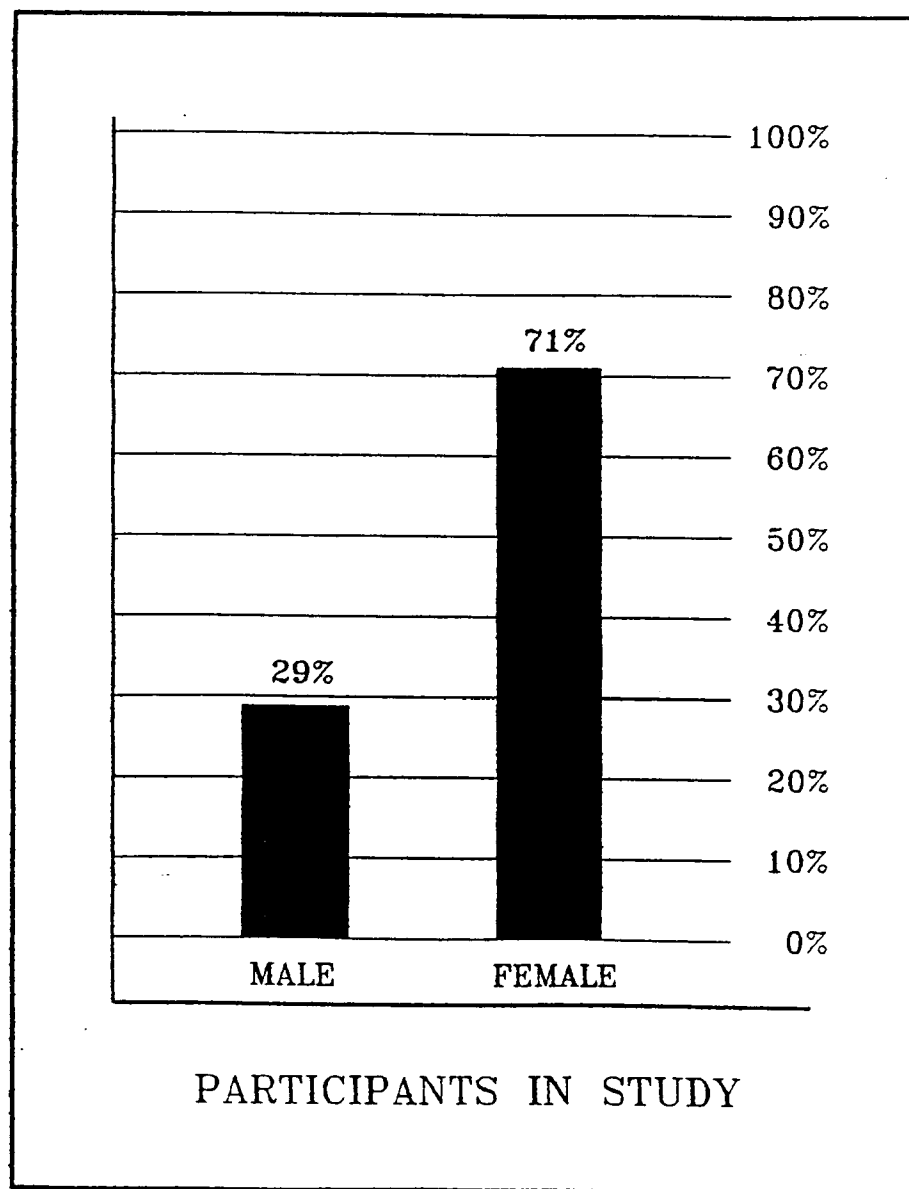


Figure 6. Percentage of Male and Female Participants in Study

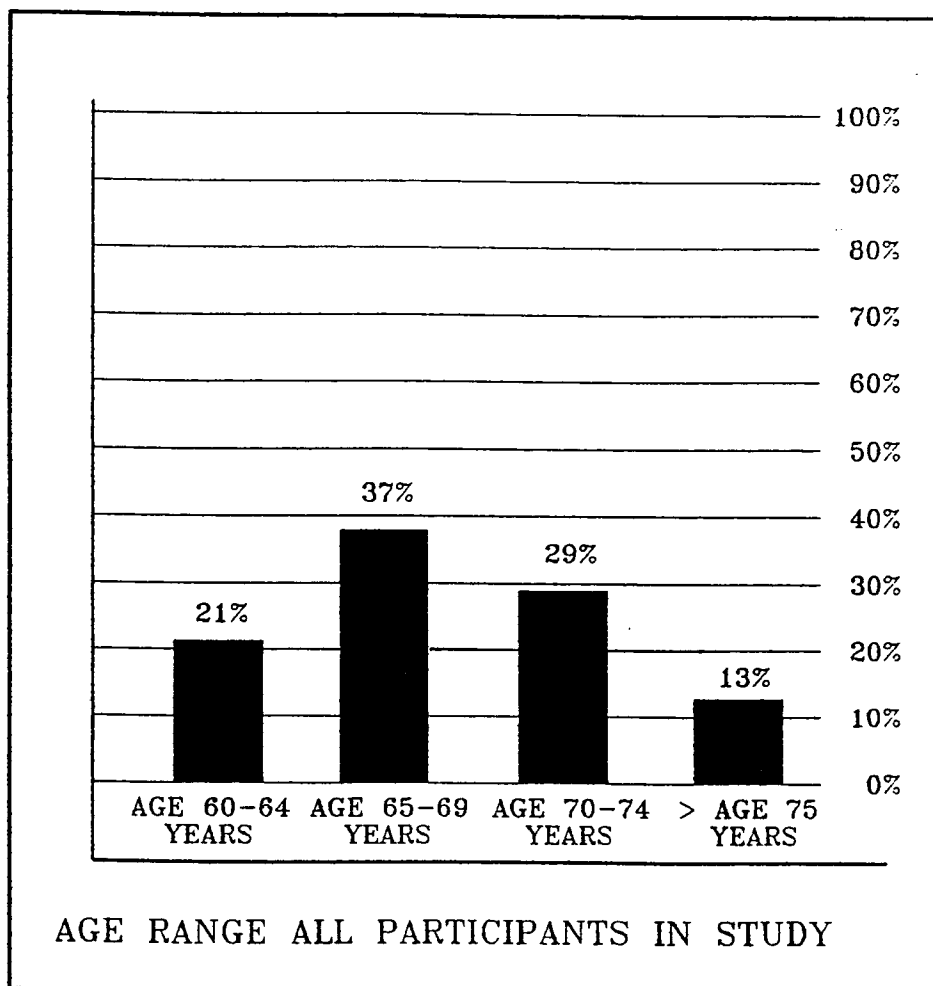


Figure 7. Age Range of all Participants in Study

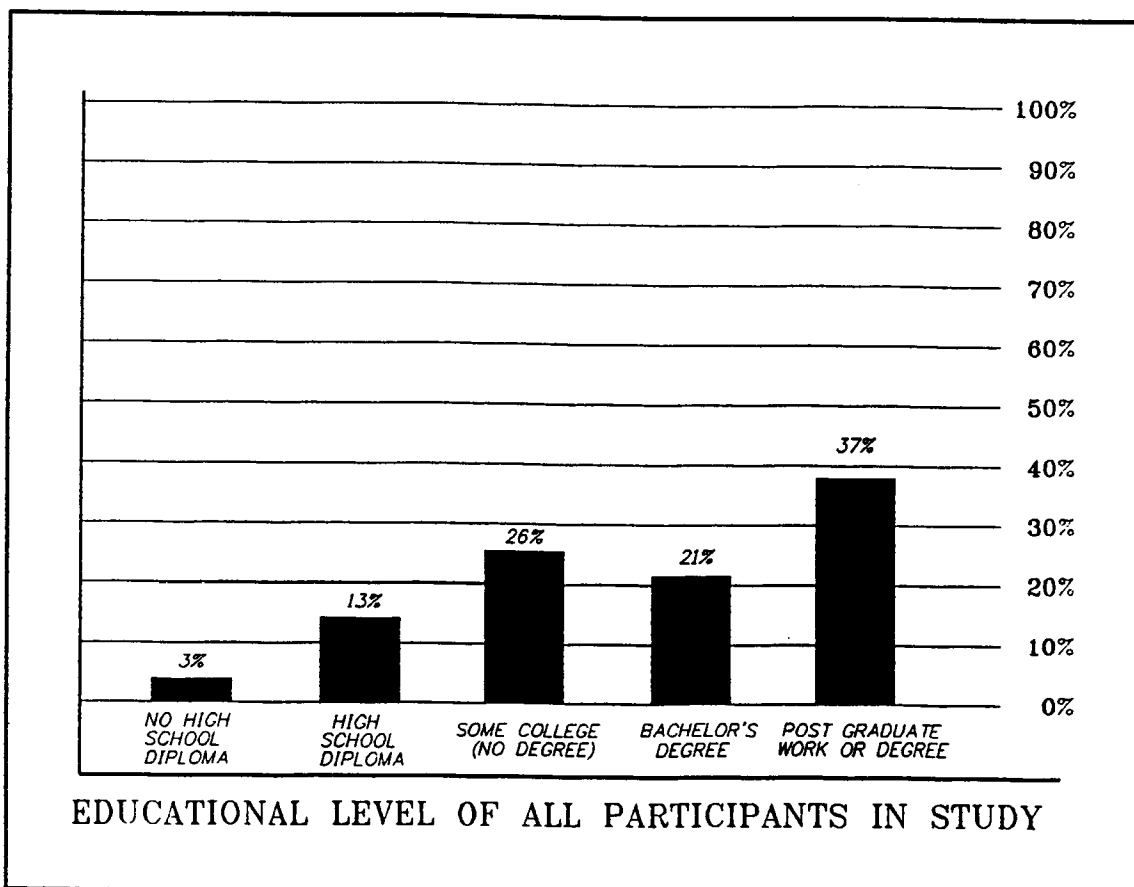


Figure 8. Educational Level of all Participants in Study

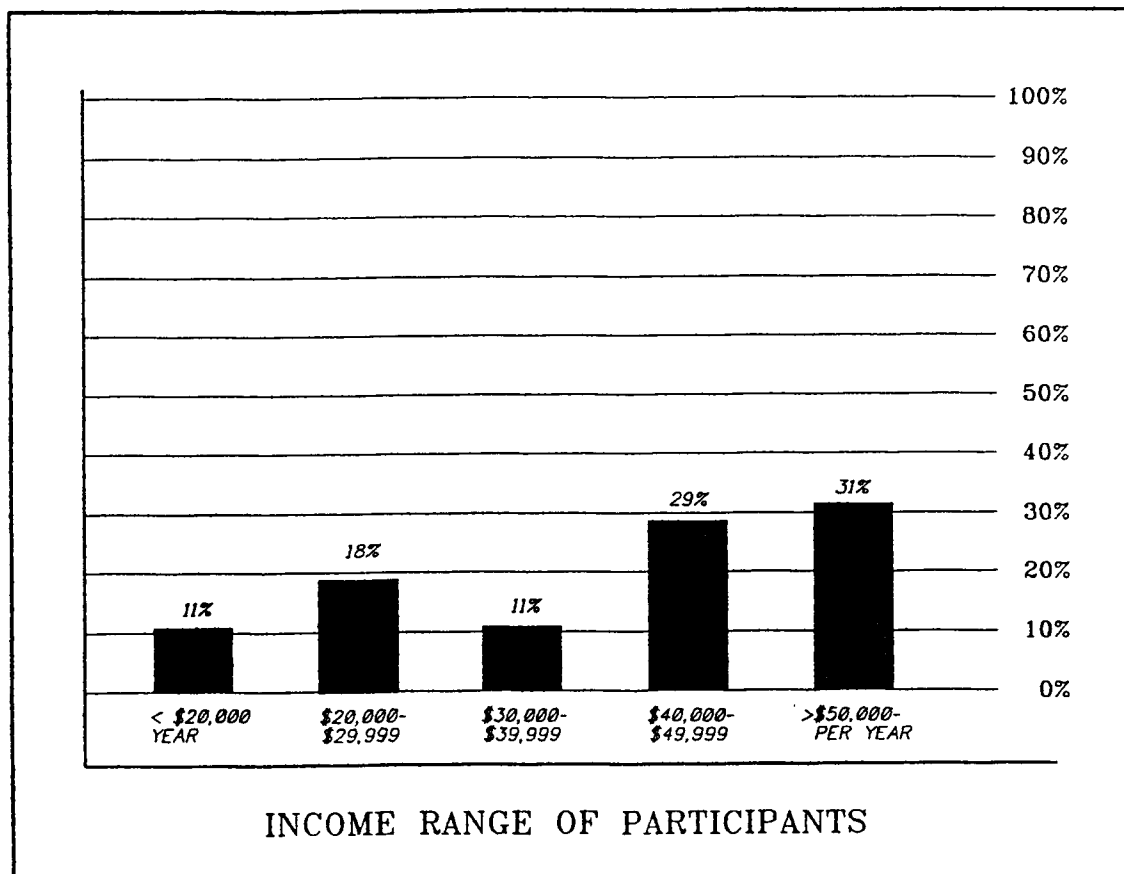


Figure 9. Income Range of all Participants in Study

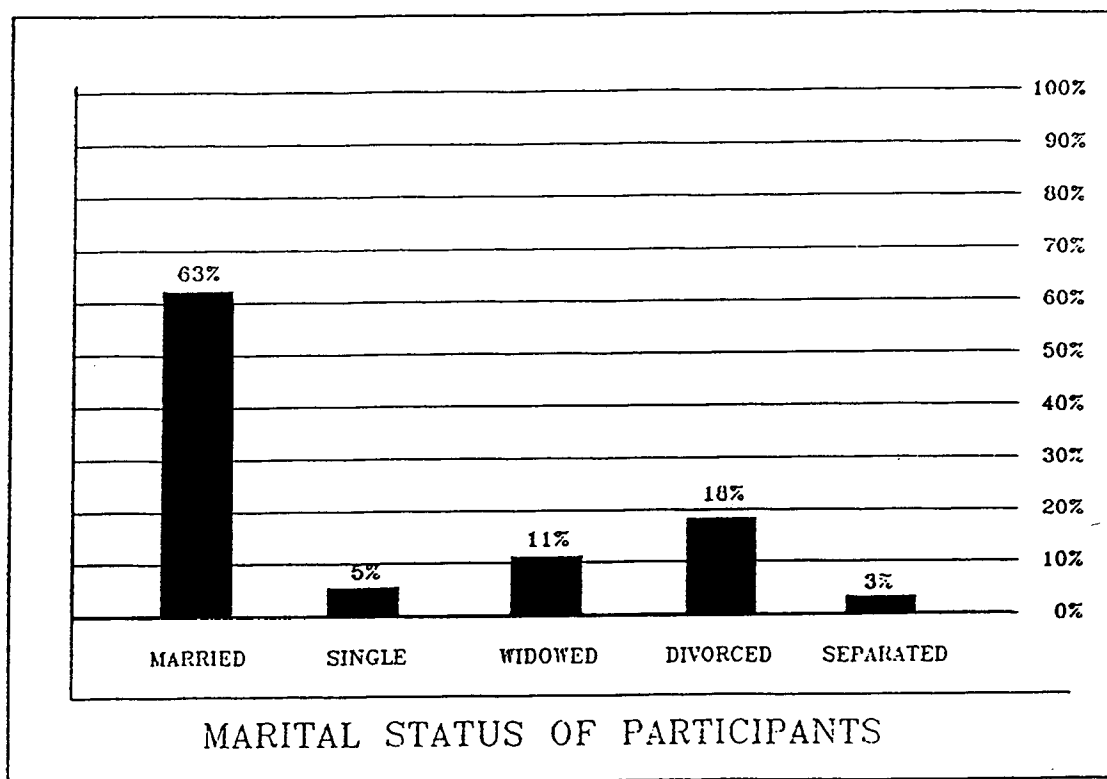


Figure 10. Marital Status of all Participants in Study

Description of Medication Use Results

Medication use information surveyed from this questionnaire found that 65 percent of this group (n=25) were taking prescription medications and 68 percent of this group (n=26) were taking over-the-counter medications on the date surveyed. Of those taking medications, the average prescriptions being taken were 2.92 per person and over-the-counter medications were 2.65 per person for those who were taking medications. The following figures show this medication use. Figure eleven shows the percentage of participants taking prescription medications and figure twelve shows the percentage of participants taking over-the-counter medications.

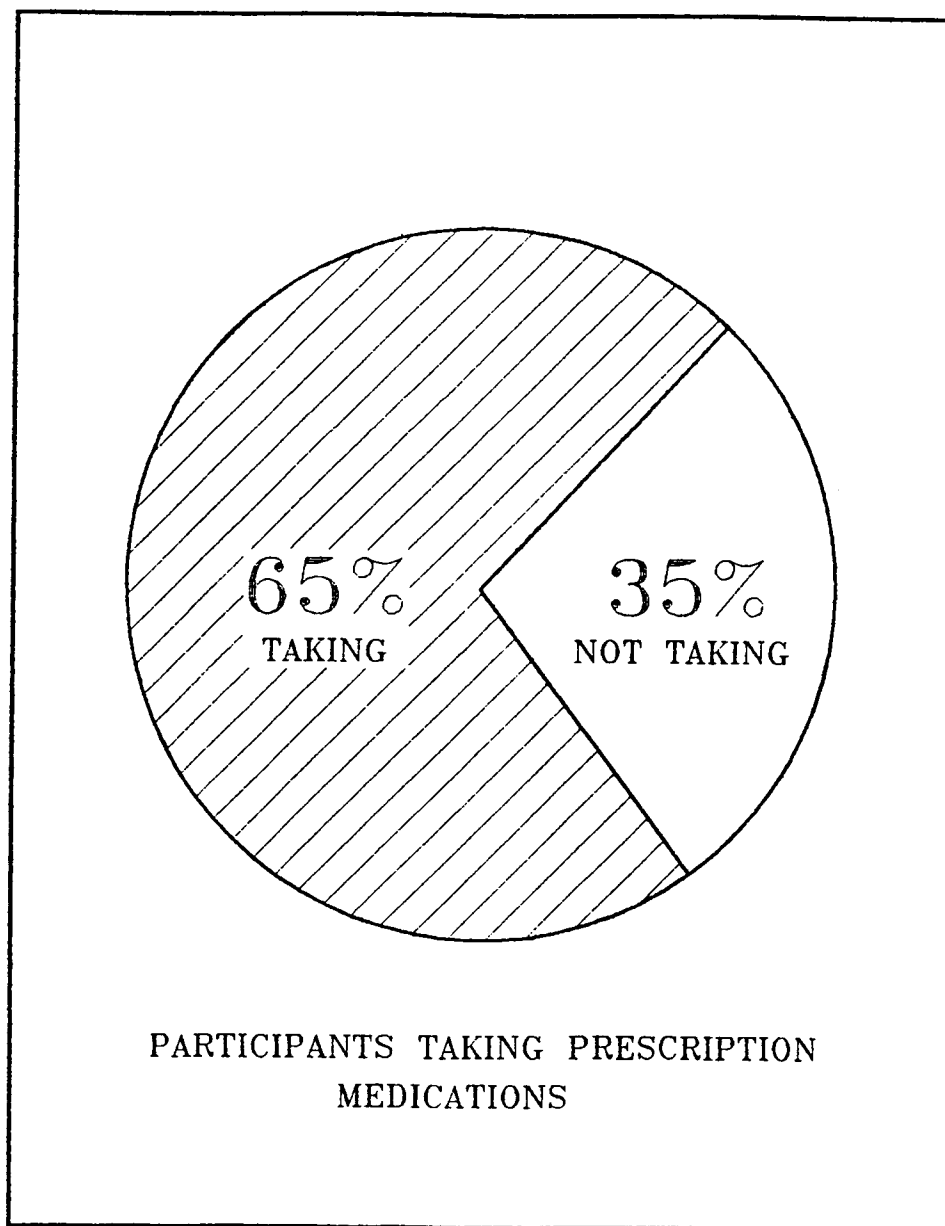


Figure 11. Percentage of Participants in Study Taking Prescription Medications

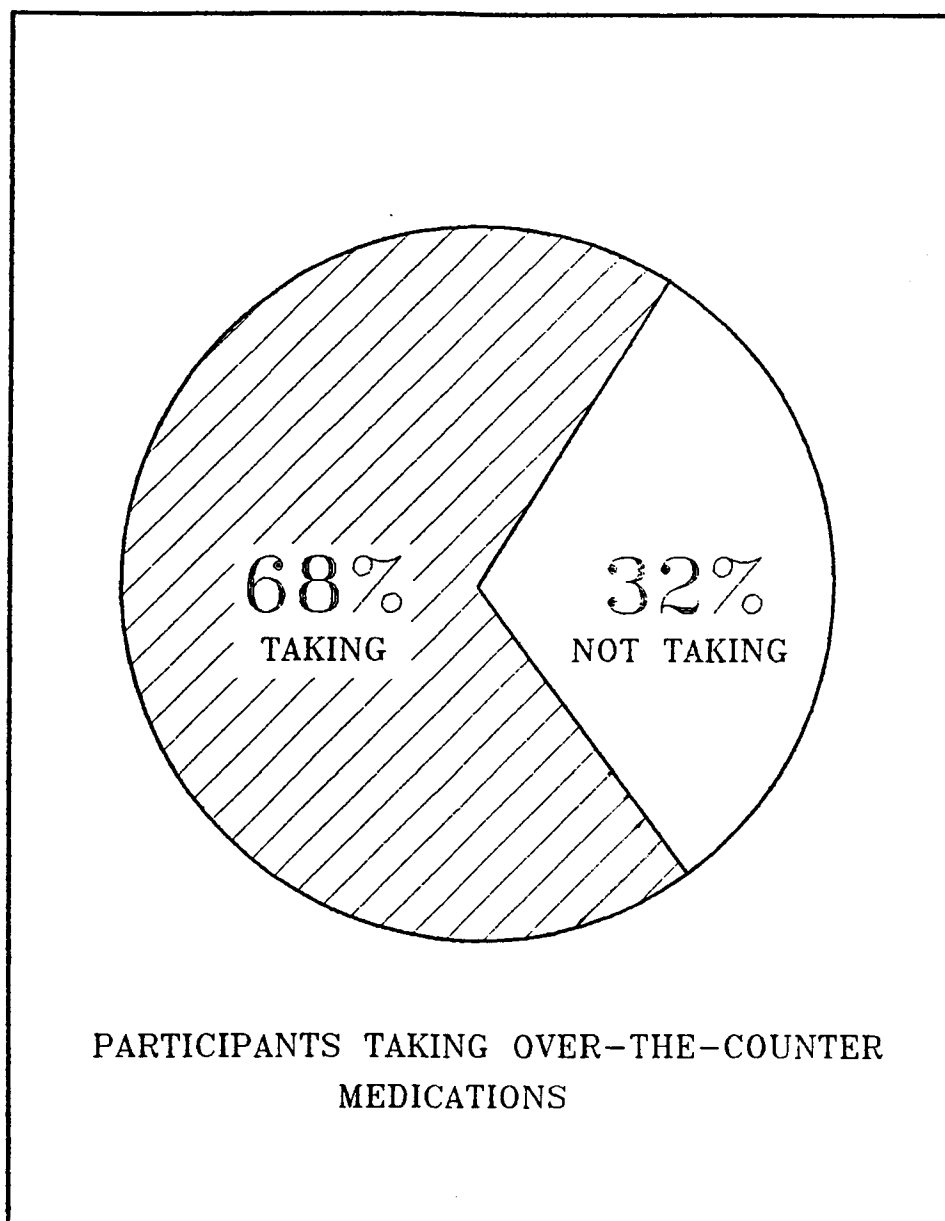


Figure 12. Percentage of Participants in Study Taking Over-the-Counter Medications

Of those twenty-five participants taking prescription medications, use per person is shown in Table One.

TABLE ONE

<u>How Many Prescription Medications Each Participant is Taking</u>	
13 participants taking	0 prescriptions daily
10 participants taking	1 prescriptions daily
6 participants taking	2 prescriptions daily
1 participant taking	3 prescriptions daily
4 participants taking	4 prescriptions daily
1 participant taking	5 prescriptions daily
1 participant taking	7 prescriptions daily
1 participant taking	8 prescriptions daily
1 participant taking	12 prescriptions daily

Of those twenty-six participants taking over-the-counter medications, use per person is shown in Table Two.

TABLE TWO

<u>How Many Over-the-Counter Medications Each Participant is Taking</u>	
12 participants taking	0 OTC drugs daily
11 participants taking	1 OTC drug daily
6 participants taking	2 OTC drugs daily
3 participants taking	3 OTC drugs daily
3 participants taking	4 OTC drugs daily
1 participant taking	5 OTC drugs daily
2 participants taking	10 OTC drugs daily

Sixty-six percent (n=25) of the entire group kept lists of medications when taking. Ninety-six percent (n=24) of those taking medications knew the names of medications they were taking and the purpose of those medications. Thirty-seven percent (n=14) of the entire group obtained medications from more than one physician. Twenty-four percent (n=9) of the entire group omitted to tell their physician about over-the-counter drug use. Thirty-four percent of the entire group (n=13) obtained their medication from more than one pharmacy.

Description of Behavioral Results

The behavioral results were based on responses from all of the participants surveyed. At the time of the survey, those who were not currently using prescription medications based their responses on prior experiences with drug taking.

Prominent behavioral findings from the study are discussed as follows. There were no important findings regarding the use of too many doses or dosage times of medication administration. However findings regarding the use of less doses per day and less medication per dose were notable. Fifty three percent (n=20 sometimes) and five percent (n=2 usually) stated they took less medication per dose than was originally prescribed by their physician. Sixty-three percent (n=24 sometimes) and three percent (n=1 usually) stated that they took less doses per day than were prescribed by their physicians. These are very important findings and are presented in the following figures. Figure 13 shows participants who take less medication per dose than prescribed. Figure 14 shows participants who take less doses per day than prescribed.

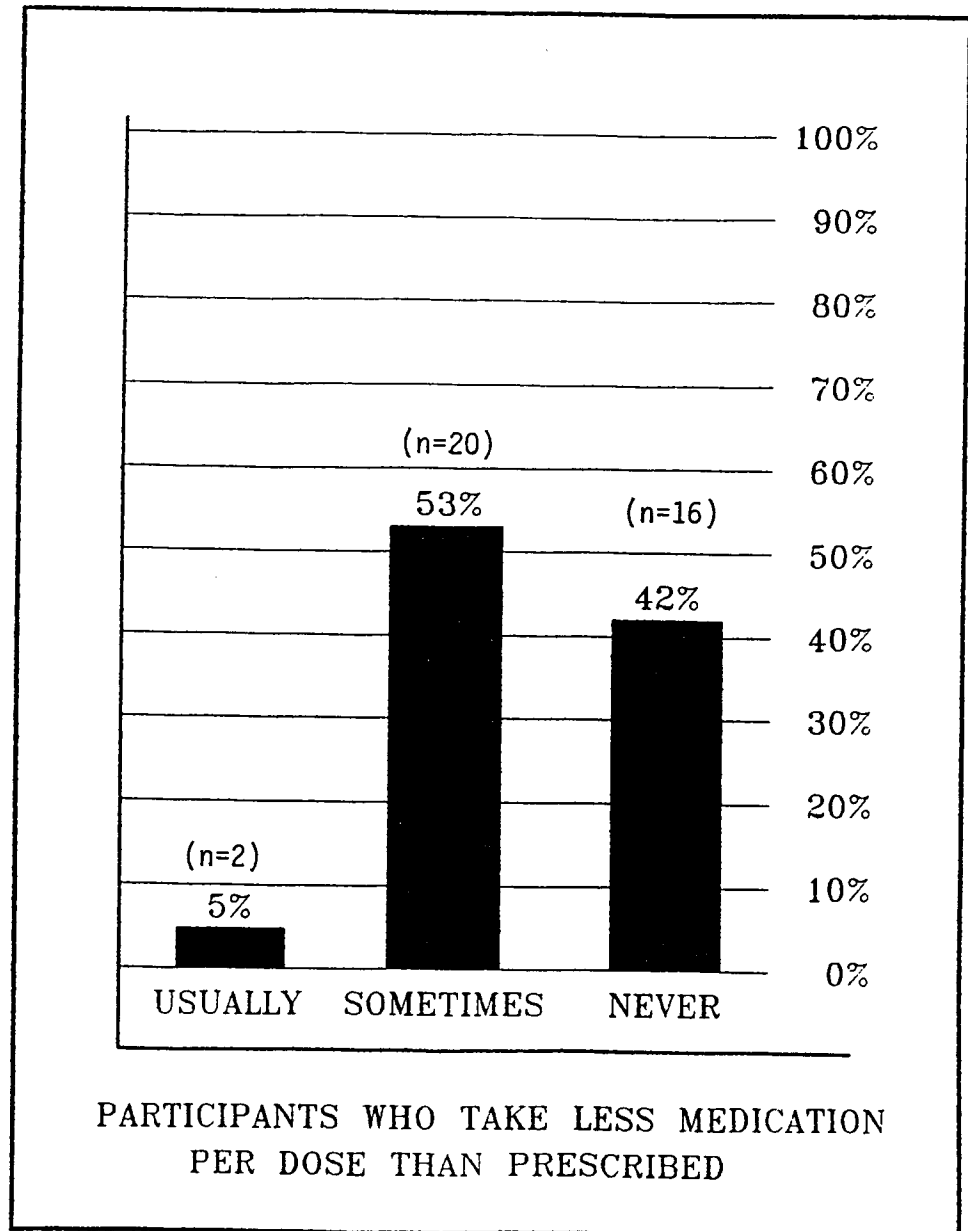


Figure 13. Participants who Take Less Medication Per Dose Than Prescribed

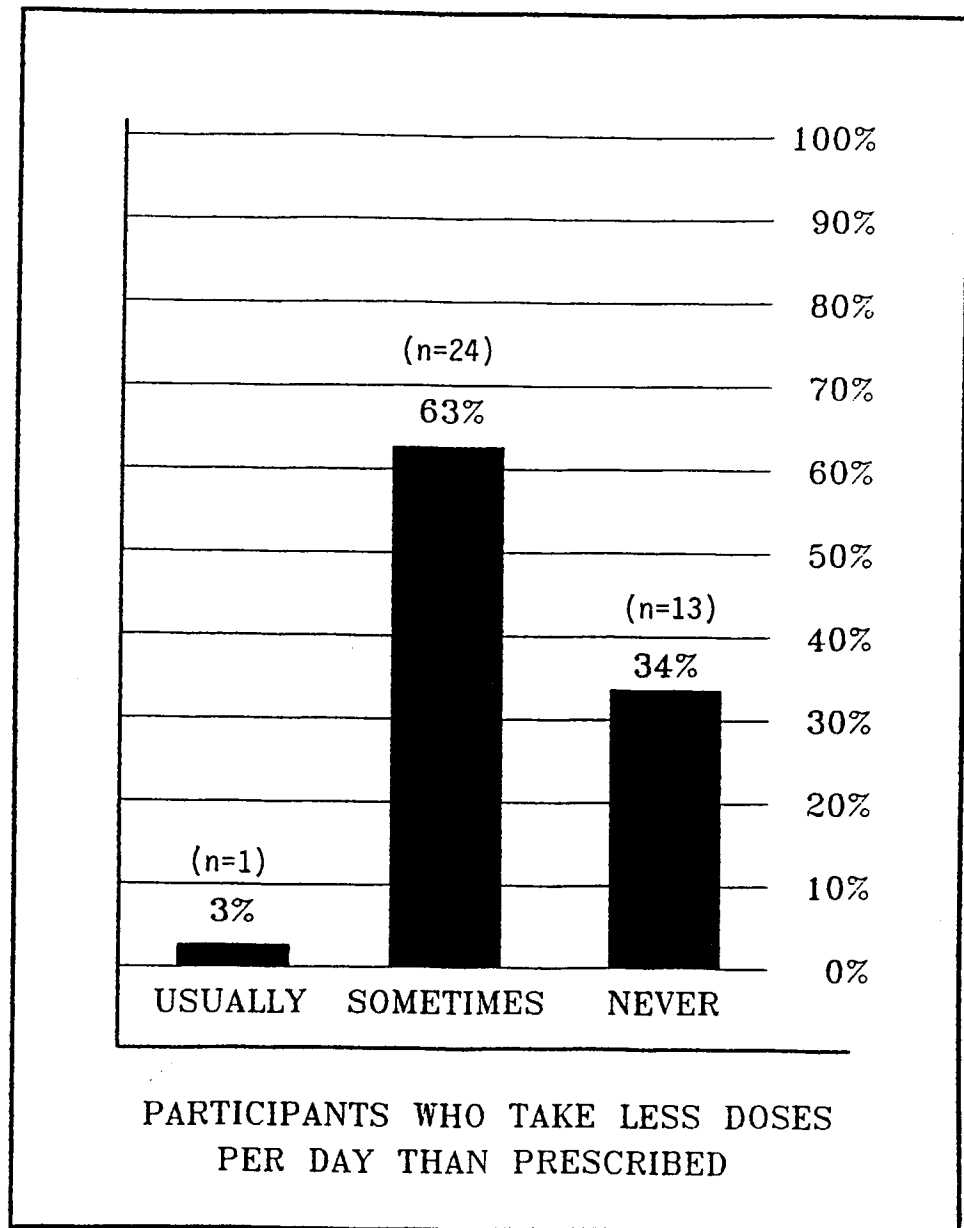


Figure 14. Participants who Take Less Doses Per Day Than Prescribed

The majority stated 97% (n=37) that they followed label directions for over-the-counter medication use. The majority 97% (n=37) stated they took medication at the prescribed time of day. Ninety-five percent (n=36) stated if they missed a dose they would not take an extra dose to make up for the missed dose.

Another notable finding was that medications were sometimes discontinued prematurely if a person was feeling better 47% (n=18 sometimes) 3% (n=1 usually). Also those who discontinued their medications prematurely if that person was feeling worse 47% (n=18 sometimes) 16% (n=6 usually). Sixty percent (n=23) did state that they would notify a physician if medications were discontinued prematurely. However 16% (n=6) stated they would sometimes notify doctor and 24% (n=9) stated they would never notify their doctor. Discontinued medications are presented in the following figures. Figure 15 shows participants who discontinue medications prematurely as they are feeling better. Figure 16 shows participants who discontinue medications prematurely as they are feeling worse.

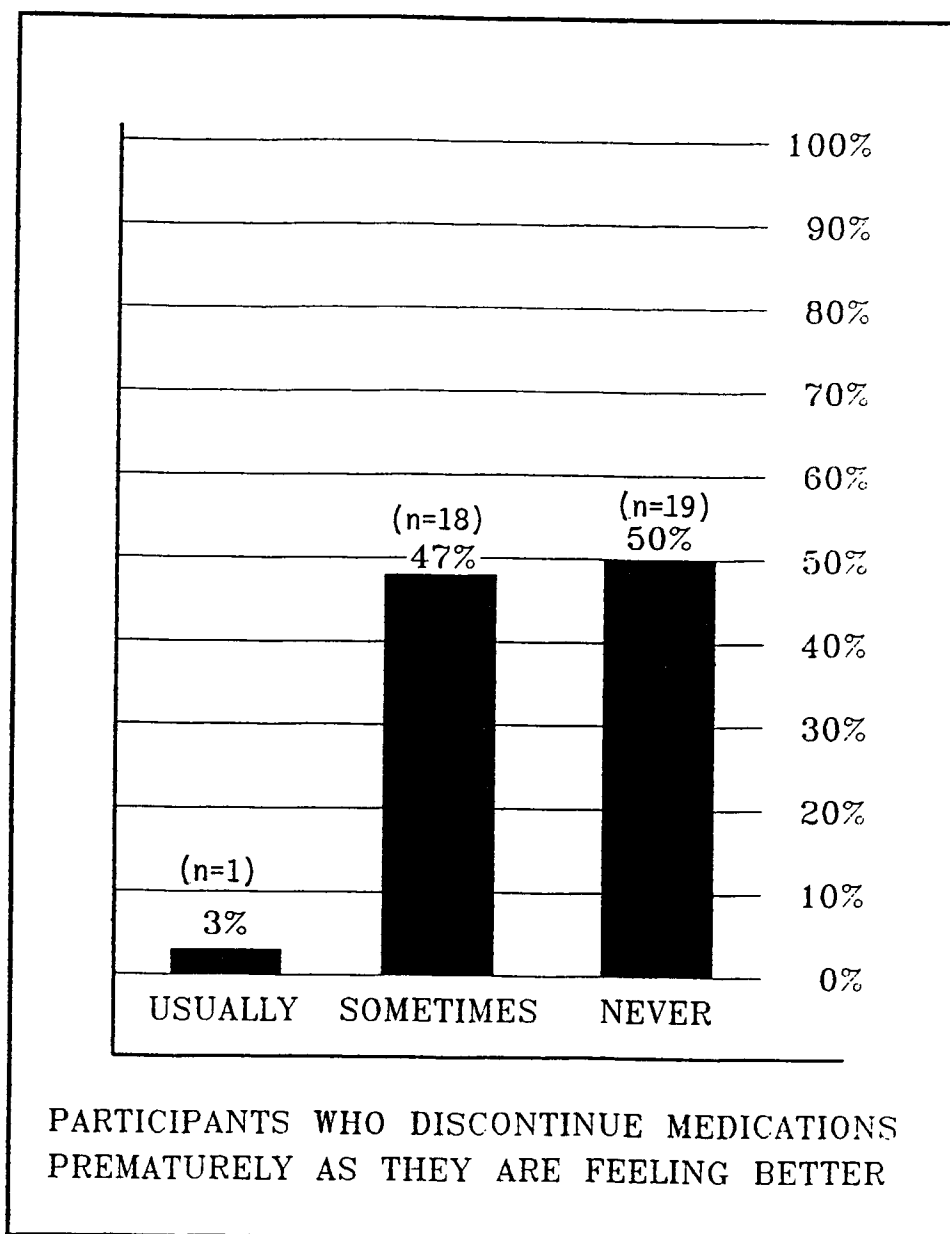


Figure 15. Participants who Discontinue Medication Prematurely as They Are Feeling Better

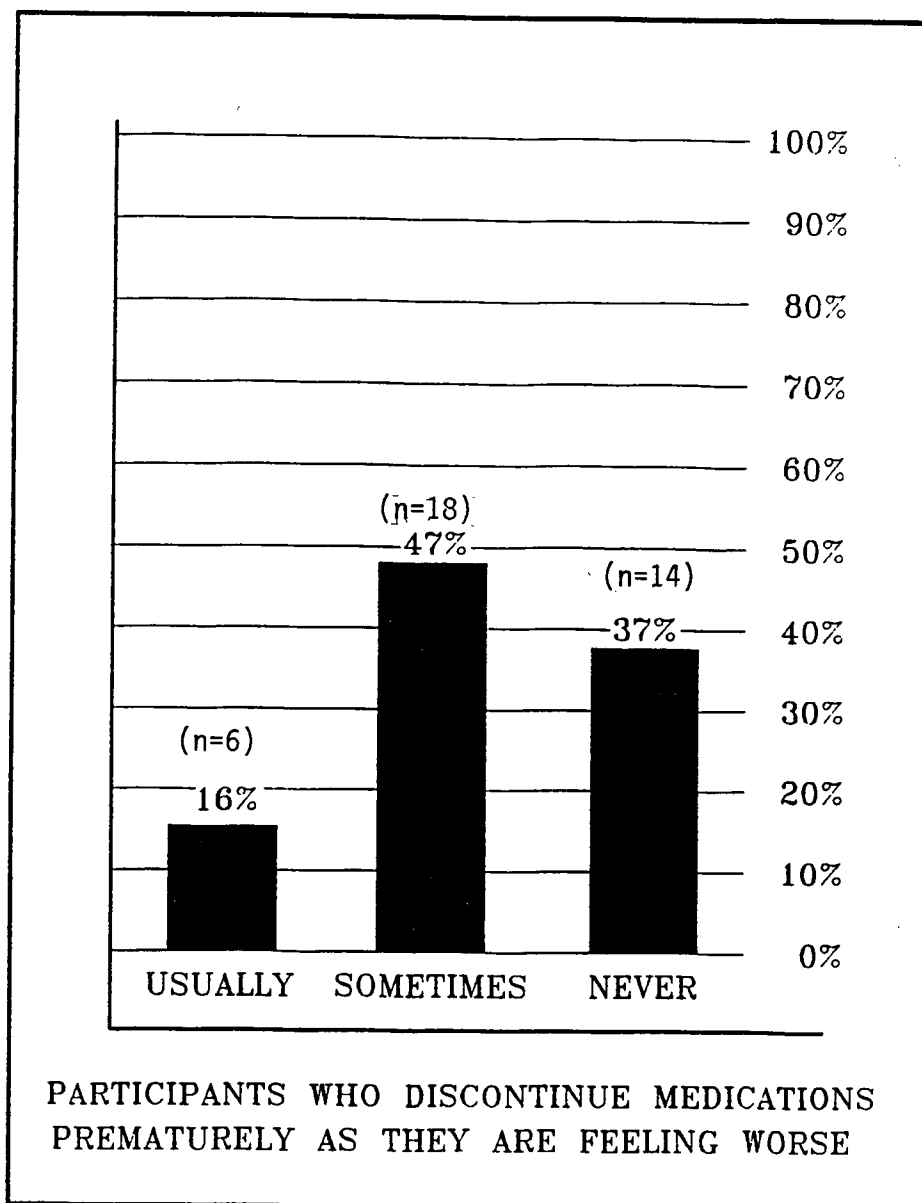


Figure 16. Participants who Discontinue Medication Prematurely as They Are Feeling Worse

Another notable finding from this study was that medications were being taken which had been leftover from previous prescriptions. Fifty percent (n=19) stated they sometimes self-medicated with leftover prescriptions. Also the use of outdated or expired medications was notable. Fifty-five percent (n=21) stated they sometimes took outdated or expired medications. Sixty-five percent (n=25) stated that they usually disposed of leftover medication if a physician had actually discontinued it but thirty-two percent (n=12) stated that they sometimes disposed of such medications. These findings are presented in the following figures. Figure 17 shows participants who take medications leftover from previous prescriptions. Figure 18 shows participants who take outdated or expired medications. Figure 19 shows participants who dispose of leftover medications after a physician has discontinued the prescription.

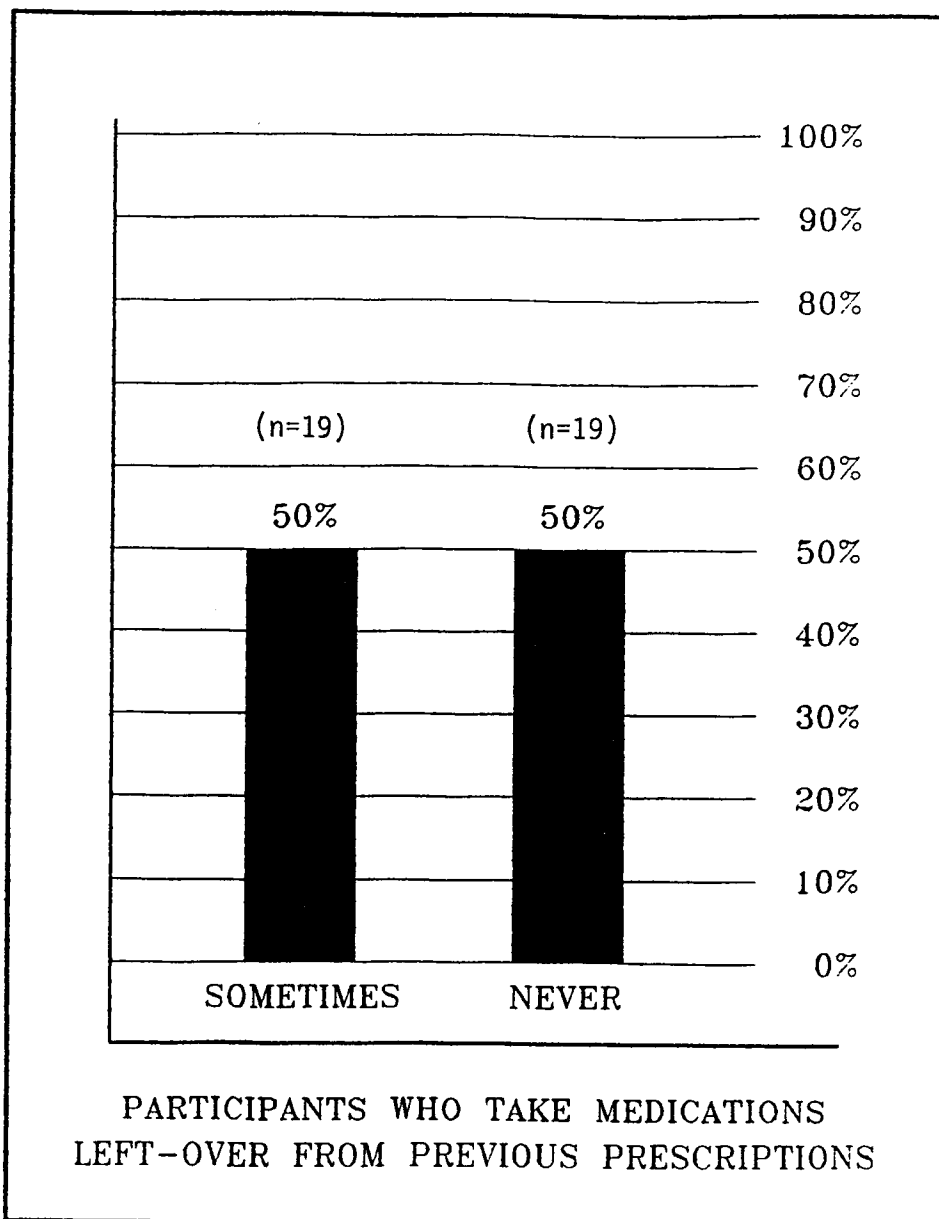


Figure 17. Participants who Take Medications
Leftover From Previous Prescriptions

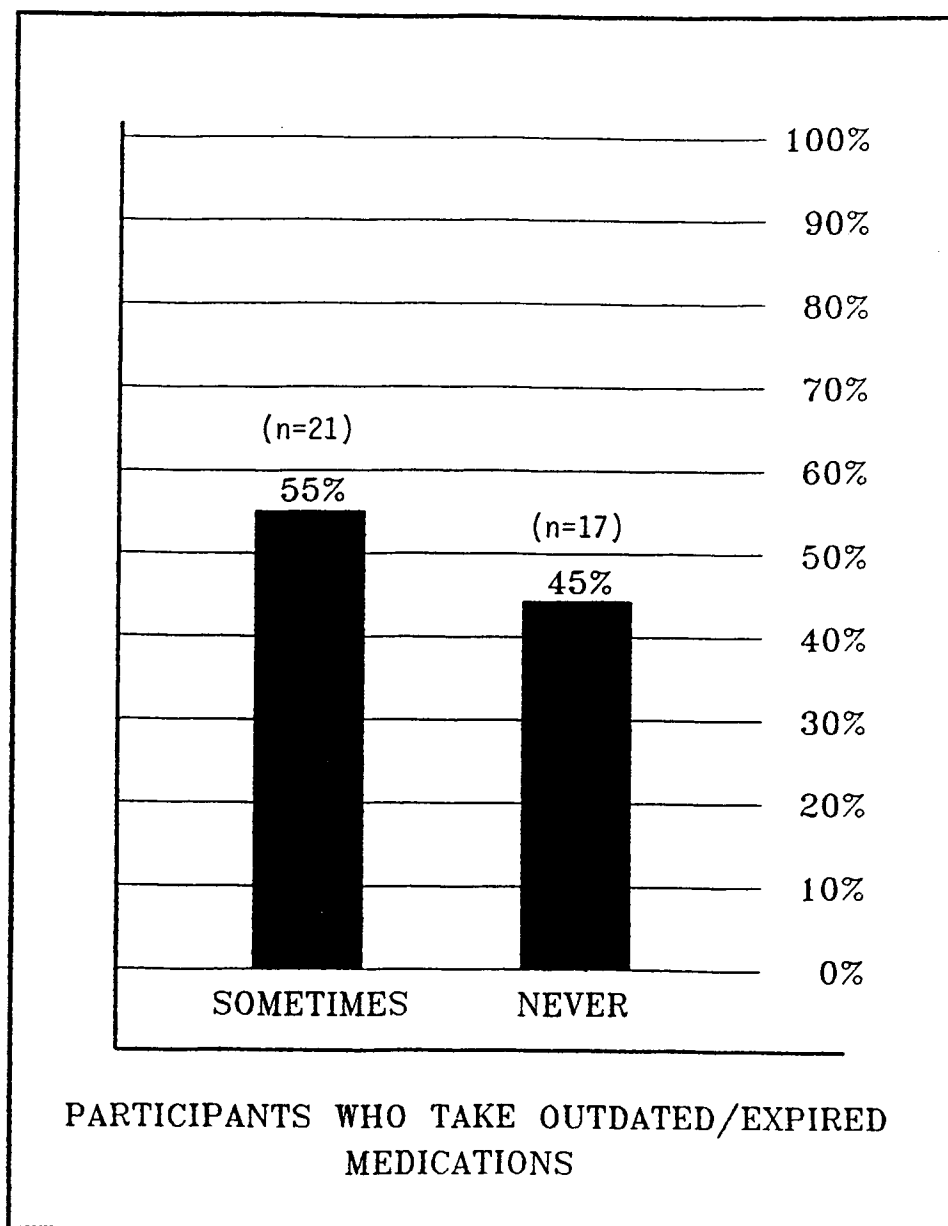


Figure 18. Participants who Take Outdated or Expired Medications

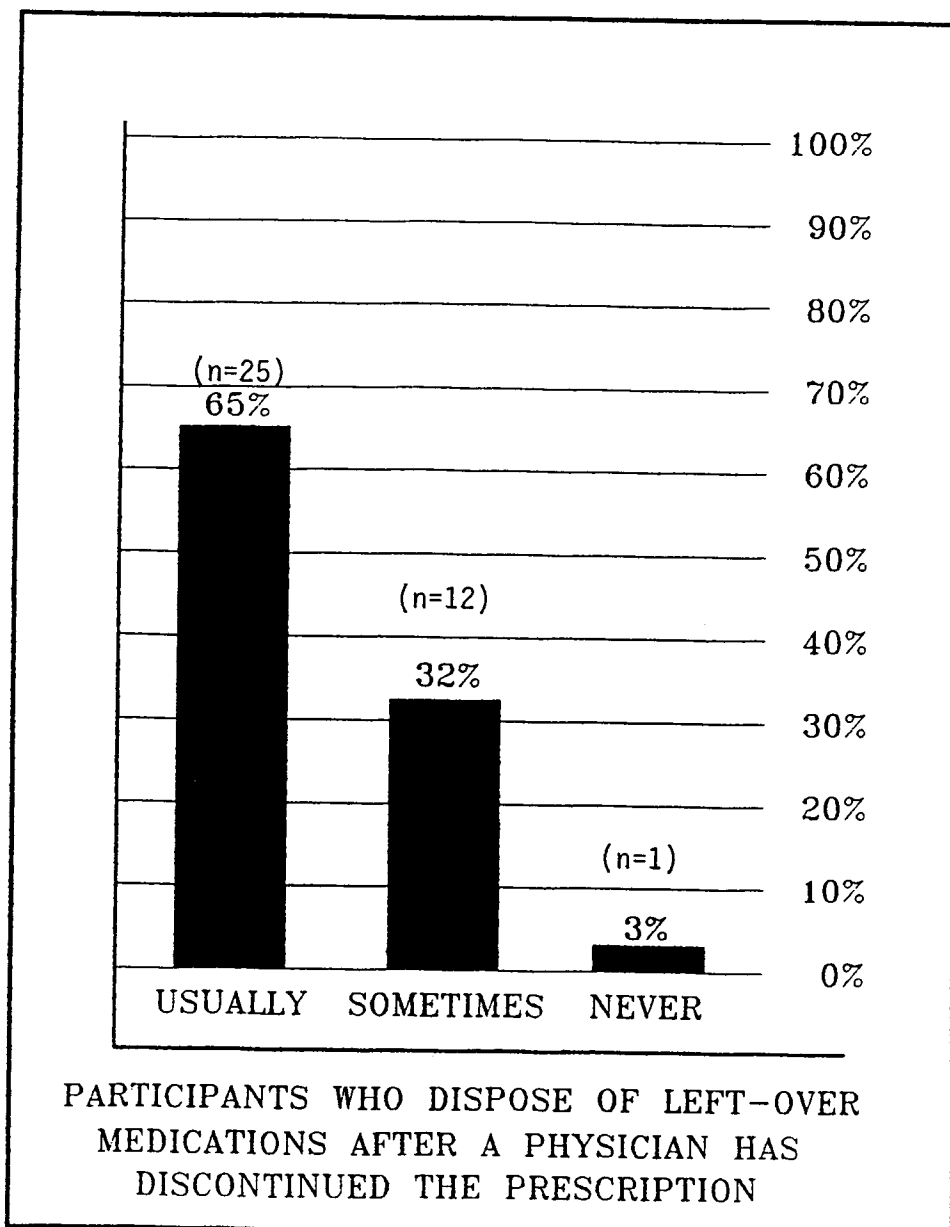


Figure 19. Participants who Dispose of Leftover Medications after a Physician has Discontinued the Prescription

Sixteen percent (n=6) sometimes took medications not specifically prescribed for them and eleven percent (n=4) took medication borrowed from a relative or a friend. Thirteen percent (n=5) loaned medications to another person such as a relative or a friend. Three percent (n=1) usually and twenty-six percent (n=10) sometimes took prescription and over-the-counter medications without knowing of potential interactions.

Another notable finding was that fifty percent (n=19) drank alcoholic beverages while using prescription medications. Of the female participants in the survey, fifty-six percent (n=15) stated that they sometimes used alcoholic beverages and forty-four percent (n=12) stated they never used alcoholic beverages. Of the male participants in the survey, thirty-six percent (n=4) stated they sometimes used alcoholic beverages and sixty-four percent (n=7) stated they never used alcoholic beverages. These findings are presented in the following figures. Figure 20 shows combined male/female participants who take alcohol while taking prescription medications. Figure 21 shows female participants only who take alcohol in combination with prescription medications. Figure 22 shows male participants only who take alcohol in combination with prescription medications. Those participants who were actually taking medications were sixty-five percent (n=25) of the total group. Of this total (n=25) sixty-eight percent (n=17) were sometimes consuming alcohol in combination with prescription medications. This included one female participant taking twelve drugs and one female participant taking eight drugs per day.

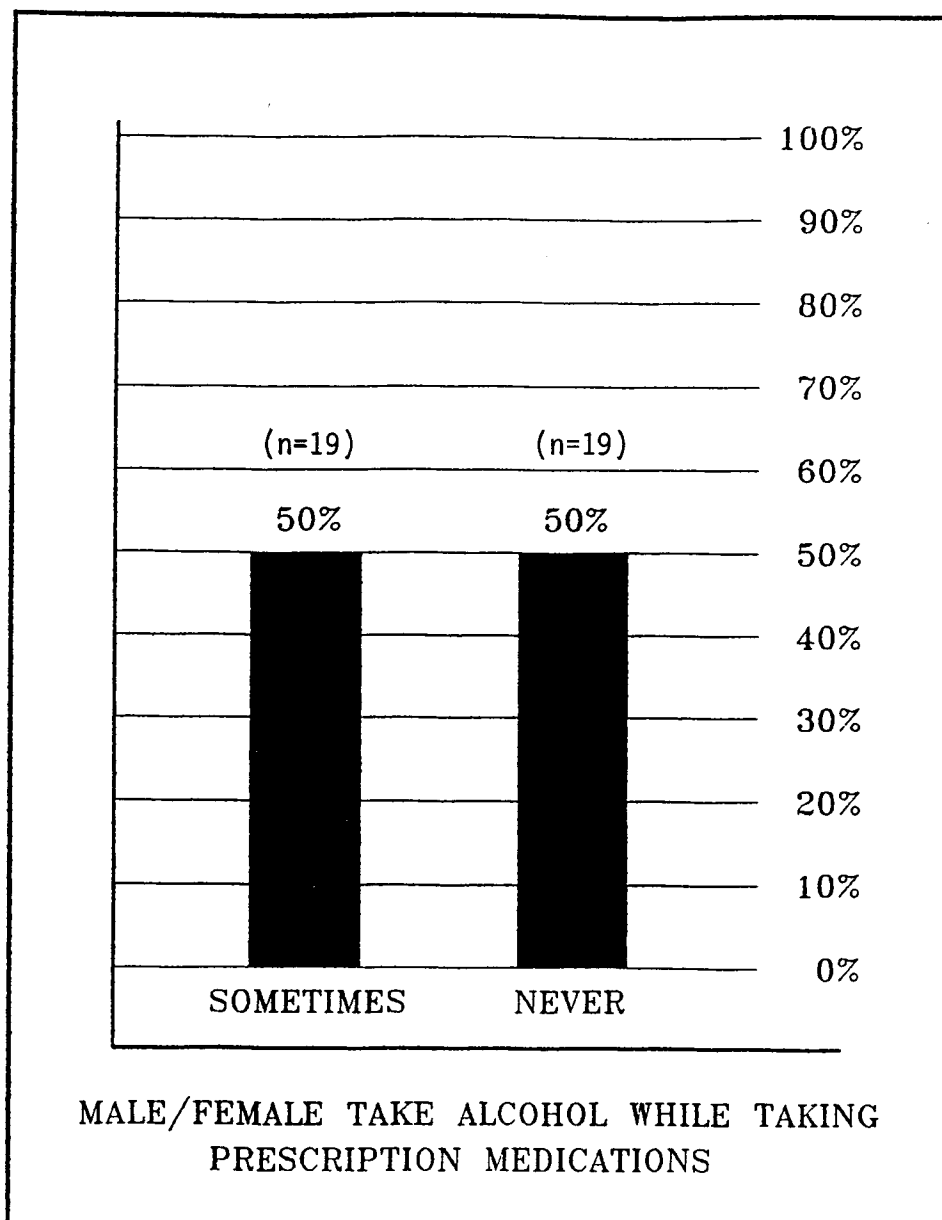


Figure 20. Male and Female Participants
Who Take Alcohol while Taking Prescription
Medications

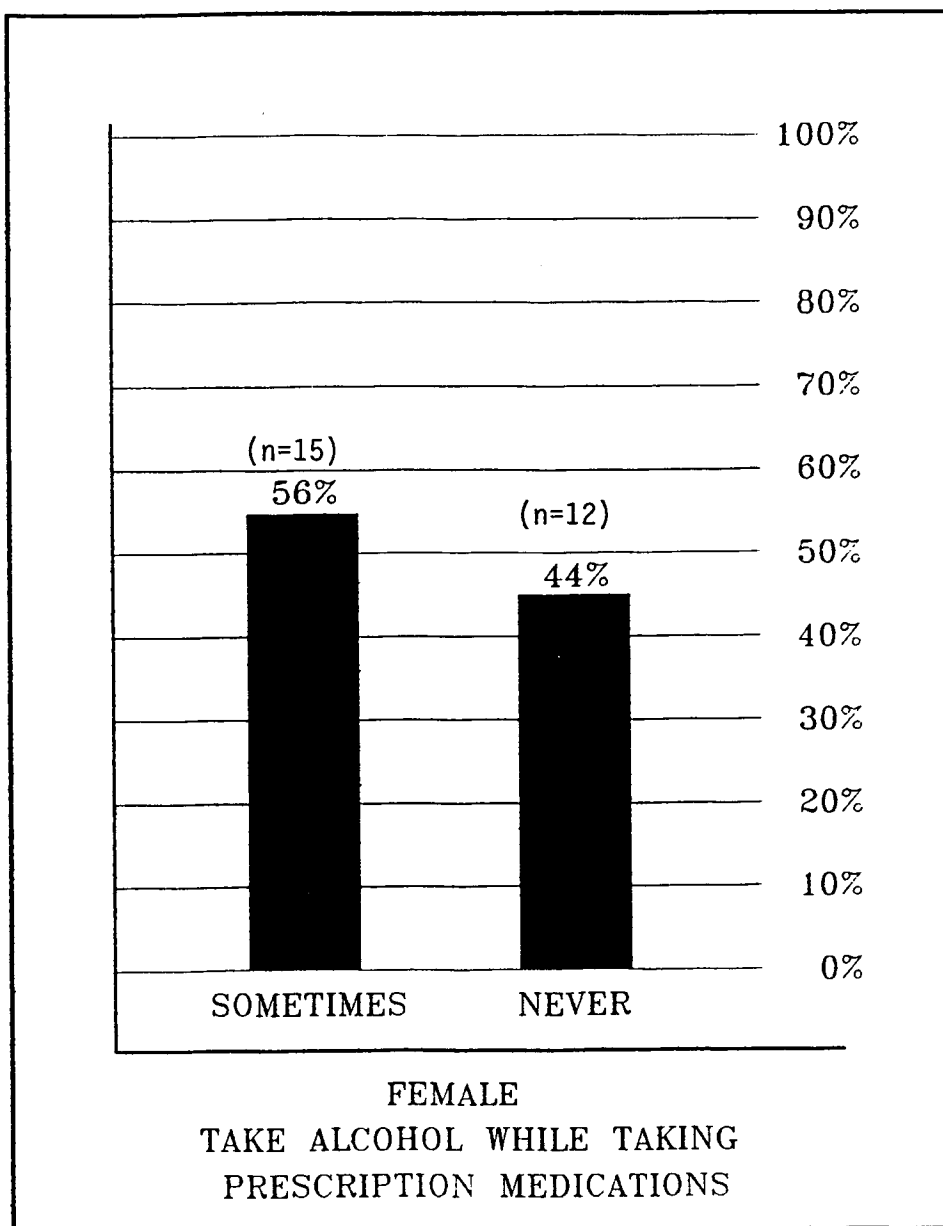


Figure 21. Female Participants who Take Alcohol while Taking Prescription Medications

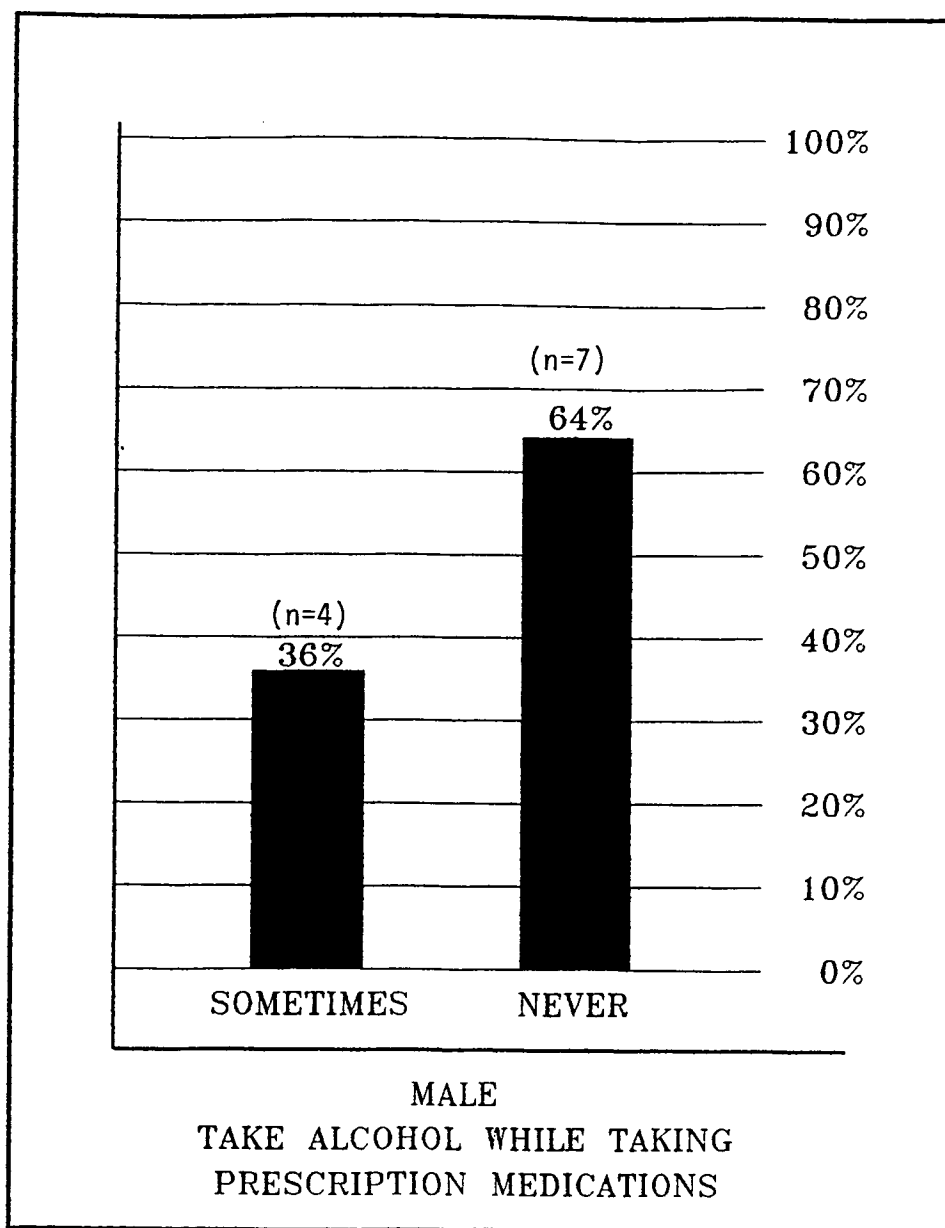


Figure 22. Male Participants who Take Alcohol while Taking Prescription Medications

One hundred percent stated that they kept the medications in original containers, however only seventy-four percent (n=28) stated that they never mixed different medications in the same container whereas twenty-one percent (n=8) and five percent (n=2) stated they sometimes or usually mixed medications respectively. Eighty-one percent (n=31) stated that they never put medications in unlabeled containers, whereas sixteen percent (n=6) and three percent (n=1) stated they sometimes or usually did this respectively.

The last notable finding related to having prescriptions filled. When asked if prescriptions were not filled because they were considered unnecessary, sixty-nine percent (n=26) stated they never did this, twenty-six percent (n=10) stated they sometimes did this and five percent (n=2) stated they usually did this. This finding is presented in the following figure. Figure 23 shows participants who neglect to have prescriptions filled as they consider them to be unnecessary.

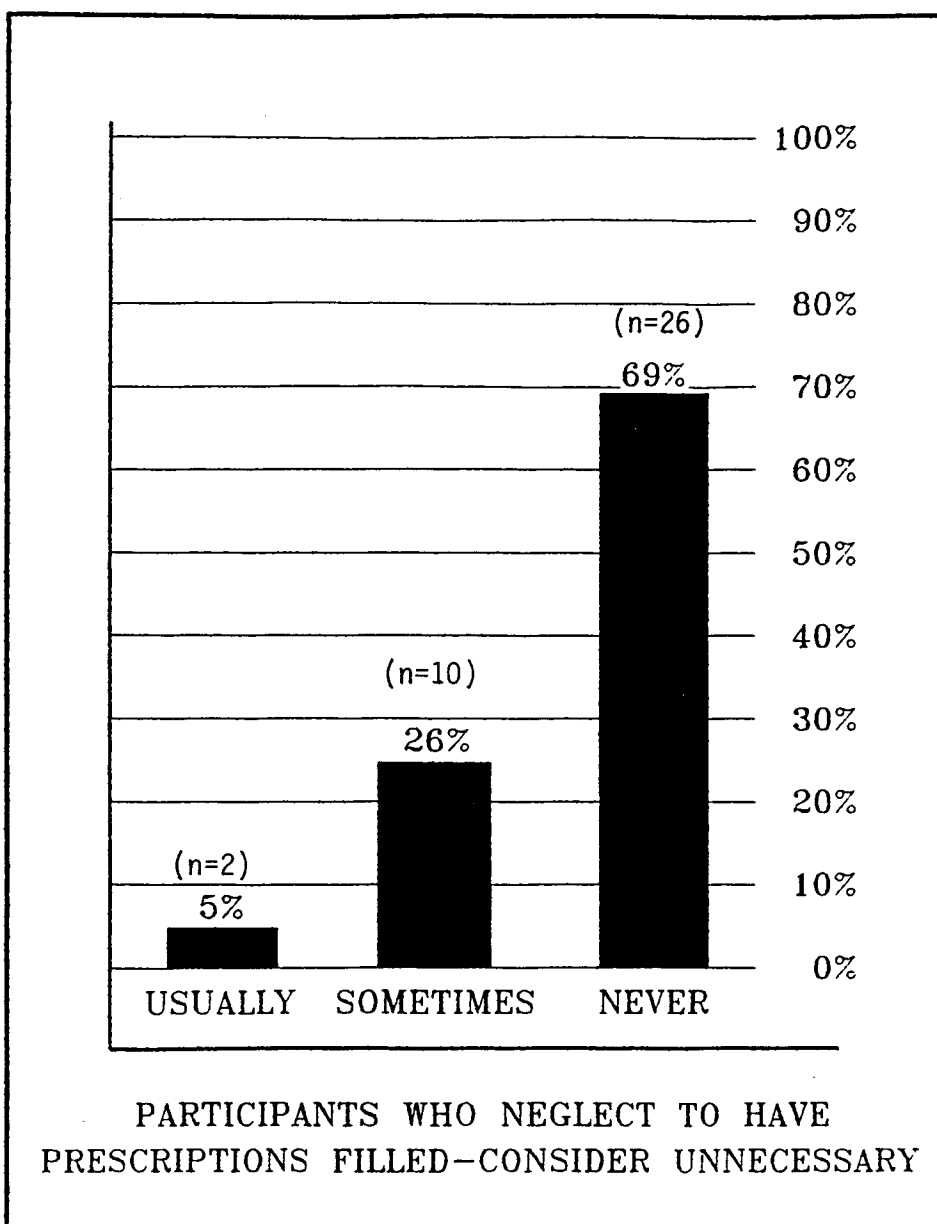


Figure 23. Participants who Neglect to Have Prescriptions Filled as They Are Considered to be Unnecessary

Seventy-nine percent (n=30) stated they never neglected to have prescriptions filled due to too high a risk in taking. Ninety-two percent (n=35) stated they never neglected to have prescriptions filled due to a drug being too expensive. Eighty-four percent (n=32) stated they never neglected to have prescriptions filled because they were dissatisfied with their health care provider and ninety-five percent (n=36) stated they never took less of a prescription to try to make it last longer.

Summary

Presentation of analysis results have been made in this chapter. Notable findings are summarized as follows:

- 1) Thirty-seven percent of those surveyed obtained their medications from more than one physician.
- 2) Thirty-four percent obtained their medications from more than one pharmacy.
- 3) Fifty-three percent (sometimes) and five percent (Usually) took less medication per dose than prescribed by a physician.
- 4) Sixty-three percent (sometimes) and three percent (usually) took less doses per day than prescribed by a physician.
- 5) Forty-seven percent (sometimes) and three percent (usually) discontinued medication prematurely if they felt better.

- 6) Forty-seven percent (sometimes) and sixteen percent (usually) discontinued medications prematurely if they felt worse.
- 7) Fifty percent (sometimes) self-medicated with left-over prescriptions.
- 8) Fifty-five percent (sometimes) took outdated or expired medications.
- 9) Fifty percent (sometimes) drank alcoholic beverages while using prescription medications. (Female 56% (sometimes) and male 36% (sometimes)).
- 10) An ambiguous finding was that one hundred percent stated that they kept their medications in the original containers; however, twenty-one percent (sometimes) and five percent (usually) stated they mixed medications and sixteen percent (sometimes) and three percent (usually) placed medications in unlabeled containers.
- 11) Twenty-six percent (sometimes) and five percent (usually) did not have prescriptions filled because they were considered unnecessary.

CHAPTER V

DISCUSSION, SUMMARY AND RECOMMENDATIONS

This study examined behaviors relating to the use of prescription and over-the-counter medications. In this study, a selected group of 38 elderly male and female subjects in the 65 plus age range were surveyed. A ten-page questionnaire was used to collect data related to medication taking behaviors. The review of the literature revealed that different studies have shown various medication taking behaviors. Under-use of medications has been found to be a major area of noncompliance (Helling et al., 1987). This study also found this to be true. Also the discontinuance of medications prematurely when feeling better or worse, self-medication with leftover prescriptions, the taking of outdated or expired medications have all been documented in the literature. This study confirmed these behaviors.

A surprising finding was the fact that one half of the entire group surveyed stated that they sometimes drank alcoholic beverages while using prescription medications. These and other findings will be noted in detail in the following discussion.

Discussion

Demographic data collected in this study for this very unique group of subjects were of major interest. The group was highly educated and eighty-four percent of the entire group surveyed had had some formal college education, whereas according to national statistics (Statistical Abstract of the U.S. 1992), in the general population sixty-five years and older only 21.9 percent had had any

formal college education. In general, the level of education in the elderly age groups has been below that of younger populations (Moritz & Ostfeld, 1990). In this group, 26 percent stated they had had some college (no degree) compared to 10.3 percent national average for age sixty-five years and older. Also 58 percent stated they had a bachelor's degree or post-graduate work or degree compared to 8.99 percent national average for age sixty-five years and older for those who had attended college for four years or more and had a bachelor's degree or higher (Statistical Abstract of the U.S. 1992). There was a distinctive difference in education for this group compared to the national average for this age group.

This group surveyed were also at a higher income level than the national average. Seventy-one percent had income in excess of \$30,000 per year compared to thirty-two percent national average income in excess of \$25,000. Thirty-one percent of this group surveyed had income in excess of \$50,000 compared to ten percent national average.

Statistics show that seventy-seven percent of the elderly population take at least one medication per day (Teague, 1987). Sixty-five percent of this group surveyed were taking at least one prescription medication. Statistics also show that sixty-six percent of the elderly population use over-the-counter medications (Lamy, 1989). Sixty-eight percent of this group surveyed were taking over-the-counter medications. This group showed a slightly lower level of prescription drug use but a similar level of over-the-

counter drug use. Table One showed prescription drug use ranging from one to twelve drugs used per day. Table Two showed over-the-counter drug use ranging from one to ten drugs used per day.

The survey showed that ninety-six percent knew the names and the purpose of medications they were taking. This is beneficial behavior and shows they are not taking medications without knowing the reason. The survey showed that thirty-seven percent obtained medications from more than one physician. This can be a problem if a good drug history is not taken by each physician and further drugs are prescribed for a specific condition which may be similar to drugs already being taken for that problem. Also there is always the possibility that if a new drug is prescribed without knowledge of other drugs taken, there is the potential for a serious interaction. Ninety-five percent usually told physicians about other prescription medications being taken which is appropriate.

Twenty-four percent stated that they did not tell their physicians about over-the-counter medications. This can be a problem as some prescription medications taken in conjunction with over-the-counter drugs can also cause the potential for interactions and thus cause adverse reactions. Often the elderly do not consider the over-the-counter type preparations to be drugs at all (MacIsaac et al., 1989), so they do not tell their physicians they are taking them and often physicians neglect to ask (Lamy, 1982).

Thirty-four percent stated they obtained medications from more than one pharmacy. This can be a problem because when a consumer purchases all medications at one pharmacy, potential

interactions with other medications being taken can be noted and action taken to minimize problems. Also a good medication profile for each client can be maintained including medication allergies.

It was found in this group that some medication taking behaviors were appropriate usage whereas other behaviors were inappropriate usage. The taking of additional doses of medications or more medication per dose was not noteworthy. This is an appropriate action as taking more medication can lead to severe problems.

A distinctive finding however, was that fifty-eight percent took less medication per dose and sixty-eight percent took less doses per day of medications than were prescribed by their physicians. This is slightly less than Montamat et al. (1989) state that possibly seventy percent of the elderly alter prescribed medication doses. The concept of "intelligent" noncompliance might apply here where reduced amounts of medications are taken to reduce the severity of adverse reactions. This may in fact decrease the possibility of adverse reactions as the elderly may need decreased doses in some cases. On the other hand, when this lessening of doses is being arbitrarily carried out, there is the possibility that the medication does not maintain a therapeutic level in the bloodstream and may not be providing any beneficial effect at all to the person taking.

Most take medications at the correct time of day prescribed and if they miss a dose do not take extra doses. When they take over-the-counter medications, they follow label directions for taking. These are also appropriate behaviors.

Fifty percent stated that medications were discontinued prematurely if a person felt better. This can be a problem in the case of antibiotic treatment where a more serious infection can develop which is more difficult to treat. Sixty-three percent stated that medications were discontinued prematurely if they were feeling worse. This can again be a problem, especially in the case of hypertension where medications are needed continually to lower blood pressure. If medication is not used, there is an increased risk of stroke, cardiovascular disease and renal problems which are substantial over the long term.

Fifty-percent of this group stated they sometimes self-medicated with leftover prescriptions without the knowledge of a physician. This can cause serious problems when a person acts as their own diagnostician for their symptoms and take medication that was actually prescribed for another illness, when, in fact, they may not have the same illness and drugs may mask their symptoms, making appropriate diagnosis more difficult.

Fifty-five percent stated they sometimes took outdated or expired medications. This is a surprising finding in light of the income level of this group, so cost is probably not a factor. Some may believe they can self-diagnose and expired medications are readily available (from other illnesses) without a visit to a physician. Taking outdated medications is not a good practice as some may have lost their potency as in the case of some capsules or tablets so they may not reach the desired therapeutic levels in the blood to exert a pharmacological effect. Some may have an

increased potency and increased toxicity as in the case of liquid medications where parts of the medication may have evaporated and the remainder is more toxic. Some may produce toxic by-products as in the case of tetracycline which may cause kidney damage. Sixty-five percent did state they usually and thirty-two percent sometimes disposed of medications after they had been discontinued by a physician. This might not be an accurate figure if fifty percent self-medicate with leftover medications and fifty-five percent take outdated or expired medications.

Taking medications not specifically prescribed or borrowing or loaning medications was not noteworthy. These are appropriate behaviors as the borrowing of medications can lead to severe consequences including adverse drug reactions and allergic reactions. Twenty-nine percent took prescription and over-the-counter drugs without knowing of interactions. This can be a problem as in the case of aspirin and anticoagulants such as coumadin, causing increased blood thinning properties. Also antacid and tetracycline use can be a problem leading to decreased gastrointestinal absorption and a decreased effect of the tetracycline (Lamy, 1982).

A distinctive finding in this study was that fifty percent of the group surveyed drank alcoholic beverages while using prescription medications. This could have serious consequences depending on the medication taken. (Medication names were not asked for in this study, so actual interactions could not be ascertained). Alcohol can potentiate the effects of certain medications such as

benzodiazepines (Elipoulous, 1990). It can cause interactions with many prescription medications. The medications zantac and tagamet used for the treatment of gastric ulcers have been recently shown to increase the absorption of alcohol thereby intensifying the effects of alcohol (ABC and CBS news 12/31/91). Drinking in combination with certain medications can indeed be a dangerous practice. Alcohol is another substance not considered to be a drug and information about its use is usually not asked for or shared in physician offices (Lamy, 1985). An interesting finding was that more females than males drank. Of those females surveyed, fifty-six percent stated they sometimes used alcoholic beverages. Of those males surveyed, thirty-six percent stated they sometimes used alcoholic beverages.

An ambiguous finding in this study was that one hundred percent stated they kept medications in the original containers, but twenty-six percent stated they mixed medications in the same container and nineteen percent stated that they put medications into unlabeled containers. This can be a dangerous practice as some medications are so similar in size, shape and color that they can be mistaken for others. Thirty-one percent stated they neglected to have prescriptions filled because they considered that the medications were unnecessary. This amounted to twelve participants, and of these five participants also believed there was too great a risk in taking some medications. This can be a problem with certain medications that might be required for specific conditions. Maybe

the physician has not provided enough education as to the reasons for taking a particular medication or a patient has decided for one reason or another that there is too great a risk. Twenty-one percent stated they neglected to have medications filled due to too great a risk. Other reasons for not filling prescriptions were not noteworthy, including those who took less of a prescription to make it last longer. Generally this is done when cost is a factor, and with this group it was not.

Summary of Research Questions

Prescription and over-the-counter medications are being taken as previously discussed with similar usage by this group to other elderly surveyed (Lamy, 1989; Teague, 1987).

Appropriate information was not always shared with current physicians regarding over-the-counter medication use. Thirty-seven percent obtained medication from more than one physician but most relayed this information to other physicians. Sixty-six percent kept lists and shared this with physicians. Otherwise correct information was mostly being shared with regard to other prescription medications being taken. Approximately one third of those surveyed are obtaining medications from more than one pharmacy.

With regard to behaviors relating to the use of prescription medications, it was found that there were some inappropriate medication-taking behaviors and medications were not always taken in accordance with physician instructions as evidenced by the use of less medication per dose and the taking of less medication doses per day than originally prescribed. Medications are discontinued when feeling better, sometimes without notification to the prescribing physician. Medications are discontinued when feeling worse, sometimes without notification to the prescribing physician. Medications are sometimes being taken that are leftover from previous prescriptions so some elderly in this group are self-medicating without notification to a physician. Outdated and expired medications are being taken also probably without notification to a physician. Occasionally medications are mixed and put into unlabeled containers. Prescriptions

1

are sometimes not filled because they are considered unnecessary but generally not for other reasons asked.

According to this survey, there were some appropriate medication-taking behaviors which were in accordance with physician instructions or label directions for over-the-counter medications. In general, taking more medication per dose and more doses per day was not a common practice. Medications were taken at the approximate time of day prescribed and few took an extra dose of a medication if one was missed. In general, medications were not taken if not prescribed specifically for that person and generally not borrowed from a relative or a friend or loaned to a relative or a friend. Few took less of a prescription to make it last longer. It was found that label directions were being followed with regard to over-the-counter medications, but approximately one third of those surveyed took over-the-counter medications without knowing of interactions with prescription medications.

It was also found that alcoholic beverages were being consumed in conjunction with the use of prescription medications. If there is a potential interaction with a prescription medication being taken, this is not an appropriate behavior.

This group therefore exhibited some appropriate medication-taking behaviors and some inappropriate medication-taking behaviors.

Summary

It is interesting to note, that those attending this wellness seminar were highly educated and highly motivated to learn as noted by their involvement with Elderhostel. Blackwell (1973) stated twenty years ago that

"...good compliance is associated with being middle class, well educated and white. These attributes were said to typify the patient most likely to abide by the rules of the game" (p.250).

Apparently this is no longer true today, at least in this group of elderly. Much is written about the elderly who are less educated and have limited finances being less compliant than those with a higher level of education who are middle class and believed to have a higher level of compliance. According to this particular study of a very well educated group of elders, this does not appear to hold true.

It is somewhat surprising that a well educated, high income and very health conscious and wellness oriented group (evidenced by seminar subject matter attendance) would be taking medications in such a manner - not always in accordance with prescription instructions and making medication errors in administration. If this group - high education and health conscious - are taking medications in inappropriate ways at times, then one can only wonder how the rest of the elderly population who have less education and lower income levels might be coping with medication usage.

It seems apparent that more education is needed to increase health awareness of the cautious and correct use of medications in elderly populations by physicians, pharmacists and nurses. This should result in a greater degree of safety and lower possibility of adverse reactions in the geriatric population (Yurick et al., 1989). Health care professionals must take responsibility for patient teaching and education (Yurick, et al., 1989). The extra time spent in education regarding medication usage, to avoid later problems and hospitalizations, might be well worth the effort.

Recommendations

Recommendations for education and health promotion and future research in the well elderly of sixty-five years and older in regard to the appropriate use of prescription and over-the-counter medications are as follows:

Education and Health Promotion

- 1) More time should be spent by doctors and nurses for education when drugs are initially prescribed. They should discuss clearly and concisely appropriate medication usage and give both verbal and written instructions concerning medications being prescribed and also information concerning the unique problems that the elderly might encounter.
- 2) Reinforcement should be given by pharmacists when drugs are dispensed. They should give both verbal and written information concerning medications and give information specific to the elderly and what to do if problems are encountered. Labeling should be used that is legible to the elderly.
- 3) Community health promotion programs should be developed that are targeted to the well elderly. These should cover appropriate medication usage and in particular the use of less medication than prescribed by physicians, discontinuing medications prematurely, self-medicating with leftover prescriptions, taking outdated or expired medications and the use of alcohol in combination with prescription medications.

- 4) Personalized "brown bag" medication reviews and counselling sessions should be established by community hospitals and senior centers. All prescription and over-the-counter medications would be taken in their original containers so that a complete review of all medications can be accomplished in order to ascertain problem behaviors and reinforce correct medication usage.
- 5) Elderhostels throughout the country should have medication education programs with managing medication handouts available.
- 6) Educational programs should be established through the American Association of Retired Persons targeting well elderly and providing medication information pertaining to the elderly in AARP mailings.

Future Research

- 1) Further studies of larger groups of well educated, healthy, active elderly. Possibly nationwide Elderhostel survey to ascertain whether the information gained from this survey is pertinent to all such groups.
- 2) Question on future survey to ask medical conditions to try to match medications being taken with specific condition.
- 3) Question on future survey to ask specific names of medications to ascertain interactions with alcohol.
- 4) Question as to whether the elderly feel that physicians,

nurses and pharmacists are giving them enough medication information and education.

- 5) Question as to whether the elderly ever question their doctor's orders with regard to medication being prescribed.
- 6) Question as to the reasons why the elderly are taking less medication per dose and less doses per day.
- 7) Question as to whether the elderly have insurance which covers prescription medications.
- 8) Question as to what type of drug education is available (i.e. written instructions) with mail order medications (if applicable).

Conclusion

Drug use needs to be, in my personal professional experience, as safe and effective as possible in order to provide the elderly with appropriate medical care in their later years so that there will be quality to their lives and not just added years. As one participant in this study stated, she could not tolerate all of the medications that her physician had prescribed for her heart condition and continue to keep active, and that further she believed that "quality of life was more important than quantity". The consequences that are attributable to inappropriate medication use are that disease processes may not be adequately treated and that new problems and symptoms may be a direct result of medications prescribed (Hulka, 1976). Fedder (1982) states that

"...drugs are on the whole safe, effective and cost beneficial. The aging process poses many unresolved problems that need to be resolved in order to reach the goal of rational drug use in the elderly" (p.5113).

Life and health are fragile conditions. With the added frailty of the elderly in their advancing years, we must do all we can not to jeopardize them further with inappropriate medication use. Pfeiffer (1986) made some apt observations about the elderly and aging

"Older people are not only treatable and teachable, they also teach us about aging. Older persons are the ultimate experts on the aging experience. They alone have been there. It is our chance to prepare, perhaps better than they did, for our own aging. We have met the aging and they are, after all, us" (p.47).

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APPENDICES

Appendix A

A Survey Form for Prescription and Over-the-Counter Medication Questionnaire on Behaviors

DEPARTMENT OF
PUBLIC HEALTH



OREGON
STATE
UNIVERSITY

Waldo Hall 256
Corvallis, Oregon
97331-6406

Telephone
503-737-2686
Fax
503-737-4001

THIS QUESTIONNAIRE WILL REMAIN CONFIDENTIAL.

THE DATA OBTAINED FROM THIS SURVEY WILL BE USED IN SUMMARY FORM ONLY FOR REPORTING PURPOSES. YOU DO NOT NEED TO GIVE YOUR NAME AND PLEASE BE ASSURED THAT YOU WILL REMAIN ANONYMOUS.

WE NEED YOUR HELP!

A RESEARCH GROUP FROM OREGON STATE UNIVERSITY, DEPARTMENT OF PUBLIC HEALTH IS CONDUCTING A SURVEY REGARDING THE BEHAVIORS WHICH RELATE TO THE UTILIZATION OF PRESCRIPTION AND OVER-THE-COUNTER MEDICATIONS. PLEASE TAKE A MOMENT TO ANSWER THE FOLLOWING QUESTIONS. THE RESULTS OF THIS SURVEY MAY HELP DETERMINE THE NEED FOR EDUCATIONAL PROGRAMS. YOUR VOLUNTARY PARTICIPATION INDICATES A WILLINGNESS TO BE PART OF THIS STUDY. IF YOU HAVE ANY QUESTIONS REGARDING THIS SURVEY, PLEASE CONTACT DR. MARGARET SMITH AT OREGON STATE UNIVERSITY 737-2386.

THANK YOU FOR YOUR ASSISTANCE.

Redacted for privacy

MARGARET SMITH EDD

Redacted for privacy

PAMELA PRATT RN, BSc

PRESCRIPTION AND OVER-THE-COUNTER MEDICATION QUESTIONNAIRE

PRESCRIPTION MEDICATIONS ARE THOSE THAT CAN BE OBTAINED ONLY WITH A PRESCRIPTION FROM A LICENSED PHYSICIAN AND FILLED ONLY BY A LICENSED PHARMACIST.

OVER-THE-COUNTER MEDICATIONS ARE THOSE WHICH CAN BE OBTAINED IN A STORE WITHOUT A PRESCRIPTION SUCH AS VITAMINS, LAXATIVES, ASPIRIN OR TYLENOL, ANTACIDS, ANTIHISTAMINES AND COUGH SUPPRESSANTS.

**1) Are you taking any prescription medications at this time?
(Circle one number)**

1 NO (skip to question 2)

2 YES (go to question 1a)



1a) How many prescription medications are you taking? State Number _____

**1b) Do you know the names of all the prescription medications you are taking?
(Circle one number)**

1 YES

2 NO

**1c) Do you know the purpose of each prescription medication you are currently taking?
(Circle one number)**

1 YES

2 NO

2) Have you taken any over-the-counter medications during the last ten days? (Circle one number)

1 NO (skip to question 3)

2 YES (go to question 2a)



2a) How many different types of over-the-counter medications have you taken in the last ten days? State Number _____

- 3) Do you keep a list of all of the prescription and over-the-counter medications that you are taking to share with your physician during office visits? (Circle one number)

1 YES
2 NO

- 4) Have you ever obtained prescription medications from more than one physician at the same time? (Circle one number)

1 YES
2 NO

- 5) Have you ever forgotten to tell your physician about prescription medications that you are taking that may have been prescribed by another physician? (Circle one number)

1 YES
2 NO

- 6) Have you ever forgotten to tell your physician about over-the-counter medications you may be taking?

1 YES
2 NO

- 7) Do you sometimes obtain your prescriptions from more than one pharmacy? (Circle one number)

1 YES
2 NO

- 8) The following questions are related to behaviors associated with your use of prescription and over-the-counter medications (even if you are currently not taking any medications but have taken drugs in the past your input will be helpful). The questions relate to how you are taking your medications. Each question has a scale and can be answered by 1) Usually 2) Sometimes or 3) Never. Please circle the number which best explains or corresponds to your answer to each question. Circle one number for each question.

- 8a) Have you ever taken more medication per dose than may have been prescribed by your physician? (eg. if one tablet has been prescribed at a certain time you take more than one tablet) (Circle one number)

1 Usually
2 Sometimes
3 Never

- 8b) Have you ever taken less medication per dose than may have been prescribed by your physician? (eg. if one tablet has been prescribed at a certain time you take less than one tablet) (Circle one number)

1 Usually
2 Sometimes
3 Never

- 8c) Have you ever taken more doses per day than may have been prescribed for you by your physician? (eg. if you are told to take medication four times a day you take it more than four times a day) (Circle one number)

1 Usually
2 Sometimes
3 Never

- 8d) Have you ever taken less doses per day than may have been prescribed for you by your physician? (eg. if you are told to take medication four times a day you take it less than four times a day) (Circle one number)

1 Usually
2 Sometimes
3 Never

8e) Do you try to follow label directions with regard to the recommended dosage amount and dosage times for over-the-counter medications? (Circle one number)

- 1 Usually
- 2 Sometimes
- 3 Never

8f) Do you try to take your prescription medication at the approximate time of day you were instructed to take it? (Circle one number)

- 1 Usually
- 2 Sometimes
- 3 Never

8g) If you have missed a dose of your medication, have you ever taken an extra dose at the next scheduled time to make up for the missed dose? (Circle one number)

- 1 Usually
- 2 Sometimes
- 3 Never

8h) Have you ever discontinued taking a prescription medication prematurely because you were feeling better? (eg. if you have been taking antibiotics for an infection) (Circle one number)

- 1 Usually
- 2 Sometimes
- 3 Never

8i) Have you ever discontinued taking a prescription medication prematurely because you may have been feeling worse? (eg. if you have experienced adverse side effects from a medication) (Circle one number)

- 1 Usually
- 2 Sometimes
- 3 Never

8j) If you have ever discontinued your prescription medications prematurely have you notified your physician?
(Circle one number)

- 1 Usually
- 2 Sometimes
- 3 Never

8k) Have you ever taken medications that may have been left over from previous prescriptions without the knowledge of your physician? (Circle one number)

- 1 Usually
- 2 Sometimes
- 3 Never

8l) Have you ever taken outdated or expired medications?
(Circle one number)

- 1 Usually
- 2 Sometimes
- 3 Never

8m) Do you dispose of left over prescription medications after a physician has discontinued their use? (Circle one number)

- 1 Usually
- 2 Sometimes
- 3 Never

8n) Have you ever taken prescription medications that were not specifically prescribed for you? (Circle one number)

- 1 Usually
- 2 Sometimes
- 3 Never

- 8o) Have you ever borrowed prescription medications from another person such as a relative or a friend believing that you may have a similar illness? (Circle one number)
- 1 Usually
 - 2 Sometimes
 - 3 Never
- 8p) Have you ever loaned prescription medications to another person such as a relative or a friend believing that they may have a similar illness? (Circle one number)
- 1 Usually
 - 2 Sometimes
 - 3 Never
- 8q) Have you ever taken prescription medications and over-the-counter medications at the same time without knowing of possible interactions between the two? (Circle one number)
- 1 Usually
 - 2 Sometimes
 - 3 Never
- 8r) Have you ever had alcoholic beverages while taking prescription medications? (Circle one number)
- 1 Usually
 - 2 Sometimes
 - 3 Never
- 8s) Do you keep your medications in the original container obtained from the pharmacy? (Circle one number)
- 1 Usually
 - 2 Sometimes
 - 3 Never

8t) Have you ever mixed several different medications together in the same container? (other than daily dose pill boxes)
(Circle one number)

- 1 Usually
- 2 Sometimes
- 3 Never

8u) Have you ever put medications in unlabeled containers?
(Circle one number)

- 1 Usually
- 2 Sometimes
- 3 Never

8v) Have you ever neglected to have prescriptions filled because you believed the treatment was unnecessary or would not be of benefit to you? (Circle one number)

- 1 Usually
- 2 Sometimes
- 3 Never

8w) Have you ever neglected to have a prescription filled because you believed there would be too great a risk in taking it? (Circle one number)

- 1 Usually
- 2 Sometimes
- 3 Never

8x) Have you ever neglected to have a prescription filled because it was too expensive? (Circle one number)

- 1 Usually
- 2 Sometimes
- 3 Never

8y) Have you ever neglected to have a prescription filled because you were dissatisfied with your health care provider? (Circle one number)

- 1 Usually
- 2 Sometimes
- 3 Never

8z) Have you ever taken less of a prescription than ordered by your physician to make it last longer due to the expense of a drug? (Circle one number)

- 1 Usually
- 2 Sometimes
- 3 Never

For the following questions which relate to demographic information, could you please circle the number corresponding to your selection.

9) What is the highest level of education that you have achieved?
(Circle one number)

- 1 8th Grade or less
- 2 Some High School (no degree)
- 3 High School Graduate
- 4 Some College (no degree)
- 5 Community College Associate Degree
- 6 University Bachelor's Degree
- 7 Post graduate work or degree

10) Are you retired? (Circle one number)

- 1 YES
- 2 NO

11) Are you employed? (Circle one number)

- 1 NO (skip to question 12)
- 2 YES (go to question 11a)



11a) If you are employed is it
(Circle one number)

- 1 Volunteer Work (no pay)
- 2 Employed for pay
- 3 Self Employed

11b) If you are employed is it
(Circle one number)

- 1 Full Time
- 2 Part Time

12) In what category does your income for last year best fit?
(Circle one number)

- 1 Less than \$10,000 per year
- 2 Between \$10,000 and \$19,999
- 3 Between \$20,000 and \$29,999
- 4 Between \$30,000 and \$39,999
- 5 Between \$40,000 and \$49,999
- 6 More than \$50,000

13) What is your household composition? Do you
(Circle one number)

- 1 Live alone
- 2 Live with others

14) What type of housing do you live in?
(Circle one number)

- 1 Retirement community (planned housing for elders)
- 2 Congregate housing with community services
- 3 Apartment Dwelling (all ages)
- 4 Apartment Dwelling (elders only)
- 5 Town House
- 6 Mobile Home Park (all ages)
- 7 Mobile Home Park (elders only)
- 8 House Single Family Dwelling (all ages)

15) Are you (Circle one number)

- 1 Male
- 2 Female

16) What is your age (Circle one number)

- 1 60-64 years
- 2 65-69 years
- 3 70-74 years
- 4 75 years and over

17) What is your marital status? (Circle one number)

- 1 Married
- 2 Single
- 3 Widowed
- 4 Divorced
- 5 Separated

THANK YOU SO MUCH FOR YOUR ASSISTANCE FOR ANSWERING
THIS SURVEY

Appendix B
Managing Your Medication

Managing Your Medication



PROJECT
DARE

Drug and Alcohol Resources for the Elderly
835 S.W. Kelly • Portland, Oregon 97201
PROGRAM OF ECUMENICAL MINISTRIES OF OREGON
503/ 221-5265

PROJECT

DARE

Guide For Going To The Doctor

**Before the visit,** complete this part yourself:

1. Bring a written list of all medications you are taking including over-the-counter medications.
2. Bring a written list of allergies and the medications you have had a negative reaction to.
3. Why am I going to the doctor? (the main reason)

4. Is there anything else that worries me about my health?
____ No ____ Yes (List) _____
5. What do I expect the doctor to do for me today? (in 10 words or less)

During the visit, complete with help of doctor:

1. What is the diagnosis? _____
2. How did I get it and how can I prevent it next time? _____
3. Are there any helpful patient education materials available for the condition? (Describe)

4. Are there any medications for me to take?
____ No ____ Yes (Describe) _____
5. Are there any special instructions, concerns, or possible side effects I need to know about the medicine?
____ No ____ Yes (Describe) _____
6. Should I continue taking the other medications I have been taking? _____

After the visit, complete with help of doctor or nurse:

1. Am I to return for another visit? ____ No ____ Yes
When? _____
2. What should I do at home?
____ Activity _____
____ Treatments _____
____ Precautions _____
3. Am I to phone in for test results? ____ No ____ Yes
When? _____
4. What danger signs should I look for? _____
5. Should I report back to the doctor or nurse by phone for any reason?
____ No ____ Yes When? _____

Adapted from *How To Be Your Own Doctor (Sometimes)* by Keith Sehnert, M.D.

PROJECT
DARE

Drug and Alcohol Resources for the Elderly
3835 S.W. Kelly
Portland, Oregon 97201

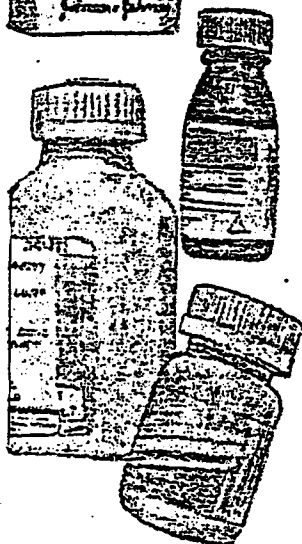
Questions To Ask Your Doctor About Medications



What To Ask	Drug #1	Drug #2
1. Name of drug?		
2. What will it do?		
3. When should I take it?		
4. How long should I take it?		
5. Should I expect side effects?		
6. Should I take the drug with meals or any other substance?		
7. Should I not take the drug with meals or any other substance?		
8. If I feel better should I discontinue using the drug?		
9. Can I get a generic brand of the drug?		
10. Will it interfere with other drugs I am taking?		

PROJECT
DARE

Personal Checklist For Medication



- Do not stretch your medicine by trying to make it last longer than it was prescribed for.
- Never borrow or lend medicine – only take your own.
- Ask for a complete label on all prescriptions and have it printed so you can read it. Labels should include:

Your name	Date prescription was filled
Your doctor's name	Expiration date for drugs
Name of the drug	
Instructions for use	
- Carry a list of all your medications with you. Keep it up to date. Share it with doctors, nurses and pharmacists at each visit.
- Know the name of each of your medicines and why you are taking them.
- Know exact directions for taking your medicines (such as between meals – with food – swallowed whole – chewed), and follow the instructions.
- Know side effects of your medicine. Some show it is working; others are danger signs to warn you to talk with your doctor.
- Know where to store your medicine. Usually in a dark, cool, dry place. Sometimes in the refrigerator.
- Childproof bottles are difficult to open. You can request easy-to-open bottle caps.
- Do not use medicine that is several years old – throw it out.
- Use a system to help you remember to take your medicine – a checklist or an association with a daily habit (haircombing, plant watering, etc.).
- Over-the-counter (non-prescription) drugs are for the relief of minor conditions. Do not use these for prolonged periods unless advised by your physician.
- Ask your physician to prescribe generic rather than brand name drugs. It may save you money.
- Don't increase or decrease medications without consulting your doctor.
- Don't suddenly stop your medications without consulting your doctor.

PROJECT
DARE



Match the Medication

Test your knowledge of some common drug terms by placing the letter of the correct definition after the drug term it describes.

- | | |
|-------------------------|---|
| 1. Generic _____ | A. drug used to lower blood pressure |
| 2. Diuretic _____ | B. pain reliever, such as aspirin |
| 3. Antiseptic _____ | C. destroys harmful germs |
| 4. Narcotic _____ | D. shortened "popular" form of a chemical name |
| 5. Antibiotic _____ | E. used for cold or allergic reactions |
| 6. Antihistamines _____ | F. used to treat constipation |
| 7. Analgesics _____ | G. destroys or stops microorganisms |
| 8. Sedative _____ | H. calming agent, tranquilizers or sleep promoter |
| 9. Laxative _____ | I. stimulant drug that affects the the central nervous system |
| 10. Amphetamines _____ | J. pain killing and sleep inducing drug that can be addictive |