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KNOWLEDGE OF HORMONE REPLACEMENT THERAPY'S RISK AND BENEFITS,ITS CARDIOPROTECTIVE PROPERTIES AND THE LIKELIHOOD TO USE HORMONE REPLACEMENT THERAPY

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By

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ABSTRACT

KNOWLEDGE OF HORMONE REPLACEMENT THERAPY'S RISK & BENEFITS, ITS CARDIOPROTECTIVE PROPERTIES AND THE LIKELIHOOD TO USE HORMONE REPLACEMENT THERAPY

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The purpose of this study is to determine the relationship of knowledge of the risks and benefits of Hormone Replacement Therapy (HRT) and women's likelihood to take HRT. The relationship of knowledge of HRT's cardioprotective properties and women's likelihood to take HRT is also evaluated. Hypotheses are: 1) Women who score higher on knowledge of HRT's benefits and risks will report that they are more likely to take HRT and that 2) Women who score higher on knowledge specific to HRT's cardioprotective properties will report that they are more likely to take HRT. This study provides health care providers with information on how knowledge of HRT's benefits and risks impact a woman's likelihood to take HRT. This study is a secondary analysis of data from the Decision Making in Menopause Study. The original study was funded by NIH, the National Center for Nursing Research grant number NR 01245-04A2. Marilyn Rothert, RN, Ph.D., FAAN was the principal investigator. A sample of 252 women ages 40 to 65 participated in the study. Data collection was via questionnaires administer at 12 months post intervention. Correlation' coefficient Pearson's r for hypothesis 1 is $r = .194$, $p = .006$ indicating a statistically significant positive correlation. Pearson's r for hypothesis 2 is $r = .103$, $p = .147$ indicating a positive yet not statistically significant relationship.

DEDICATION

To my husband John for his love and support. To my daughter Jennifer and my son Scott whose patience and understanding have kept me going. And to my parents; my father Vance Carver whose encouragement remains an inspiration in my life, my mother Gladys Carver whose memory provides immeasurable guidance and love which empowers my endurance.

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I wish to thank my committee, Marilyn Rothert, Georgia Padonu, and Suzanne Budd. Marilyn Rothert, my chair, thank you for keeping me focused and going in the right direction. Georgia and Suzanne, thank you for your guidance in selecting an appropriate conceptual framework and for your insight into womens' health issues. I wish to thank all of you for challenging me to succeed. I also wish to thank Jill Kroll for her assistance in data analysis.

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INTRODUCTION

Background

Over the next two decades, in the United States there will be 40 to 50 million women undergoing menopause (Aburdene & Naisbitt, 1992). By their numbers they will help to revolutionize nursing's approach to women with heart disease. Menopause in and of itself is not a disease; every woman who lives long enough will eventually go through it and become post-menopausal (Barrett-Connor, 1989). Menopause is a natural developmental process sometimes brought about prematurely by surgery. Even though it is truly a natural event in women's lives, it has been socially constructed as a disease requiring medication (MacPherson, 1992). Unfortunately, the stereotypic picture of the menopausal woman as irritable, depressed, uninterested in sex, and besieged by hot flashes helps to establish negative connotations to the menopause (Dickson, 1990).

In the United States , a woman's life span is currently about seventy five years and in the absence of disease, eighty five years is a realistic expectation (Paskow & Libov, 1993). The mean age at menopause is approximately 51 (Rothert et. al., 1990). At the menopause a woman can expect to have at least one third of her life ahead of her. Changes leading to menopause occur during a thirty year period from the ages of 35 to 65 and mark just another event in the continuum of changes a woman's body experiences (Notelovitz, 1989). Indeed, while menopause may be defined as occurring at a specific

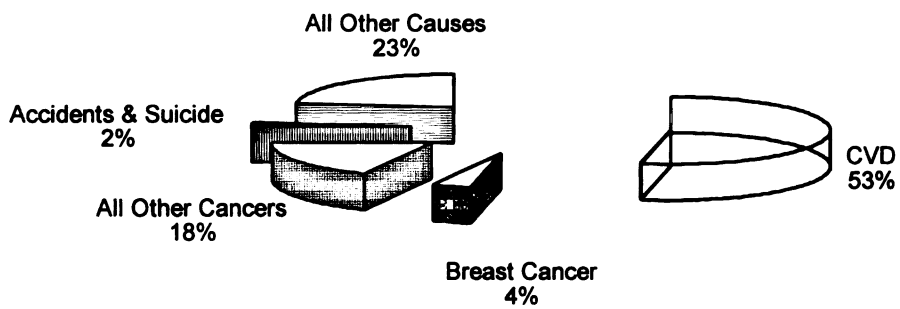
point, the woman's body will begin to gradually decrease the production of estrogen well before the menses stop. Estrogen production will continue to decline gradually for years after the point of menopause (Lush, 1992) and the woman's natural estrogen then may give some protection for many years beyond menopause (Isles, 1992). Therefore, the menopause period (pre-menopause through post menopause) takes up over one half of an average woman's life. An emphasis on the women's' life experiences is important, specifically Coronary Heart Disease (CHD) in menopausal women.

Despite these rather impressive statistics, prior to 1991 the study of heart disease was centered predominantly on male subjects (Bancroft, 1994). Women have been grossly under represented in clinical trials for new drugs associated with coronary heart disease (Arburdene & Naisbitt, 1992). CHD before the age of 50 or 60 (premature disease), being relatively rare in women, has historically been the focus of prevention efforts but CHD has not been considered a significant health concern for women (Bush, 1991). General health studies have focused on premature death from other causes-particularly cancers. The definition of "premature" is more appropriately considered to be death from any causes before the age of 75 which brings many more women into the critical age group (American Heart Association, 1996).

Everyone, especially women, need to understand that heart disease is not only a male problem. In fact, one in nine women between the ages of forty-five and sixty-four have some form of coronary heart disease. This number increases to greater than one in four after age sixty-five (Parchart, 1989; American Heart Association, 1996). Through knowledge of their inherent risk and symptom perception, a woman's approach to prevention strategies and response to illness will be directly affected (Douglass, 1993).

Knowing risk factors for heart disease as well as risk factors for other diseases as one approaches menopause will help women to evaluate the use of hormone replacement therapy (HRT) (Paskow & Libov, 1993).

Statistics show that three times more post menopausal women will die from heart disease than will die from all cancers combined (Legato & Colman, 1991). This can be graphically illustrated by Figure 1 below.



Causes of Death in Menopausal Women

Figure 1

Adapted from Legato & Coleman, 1991

In total, an estimated 250,000 women die each year from heart disease (Hawthorn, 1994). Their incidence rate of coronary artery disease will equal that of men in their age group (over 60) but the mortality rate is far greater for women due to a number of reasons-the greatest of which may be the lack of knowledge about the symptoms, predisposing factors, and treatment of women with heart disease (Hawthorn, 1994). Because heart disease is the leading cause of death among postmenopausal women (Reid, 1995), the effect of HRT on the risk of heart disease is a critical issue (Martin & Freeman, 1993; Cosgrove, 1994).

There is a well-known correlation between menopause and increased risk of heart disease in women (Kennington, 1994). Recent studies have also shown a strong correlation between HRT use and the reduction of risk factors associated with heart disease (Murdaugh ,1990). Cardiac education, therapeutic regimens, teaching material, support services, and treatment expectations are mainly focused on what is known about men (King, & Jensen, 1994). The research that does exist on women's cardiovascular health and disease prevention practices has been concerned with pathology rather than normality and has been characterized by poor planning and design (Nachtigall, 1990). The research has been conducted primarily by males and until recently, there has been little emphasis on the special needs and differences of women and their life experiences.

One of the most important factors influencing a woman seeking health care is knowledge. If the woman is informed about the importance of specific health screening, care, treatment and follow-up, she will be more likely to seek that care (Edge & Miller, 1994). While traditionally women use medical services more than men, the services tend to focus primarily on reproductive organ concerns rather than general health issues. Heart disease in women is one of those areas in which medical knowledge is felt to be lacking and patient care is thought to be adversely affected by that ignorance (Douglass, 1993). Thus, not having prior experience or knowledge as a basis, a symptom of chest pain, jaw pain, or back pain may be perceived by the elderly woman as natural or an inevitable occurrence with no cause for alarm.

Summary

The lack of knowledge affects the decision by menopausal women of whether or not to use hormone replacement as an aid in the prevention of CHD. There are indeed many personal factors affecting a woman's decision to take HRT. The lack of knowledge about the benefits and risks of hormone replacement including the reduction of risk of coronary heart disease denies women of their rights to informed consent and autonomy. Information that is available is often contradictory. For instance, even though the Food and Drug Administration (FDA) agreed in 1991 that Estrogen Replacement Therapy (ERT) seems to infer substantial protection against coronary heart disease, this protection has not been added by the FDA as an indication for ERT use. Despite this, for many health care providers estrogen has become the drug of choice for preventing CHD in postmenopausal women (MacPherson, 1992).

As a major decision in the broader scope of a woman's health care, the decision to take HRT is a very complex one because it involves weighing both the advantages and disadvantages related to the physiological risks of hormone replacement therapy (Rothert et. al., 1990). The decision is also value laden since not only physiological but also psychological concerns influence the woman's decision. For women to effectively make the best decision, they must thoroughly understand their personal risks and honestly evaluate their personal beliefs related to both HRT and preventive health care in general.

Research Questions

1. What is the relationship between knowledge of the risks and benefits of HRT and women's likelihood to take HRT?

2. What is the relationship between women's knowledge of HRT's cardioprotective effects and the likelihood to use HRT?

REVIEW OF THE LITERATURE

Conceptual Definitions

Key concepts of this study are: *the cardioprotective effect of HRT, knowledge of HRT, and likelihood to use HRT.* These concepts will be defined and discussed briefly here to preface the information contained in a review of the literature.

The conceptual definition of the *cardioprotective effect of HRT* for this study would include the favorable effect on lipoproteins (both HDL and LDL cholesterol), improved vaso-motor and blood flow, inhibition of platelet aggregation, lowered blood pressure and improved insulin tolerance-all of which (when unfavorable) are risk factors for coronary heart disease.

The concept of HRT's cardioprotective effects has been discussed in various ways by many different authors. Grimes (1995) defines the cardioprotective effect of HRT by its impact on the lipid profile and the improved vasomotor effect and blood flow which is associated with HRT. There is a favorable increase in HDL cholesterol which is associated with the effects of HRT, while the unfavorable LDL level is reduced. Grady (1992) indicates the cardioprotective effect of HRT is enhanced by its favorable effect on altering thrombolitic mediators. Bowman (1991) cites the direct affects on coronary arteries as another of the cardioprotective effects of HRT. Dyer (1993) looks at the

inhibitory action which HRT has on platelet aggregation. MacPherson (1992) adds the possibility of improved blood flow, lower blood pressure and improved insulin tolerance to the protective nature of HRT on the heart.

As synthesized, *knowledge of HRT* in this study can be defined as any factual information about HRT risks and benefits as well as specific knowledge related to HRT's cardioprotective effects as it impacts the clients' decision to use or not to use HRT. Hormone Replacement Therapy (HRT) in this study includes both estrogen only (ERT) and combination therapy with estrogen and progestogen (PERT).

Knowledge is simply representative of the best explanation available-these are the explanations that people trust enough to act upon according to Dickson (1990). Ferguson, Hoegh, & Johnson (1989) define knowledge much broader and specific to hormone replacement as any of the elements that may influence a woman's decision to use post menopausal HRT. Another definition is offered by Hawthorn (1994) who defines knowledge as an individual's interpretive framework which operates within to assign meaning to lived events. This is a product of culture and socialization. Hunt (1989) expands on this definition to include a process in which current formulations become interactional objects in a social environment, which are molded in and by the circumstances in which they are employed as well as pre-existing conceptions.

The conceptual definition of the *likelihood to use HRT* in this study can be drawn from the following definitions to be any non-contraceptive use of hormone replacement for treatment of menopausal symptoms and/or to reduce the risk of osteoporosis or coronary heart disease in menopausal and post menopausal women.

Usage is defined in Webster's dictionary (1990) as a habitual or customary practice or procedure. This concept, when related to HRT, is viewed by Abrams (1992) as taking estrogen for several years rather than the several months it takes to relieve the hot flashes of menopause. Barrett-Connor, & Bush, (1991) cite that in the U.S. some form of estrogen replacement therapy is prescribed for more than one quarter of all post menopausal women and increasingly the prescription is given in the absence of or beyond the period of menopausal symptoms. Nachtigall (1990) defines usage as non-contraceptive estrogen replacement which includes transdermal as well as oral forms of estrogen.

The cardioprotective effect of HRT

Estrogen appears to exert significant influences on the cardiovascular system. These include estrogen's favorable effect on lipoproteins, direct affect on coronary arteries, platelet aggregation, favorably altering thrombotic mediators, as well as glucose, insulin, and blood pressure levels (Dyer, 1993, Grady, 1992, & Nabulsi et. al., 1993). Taken together, the epidemiologic evidence of a protective effect of estrogen replacement therapy against cardiovascular disease is compelling (Nabulsi et. al., 1993). While there is no general consensus as to why this protection occurs, the vast majority of studies indicate that postmenopausal estrogen use reduces cardiovascular disease (Nachtigall, 1990; Eaker, Johnson, Loop & Wenger, 1992).

Estrogen's role in prevention of heart disease appears to also be linked to the dilation effect it has on the micro vascular vessels of the heart. It has been shown that females have more episodes of vaso-spastic angina (Bancroft, 1994), this is due to the hypersensitivity of the nerves leading to the micro vessels which results in failure of the

vessels to dilate. The post menopausal woman may have an exacerbation of this due to the lack of estrogen and its role in vasodilatation. It is entirely possible that estrogen directly affects the coronary arteries as estrogen receptors have been found in the coronary and other arteries (Bowman, 1991).

Nabulsi et. al. (1993) used data from the Arteriosclerosis Risk in Communities study in a cross sectional analysis to examine the association of HRT with lipids, fasting concentrations of glucose, insulin, and blood pressure. This study found that users of HRT had higher levels of HDL, lower levels of LDL, fasting glucose and insulin, and higher triglycerides correlating to an estimated 42% reduction of CHD compared to non-users. This estimate assumed that the independent favorable effects on these CHD risk factors are additive and causal and that the associations between these changes and CHD risk in women are the same as those found in studies on men.

With increasing age there is a tendency toward increased levels of total cholesterol, however in the post menopausal woman, a large portion of this cholesterol appears to be low density lipoprotein (Miller & La Rose, 1991). Estrogen replacement acts on lipoproteins effectively increasing the relative level of high density lipoprotein while reducing low density lipoprotein (Ulrich, 1991). This is of importance in the post menopausal woman because of the inability of the body during this life phase to produce adequate amounts of natural estrogen.

The Grady study (Grady, et. al., 1992) concluded that estrogen therapy should probably be recommended for women who have had a hysterectomy or bilateral oppharectomy, as well as those with CHD or with a high risk of CHD. This study was a critical review of English-language literature published since 1970 covering the risks and

benefits of hormone therapy for asymptotic postmenopausal women. This conclusion was based on a meta analysis to pool estimates from various earlier studies to determine relative risks in hormone users for: endometrial cancer, breast cancer, coronary heart disease, osteoporosis, and stroke. The study used modified life table methods to estimate changes in life expectancy due to the use of HRT.

In an attempt to determine the primary cardioprotective benefits of estrogen use in postmenopausal women, the Postmenopausal Estrogen/Progestin Interventions (PEPI) Trial sought out to differentiate several biologically plausible mechanisms that have been proposed. This study was designed to measure the differences in high density lipoprotein cholesterol (HDL-C), fibrinogen, insulin, and blood pressure as primary heart disease risk factors in postmenopausal women treated with a placebo (control group), unopposed estrogen, or one of three combined estrogen/progestin hormone regimens. The PEPI Writing Group (1995), commenting on the results of the PEPI Study, found that up to one half of the apparent cardiovascular benefit observed in estrogen-treated women may be mediated by the higher levels of HDL-C. Unopposed estrogens had a favorable effect of both increasing HDL-C and lowering low density lipoprotein cholesterol (LDL-C) levels by 10%-15% when compared to pre-study levels (PEPI, 1995). The PEPI study is a well thought out, randomized, double-blind, placebo-controlled trial that yielded significant results. Conclusions related to reduced risk of CHD in these women are based on assumptions that increased HDL-C and decreased LDL-C are as important heart disease risk factors for women as they have been shown to be in men. If it is indeed true, then the fact that estrogen is more effective than medications specifically formulated to treat

hypercholesteroliemia by favorably affecting lipid profiles is significant (Bowman, 1991).

Because of the strong link to endometrial cancers, the use of progestins in combination therapy appears prudent in women who have an intact uterus even though the addition of progestin appears to attenuate some of the lipoprotein benefits of estrogen and may increase risk of side effects (Martin & Freeman, 1993). Even though cancer is a serious complication of any therapy, it ranks less than heart disease as a cause of mortality or morbidity. In 1983, there were 26.6 hospitalizations for ischemic heart disease per 1,000 women 55 years of age and older in the U.S. compared with 1.3 hospitalizations for endometrial cancer in the same population (Barrett-Connor, & Bush, 1991). The prevention of heart disease would have far greater consequences for morbidity and mortality than the expected increase in endometrial cancer risk. HRT use even has a favorable benefit with regards to endometrial cancer. Estrogen-associated endometrial cancer is better differentiated, less invasive at diagnosis, and less often fatal than endometrial cancer occurring in women who have not used HRT (Barrett-Connor, 1989).

Summary

Taken all together, the cardioprotective benefits of estrogen have been associated in a 33% to 50% reduction in the rate of heart disease and mortality from heart disease in estrogen users when compared to that in non-users (Bowman, 1991). It has also been shown to reduce the risk of a second heart attack for those who already have CHD (Grady et. al., 1992). These results remained significant after correcting for all known cardiac risk factors but not after correction for blood lipid levels (Lush, 1992). These results are particularly important when considering women with premature surgical menopause who

have a 2.2 fold increase in their relative risk of developing coronary artery disease. This increased risk may be reduced to normal by HRT (McKeon, 1990).

In total, the evidence suggesting that the unopposed oral estrogen reduces the risk of cardiovascular disease is strong, fairly consistent, biologically plausible, and clinically proven (Barrett-Connor, & Bush, 1991). The magnitude of the cardioprotective benefit is significant and in excess of any general risk. While individual risk factors need to be examined, it would be wise to consider the use of HRT in most if not all postmenopausal women.

Knowledge of the significant reduction of common CHD risk factors as well as the potential for increased risks for other health disorders in women taking HRT can have a strong influence on a woman's likelihood to use HRT. Through educator and advocate roles of the Advanced Practice Nurse (APN), the misconceptions and areas of uncertainty may be dispelled allowing for more rational decision making on the part of the client.

Risks and Benefits of HRT

Every woman's situation is different and every individual's risk profile and personal values are unique. A woman's assessment of the risks and benefits of HRT is likely to depend on her risk status. Thus, each women should participate in the decision concerning preventative therapy with hormones. The following Table 1 lists the more common risks and benefits related to the use of hormone replacement.

Table 1
HRT Risks & Benefits

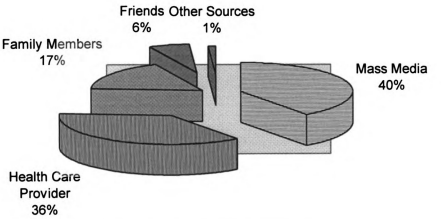
Risks/Side Effects	Benefits
Increased endometrial cancer (Estrogen only)	Decreased heart disease
Coagulation disorder & thrombosis	Decreased risk of Osteoporosis
Possible increase breast cancer	Alleviation of urogenital atrophy
Bleeding, bloating, weight gain	Alleviation of vasomotor instability

Summary

The effect of HRT therapy on quality of life may be the single most important consideration for women and must be discussed and understood (Grady et. al., 1992). Certain other benefits such as preservation of urinary and sexual function, reduction of osteoporosis risk, prevention of skin aging, and the general sense of well-being might be more important to some women than the prevention of cardiovascular disease and possible premature death. Similarly, drawbacks to HRT such as resumption of vaginal bleeding, the need for regular health care visits and endometrial monitoring, the need to take daily medication, and the fear of cancer might outweigh the cardioprotective benefits. The fear of cancer is a real one but the elevated risk of endometrial cancer in HRT users must be weighed against the beneficial effects of HRT on morbidity and mortality from CHD.

Variables influencing likelihood to take HRT

Information on health care is plentiful and it comes from many sources-some less credible than others but curiously more believable than the health care provider. How people weigh and combine the information that they have access to make a judgment about a specific treatment regimen varies considerably. Figure 2 shows the mix of information that women typically cite as sources for health care information. Mass media (newspaper, magazines, television, radio, and on-line information) was found to be the most likely source. Without the ability to question the information as is the case with the personal interaction with a health care provider, family member, or friend, mass media as a credible source of technical information is seriously lacking. People must draw on their knowledge gained from these varied sources to generate hypotheses about predictive factors, to weigh and integrate them into their situation and particular health care beliefs. Only when fully informed, can it be said that the woman made a knowledgeable decision.

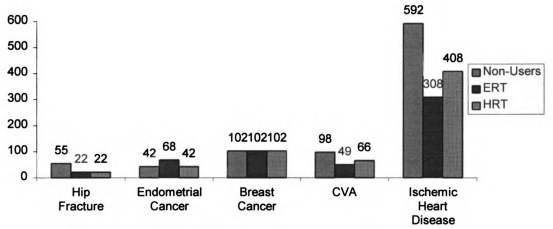


Sources of Health Care Information

Figure 2

from Wallis, 1992

Helping women make an informed decision regarding hormone therapy is complex. The overall effect of taking HRT is probably to increase life expectancy and decrease the lifetime probability of CHD and hip fracture when compared to non-users of HRT. Imparting knowledge takes more than spreading information though, information without understanding provides little guidance to the patient. Ideally, the woman should understand the likely changes in her risk for various diseases and the expected change in her life expectancy due to hormone therapy (Figure 3 below).



Mortality per 100,000 Post Menopausal Women

Figure 3

Adapted from Stampfer, 1991

Given the proven cardiovascular benefits of HRT and the fact that coronary heart disease is the leading cause of death among postmenopausal women, even a minor change in CHD risk could affect the life expectancy of a very large number of women in the United States alone (Rothert et. al., 1992). If estrogen's cardiovascular protection is truly of the magnitude seen in many observational studies and most recently the PEPI study, a 50% reduction in cardiac deaths would be expected to surpass the possible risk of

endometrial or breast cancer and the benefit of fewer osteoporotic fractures in postmenopausal women (PEPI Writing Group, 1995).

For a 50 year old woman, the life time risk base rates for the following diseases along with the relative risks for incidence for HRT users according to Grady et. al. (1992) are as follows in Table 2. Usage of HRT influences a woman's relative risk of having a particular disease. For instance, a relative risk of .65 represents an average 35% reduction in life time risk of CHD. The incidence of endometrial cancer in users of HRT is 8.22 times that of non-users or an effective increase in life time risk of 722%- a far greater change in percentage but still far fewer than the *number* of women who have CHD.

Table 2
Base Rates for Disease in Menopausal Women

	Incidence	Death Rate	HRT Users' Relative Risk #
CHD	46%	31%	.65
Stroke	20%	8%	.96
Breast Cancer	10%	3%	1.01 *
Hip Fracture	15%	1.5%	.75
Endometrial Cancer	2.6%	.3%	8.22

* Inconsistent data and large variance for long term users
# Relative Risk of 1.00 represents No Change in risk for a particular disease for HRT users. Relative Risk less than 1.00 represents a Decrease in risk while numbers greater than 1.00 represent an Increase in risk among users of HRT.

Adapted from Grady, et. al., 1992

Failure to integrate comprehensive risk factor modification into standard patient care provided primarily reflects the lack of an organizational framework or system to deliver the care (DeBusk, et. al., 1994). Each of these diseases are a major source of mortality in adult women making it crucial to determine the net effect of HRT on

mortality and if therapy is the right choice. The best treatment regimen for the prevention of coronary heart disease is the safest regimen with the most benefits on heart disease risk factors (PEPI Writing Group, 1995).

Patients typically report that they desire more information from their primary care providers (Beisecker & Beisecker, 1990), but may not assertively let their desires be know to the provider. This information-seeking varies widely during health care encounters (Beisecker & Beisecker, 1990). Assessing the patient's beliefs about the nature of menopause would be a reasonable place to start educating a patient. However, it is important to recognize that some women may not be willing to change their beliefs (Ferguson, Hoegh, & Johnson, 1989).

In a study assessing women's attitudes toward estrogen replacement intended to examine elements that might influence a woman's decision to use postmenopausal HRT, Feguson, Hoegh, & Johnson (1989) suggest that a systematic educational approach could influence a woman's willingness to take HRT. This conclusion was based on results which showed that women taking HRT were more likely to know that decreased estrogen levels lead to osteoporosis, to perceive the menopause as a medical condition, and to take HRT for hot flashes. The study also found that women taking HRT believed that the benefits outweighed the risks.

Women are more interested and involved in their health than ever before, yet there is a deficit of information available to them, which is due primarily to the lack of research conducted on women in mid-life (Nachtigall, 1990). This interest about women and their health developed out of the women's health movement, a component of the women's

movement. Also, the increasing numbers of active, well educated women over 50 years of age has helped to force many women's issues into the forefront.

Many more millions of American women might choose to take HRT if more of their primary care providers were willing and able to educate women regarding the tradeoffs of HRT, and support the decision making process to take estrogen for several years rather than the several months it takes to relieve the hot flashes of menopause. The two reasons most patients cite for their unwillingness to accept much more than short-term estrogen therapy are fear of endometrial and breast cancer and uterine bleeding that HRT usually evokes (Abrams, 1992). Recent studies suggest that the increased risk of breast cancer with HRT is minimal at worst. Endometrial cancer risk, while substantially greater in women using HRT, is much less of an absolute risk than CHD to postmenopausal women.

Despite the widespread use of prescription medicines, patients' knowledge about what they take is often inadequate. Even when information is given verbally it is often forgotten or misunderstood (Gibbs, Walters, & George, 1989). While the health benefit-to-risk ratio may favor prophylactic HRT for many women, clinical experience suggests that many women are reluctant to take estrogen even when the provider carefully explains HRT's benefits (Ferguson, Hoegh, & Johnson, 1989). Women may be reluctant to take long-term HRT because they think it is inconvenient, they fear the possible cancer risks, or because they do not understand its potential benefits and don't have a clear sense of negatives and resulting tradeoffs involved. The health care provider must examine elements that might influence a woman's decision to use postmenopausal HRT. Women taking HRT are far more likely than those not taking HRT or those who had not gone

through menopause to believe that women should be on a HRT regimen if they experienced distressing menopausal symptoms (Ferguson, Hoegh, & Johnson, 1989).

Knowledge is fallible. It merely represents the best explanations available that people can trust enough to act (Dickson, 1990). This definition came out of Dickson's (1990) study that compared historical, medical literature on the scientific disclosures on menopause with modern postmenopausal women's interpretation of menopause. The study found that socialization leads to different perspectives on aging in general and menopausal women specifically. Through this socialization, women come to expect certain symptoms to result from this natural stage of life rather than their actual experiences related to it. These women viewed menopause as "a beginning of a new life, of feeling great, of being wonderful, and enjoying their lives" rather than as a disease state or deficiency (Dickson, 1990). However, these same women wondered why they were coping so well and when the negative symptoms that they were told to expect would appear. This study compared nearly 100 years of medical definitions to the views of only 11 women recruited from a single source which resulted in a very homogenous sample. Such a small sample of women can hardly be generalized to the entire population of postmenopausal women. Dickson does, however, bring up significant issues related to the past research and the impact of culture on perspectives related to menopause.

Understanding a patient's perspective requires acknowledging their interpretive framework which helps to assign meaning to lived events (Kennedy, Probart, & Dorman, 1991). Considering the influence of culture and socialization, one patient's interpretive framework is likely to differ significantly from other patients even under apparently similar circumstances. The patients' current health care decisions are made in a social

environment which directly influences the patients' perspective (values and beliefs). The patients' relationship with the health care provider is but one of the many social interactions that the patient may use to help decide the best course to take regarding HRT. The understanding of menopause and coronary heart disease that people hold prior to the encounter influences their responses to a health care provider's recommendations.

The health care provider must examine elements that might influence a woman's decision to use postmenopausal HRT. Women taking HRT were far more likely than those not taking HRT or those who had not gone through menopause to believe that women should be on an HRT regimen if they experienced distressing menopausal symptoms (Ferguson, Hoegh, & Johnson, 1989). Results from this study also suggest that a systematic educational approach could influence a woman's willingness to take HRT. This conclusion was based on results which showed that women taking HRT were more likely to know that decreased estrogen levels lead to osteoporosis symptoms (Ferguson, Hoegh, & Johnson, 1989).

Individuals tend to interpret the biomedical explanations provided to them in ways which make sense in terms of their particular understandings or level of knowledge on the topic. When asked after an encounter with a health care provider, patients often give distinctly different answers to questions about their understanding of the explanation given (Kennedy, Probart, & Dorman, 1991). The information, although well understood, was not equivalent to how they interpreted, elaborated and integrated it into their prior concepts of menopause, HRT, and coronary heart disease. The health care provider's recommendations are not simply accepted or rejected as explanations for symptoms, it is how those explanations are transformed into the related concepts employed prior to

consultation with the health care provider that guides the decision making process (Hunt, Jordan, & Harris, 1989).

Given the asymptotic nature of coronary heart disease in its early stages, the need for and benefit of hormone additive therapy is better understood by the patient if one can see or measure improvement in their condition. Documentation and subsequent improvement in a specific parameter such as serum cholesterol can be an incentive for behaviors which may enhance a woman's health (Notelovitz, 1989).

Summary

Coronary heart disease has only recently been acknowledged as the primary killer of women. There are now important findings for post menopausal women showing that there is a method to significantly reduce their risk and decrease the mortality rate associated with coronary heart disease. Several large studies over the last five years are providing a growing body of evidence supporting the use of hormone replacement in post menopausal women. Women must be fully informed of these scientific findings so that they can make knowledgeable decisions regarding their own health care. By providing them with the information and helping them to understand the ramifications, they will be better suited to make decisions with the assistance of their health care provider with fully informed consent.

The patients' relationship with the health care provider is but one of the many social interactions that the patient may use to help her decide the best course to take regarding HRT. The understanding of menopause and coronary heart disease that people hold prior to the encounter influences their responses to a health care provider's recommendations. Underlying beliefs may render ineffective an otherwise effective educational program

when the only outcome measured is usage of HRT. Assessing the patient's beliefs about the nature of menopause would be a reasonable place to start educating a patient.

Critique of the Literature

While there is a large body of literature covering the cardioprotective effects of HRT use in menopausal women, research is lacking which addresses women's knowledge of this very significant benefit and the relationship of this knowledge to women's likelihood to use or not to use HRT. Data have established CHD as the primary killer of menopausal women. How women base their decisions to use or not to use HRT incorporating this knowledge into their particular situations and considering other health risk factors and personal values needs further evaluation.

The Grady et. al (1992) study helped to bring together results from many studies on the risks and benefits of using HRT. However, analyses such as this one tend to fall prey to inaccuracies inherent in the original studies. One weakness cited in the study was the question of quality of life changes-both positive and negative ones that HRT may help create. The authors cover most of the study's significant weaknesses such as the inconsistencies related to breast cancer as well as the need for additional study to evaluate more accurately the variables and the possible impact of long term use of HRT.

Nabulshi and colleagues (1993) make broad assumptions regarding the independent favorable effects of HRT and their additive factors. These assumptions weaken the reliability of the study's conclusion. Also, as the authors cite, this was not a randomized study and therefore may have been subject to selection bias related to hormone replacement.

The PEPI Study (1995) is promising not only because of its findings but due to the simple fact that such a dedicated and relatively large scale study of significant women's health care issues was being done at all. Recognizing that it has only provided intermediate data at this point, it is still too early to draw any far reaching conclusions about the long term benefits and risks associated with HRT.

Short term studies with poor samples highlight the methodological shortcomings in the literature. Sample selection, either through convenience or design, has been dominated by rather well educated, white women from households with medium to high incomes. Studies which include women of color, poor, and less educated women need to be complete before any generalizations about the appropriateness of wide spread recommendations for use can be made.

Proposed Study

The purpose of this study is to determine the relationship of knowledge of the risks and benefits of HRT and women's likelihood to take HRT. The relationship of knowledge of HRT's cardioprotective effects and women's likelihood to take HRT will also be evaluated. While substantial information about the cardioprotective effects of HRT is now available, few if any studies have been done to examine the impact of this knowledge on women's likelihood to utilize HRT for the purpose of reducing their risk of CHD.

Conceptual Framework

Nola Pender's Health Promotion Model will be used to form the basic conceptual framework to describe and analyze the relationship of knowledge of HRT's general benefits and risks, its cardioprotective effects, and menopausal women's likelihood to use

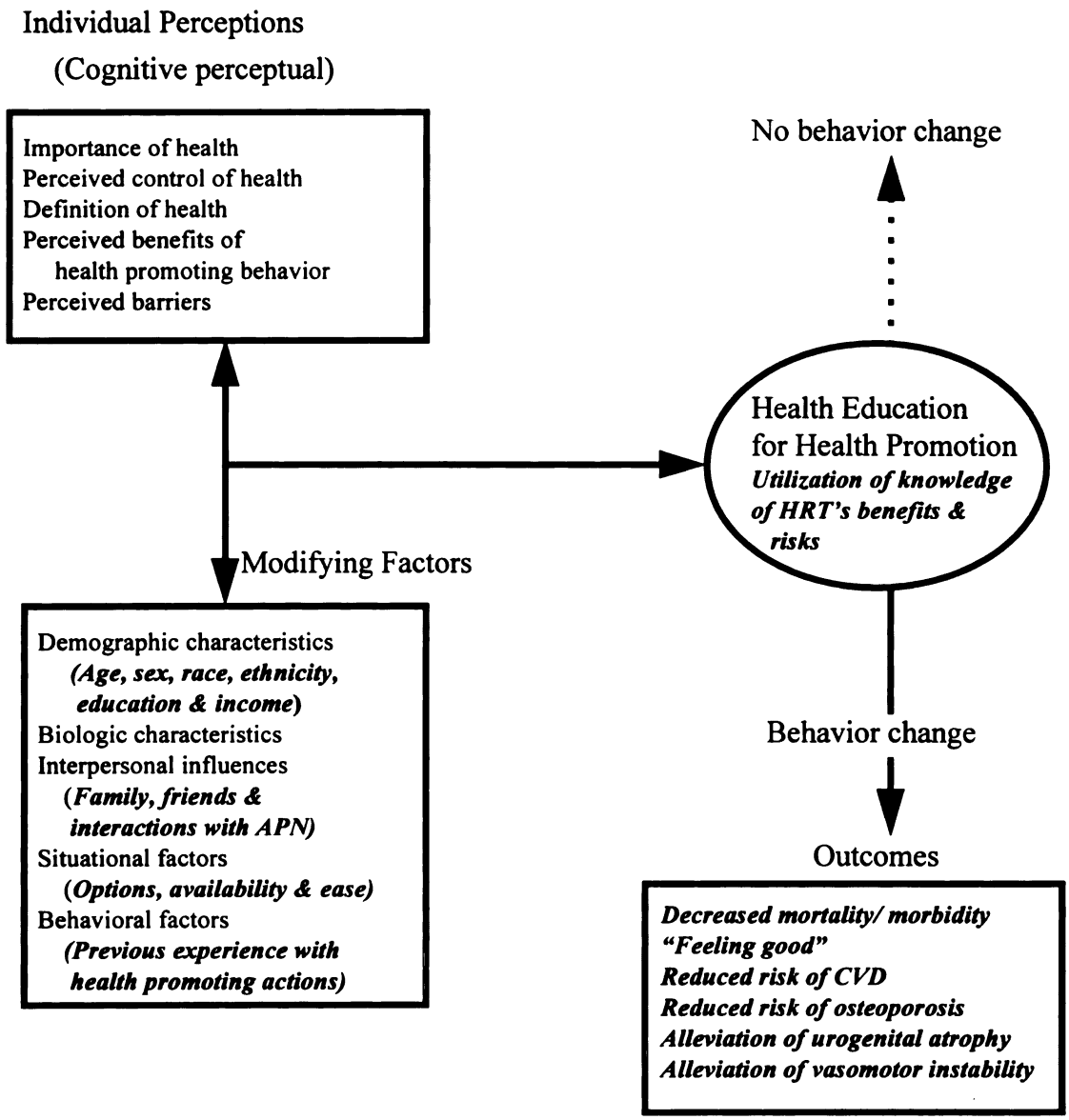
HRT. Pender's Health Promotion Model focuses on factors which affect health behavior and outcomes of self-care education (Ellis & Kanusky, 1996). The model is derived from the Social Learning Theory which stresses the importance of cognitive mediating processes in the regulation of behavior (Pender, 1987). In the Health Promotion Model, cognitive perceptual (individual) factors are seen as primary motivational mechanisms. These are individual perceptions, unique to each woman.

Pender views the value of health as a key motivational factor (Pender, Walker, Sechrist, & Stomborg, 1988). The personal value placed on enhancing health status seems to affect the frequency and intensity with which health promoting behaviors are practiced. Perceiving oneself to be in control as well as possessing a strong desire for control can result in health promoting behaviors (Pender, 1987). Health promoting behaviors are continuous activities which compose an integral part of the individual's life style. These behaviors depict the individual acting on their environment as one progresses toward higher levels of health. Through education, old patterns of behavior can be abandoned and new patterns learned to enhance health and well being.

Once health is defined as a positive construct, the nature of behaviors can be directed toward maintaining health. The definition of health to which one subscribes is likely to influence the extent to which the individual engages in health promoting behavior (Pender, Walker, Sechrist, & Stomborg, 1988). The perceived benefits of health promoting behaviors affect the level of participation (Pender, 1987). "Feeling good" may be a source of motivation for taking actions that increase personal health status. Barriers to health promoting behavior may be real or imagined and consist of perceptions

concerning the unavailability, inconvenience, or difficulty of a particular health promoting option. This is graphically illustrated in Figure 4.

Just as exercise and healthy eating habits throughout life can be shown to be beneficial to one's health (but not followed by too many), the use of HRT in postmenopausal women can be equally beneficial with regards to their cardiovascular health. While the simplicity of the HRT regimen makes following it much easier and less of a commitment than other methods of reducing health risks, it is often the perceived risks and potential side-effects which sometimes surface that have more impact on the woman's decision to use or not to use HRT. Women should do all in their power to minimize the potential for disease-both cardiovascular and cancer, by utilizing all tools available to them. This would include assessing the usefulness of HRT as a preventive agent, periodic check-ups including mammograms and Pap smears, and a generally healthy life style.



Health Promotion Model
Figure 4

Adapted from Pender, 1989
adaptations in bold italics

The individual is the focus of the model here. Each person is uniquely expressed by their own pattern of perceptions and modifying factors. The model represents the interrelationships between cognitive-perceptual and modifying factors influencing menopausal women's health promoting behaviors through utilization of knowledge of HRT's risks and benefits. The APN is in an optimal position to present a broad picture of personal risks and benefits of HRT and to empower women's understanding of this complex health issue through education.

The woman's decision to make a change in health promoting behavior (in this case, use HRT) may be for one or more personal goals. Outcomes that the client may have as primary goals may include: reducing the risk of CHD; minimizing the risk of osteoporisis; or relief from menopausal symptoms such as hot flashes.

Rational for Study

This research will study whether or not menopausal women's knowledge regarding HRT's risks and benefits, CHD, and HRT's cardioprotective effects will have significant influence on their likelihood to use HRT. Literature is lacking which examines the impact of knowledge on menopausal women's likelihood to use HRT. Current health seeking behavior can be seen as a result of the balancing of personally acknowledged future health risk factors. Data from the Decision Making in Menopause Study (Rothert et. al., 1992) will be utilized to investigate the significance of knowledge of HRT's benefits and risks as well as specific knowledge of CHD and the use of HRT.

Purpose

This study will examine the effects of women's knowledge of HRT's risks and benefits and of HRT's role in prevention of CHD and the impact of this knowledge on the use of HRT in menopausal women.

Hypothesis

This study will test the hypothesis:

1. Women who score higher on knowledge regarding HRT will report that they are more likely to use HRT.

2. Women who score higher on knowledge specific to CHD and HRT's cardioprotective effects will report that they are more likely to take HRT than those who score lower on cardiac specific knowledge.

METHODS

Main Study

An experimental study by M. Rothert, D. Rovner, M. Holmes-Rovner, J. Kroll, L. Breer, G. Talarczyk, N. Schmitt, & G. Padonu from Michigan State University entitled study "Decision Making in Menopause Study", (1992) (grant number NR01245-04A2 funded by National Institute for Nursing Research) will be the basis for this new study. The instrument for the original study was a questionnaire made up of six separately identified measurement sections which incorporated a total of 143 questions.

This was a true experimental design which utilized nurses as facilitators in educational and decision support interventions. Participants were randomly assigned to one of the three groups. The independent variable of the study was knowledge and the dependent variables were decision making and satisfaction. Data were evaluated pre (T1), and immediately post intervention (T2), at six months (T3) and twelve months (T4) post intervention. Instruments included a questionnaire of six sections which was composed of both multiple choice and true/ false questions.

Sample

The sample for the current study is the same that was used for the larger study. The sample consists of 201 women age 40-65 (mean age of 51) who were recruited for the study via media as a convenience sample from the Mid-Michigan area. No attempts were

made to exclude women due to menopausal status, hysterectomy or current medication use. Intervention sessions were attended by two hundred fifty two of the women. Some of the post menopausal women left the study during this phase. The small number of African American women in the study had a higher percent of attrition. Most of the participants were white (94%), college educated (49%), with yearly household incomes from $15,000 to $99,999. Fifty-eight percent had or were currently having menopausal symptoms. Women who were unsure if they were experiencing symptoms amounted to 24% of the sample. Seventeen percent of the women had menstruated irregularly over the previous twelve months and 24% had not menstruated for at least twelve months. Participants completed consent forms and written questionnaires at the beginning of the larger study.

Procedure for Protection of Human Rights

Prior to beginning the main study, the subjects each signed a consent form. The consent described the nature of the study, the time frame, and expectations. Participants were free to withdraw from the original study at any time without retributions. Participants of the original study were assigned a code number instead of using names to identify subjects throughout the study. All data was to be released in aggregate form only. This study has been approved by Michigan States University Committee on Research Involving Human Subjects (UCRIHS) before the research began.

Operational Definitions

1. Menopause is used to describe the stage in a woman's life marked by the absence of a period for six to twelve months. It is a physiologic cessation of menses as a result of decreased ovarian function (Miller, Ravnikar, & Timmons, 1990). For the purpose of this

study, premenopausal, perimenopausal and postmenopausal women with a mean age of fifty will be considered as participants to study mid-life issues including menopause.

2. *Knowledge* is the state or fact of knowing; familiarity, awareness, or understanding gained through experience or study; the sum or range of what has been perceived, discovered, or learned; specific information about something (Webster's, 1990). As used here, knowledge is measured by a potential score of 0 to 24 for overall knowledge of HRT's risks and benefits and a score of 0 to 6 for knowledge specific to HRT's cardioprotective effects. These scores correspond to the number of correct responses to questions related to a basic understanding of HRT, and correct responses to a subset of questions related to the role that HRT can play in the reduction of risk of cardiac disease in menopausal women.

3. *Hormone replacement therapy* (HRT) is used to cover both the use of estrogen only (ERT) and estrogen used in combination with progestin (PERT) by menopausal women to alleviate a number of symptoms common to menopausal women or to reduce risks associated with the decrease in estrogen production.

4. *Coronary heart disease* (CHD) is used to cover any of a number of disease states involving the heart and vascular system. Includes, but is not limited to: myocardial infarction, embolism, arteriosclerosis, angina, and other diseases.

Data Collection Instruments

The Knowledge scale (Appendix 1) from which data for this study was extracted includes a total of 24 multiple choice and true/false questions. The questions assess the participants' level of understanding of menopause and its symptoms, the various risk factors associated with this stage of life, risks and benefits associated with HRT, and self-

care issues related to menopause. This particular section of the instrument had an alpha coefficient = .85. The total score of correct responses to all of the questions from this section will be utilized to represent the woman's level of overall knowledge of HRT's risks and benefits.

A sub-scale of six questions from the Knowledge section of the questionnaire was utilized to identify knowledge of hormone replacement therapy options and cardiac risk for menopausal women (Appendix 2). Questions numbered 71, 77, 78, 81, 90, and 92 will comprise the sub-scale with each question weighted equally. This data was used to determine the association between the level of knowledge of HRT's cardioprotective effect and the likelihood to use of HRT. Numerical scores will be assigned to quantitatively determine the respondents' level of knowledge using the number of correct responses to the six selected questions.

A woman's likelihood to use HRT was measured from participants' responses to two specific questions from the Health Background section of the questionnaire. These questions are:

How likely are you to take estrogen replacement therapy (ERT)?

How likely are you to take estrogen/progestogen combined therapy (PERT).

A "likelihood to use HRT" score was calculated by taking the highest value for *either* likelihood to use ERT or likelihood to use PERT for each participant. This makes sense for this analysis since it gives credit to personal preference of one regimen or the other. The results are shown as a single new variable "likelihood to use HRT" in order to quantify participants' overall likelihood to use either therapy.

Design

A secondary analysis was done using the data from the original study the "Decision Making in Menopause Study" (grant number NR01245-04A2) funded by National Institute for Nursing Research. This study will use a descriptive correlational design utilizing data from all participants (N=252) of the "Decision Making in Menopause Study". This study will look at the data collected (Time 4) 12 months post intervention to examine if there is a significant relationship between the likelihood to utilize HRT and the overall knowledge of HRT's benefits and risks. It will also examine the relationship of the knowledge of cardioprotective effects of HRT and the likelihood of taking HRT.

Scoring

Values were assigned to each response for the multiple choice based solely on the correct response to the question. Multiple choice questions had up to six responses. The correct response was assigned the value = 1 while all the other choices were given the value of = 0. True/false questions were assigned values as follows: correct response = 1, incorrect response = 0.

Data Analysis

Analysis using Pearson's r statistical method was used to determine if there is a significant relationship between: (1) the independent variable, knowledge of risks and benefits of HRT as measured by the total Knowledge instrument, and the dependent variable-women's likelihood to use HRT and (2) the independent variable, knowledge of the cardioprotective benefits of HRT as measured by the sub scale of 6 questions, and the dependent variable, the likelihood to use or not to use hormone replacement. Women's likelihood to use or not to use hormone replacement was measured by responses to two

specific questions from the demographic portion of the questionnaire. The level of significance was set to $p \leq 0.05$.

RESULTS

Of the 252 participants entering the study, there were only 201 completed questionnaires returned representing a 20% attrition rate over a twelve month period. Cronbach's alpha for the Knowledge Section of the questionnaire was .85 which indicates high internal reliability.

Participants were asked to respond to a combination of 24 multiple choice and true/false questions intended to measure their knowledge of HRT. Responses were recoded to 1 = correct response and 0 = all incorrect responses to facilitate the consistent scoring of the two types of questions. From this recoding, a knowledge score was calculated for all participants for overall HRT knowledge. Knowledge of HRT's cardioprotective effects was measured by evaluating scores from six specific questions in the sub scale. Two separate questions asked the participants to rate their intentions to use either ERT or PERT along a five item scale from very certain not to use HRT to very certain to use HRT. A scale was used to score these five items. Scores from 5 "very certain to use" to a score of 1 "very certain not to use" were assigned.

Descriptive results from this study are shown below in Table 3.

Table 3
Statistical Output

Variable	Mean	Median	Mode	Range
Knowledge	20.80	21	22	13
Cardioprotective Knowledge	5.20	6	6	5
Likelihood to use HRT	3.83	4	5	4

The mean score on the Knowledge scale was 20.80 on a 24 point scale, with a standard deviation of 2.7 and a range of 13. The median score was 21, with the mode being 22. This reflects a strong understanding of the benefits and risks of HRT.

The Knowledge of Cardioprotective effects of HRT sub scale similarly reflects good understanding by participants having a mean of score of 5.2 on a 6 point scale. The median and mode here were both 6 with a standard deviation of 1.04.

The Likelihood to use HRT had a mean score of 3.8 on a 5 point scale. The median score was 4, and the mode was 5. The range of scores for this variable covered the fullest possible range from 1 (very certain not to take either ERT or PERT) to 5 (very certain to take either ERT or PERT).

A correlation coefficient (Pearson's r) was then computed for the knowledge of HRT's benefits and risk as a predictor of Likelihood to use either ERT or PERT (HRT) ($r = .194$, $df\ 200$, $p = .006$). This is a small but statistically significant relationship at the targeted .05 level of confidence and signifies a positive correlation. This shows that menopausal women with higher levels of knowledge of HRT's risks and benefits express a stronger likelihood to use HRT than those women who scored lower on the knowledge scale.

The correlation coefficient (Pearson's r) for Likelihood to use HRT and Knowledge of HRT's cardioprotective effects was r = .103, df 200, p = .147. The data from this study suggests a positive relationship between the two variables, but does not prove significant at the targeted level of confidence of .05 (p= .147).

Variables were split to examine the likelihood to use ERT and PERT independently. It was found that knowledge of HRT's cardioprotective effects had little effect on either of the items. However, overall knowledge of risks and benefits of HRT and likelihood to use ERT did show a positive correlation with a r =.148 and p = .037.

Some significant and surprising demographic influences were seen when examining the results. Likelihood to use HRT was negatively correlated (varied inversely) to the participants' level of education (r = -.122 at p=.084). Likelihood to use HRT declined as the women's age increased (r = -.148 at p = .036), as it also did for women with a past history of either oophorectomy or hysterectomy (r = -.199 and p = .005 & r = -.152 and p = .031).

DISCUSSION

The results of this study present some interesting information. Hypothesis 1 for this study, women who score higher on knowledge regarding HRT will report that they are likely to use HRT was weakly supported by the data collected. Hypothesis 2, women who score higher on knowledge specific to CHD and HRT's cardioprotective effects will express that they are more likely to take HRT than those who score lower on cardiac specific was not supported. The restricted range of possible scores being only six and the limited variability of the actual scores may explain the lack of significance here. Over one half of the women scored a perfect score of 6 and better than 80% scored 5 or 6. While there was a statistically significant positive correlation between HRT use and overall knowledge of risks and benefits, HRT use in menopausal women can hardly be predicted solely from their knowledge level of either the overall risks and benefits or knowledge of HRT's cardioprotective effects.

Several sub scale analyses did provide interesting information when looking at specific demographic groups. The fact that there was no significant relationship between the women's level of education and the likelihood to use was contrary to the anticipated result. Results are shown below in Table 4.

Table 4
Education and Likelihood to Use HRT

Highest level of education	n	Mean Likelihood to use HRT
High School graduate	n=16	3.938
Greater than 12 but no degree	n=53	4.019
Technical Trade/Community College	n=25	3.560
Bachelors Degree	n=52	3.904
Masters Degrees	n=37	3.919
Ph.D./Professional Degree	n=16	3.313
Other	n=2	2.000
51 missing		

Given the strong evidence supporting HRT use as a tool to reduce overall mortality and morbidity in menopausal women, it was expected that the level of education would correspond to an increase in knowledge (it did with r = .1947 and p = .006) and therefore increase the likelihood to use HRT. Instead, no significant impact on the likelihood to use HRT was revealed by the actual data. The fact that the original study took place prior to the publicity of the preventive notion of HRT may explain the lack of correlation here.

Not surprising was the negative correlation between likelihood to use HRT and the women's age. Younger women in the sample (those aged 40-45 and 46-50) scored essentially equal with other age groups in level of knowledge for both scales yet expressed a significantly higher likelihood to use HRT than the older participants suggesting a generation difference in acceptance of HRT or the possibility that women were experiencing menopausal symptoms. The small numbers of women over the age of 55 (7) is a considerable limitation to this conclusion. Scores are shown below in Table 5.

Table 5
Knowledge and Likelihood by Age Group

Age Group	Mean Knowledge Score	Mean Cardioprotective Knowledge Score	Mean Likelihood to Use HRT
40-45 n=62	20.85	5.16	3.919
46-50 n=84	20.71	5.24	3.952
51-55 n=48	20.90	5.17	3.625
56-60 n=5	21.00	5.20	3.200
61-65 n=2	19.50	5.50	2.500
51 missing			

Women who have had either an oophorectory or hysterectomy were negatively correlated with ERT use. The correlation between cancer and likelihood to use PERT was significant at $r = .2359$ $p = .001$. This is both predictable and surprising. Women who have had an oophorectomy probably did so because of either a diagnosis of cancer or possible cancer. With an intact uterus, it would be wise for this group to consider PERT given ERT's association with uterine cancer. However, for women who have had a hysterectomy this should not be a concern as endometrial cancer is not possible. Standard practice is more often to prescribe ERT for women post hysterectomy. ERT's cardioprotective benefits are mitigated somewhat by the addition of progestogens with no discernible added benefit for these women.

The final demographic group that will be discussed is that of women with a history of heart disease. While this is a very small group in the sample (6/201), their responses to likelihood to use HRT were surprising. This group scored essentially no correlation to likelihood ($r = .002$ and $p = .978$). The age group that made up the total sample was

heavily weighted to the under 50 group (146/201) which is younger than the average onset of symptomatic CHD in women and would explain the small number of participants with heart disease. For those few women who did report past history of heart disease, it might be expected that they would have been strongly encouraged by their health care provider to use HRT for its cardioprotective effects. However, the original study was conducted prior to the publicized cardioprotective effects of HRT which may account for these results.

Summary

The first hypothesis, that women who score higher on knowledge regarding HRT will be more likely to use HRT was supported by the data from this study. The second hypothesis, that women who score higher on knowledge specific to CHD and HRT's cardioprotective effects will express that they are more likely to take HRT than those who score lower on cardiac specific knowledge was not supported. High scores from both the knowledge scale and cardioprotective knowledge sub scale showed too little variance to adequately draw conclusions about the impact of knowledge on women's likelihood to use HRT. The statistically significant positive correlation between women's overall knowledge and likelihood to use HRT suggests that the question needs to be studied further.

Application of Conceptual Framework

The conceptual framework presented earlier in this study suggested that each person is unique in the way that they develop their own pattern of perceptions and modifying factors. The complex and forever changing inter-relationships between these factors influence women's health promoting behavior as does their personal definition of what

health is. The data from this study is testimony to the high degree of variability in women's decision making processes. This study could not take into account the personal reasons or rationale for each of the participants decisions regarding their likelihood to use HRT without in-depth personal interviews of each woman-the output from which would have been impossible to analyze statistically. In daily practice, however, the Advance Practice Nurse can seek to understand the underlying reasons, personal perceptions, and fears that the patient brings with them to help them make the correct decision considering their own circumstances.

Limitations

Among the limitations to this study is the use of a tool which was not specifically designed to measure the relationship of knowledge to the likelihood to participate in a health promotion behavior. A source of error in measurement of knowledge lies in social desirability (Brink, & Wood, 1994). Social desirability is defined as the subject responding with what they feel is the positive social response whether it be true or not. The knowledge portion of the questionnaire utilized fixed alternative multiple choice questions along with the true/false questions. When the subject is asked to choose one of the given alternatives as is the case in this type of questioning, there is chance for the subject to guess at the socially correct response (Brink, & Wood, 1994). These standardized questions are necessary however, to ensure that the subjects' answers can be compared objectively.

The use of a non-probability sample as is the convenience sample of this study, allows for bias. The sample used being relatively homogenous may not be truly representative. Minorities were not excluded; however the demographics do not prove to include a high

minority population. This may limit generalizability to women of color and also to other socio-economic groups (Brink, & Wood, 1994).

Cardioprotective effects of HRT were not a major focus of the knowledge questionnaire, which is also a limitation of this study. The focus of the items in the knowledge questionnaire were more of general knowledge of risks and benefits of HRT. Few questions touched on the broad aspects of HRT's association to cardiovascular protection. This limits the generalizability of this information as a source of cardioprotective knowledge.

Secondary analysis of data limits investigation due to the inability to collect the exact data desired (McArt, & McDougal, 1985). The researcher must use what is available and measures used by the primary researchers. The attempt is made to fit the questions to the available data, as opposed to designing the data collection to fit the questions.

IMPLICATIONS

Understanding how consumers can be motivated to attain personal health has social relevance that will be of increasing importance to planners of health care delivery and to those who provide the care. The woman's perceived benefits of health promotion behaviors, personal definition of health, the perceived control of health and the barriers to achieving it, as well as the importance that the client puts on health all require assessment. By understanding what the experience means to the individual woman, health care providers will be able to appropriately and successfully participate in the planning of women's health care (King, & Jenson, 1994). Advance Practice Nurses must support healthy behavior during the important transition period as women undergo menopause while being aware of actions that regulate a patient's ability to maintain a prescribed treatment regimen. Efficiency, effectiveness, and quality are necessary elements in health care reform.

It is estimated that 20% of the population of the U.S. in the next century will be the elderly. In this population, elderly women will predominate (Dumas, 1992). Although significant physiological and psychosocial changes occur during mid-life, this period is often overlooked in the study of the human life cycle. Because limited variables have been identified in the literature regarding menopausal women's knowledge of HRT and the likelihood to use, especially for its cardioprotective effects, APN's must take the

direction to assess and implement interventions specific to the individual woman. Factors such as age, race, ethnicity, education, and income need to be considered for each woman. Through interactions with the client, the APN can best assess the options available to meet the needs of the individual. By forming a comfortable, trusting relationship with the client, the APN can assist them in the validation of previous health promotion behaviors or help to dispel any misconceptions before they are internalized.

It is never too early to start educating women. The APN should address menopausal concerns as well as CHD risks early in a woman's life much in the same way that young women are taught early in life to consider the risk factors for breast cancer. In this way, the woman can better decide on health promotion behaviors which are best given her particular situation. Primary prevention involves teaching all age groups and not just menopausal women.

Nurses are in an optimal position to assume leadership roles in diverse settings as advocates, decision makers, and policy planners. Health care providers may have disregarded women's symptoms in the past, it is therefore crucial that the APN teach women to advocate for themselves in medical situations and, if necessary, assist in the advocacy process. Women need to receive counseling about the risks and benefits of HRT in order to make an informed choice. Women in the 40 - 60 age range are high users of health care services (Napholz, 1985). This means more opportunity for contact with this growing segment of the population. Through counseling menopausal women on the risk and benefits of HRT, the APN can empower these women via knowledge to participate in health care decisions concerning them. This empowerment is gained through increased awareness and interaction between decisions and actions.

Health care policies need to address the appropriateness of available services. Full involvement of the consumer needs to be assured in decisions affecting the selection of service, service provider, service timing, and service setting. More attention has to be given to extraneous variables that inadvertently diminish the usefulness of treatment regimen (Kegal, 1995). Through understanding of what the experience means to the individual woman will health care professionals be able to appropriately and successfully participate in the planning of women's care. By acknowledging women's perceptions of their own health the APN can develop an understanding necessary to effectively collaborate with women and to assist them in the right decision regarding HRT use. The woman's particular circumstances, perceptions, and beliefs need to be taken into account.

Health promotion and disease prevention needs to be a major focus of primary care practitioners. Increased access and availability of services to clients will play a key role in health prevention and promotion efforts. Nurses are encouraged to look at the whole person including CHD and its risks and to empower women's understanding of this complex health issue through educational, clinical, and research endeavors. These are areas in which the APN can fully utilize the tacit knowledge which is inherent to the role.

APN's should seek to eliminate patriarchal structures and create an atmosphere where the client and the care giver can work in collaboration to meet the specific needs of the client. Nurses have long espoused the belief that clients have a right to be informed and active participants in their own health care and that nurses have a responsibility to provide care to that end (Rothert et. al., 1990). By being a client advocate, the APN can assist clients in creating a climate of mutuality in which the client can improve self care by exercising their rights. In this way, the APN can empower the client to feel

comfortable in seeking information on prescribed treatment regimens in general and HRT use specifically. The clients would also be able to be fully informed about the risks and benefits of HRT, the client specific susceptibility to CHD, and ultimately reach a mutually satisfactory decision if HRT is an appropriate preventative action for them. As a first step APN's need a basic knowledge about the physiology of menopause, the development of CHD, and the individual model of treatment (MacPherson, 1992).

This is an opportune time for Advance Practice Nurses to extend their roles in policy formation to include their involvement with drug study groups, select work groups, and groups organized by the Office on Women's Health Research Agenda as well as congressional hearings (MacPherson, 1992). APN must seek funding for menopause and health research related to women's unique needs through the variety of life circumstances. Women are no longer willing to look a studies of heart disease in men and wonder if it applies to them (Miller, & LaRose, 1991). Further research by APNs must be done to identify specific problems of women with cardiac disease and other health problems women face. Sound scientific based research can play a significant role in gaining recognition of issues which confront women specifically.

The roles of political activist, community servant and educator are only some tools that the APN can utilize. Through community involvement, the APN can lobby for universal access to affordable primary health care and advocate new approaches that promote healing, and harmony with one's self, with others, and with the environment through social action. Through participation in professional seminars both as presenter and attendee, the APN can heighten the awareness of others (as well as herself) of women's issues involving menopause, CHD and treatment modalities. Personal

responsibility for health care is the cornerstone of every plan for health care reform in the United States. Understanding how consumers can be motivated to attain personal health has social relevance that will be of increasing importance to planners of health care delivery and those who provide the care.

Health promotion is a goal for the twenty-first century just as disease prevention was a task of the twentieth century. Nursing is committed to the promotion of health, the adaptation of individuals and groups to health problems and the nursing interventions that promote health (Spellbring, 1991). Assessing the potential risks of individuals is the first step in health promotion. A major goal in assessing each functional health pattern is to determine the client's knowledge of health promotion and how this knowledge is used in the decision making process with regards to health promotion. The goal of advocacy in nursing is to inform people so that the best decisions possible can be made for themselves. For example, the best possible decision regarding the use or non-use of HRT would be the one which decreases the woman's overall mortality/morbidity, the risk of osteoporosis, the alleviation of urogenital atrophy and vasomotor instability (if present), and in general "feeling good". The sharing of knowledge that is patient education is an important independent function of professional nursing. Individualized educational and counseling programs need to be developed for women; nurses are the primary source for development of such programs that meet the specific needs of women (Parchert & Creason, 1989).

RECOMMENDATIONS

Further research is needed to better understand the decision making process and the factors that women consider when deciding their health promotional behavior. While HRT usage is truly a personal, multi-faceted decision, health care providers could benefit from profiling the factors that most women consider when making this important decision.

Measures need to be taken by the APN and other health care providers to assist women in attaining and maintaining their knowledge regarding the benefits and risks of HRT and its cardioprotective effects as well as other important health issues. APN's need to become role models in reinforcing and increasing women's' knowledge regarding the different time periods of their lives so that fully informed decisions can be made.

It would be wise to begin educating women early in their lives so that modifiable risk factors may be changed and so that misconceptions about the menopause never develop (or at least can be addressed though on-going interaction between the APN and the client). The general public also needs to be educated on menopause to assist in dispelling misconceptions which exist about menopausal women.

A qualitative study which looks at women's rationale for likelihood to use HRT might prove beneficial given that each woman's values and risk are different. This would

enable the researcher to have more insight into why women decide to use or not to use HRT.

APPENDICES

APPENDIX 1

DECISION MAKING IN MENOPAUSE STUDY
MENOPAUSE INFORMATION

The following questionnaire contains questions about menopause, (the change of life) a time which signifies the end of the menstrual cycle. In this section we are interested in your knowledge about the process of menopause. Answers to some of the questions will depend on whether or not a woman has a uterus. Please answer all questions assuming the woman has a uterus.

1. What can be said about birth control after menstruation stops?

1 = Birth control should be used for 1 year
2 = Birth control should be used up to 5 years
3 = Birth control should be used as long as sexually active
4 = Birth control is not necessary
5 = Don't know

2. What causes the symptoms of menopause?

1 = The pituitary gland stops functioning
2 = The uterus will not allow egg implantation
3 = The fallopian tube becomes blocked
4 = The ovaries produce less estrogen (female hormone)
5 = All of the above
6 = Don't know

3. Menopause is a risk factor for which of the following:

1. Liver disease
2. Eye disease
3. Kidney disease
4. Lung disease
5. Osteoporosis
6. All of the above
7. None of the above
8. Don't know

4. What physical changes can occur in the vagina due to menopause?

1 = It becomes dryer, shorter and less elastic
2 = It becomes less easily injured
3 = The vagina remains the same following menopause
4 = Don't know

5. Risk of osteoporosis (brittle bones) can be reduced by:

1 = Vitamin C
2 = Estrogen pills
3 = Relaxation exercises
4 = Don't know

6. To help reduce the uncomfortable feeling associated with hot flashes, a person can....

1 = Increase caffeine intake
2 = Take vitamins above recommended daily allowance
3 = Wear several light wraps so one can be removed
4 = Increase spices and seasoning in food
5 = Don't know

7. Vaginal dryness caused by menopause may lead to....

1 = Increased chance of vaginal infection
2 = Decreased chance of vaginal infection
3 = No change in chance of vaginal infection
4 = Don't know

8. Vaginal dryness can best be relieved by....

1 = Using a petroleum jelly lubricant (Vaseline®)
2 = Estrogen replacement therapy
3 = Using cold cream
4 = Don't know

9. After menopause, a woman's risk of heart disease:

1 = Decreases
2 = Increases
3 = Is the same as before menopause
4 = Don't know

10. Estrogen replacement therapy:

1 = Increases a woman's risk of heart disease
2 = Decreases a woman's risk of heart disease
3 = Has no effect on a woman's risk of heart disease
4 = Don't know

Please answer questions 11-23 using the following scale:

1 = True
2 = False
3 = Don't know

11. Although many women have menopausal symptoms, approximately 20% seek medical relief.

12. Hormone therapy (estrogen) after menopause increases the risk of osteoporosis.

13. Hormone therapy (estrogen) can be used to relieve the symptoms of menopause.

14. Estrogen therapy without progestogen increases the risk of cancer of the uterus.

15. If a menopausal woman unexpectedly bleeds or spots a year after she completely stops menstruating she should report this to her physician.

16. Symptoms most often reported during menopause are hot flashes and night sweats.

17. Once a woman is through menopause she no longer has to be concerned with breast cancer of other female cancers.

18. As long as a woman is ovulating she can still become pregnant.

19. Ovulation may occur without menstrual bleeding occurring.

20. The addition of a progestational agent (Provera®) to estrogen replacement therapy frequently results in monthly menstrual flow.

21. The addition of a progestational agent (Provera®) to estrogen replacement therapy increases the risk of cancer to the uterus.

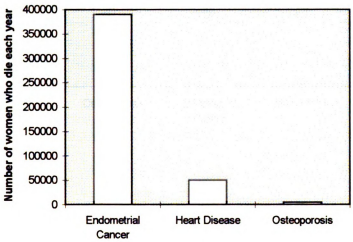
22. The most common cause of death among women is breast cancer.

23. A woman's chance of dying from cancer of the uterus is greater than her chance of experiencing osteoporosis fractures.

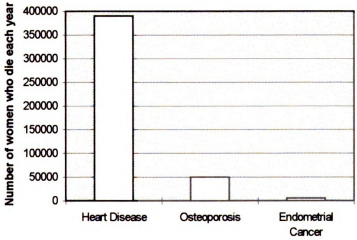
24. Choose the graph below which correctly shows the number of women who die each year from these medical problems. Darken the circle on your answer sheet corresponding to the correct graph. Use the following scale:

1 = Graph 1
2 = Graph 2
3 = Graph 3
4 = Don't Know

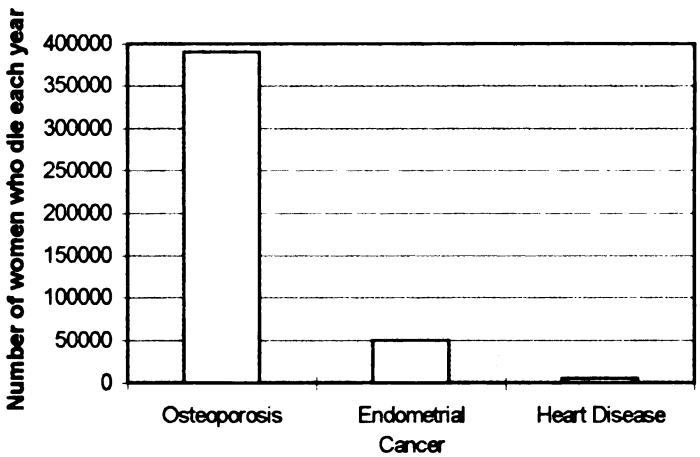
Graph 1



Graph 2



Graph 3



APPENDIX 2

KNOWLEDGE OF CARDIOPROTECTIVE EFFECTS OF HRT
SUB SCALE

Selected Questions:

1. After menopause, a woman's risk of heart disease:
   1 = Decreases
   2 = Increases
   3 = Is the same as before menopause
   4 = Don't know

2. Estrogen replacement therapy:
   1 = Increases a woman's risk of heart disease
   2 = Decreases a woman's risk of heart disease
   3 = Has no effect on a woman's risk of heart disease
   4 = Don't know

3. Hormone therapy (estrogen) can be used to relieve the symptoms of menopause.
   1 = True
   2 = False
   3 = Don't Know

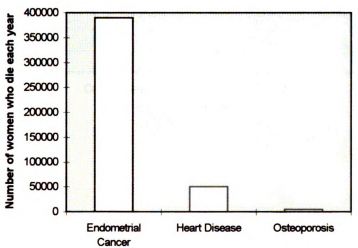
4. Menopause is a risk factor for which of the following:
   1. Liver disease
   2. Eye disease
   3. Kidney disease
   4. Lung disease
   5. Osteoporosis
   6. All of the above
   7. None of the above
   8. Don't know

5. The most common cause of death among women is breast cancer.
   1 = True
   2 = False
   3 = Don't Know

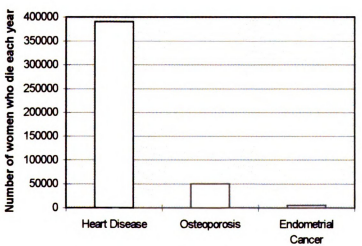
6. Choose the graph below which correctly shows the number of women who die each year from these medical problems. Darken the circle on your answer sheet corresponding to the correct graph. Use the following scale:

1 = Graph 1
2 = Graph 2
3 = Graph 3
4 = Don't Know

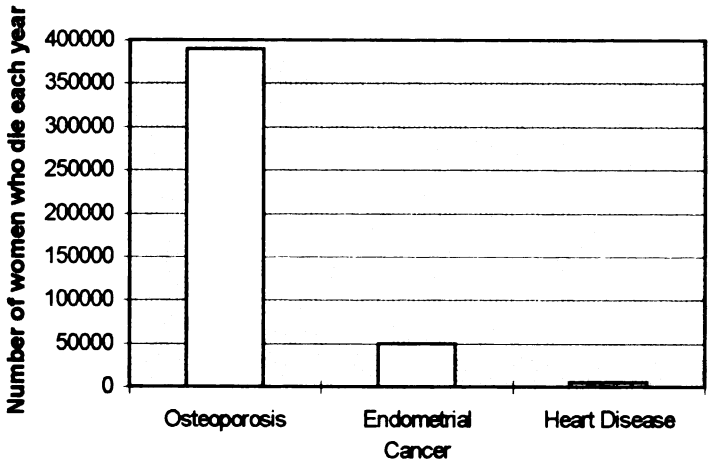
Graph 1



Graph 2



Graph 3



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