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The Relationship Between Income and the Ability to Follow the Prescribed Medication Plan in Elderly Persons with Heart Failure

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THE RELATIONSHIP BETWEEN INCOME

AND THE ABILITY TO FOLLOW THE PRESCRIBED MEDICATION PLAN

IN ELDERLY PERSONS WITH HEART FAILURE.

By

Lori Houghton-Rahrig

A THESIS

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ABSTRACT

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The purpose of this study was to determine if there was a relationship between income, and obtaining and taking of medications as prescribed. The conceptual framework used for this study was Madeleine Leininger's cultural care diversity and universality theory. This secondary analysis used the initial data from the primary study, " Home Care Outcomes for Heart Failure: A Test of Two Nursing Approaches" (Kline, 1999). A convenience sample of 70 home care clients with heart failure were interviewed using a Likert scale format. A nonparametric correlation using Spearman's rho depicted a weak relationship between annual income and taking the medication as prescribed, and no relationship between annual income and obtaining the medication as prescribed. The hypothesis that there is a positive correlation between income and the ability to follow the medication plan as prescribed, was not supported.

Dedication

This thesis is dedicated to my wonderful husband, Kevin, and our three lovely children, Elizabeth, Paul, and Peter whose love and support through this educational process have been outstanding. I would also like to thank our extended families for their ongoing encouragement.

Acknowledgments

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Chapter 1

INTRODUCTION

General Statement of the Problem

The inability to follow a prescribed medication plan in the population with heart failure may be attributed to many variables such as the cost of medication, income level of the client, and monthly medication expenditures. The lack of understanding of the medication plan due to a deficit in the cognitive level of the client or knowledge deficit, medication actions, medication side effects, and the inability to recognize worsening symptoms also play a role in the inability to follow medications as prescribed (Vinson, Rich, Sperry, Shah, & McNamara, 1990).

Vinson et al. (1990) also found other factors that affect the ability to take medication as prescribed in the population with heart failure. These factors include lack of follow-up after discharge from the hospital, lack of transportation to return for follow-up visits, knowledge deficit related to the understanding of the medication regime, and changes in cognitive functioning in the elderly. In addition, hospital readmissions for heart failure occurred when the client did not seek medical attention when symptoms worsened (Vinson et al., 1990).

There are additional factors that may contribute to the inability to follow the medication plan as prescribed. For instance, many retired people live on a

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limited and fixed income receiving only social security in their retirement years. Thus, prescription coverage is not affordable for many people. Older household prescription expenditures averaged 3.1 percent of household income, ranging from 1 to 10 percent of total household income. Those with prescription coverage spent approximately 1.4 percent of total household income on medications (Center for the Study of Aging, 1999).

Prescription coverage for the elderly population is a growing problem in the United States. Ninety-eight percent of people 65 years and older in 1999 were receiving health care coverage via Medicare and private insurance (Mills, 1999), however Medicare does not cover prescriptions, hearing, vision, dental, or long-term care (Butler, 1996). According to the Center for the Study of Aging (1999), 67 percent of prescription costs are paid from household income rather than prescription coverage plans. Many retired citizens do not have prescription coverage due to the cost of prescription riders. They find it less expensive to pay for the medications out of their pockets, which may range from $2000 - $2700 per year for the average senior citizen (Butler, 1996; Center for the Study of Aging, 1999).

Older people with chronic illness can expect to pay even more out of their pockets for medications. People with chronic illnesses such as heart failure have many more financial burdens than those who are fortunate enough to have good health. Individuals with heart failure have more medications, more health care provider visits, and more admissions into the hospital. Chronic illnesses such as heart failure increase the percentage of household medication expenditures two

and one-half times higher than those without chronic illness (Center for the Study of Aging, 1999).

Allocating money for medications can be especially troublesome for those with chronic illness living on a limited income. Patients with chronic illness may become creative with their medication plan to make their dollar "stretch". For example, an elderly person suffering from heart failure may be prescribed a diuretic two to three times per day. Rather than taking the medication as ordered, the elder may decide to "spread out" this medication over a three month period of time to save money, thus taking one pill once a day for three months rather than two to three pills a day over one month. The ability to follow the medication plan as prescribed by a nurse practitioner, physician or physician's assistant becomes impossible due to the cost factor alone. Those heart failure patients who are unable to purchase medications to keep themselves healthy are often admitted into the hospital emergency rooms with a diagnosis of acute heart failure, a life-threatening situation (Vinson, et al., 1990).

In the population with heart failure, the inability to follow the medication plan as prescribed can lead to hospital readmissions, early nursing home placement and possibly even death (Soumerai et al., 1991; Stanley, 1999; Vinson et al., 1990). According to the American Heart Association [AHA] (2000), cardiovascular disease, a category of chronic illness which includes heart failure, was found to be the leading cause of death in people 65 years of age and older. Five percent of these deaths were attributed to heart failure alone (AHA, 1999).

Another factor that may impact the inability to follow the medication plan as prescribed is the retail cost of medications. This is a significant issue that may impact the purchase of medications. Older people who pay out of pocket for their medications, pay more for the same medication than do larger, more powerful buyers such as Health Maintenance Organizations (HMO) or the Federal Government. Bondi cites a survey conducted by Michigan State House Representative Debbie Stabenow, which depicts the differences in bulk purchasing versus the purchasing power of single individual seniors. According to Representative Stabenow's survey, the federal government may pay $34 for Zocor, whereas an individual person may purchase this same drug for $109 (as cited by Bondi, 1999).

Medications for heart failure patients without prescription coverage can be expensive. According to Agency for Health Care Policy and Research guidelines (Konstan et al., 1994), heart failure patients should receive medications such as Furosemide (Lasix), Enalapril (Vasotec), and Digoxin (Lanoxin) to control their disease process, adding others as needed to control heart failure and enhance cardiac function. These three medications alone can cost the patient approximately $82 a month if the patient is able to purchase the generic brand from a discounted internet pharmacy site and $98 to purchase trade name drugs (RXUSA, 2000). Adding other medications to treat additional comorbidities, such as Lipitor to control high cholesterol or nitrates for coronary artery disease, can raise the monthly medication expenditure to at least $180 or more (RXUSA, 2000). This does not include the cost of follow-up health care provider visits.

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It is interesting to note that heart failure is also the most common diagnosis for hospital admissions in the older population. Over 1 million admissions for heart failure accounted for 10 billion dollars in health care costs alone in 1994 (Stanley, 1999). According to the AHA, over 4.6 million people currently have heart failure (AHA, 2000).

Significance of the Problem to Nursing

Nursing can play a significant role in assisting clients in the management of heart failure. Nursing interventions, such as medication and disease education, initiation of daily reminder medication containers, scheduling health care visits, and home monitoring of the client's heart failure, support health promotion strategies to prevent further deterioration of the patient's health. Follow-up by nurses, including those with advanced practice, and other members of the health care team, may be key in enhancing the ability to follow the medication plan as prescribed, thus preventing readmissions for heart failure (Michalsen, Konig & Thimme, 1998; Rich, Gray, Beckham, Wittenberg, & Luther, 1996).

The lack of nursing care to assist in follow-up, lack of transportation for obtaining medications, and the lack of follow-up physicals are additional factors that impact the well being of the heart failure patient (Vinson et al., 1990). Nurse practitioners and other health care providers should assess these factors that may impede the ability to follow the medication plan when prescribing medications. More importantly, acute care nurses, nurse practitioners, and other acute care health providers, as well as home health nurses, should consider the

potential inability to follow the medication plan as prescribed due to a low or limited income before a client is discharged from the acute care setting following a congestive heart failure episode. Many heart failure (HF) episodes could be averted by the early identification of these factors, along with the development of a proactive multidisciplinary plan to assist the client in obtaining and maintaining optimal health (Michalsen, Konig & Thimme, 1998; Rich, Gray, Beckham, Wittenberg, & Luther, 1996; Vinson et al., 1990).

Purpose

The population with heart failure, those 65 years of age and older, who are living on a limited income may be unable to follow the medication plan as prescribed. Medications are very expensive and many senior citizens do not have prescription coverage. Therefore, income levels may be a predictor of the inability to follow the medication plan as prescribed. The purpose of this study is to determine if there is a relationship between income, and the obtaining and taking of medications as prescribed.

Chapter 2

CONCEPTUAL FRAMEWORK AND LITERATURE REVIEW

Conceptual Framework

This study is founded on the belief that many clients, who are elderly, that

is 65 years of age and older, live on a limited income and may forego taking

medications as prescribed due to the expense of the medications and a lack of

financial means to purchase them. Also, people who live on a limited income

may try to "ration" their medications, thus not following the medication plan as

prescribed. The conceptual framework, which may help to understand this

phenomenon, is Madeleine Leininger's (1991) cultural care diversity and

universality theory. Many factors are utilized in this model that help address

factors that may impede the older client's ability to follow the medication plan as

prescribed.

Leininger's cultural care diversity and universality theory reflects that

identification and incorporation of a client's culture will allow the practitioner to

provide "culturally congruent care," meaning that it is imperative that the

practitioner not only recognizes but also incorporates the client's culture into

planning and delivering care to achieve optimal mutually satisfying outcomes (as

cited in Alexander et al., 1994). Although this model is designed to study and

plan care for ethnic cultures or populations, Leininger's model is being used to

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study the 65 and older population living on a limited income, realizing that there are other cultural perspectives within this population that will not be addressed in this study.

Madeleine Leininger defines theory as " sets of interrelated knowledge with meanings and experiences that describe, explain, predict, or account for some phenomenon (or domain of inquiry) through an open, creative, and naturalistic discovery process" (Leininger, as cited by Reynolds & Leininger, 1993, p. 13). Leininger believes that "culture refers to the learned, shared and transmitted values, beliefs, norms and lifeways of a particular group that guides their thinking, decisions, actions and in patterned ways" (Leininger, as cited by Reynolds & Leininger, 1993, p. 19). The older population is an example of a culture that has learned and shared values due to the experiences they have encountered and with which they have interacted. The health care views of the client who is 65 years of age and older may be somewhat different from that of another generation due to life experiences, not to mention other cultural variables that may also play a part in developing their perceptions.

There are both commonalities (universality) and diversities within age groups and between age groups. For example, cultural universality or a commonality may be that all current older people lived during the times of the Great Depression. Cultural diversity within this commonality may be reflected in how one has lived life as an adult through a financially stressful time. An older person who has lived and struggled through the Great Depression may live life in a very frugal manner always saving for a "rainy day". This person may be more

apt to "ration" medications, whereas another person who has also lived through the Great Depression and is no longer financially struggling, may take medications as prescribed.

Leininger's cultural care diversity and universality theory can be better described using her sunrise model as depicted in Figure 1 (Leininger, 1991, p. 43). The sunrise model contains seven key factors that interact with the health care practices of the client as well as the provider's health care practices. These seven factors are technological, religious and philosophical, kinship and social, cultural values and lifeways, political and legal, economic, and educational factors. These factors assist the nurse to incorporate all aspects of the client's culture in order to obtain mutually satisfying outcomes.
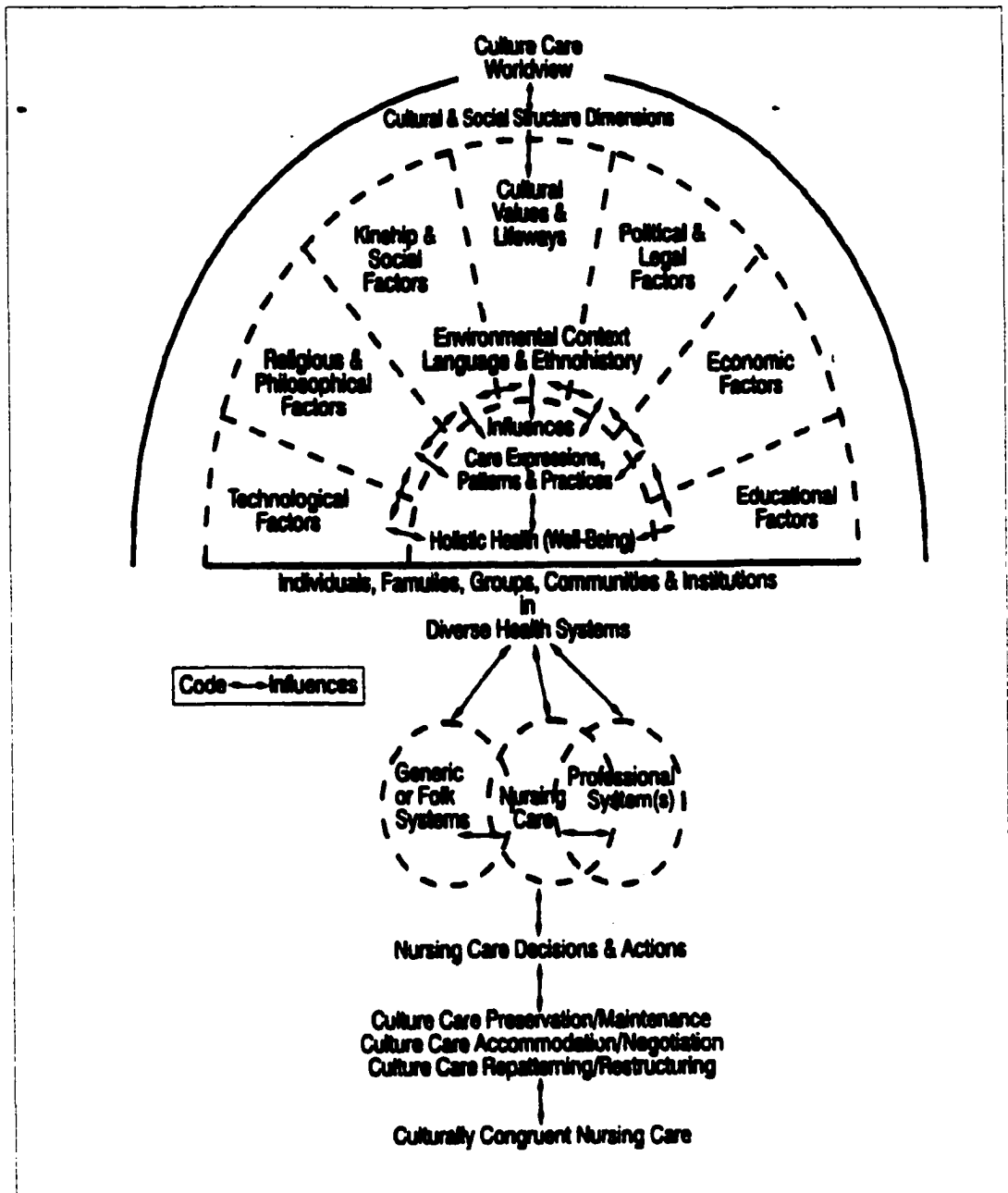
Figure 1. Leininger's Sunrise Model to Depict the Theory of Culture Care
Diversity and Universality. From _Culture care diversity and universality: A
theory of nursing_ (p. 43), by M. Leininger Ed., 1991, New York: National League
for Nursing Press. Copyright 1991 by Madeleine Leininger. Reprinted with
permission (see Appendix A).

Leininger's model (1991) can help the nurse identify unique needs of the heart failure population and assist in developing a mutual satisfying plan of care. For example, technological factors in regards to the heart failure population may be exemplified by a lack of transportation to purchase medications or the inability to open the medication bottles due to arthritis. Religious and philosophical factors, which impact this population's ability to take medication as prescribed, may be as simple as the effects of diuretic medications interfering with religious worship. Geriatric clients may not want to take their anti-hypertensive medications due to the urinary frequency caused by diuretic medications.

Taking medication as prescribed may be affected by kinship and social factors, such as the attitude of family and friends of how medications can produce undesirable side effects. For example, many anti-hypertensives, such as the beta-blockers, cause impotency in males, an undesirable effect in a sexually active person. Attitudes of family and friends regarding taking any medication whatsoever may also influence the client's ability to take medication as prescribed.

Cultural values and lifeways that may influence the ability to take medication as prescribed include recommendations by friends and family to self-adjust medications or to take herbal medications, which may impair the properties of the prescribed medications. Another example of a cultural values and lifeways factor affecting the ability to follow the medication plan as prescribed is the effect that the medications may have on the activities of daily living such as having to take medications at all or remembering when to take

them. In addition, clients may be symptom-free when they forgot to take their medication a particular morning, thus erroneously assuming that they really do not need to take their medication after all (Ferriera, Alcocer, Leary, & Reyes, 1992).

Political and legal factors are important to consider in obtaining and taking medication in the older population. Large corporations are able to purchase medications for a fraction of what individuals pay for medications. On-line pharmacies are now available in which people can order medications from anywhere in the world. Legal issues arise when the medications are ordered from other countries. These medications may not be approved by the Food and Drug Administration for use in the United States. Herbal medications are regulated in some countries, but not in others (K. McCarthy, personal communication, March, 2000).

Economic factors include the ability to pay for medications, income level of the older population, and the cost of the medications. Other economic factors to consider in caring for the older population include having to wait long periods of time to fill prescription or to see the health care provider.

Educational factors may play a role in the ability to follow the medication plan as prescribed. The ability to understand why the medication is to be taken, when to take it, and the importance of obtaining and taking the medication are all key factors that contribute to the client's ability to follow the medication plan as prescribed.

In keeping with Leininger's model depicting diverse health systems, generic folk or lay systems refer to the "home-based" knowledge or the culturally learned skills and knowledge used to care for someone (Leininger, 1991). Providing chicken soup to an ill loved one may be an example of a learned folk system. This may also be thought of as the "micro-culture" of the client that makes this individual unique beyond his or her ethnicity (Phuntsog, 1998). The client's micro-culture or folk system may influence health care decisions that, in turn, may affect the ability to follow the medication plan as prescribed.

Professional systems refer to the formal and cognitively learned skills that are learned in a professional institution in order to serve health consumer needs (Leininger, 1991). Health care providers are products of professional systems. Nurses, including those in home care, represent a product of a professional system. The nurse's decisions are based on the ideas and framework learned in the professional system and their own cultural world view.

Optimal nursing care must also reflect the generic or folk systems of the client's culture as well as the professional health system in order to develop well thought-out nursing care decisions and interventions as depicted in the sunrise model. It is imperative that the nurse preserves the client's culture, accommodates for that culture and negotiates a compromise if the professional health care system's recommendations and the client's culture do not coincide. For example, in the Mexican-American population, a Curanderos is a person who incorporates prayers, rituals, and some herbal remedies to assist in restoring balance to one's health (Lipson, Dibble, & Minarik, 1996). Another example is

the use of additional table salt in some European methods of cooking (W. Rahrig, personal communication, 1981; K. Litwack, personal communication, 2000). Additional salt is contraindicated in the diets of heart failure patients. These practices must be considered in order to develop a mutual satisfying plan of care.

According to Leininger's model, in order to provide culturally congruent nursing care, all three "modes of action or decision" must be considered when determining nursing care decisions and actions (Reynolds & Leininger, 1993). These three modes of action are culture care preservation/maintenance, culture care accommodation/negotiation, and culture care repatterning/restructuring. The nurse must evaluate if nursing decisions or actions will preserve the culture of the client, if accommodation is necessary to achieve the goals or if culture care repatterning/restructuring will be necessary. For example, the folk system of making chicken soup for the ill family member may need repatterning if the soup is high in sodium and contraindicated for the heart failure patient. Also, the patient who avoids taking diuretics as it interferes with religious services may need cultural care accommodation to adjust the times of medications to reduce interference with the activities of daily living.

Although all of these factors are very important to consider in developing a mutually acceptable plan with the heart failure client, this study will focus on how the economic factors within this model affect the client's ability to obtain and take medication as prescribed and, ultimately, affect the well being of this client.

Literature Review

This section presents a variety of studies that discuss the relationship of

income and the inability to follow the prescribed medication plan. The incidence of heart failure and a description of the 65 years of age and older population in the United States will also be discussed. This section will not include extraneous variables of the client related to the ability to follow the prescribed medication plan such as educational levels, cognitive deficits, technological factors, or social factors.

<u>Ability To Follow The Medication Plan</u>

The older population with heart failure is hospitalized frequently with exacerbations of this disease. Vinson et al. (1990) studied 161 patients who were at least 70 years of age and who had been hospitalized with heart failure over a 6-month period. Thirteen percent (n=21) of these patients expired in the hospital during the study. Of the remaining 140 patients, 47% (n=66) were readmitted to the hospital within 90 days of the last hospital discharge. Fifty-seven percent (n=38) of these 66 patients were readmitted with recurrence of their heart failure. The inability to follow the prescribed medication plan was believed to contribute to these readmission rates. The Vinson study concluded that 53% of the readmissions were potentially preventable. Factors that contributed to possibly preventable or probably preventable readmissions were 15% with medication noncompliance (n = 10) , 18% with dietary noncompliance (n = 12), 20% who failed to seek medical help (n = 13), 15% who had inadequate discharge planning (n = 10), 20% who had inadequate follow-up (n = 13) and 21% with inadequate social support (n = 14).

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Household income less than $20,000 was found to be a significant contributor (p = 0.002) to the inability to follow the medication plan as prescribed in the patient with asthma. Educational levels less than 12 years (p<0.001), poor patient-clinician communication (p < 0.001), Spanish as a primary language (p = 0.005) and minority status (p = 0.007) were also contributors (Apter, Reisine, Affleck, Barrows & ZuWallack, 1998). Apter et al. studied 50 adult patients (with asthma) whose ages ranged from 20 – 81 years of age with a mean of 46 years. The mean rate of following the medication plan as prescribed in this population was 63% (SD = 38). Disease severity in this study had no impact on following the medication plan as prescribed.

Col, Fanale, and Kronholm (1990) examined medication noncompliance and adverse drug reactions in the hospitalized elderly. Of the 315 elderly patients who were interviewed, 28.2% (n = 89) of these hospitalizations were related to medications, of which 36 (11.4%) were due to noncompliance with the medication plan and 53 (16.8%) were due to adverse drug reactions. Col et al. found that 81% of the noncompliance cases were due to underuse of the medications, with 17% being due to overuse and only 2% was due to misuse. They also found that those with an income of $10,000 - 15,000 had an increase risk of hospitalization related to an inability to follow the medication plan as prescribed. Interestingly, the highest proportion of patients with a history of noncompliance was in the cardiac population (i.e. heart failure) (31.1%), followed by falls (13.6%), gastrointestinal problems (7.8%), chronic obstructive pulmonary

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disease (28.6%) and metabolic disturbances (9.5%). Patients identified

forgetfulness as the most frequent cause of noncompliance (39.6%).

Arcangelo (1991) also found that patients who are noncompliant with

medications tend to underuse medications rather than overuse them. This study

consisted of 196 patients who were 65 years of age and older who used a total of

684 medications. Of 196 patients who were studied, 139 used the medications

100% of the time. Fifty-seven patients (29.1%) misused their medication with 50

of these 57 patients underusing their medications.

The above studies (Apter et al., 1998; Arcangelo, 1991; Col et al., 1990;

Vinson et al., 1990) reflected that an inability to follow the prescribed medication

plan was associated with a variety of factors including lower incomes or an

underuse of medications. The inability to purchase or follow the medication plan

as prescribed can negatively impact the health of clients.

Income

Medications for heart failure are costly, especially to those on a fixed

income. Although overall income levels for the elderly have been increasing over

the last thirty years, there are still those who are struggling financially. According

to a report written by the Federal Interagency Forum on Aging:

> Among the older population, poverty rates are higher among women (13
>
> percent) than among men (7 percent), among the nonmarried (17 percent)
>
> compared with the married (5 percent), and among minorities compared
>
> with non-Hispanic white persons. In 1998, divorced black women ages 65
>
> to 74 had a poverty rate of 47 percent, one of the highest rates for any

subgroup of older Americans. (Social Security Administration.

as cited by the Federal Interagency Forum on Aging, 2000b, p. 2).

Financial hardship or low-income levels may have an impact on the ability to follow the prescribed medication plan. Arcangelo (1991) found that low-income subjects (<$1,350/month) had a higher misuse rate of medications than did the higher income subjects (>$1350/month). Col et al. (1990) also discovered that those with an income level of $10,000 - $15,000 per year, using 1974 income levels, had an increased risk of hospitalization due to the inability to follow the prescribed medication plan. Col et al. also surveyed the subjects' perceptions of their medication costs. Of those patients who were hospitalized due to the inability to follow the prescribed medication plan, 13.6% of these patients felt that their medications were very expensive (odds ratio = 7.205, p=.02).

Coons et al. (1994) found somewhat different results in a study of medication noncompliance. These researchers examined possible predictors of medication noncompliance in a sample of 1028 randomly selected adults who were 55 years of age and older living independently in the southeastern United States. Of the 1028 subjects, 785 were studied who were taking medications. The mean age of these subjects were 73.9 years with a median income of $12,500 and an annual income range of less than $1000 to greater than $40,000. A significant association was found between noncompliance and a higher socioeconomic status (p = 0.001), a greater number of medications (p = 0.008) and a higher psychological distress score (p = 0.012). This association of a

higher socioeconomic status and medication compliance was interpreted by Coons et al. that those of lower income may have valued health care more than the higher income subjects in this study, thus being more apt to take their medications as prescribed than the higher income subjects. These findings vary from other studies that examine income level and the inability to follow the prescribed medication plan.

Other studies depict that financial assistance with health care or free care can result in increased control of hypertension, a disease that is sometimes a precursor to heart failure. Keeler, Brook, Goldberg, Kamberg and Newhouse (1985) studied 3958 adults with hypertension over a period of three to five years to examine the relationship between insurance plans and blood pressure control. The adults ranged in age from 14 years of age to 61 years of age with approximately 24% meeting the criteria for a diagnosis of hypertension at the onset or exit of the study. Their study depicted that the group receiving free care had better control of their hypertension than the groups who had to pay for some portion of their care, however it was shown that the additional time spent with the physician allowed an increase in detection and better treatment for the control of hypertension. People who were utilizing cost sharing plans had minimal differences between the plans, but those people who had the least amount of coverage, had higher exit blood pressure readings. This suggests that those who had to pay more for health care may have had less control over their health possibly due to the financial burden or to a lack of frequent health care follow-up.

Soumerai, Ross-Degnan, Avorn, McLaughlin and Choodnovskiy (1991) researched the effect of limiting medication reimbursement to a total of three medications for people receiving Medicaid who lived in New Hampshire (n = 411) and compared them to people receiving Medicaid in New Jersey who did not have a three-drug limit (n = 1375), but who were taking a minimum of three drugs. Both groups consisted of patients who were 60 years of age and older. These patients had a variety of chronic illnesses such as heart disease, pulmonary disease, diabetes, and seizures, and were living in the community. None of these groups had nursing home admissions six months prior to the study. This study examined 36 months of Medicaid claim data, which covered the time frame within and without the reimbursement limit. Soumerai et al. found a 35% decrease in the use of medications was associated with an increase in nursing home admissions during this time frame. They concluded that this type of reimbursement limit places the low-income elderly client at a higher risk for deterioration in health status resulting in nursing home placement.

Soumerai et al. (1991) found reimbursement limits resulted in an increase risk of nursing home placements and suggested that this may increase Medicaid costs. Feldman and DeTullio's (1994) article warns of the high cost to the health care system as a result of medication noncompliance. All of these studies depicted a relationship between the inability to follow the medication plan as prescribed and the level of reimbursement or income level as it relates to filling the client's prescriptions. Few studies are available linking low income and the

inability to follow the prescribed medication plan in the population with heart failure. More research is needed in this area.

Older Population and Heart Failure

The older population is growing. As the baby boomers age, this population will be exploding. According to the Federal Interagency Forum on Aging Related Statistics (2000a), the total number of persons aged 65 and older is projected to double by the year 2030. Currently, this group of people comprise over 13 percent of the U.S. population. By the year 2030, this number is projected to rise to 70 million, which is 20 percent of the population (Federal Interagency Forum on Aging Related Statistics, 2000a).

The number of older people is rising. Life expectancy for the older patient is longer. People are living longer for a variety of reasons such as health promotion and disease prevention as well as advances in health care technology. People living to age 65 can expect to live at least 18 more years, whereas those living to age 85 have an average life expectancy of at least 6-7 more years (Federal Interagency Forum on Aging Related Statistics, 2000b).

The elderly person also has a higher incidence of heart failure (HF) events. Not only is there a growing increase in the elderly population, more and more people will be suffering from HF in the future. As noted in Table 1, the prevalence of new and recurrent HF events increases with age. Table 1 depicts that those over the age of 85 have a higher incidence of HF events than do those under 84 years of age and younger. The estimated rate of heart failure events doubles or nearly doubles in all female and male groups from ages 75-84 years

of age compared to the 65-74 years of age category. The 85 years of age and older group's estimated rate of new and recurrent HF events are 2.5 to 5.7 times higher than the 65-74 years of age category. Non-black females had the lowest rate of new and recurrent HF events in the 65-74-age category, yet had the highest increase of 5.7 times that initial estimate in the 85 years of age and older category. Black females had the lowest estimated rate of new and recurrent HF events in all categories as well as the lowest increase from the 65-74 years of age when compared to the 85 years of age and older age group. Black and Non-black males had similar estimates of new and recurrent HF events in all age groups with the non-black male category having a slightly larger increase in the 85 years of age and older group (Cardiovascular Health Study, NHLBI, as cited in AHA, 1999).

Table 1

Annual Estimate Rate of New and Recurrent HF Events per 1000 people

	65-74 years of age	75 –84 years of age	85 years of age and older
Black Males	21.1	52.0	66.7
Non-black Males	21.5	43.3	73.1
Black Females	18.9	33.5	48.4
Non-black Females	11.2	26.3	64.9

Summary

Overall, the literature suggests that there are many factors that may impact the 65 year old and older client's ability to follow the prescribed medication plan. There may be a relationship between income and the ability to obtain medication and take the medication as prescribed in the population with heart failure. In practice, as well as in the literature, patients forego taking their medication due to affordability. The cost of hospital readmissions for a heart failure exacerbation is expensive, far more expensive than the medication itself that would avert an exacerbation. Nursing can have a key role in coordinating the care of these patients to avoid hospitalizations by ensuring that the client is able to obtain medications. Income may be a helpful screening tool in assisting nurses to identify patients at risk for the inability to follow the prescribed medication plan. Although more research is needed to examine the relationship between income and components of medication compliance, this study will begin to assess this possible relationship between income and obtaining and taking medication as prescribed.

Research Question

What is the relationship between income and the perceived ability: 1) to obtain medication and 2) to take the medications as prescribed in the population of clients with heart failure who are 65 years and older?

Hypothesis

The hypothesis for this study is that there will be a positive correlation between income and the ability to follow the medication plan as prescribed.

Definition of Terms

1. Ability to follow the medication plan as prescribed indicates obtaining and taking medication.

2. Income is defined annual income in dollars.

3. Older refers to those 65 years of age and older, the population under study.

4. Heart failure is the diagnostic category used for admission into the primary study in the home care population.

Chapter 3

METHODS

<u>Design</u>

This was a secondary analysis of data obtained from a larger, primary

study entitled "Home Care Outcomes for Heart Failure: A Test of Two Nursing

Approaches," conducted by Dr. Kay Setter Kline, Professor, Grand Valley State

University, Kirkhof School of Nursing. The primary study used a double blind

experimental design whose purpose was to examine the nursing interventions in

the care of heart failure patients. Data for the primary study were obtained at the

initial visit and at consecutive 3-, 6-, 9-, and 12-month visits. Research

assistants, who were graduate students in the MSN program at the Kirkhof

School of Nursing, interviewed 83 home care clients with heart failure. Each of

these clients was asked a series of questions regarding general demographic

data, medications, health perceptions, and self-efficacy as related to their heart

failure. This secondary analysis used the data only from the initial visit in the

primary study. These data related to the client's income level, and the ability to

follow the medication plan as prescribed. The questionnaire used for this portion

of the study was a self-management tool developed for the primary study (Kline,

1999).

Sample and Setting

In the primary study, all clients were referred for care of heart failure as their primary diagnosis to one of two home care agencies located in two different cities. All clients were over the age of 18 years and spoke English as their primary language. Non-English speaking clients were excluded from this study in order to facilitate the interviewing process. Other than language, no restrictions were place on the selection of clients based on their ethnicity, socio-economic status or gender. Client interviews were conducted in the client's home via trained data collectors. For the secondary analysis, only those subjects who were 65 years of age or older were included.

Instruments

The Self-Management Tool (SMT) was adapted by Kline from the Chronic Disease Self-Management Study Measures (Lorig et al., 1996). A Likert scale ranging from 0-5 was used to assess the perception of medication usage with 0 referring to "none of the time" to 5 referring to "all of the time" (see Appendix B).

The client was asked to rate six different questions relating to the following recommendations about medication. The medication questions used in the primary study were, "During the past month I was able to follow the recommendation to: (a) take the prescribed dose, (b) understand why I was taking the medication, (c) recognize side effects, (d) take proper action when side effects occurred, (e) work this medication into my regular routine, and (f) obtain this medication. For this secondary analysis, the data from only two of these questions; (a) take the prescribed dose, and (f) obtain this medication, were

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used. A variable mean item score was determined from the following responses of each question: (a) 0 = none of the time, (b) 1 = a little of the time, (c) 2 = some of the time, (d) 3 = a good bit of the time, (e) 4 = most of the time, (f) 5 = all of the time.

The clients were asked to identify their annual income in dollars within one of six different levels on the Demographic Tool (see Appendix C). The six different income levels were (a) less than $10,000, (b) $10,001-20,000, (c) $20,001-30,000, (d) $30,001-40,000, (e) $40,001-50,000, and (f) over $50,000.

The medication section of the tool created by Kline had a reliability coefficient of .58 for all six questions, however only two of the six questions were utilized in this secondary analysis. The content of this tool was also validated by a group of nursing experts (Kline, 1999).

Procedure

In the primary study, a research assistant contacted the home care agency for potential subjects who met the criteria and then contacted them for an initial appointment. The initial appointment consisted of explaining the study and seeking informed consent for inclusion into the study. Once the subject had consented to join the study, a data collection interview was conducted at the first meeting or second meeting depending on the health of the client. This interview consisted of questions relating to general demographic data such as age, educational level and income level as well as questions relating to self-management of the disease process and those relating to perception of the

quality of life. All questions were asked during the initial visit prior to the treatment application.

Permission was obtained from the Human Research Review Committee at Grand Valley State University to conduct this secondary analysis (see Appendix D). Permission was obtained from the Primary Investigator for access to the data (see Appendix E). Data specific to the research question time period were utilized for this secondary analysis. The data from the initial visit was coded, collated, and analyzed.

Chapter 4

RESULTS

Statistical Techniques Used for Analysis

The purpose of this study was to determine if there is a relationship

between income, and the obtaining and taking of medications as prescribed.

Data were analyzed using the Statistical Package for Social Sciences (SPSS) at

Grand Valley State University. Demographic data were analyzed using

descriptive statistics. The level of significance was $p < .05$ for all statistical

procedures. The Spearman's rho test was utilized as both the independent

(income) and dependent (obtaining and taking medication) variables were

measured on an ordinal level.

Characteristics of Subjects

There were 70 respondents in this secondary analysis whose ages ranged

from 66 to 94 years of age with a mean age of 79.71 and standard deviation of

6.73. Of these 70 respondents, 37.1 percent (n = 26) were married, 1.4 percent

(1) was never married, 55.7 percent (n = 39) were widowed, and 5.7 percent (n =

4) were divorced. Ninety-seven percent (n = 68) responded that they were

unemployed. Two participants had missing data in this area. Of the 70

respondents, 1 person indicated being employed for 2 hours per week.

The respondents in this study were educated, with 21 percent having a 10th

grade education or less (n = 15), fifty-four percent having a high school education

of 11th grade or 12th grade (n = 38), and twenty-four percent having some college education (n = 17).

The respondents were asked to categorize the number of years of having had heart failure. Of the 70 respondents, 38.6 percent (n = 27) had heart failure for less than one year, 11.4 percent (n = 8) had heart failure from 1-2 years, and 18.6 percent (n = 13) had heart failure for 3-5 years. Thirty-one percent (n = 22) had heart failure over five years.

All 70 respondents had Medicare for their primary health insurance with 11 percent (n = 8) also receiving Medicaid. Twenty-eight respondents (40%) identified a specific supplemental insurance. Ten respondents had other primary insurance providers not listed in the self-management tool.

Use of health care providers to treat heart failure varied within this group. Almost 19 percent (n = 13) utilized a family practice physician for health care, 79 percent (n = 49) utilized a cardiologist, 36% (n = 25) utilized an internist, and 3 percent (n = 2) utilized a nurse practitioner. No patients indicated they utilized a physician assistant and approximately 6 percent (n = 4) utilized other health care providers such as a dietician or a social worker. These percentages were not mutually exclusive as some patients saw both a primary provider such as a family practice physician or nurse practitioner in addition to seeing a cardiologist.

Study Variables

Income, in this study was a demographic variable, as well as a study variable. As noted in Table 2, the respondents most frequently indicated an annual income between 10,000 and 20,000 dollars representing 45.7 percent

(n=32) of the 70 respondents. Twenty percent (n=14) of the respondents reported an annual income of less than 10,000 dollars. Twenty-seven percent reported an income between 20,001 and 30,000 dollars with approximately six percent having an income of 30,001-40,000 dollars. No respondents reported an income of 40,001-50,000 dollars or over 50,000 dollars. One respondent did not answer this question.

Table 2

Annual Income of Subjects

Annual Income	Frequency	Percent
<$10,000	14	20.0
$10,001-20,000	32	45.7
$20,001-30,000	19	27.1
$30,001-40,000	4	5.7
$40,001-50,000	0	0.0
Over $50,000	0	0.0
Missing data	1	1.4
Total	70	100.0

The category of medications was the other study variable. During patient interviews, a series of questions were asked about each of their medications. The number of medications for the client ranged from a minimum of 4 to a maximum of 10. Although some patients had more medications prescribed, only 10 medications were included in the study. The average number of medications

included in this study per patient was 8 with a mean of 8.01 and a standard deviation of 1.85. Sixty-four percent of the 70 patients were taking at least eight medications or more. From these data, all patients' mean item scores for each question were calculated to a variable mean score.

The respondents were asked if they were able to follow the recommendation to take the prescribed dose. The average of the mean item scores for this question was 4.99 with a standard deviation of .06 (n=70). Almost all of the patients' (95.7%) mean item scores were 5.0. This suggests that on average, the patients were able to take the prescribed dose "all of the time".

The respondents were asked if they were able to obtain the prescribed medication. The average of the mean item scores for this question was 4.97 with a standard deviation of .17. Of the 70 respondents, 97.1 percent had a mean item score of 5.0. This suggests that on average, the patients were able to obtain their medications "all of the time".

Research Question and Hypothesis

The research question for this secondary study was, "What is the relationship between income and the perceived ability: 1) to obtain medication, and 2) to take the medications as prescribed in the population of clients with heart failure who are 65 years and older?" A nonparametric correlation using Spearman's rho was conducted to compare the possible relationship between annual income and taking the prescribed medication dose as well as with obtaining the medication as prescribed.

In this secondary analysis, it was found that there was a very weak, non-significant relationship between annual income and taking the prescribed dose (r = -.190, p = .118). In addition, there was no relationship found between annual income and obtaining the medication as prescribed (r = .042, p =. 733). Therefore, the hypothesis that there is a positive correlation between income and the ability to follow the medication plan as prescribed was not supported.

Other Findings of Interest

During data analysis, other findings of interest were identified. These will be discussed briefly.

Understanding reason for medication. The clients' perception of understanding why they were taking the medication was ascertained. The average of the mean item scores reflecting the client's perception of understanding why the medication was taken was 3.66 (SD = 1.60). On average, only 57.1 percent of the respondents mean item scores reflected that they understood the reason that they were taking a particular medication "most of the time" or "all of the time". A weak, but significant relationship existed between annual income and "understanding of why I was taking the medication" (r = .272, p =. 024).

Recognizing side effects. Subjects were asked if they recognized side effects of the medications. The average of the mean item scores asking if the client recognized side effects of the medication was 1.93 with a standard deviation of 1.98. On average, only 30 percent of the 70 clients recognized side effects of the medication "most of the time" or "all of the time". A weak, but

significant relationship existed between annual income and "recognizing side effects of the medications" (r = .347, p = .003).

Taking proper action. Taking proper action when side effects from medication occurred also rated low with these respondents. The average mean item score for this question was 2.27 with a standard deviation of 2.09. On average, only 30 percent of the 70 respondents indicated that they took proper action when side effects occurred "most of the time" or "all of the time". There was also a weak, but significant relationship between annual income and "taking proper action when side effects occurred" (r = .245, p = .042).

Working the medication into the regular routine. When asked if the client was able to work the medications into the regular routine, the average mean item score was 4.96 with a standard deviation of .172. On average, 92.9 percent were able to work the medications into the regular routine "all of the time". There was no relationship, however, between income and "working this medication into my regular routine" (r = -.015, p = .905).

Relationship between number of medications and income. In this study, a maximum of ten medications were examined for each subject, as determined by the self-management tool used for the initial data collection, however, some patients had more medications. A Spearman's rho procedure was conducted to determine if there was a relationship between the number of medications examined and annual income. The results indicated that there was no relationship between annual income and the number of medications that were taken (r = -.036, p = .769).

CHAPTER 5

DISCUSSION AND IMPLICATIONS

The purpose of this study was to determine if there is relationship between income, and the obtaining and taking of medications as prescribed. A nonparametric correlation using Spearman's rho depicted a weak, but not significant relationship, between annual income and taking the medication as prescribed. There was no relationship between annual income and obtaining the medication as prescribed.

Other findings of interest were found in the relationships between annual income and other questions on the medication section of the self-management tool. Weak, but significant, positive relationships existed between annual income and: (a) "understanding of why I was taking the medication," (b) "recognizing side effects of the medication," and, (c) "taking proper action when side effects occurred." For example, as income declined, so did the clients' perception of understanding why the medications were being taken. All three of these relationships resulted in stronger relationships than did the relationship between income and (a) "obtaining the medication," and (b) "taking the medication." There was no relationship between annual income and "working this medication into my regular routine," or between annual income and the number of medications that were taken.

The hypothesis for this study, that there is a positive correlation between income and the ability to follow the medication plan as prescribed was not supported. This section will discuss variables that may have impacted the results of this study.

Although this study found that there was no relationship between income level and the ability to follow the medication plan as prescribed in a sample of persons 65 years of age and older with heart failure, the findings suggest that regardless of income, heart failure clients in this study were able to follow the medication plan as prescribed. Given these findings, one needs to examine what causes people to take medication regardless of income.

One must ask if patients are obtaining medications by other means unrelated to income such as the client receiving free medication samples from the health care provider's office or supplemental insurance that includes prescription coverage. Although this study did assess some insurance, it did not include if the patient was receiving prescription coverage. Receipt of this type of benefit may have positively influenced following the medication plan as prescribed. Also, pharmaceutical representatives distribute significant amounts of medication samples, which are frequently given to lower income clients to assist in adherence to the medication regime (K.J. Sterk, personal communication, September, 2000; J. Joslin, personal communication, January, 2001; T. Wright, personal communication, August, 2001). This also may have positively influenced following the medication plan as prescribed.

Discussion of Findings to Previous Research

Some patients do not take medications as prescribed due to the side effects of the medication (Col, Fanale, & Kronhom, 1990). It is interesting to note that the clients in this secondary study perceived that they were able to obtain and take the medication as prescribed, but were not as confident in understanding why they were taking the medication, recognizing side effects, or in taking proper action when side effects occurred. One must ask if the clients in this secondary study followed their medication plan because they valued their health over the displeasure of side effects.

Patients who spent more time with their health care provider tend to follow the prescribed medication plan (Keeler, Brook, Goldberg, Kamberg, & Newhouse, 1985). Patients may not want to cause conflict in the patient-provider relationship by not following the prescribed medication plan. It would be interesting to examine how the client perceives this relationship, such as the provider is an authority figure in which one would not veer from the prescribed plan due to "blind obedience" or is the relationship viewed as a strong, mutually respectful, trusting relationship in which the provider's role is primarily education and culturally congruent care is achieved (Leininger, 1991). The sample in this secondary analysis involved clients receiving home care on a regular basis in addition to receiving the treatment interventions. It may be possible that this additional time spent with a health care provider in the home also had a positive effect on following the prescribed medication plan.

The age range in this study was similar to that of a study conducted by Coons et al. (1994). Although Coons et al. found that a higher socioeconomic status and the inability to follow the medication plan had a significant inverse association and this secondary study found no relationship between income and the ability to follow the medication plan, one must ask if income is really a contributing factor. There is a similarity in these two studies that may suggest that these two study groups valued their health by following the medication plan as prescribed as they were at least 65 years of age and older. Perhaps as clients near the age of retirement, they begin to be more conscious of their health in order to live as long as possible.

Following the medication plan as prescribed may not be affected by disease severity as was found in a study of asthma clients, (Apter, Reisine, Affleck, Barrows, & ZuWallack, 1998) it may be interesting to assess this factor in the heart failure population. Although this secondary analysis did not examine the severity of heart failure, it did assess the number of years that a client had heart failure, which may suggest severity. It is interesting to note that in this secondary analysis, the majority of patients had heart failure more than 1 year, with 31.4% of these patients having heart failure over 5 years.

One factor of hospital readmission rates is thought to be due to the inability to follow the medication as prescribed (Vinson et al., 1990). It would be interesting to follow the sample in this secondary analysis to assess hospital readmission rates and to correlate the findings with the current data regarding the perception of following the medication plan.

Discussion of Findings to Conceptual Framework

According to Leininger's (1991) sunrise model, there are a variety of factors that impact the client's health. Each of the seven factors within the sunrise model; technological, religious and philosophical, kinship and social, cultural values and lifeways, political and legal, economic, and educational factors may impact the ability to follow the medication plan as prescribed. However, in this analysis, the clients were able to follow the medication plan as prescribed, despite a their income level.

One explanation of the results of this study may be the delivery of culturally congruent nursing care as defined in Leininger's (1991) model. Clients in this secondary analysis were all home care clients. Home care nurses visit these patients periodically to assess the health of the client, monitor medication usage, and coordinate the care of the client. Health care interventions provided by the primary care provider may have incorporated all of the seven factors of the model utilizing the folk systems of the client, and nursing care provided by the home care nurse working within the realm of professional and cultural systems. Cultural care preservation, accommodation and repatterning may have occurred to provide culturally congruent nursing care. For example, the health care providers may have ordered generic medication or less expensive medication to assist the client with economic factors. Client education may have occurred to reinforce adherence to the medication plan. However, more information is needed to assess all aspects of the model in this home care heart failure population.

<u>Limitations</u>

As stated earlier, this study was a secondary analysis of data obtained from a larger, primary study entitled "Home Care Outcomes for Heart Failure: A Test of Two Nursing Approaches," (Kline, 2001). This secondary analysis was limited by the information available in the database obtained through the primary study. For instance, information relating to how the clients obtained their medication was not available.

The self-management tool used in the data collection of this study assessed the patient's perception of following the medication plan as prescribed. Response bias may occur in this type of data collection due to social desirability. Social desirability refers to the tendency of some individuals to answer questions in a manner consistent with social mores (Polit & Hungler, 1995). The client's perception may not be reality. Also, hospital admission rates for heart failure were not assessed in this study to determine if the client remained in good health. Although hospital admission rates may indicate that the heart failure has exacerbated, it may not provide an explanation as to the cause of the exacerbation albeit lack of finances to purchase medications or simply deteriorating health.

The measurement of income levels was assessed, but not how people choose to spend their money. Clients in this study may have chosen to spend their limited income on medications whereas; others may forego their medications and spend their income on food or gifts for their grandchildren. The relationship between perception of affordability, the level of income and the ability

to follow the medication plan as prescribed would be interesting to assess as the majority of this sample had an annual income of $10,001 and 20,000. Lastly, the Hawthorne effect may have played a role in the results. Clients may have modified their medication adherence behavior due to the fact of being a participant in a study. The addition of a method to verify if the client was actually taking the medication as prescribed would be beneficial to assess rather than the client's perception. The use of a self-reporting tool such as the self-management tool can be biased (Polit & Hungler, 1995).

<u>Applications to Practice</u>

As discussed in the literature review, there are many components to consider when assessing the ability to follow the medication plan as prescribed. Leininger's (1991) model can assist the nurse in identifying these factors when making nursing decisions. This secondary analysis may exemplify a true example of culturally congruent care as delivered by home care nurses. However, the findings relating to the research question, "What is the relationship between income and the perceived ability: 1) to obtain medication and 2) to take the medications as prescribed in the population of clients with heart failure who are 65 years and older?" suggests that regardless of income, clients were to follow the medication plan as prescribed. Further study needs to be conducted to determine if this finding is true across many populations. Home care clients in this study perceived that they were able to obtain and take the medication as prescribed. This perception may be influenced by the interactions with the home care nurse or the primary care provider.

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Other findings of interest also suggest some applications for practice. In this secondary study, clients did not have sufficient understanding of why they are taking their medications. Clients also did not recognize the side effects of the medication nor were they familiar with the actions of the drugs. Patient education would be beneficial in assisting the patient to understand their medications.

Nurses should incorporate research findings in their practice. For example, the nurse educator may want to incorporate Leininger's (1991) sunrise model into teaching nursing students at the undergraduate and graduate level to assist them in identifying areas in which the medication plan may falter. Including the findings from this study in nursing education may help the future practicing nurses to recognize that income may not be a contributing factor in the ability to follow the medication plan as prescribed, but nursing education about medications may have a very important role. Likewise, the nursing administrator may utilize this data to consider adjusting staffing ratios as nurses may need more time for client education about medications.

Suggestions for Further Research

It would be interesting to assess the future interventions to be used by these home care agencies to determine if the nursing interventions will have an impact on the results of this analysis. In this study, the initial data were collected within the week prior to the homecare nurse's visit. A study examining actual medication usage to compare with income levels or net worth may also be helpful. Readmission rates of the heart failure patient may also be helpful to examine. As stated earlier, although hospital admission rates may indicate that

the heart failure has exacerbated, it may not provide an explanation as to the cause of the exacerbation albeit lack of finances to purchase medications or simply deteriorating health. Examining various reasons that clients were admitted to the hospital with heart failure using Leininger's (1991) model may be beneficial in determining how proactive nursing interventions could help prevent such hospitalizations.

Specific classifications of medications, such as diuretics or beta-blockers, may also be interesting to examine. For example, determining which types of medication decrease the patient's ability or desire to follow the medication plan as prescribed by using a medication counting method rather than assessing patient perception. This may give the health care provider insight into the ability to obtain and take medication as prescribed based on side effects, number of doses required per day, the expense of the medication, and the efficacy of the medication.

It would be interesting to assess the client's cognitive function and compare this finding with the educational levels. One would wonder if this sample population did not suffer from cognitive deficits that prevent clients from following the medication plan as prescribed.

Technological factors such as the ability to access the medication, and social factors such as having assistance from family and professional care givers would also be interesting to assess. These findings might help to determine if clients in this study had additional assistance that enhanced their ability to follow the medication plan as prescribed.

Conclusion

The 65 years of age and older population with heart failure receiving home care perceive that they are able to follow the medication plan as prescribed. There was no relationship between the income level of the client in this setting and the ability to obtain the medication as prescribed. There was a weak, although not significant relationship between income and the ability to take the medication as prescribed.

APPENDICES

Appendix A

Dr. Madeleine Leininger's Letter of Approval to Use Sunrise Model

May 18, 2001

Lori Houghton-Rahrig
0-2098 Leonard St. NW
Grand Rapids, MI 49544

Fax: 616 677-5242
Phone: 616 677-2615
e-mail: klrahrig@painternet.com

Madeleine Leininger, PhD, LHD, CTN, RN FAAN, LL
Founder, Transcultural Nursing Society and Transcultural Nursing
11211 Woolworth Plaza
Omaha, NE 68144

Dear Dr. Leininger,

I am a Nurse Practitioner student completing my MSN (August, 2001) at Grand Valley State University, near Grand Rapids, Michigan. I am in the process of completing my thesis entitled, "Is there a relationship between income and the ability to follow the prescribed medication plan in persons 65 years of age and older with heart failure?". This is a secondary study from a primary longitudinal study whose purpose is to examine nursing interventions in the care of heart failure patients.

I am using your Cultural Care Diversity and Universality Theory as my conceptual framework and am asking permission to include your sunrise model in my thesis. There are many factors that impact the ability to follow the prescribed medication plan as prescribed. The sunrise model clearly depicts the many influences that may impact the health care of the client. Of particular importance in my study is the impact that the economic factors may have in developing a mutually satisfying, culturally congruent plan of care.

My fax number as well as my e-mail address is provided for your convenience in responding to this request.

Thank you very much.

Sincerely,

Lori Houghton-Rahrig, RN BSN
Nurse Practitioner Student
Grand Valley State University – Kirkhof School of Nursing

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Self-Efficacy Tool – Medication Section

MEDICATIONS

During the past month I was able to follow the recommendation to (circle one answer for each question):

Name of Medication:	None of the time	A little of the time	Some of the time	A good bit of the time	Most of the time	All of the time
1. Take the prescribed dose	0	1	2	3	4	5
2. Understand why I was taking the medication.	0	1	2	3	4	5
3. Recognize side effects.	0	1	2	3	4	5
4. Take proper action when side effects occurred.	0	1	2	3	4	5
5. Work this medication into my regular routine	0	1	2	3	4	5
6. Obtain this medication	0	1	2	3	4	5

Appendix C

Demographic Data

DEMOGRAPHIC DATA   Record Number: _____
(To be collected at time of initial interview   Subject Number: _____

1. Age _____

2. Marital Status
___Never Married
___Married
___Divorced
___Widow/Widower

3. Employment Status
___Employed (hours per week)
___Unemployed

4. Highest Level of Education
___1^{st}-7th grade
___8^{th} – 10th grade
___11^{th}-12th grade
___Associate's Degree
___Bachelor's Degree
___Master's Degree
___Doctoral Degree

5. Insurance Provider
___Private Insurance (Name of Company)_____
___HMO(Name of Group)_____
___Medicare___
___Medicaid
___Supplemental Insurance (Name of Company) _____
___PPO (Preferred Provider Organization _____
___Other_____

(Continued on next page)

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6. Health Care Provider (Who treats your heart failure?)
___Family Practice Physician
___Cardiologist
___Internist
___Family Nurse Practitioner
___Physician Assistant
___Other_____

7. Annual Income in Dollars:
___less than $10,000
___$10,001 – 20,000
___$20,001 – 30,000
___$30,001 – 40,000
___$40,001 - 50,000
___over $50,000

8. How long have you had heart failure?
___less than 1 year
___1-2 years
___3-5 years

9. List current medical diagnoses.

_____

_____

_____

_____

Appendix D

Human Research Review Committee Approval

GRAND VALLEY
STATE UNIVERSITY
1 CAMPUS DRIVE · ALLENDALE, MICHIGAN 49401-9403 · 616/895-6611

February 20, 2001

Lori Houghton-Rahrig
0-2098 Leonard St. NW
Grand Rapids, MI 49544

RE: Proposal #01-132-11

Dear Lori:

Your proposed project entitled **Is There a Relationship Between Income and the Ability to Follow the Prescribed Medication Plan in Persons 65 Years of Age and Older With Heart Failure?** has been reviewed. It has been approved as a study, which is exempt from the regulations by section 46.101 of the Federal Register 46(16):8336, January 26, 1981.

Sincerely,

Paul A. Huizenga, Chair
Human Research Review Committee

Kline's Permission to Use Data

GRAND VALLEY STATE UNIVERSITY

I CAMPUS DRIVE · ALLENDALE MICHIGAN 49401-9403 · 616/895-6611

January 12, 1999

Kay Setter Kline
222 HRY
Kirkhof School of Nursing

Dear Kay:

The Human Research Review Committee of Grand Valley State University is charged to examine proposals with respect to protection of human subjects. The Committee has considered your proposal, *"Home Care Outcomes for Heart Failure: A Test of Two Nursing Interventions"*, and is satisfied that you have complied with the intent of the regulations published in the Federal Register 46 (16): 8386-8392, January 26, 1981.

Sincerely,

Paul Huizenga, Chair
Human Research Review Committee

*Lori,
you have my permission
to use data from your
above study for your
this*

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