HEALTH BELIEF MODEL AS AN EXPLANATION OF PARTICIPATION IN CANCER SCREENING

by

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CHAPTER I

INTRODUCTION

Health problems in this nation today are markedly different from those prevalent a few decades ago. Chronic diseases have replaced the acute communicable diseases as the major threat to life and physical well being. The strategies historically developed to contend with acute diseases are oriented toward curing disease or toward preventing disease through such measures as immunization, sanitation and other public health measures. These strategies have proven less successful in controlling chronic disease.

To date, effective cures for common chronic disease are frequently unknown, and simple preventive measures are lacking. Preventive programs for chronic disease usually involve considerable education of the public, in order to persuade citizens to modify basic life styles. Examples of such public health programs are those that stress the control of diet in order to prevent coronary heart disease or those that attack smoking in order to prevent lung cancer. These programs are not usually very successful since the public may doubt the effectiveness of such measures and may resist drastic changes in life styles.

From the viewpoint of health professionals, public

participation in screening and preventive programs is also disappointingly low. It is possible that participation in such tests could be made mandatory through legislation. However, health professionals have been most reluctant to promote such a policy, and instead have preferred persuasive methods of motivating individuals to take protective health measures. This preference on the part of the health professionals has led to an interest in "health behavior" and its determinants as distinguished from "illness behavior" (Kasl & Cobb, 1966). "Health behavior" refers to behavior before the fact of illness, whereas "illness behavior" refers to the reactions and coping strategies following the perception of illness. Health behavior is undertaken at a time that the individual perceives himself to be asymptomatic and in a state of health. The action taken is directed to the prevention of the future occurrence of a specific illness, to the maintenance or improvement of a condition or physical function. "Health behavior" also includes action taken to detect a specific disease in its incipient stage, so that early diagnosis may lead to more effective treatment.

In that success in dealing with chronic illness today appears to depend largely on the ability to influence "health behaviors" of the population, information regarding the determinants of such behaviors is greatly needed. Although much research has been directed to this end, many questions remain. The present investigator will attempt to explicate

the influence of some selected factors on one specific kind of health behavior, namely, participation in a cancer screening program.

Past Research and Review of the Literature

Research on health behavior has proceeded largely on a pragmatic, atheoretical level. Investigators have focused on economic, geographic, social, psychological, or demographic factors to explain the under-utilization of preventive health services. Solutions proposed by these investigators are couched in terms of these factors. Thus, it has been suggested that preventive health facilities should be free or at nominal cost, and located within or close to the residential areas of the target populations. It has been suggested that walk-in facilities be substituted for facilities with appointment schedules (Stoeckle, 1969). It has also been suggested that propaganda campaigns be so designed as to promote a positive attitude in the public towards early treatment, and to soft-pedal the dire results of delayed action (Janis & Feshbach, 1953).

To date, the yield from existing research on the factors affecting the taking of preventive health action has been disappointingly slim. Among the more publicized findings are: (1) women more than men, appear to participate in preventive health action (Susser, 1962; Anderson, 1963); (2) persons of higher socioeconomic status and persons with

more years of formal education participate to a greater extent in preventive health programs than do persons of lower socio-economic status and persons with less education (Sellin, 1966); (3) certain ethnic groups, such as Jews, participate more than do members of other ethnic groups (Zola, 1966).

Even these findings are somewhat questionable in that they are based usually on zero-order relations between the independent variable (sex, income, ethnic group, and socio-economic level) and the dependent variable (frequency or extent of health action). In the absence of controls for other relevant variables, the meanings of the correlations remain somewhat ambiguous. Quite obviously, the interplay of various variables in affecting the outcome (here, health action) needs to be explicated by the technique of multivariate analysis. In addition, it is necessary to integrate the fragmented and scattered findings into a theoretical framework (McKinlay, 1972).

Health behavior, then appears to be a complex phenomenon, and the product of a number of antecedent conditions and events. In recognition of this complexity, three major attempts have been undertaken to provide a theoretical framework which perhaps may lead to more fruitful research. As will be shown below, these three health models share common elements, but with differing emphases.

The first model to be considered is the one presented by Mechanic (1962). In his explanation, the individual's health

behavior is the result of two factors. First, it is a product of the individual's perceptions of disease (e.g., its predictability, its seriousness) and the effectiveness of treatment. Second, the individual's health behavior is a product of the perceptions of his significant others. Thus, the probability of an individual's participation in preventive programs depends on whether or not his social network deems such participation desirable.

A second conceptualization has been provided by Sussman (1964). Relying on the basic epidemiological model, Sussman has analyzed health behavior in terms of host factors (e.g., the individual's perceived susceptibility to disease), agent factors (e.g., the unpleasantness and difficulty of the health action) and environmental factors (e.g., the interpretation of the appropriate and desirable aspects of health behavior, as provided by the individual's social network and reference groups.)

The third health model is perhaps the best known and most frequently utilized to date. The model's core dimensions were derived from a well-established body of psychological and behavioral theory, particularly the work of Lewin (Lewin, Dembo, Festinger & Sears, 1944). Developed by several investigators working in collaboration, the model is known by several names, such as the "Hochbaum Model," the "Rosenstock Model" (after the two main investigators) the "Behavioral Science Model" and the "Health Belief Model" (Hochbaum, 1958; Rosenstock, 1974). It has been applied by Hochbaum (1958)

to the field of tuberculosis screening, by Heinzelman (1962) to programs for prevention of rheumatic fever, by Leventhal, Rosenstock, Hochbaum and Carriger (1960) to immunization for Asian influenza and by Kegeles (1963a) to the seeking of preventive care for dental disease.

This paradigm holds that social psychological factors are of primary significance in inducing or inhibiting health action. Three principles underlie this model.

> Principle one - preventive or therapeutic behavior relative to a given health problem in the individual is determined by the extent to which he sees the problems as having both serious consequences and a high probability of occurrence in his case, and the extent to which he believes that some courses of action open to him will be effective in reducing that threat.
>
> Principle two - behavior emerges out of frequent conflict among motives and among courses of action. Where motives themselves conflict or compete for attention, those that have the highest value or salience for the individual will actually be aroused.
>
> Principle three - health-related motives may not always give rise to health-related behavior and conversely, health-related behavior may not always be determined by health-related motives (McKinlay, 1972, p. 123).

On the basis of these principles, assessments are made of the individual's perceptions of the extent of his suscepti-

bility, the seriousness of the illness, the benefits from taking action, and the barriers to taking action (namely, cost, inconvenience, inaccessibility of facilities, view of health action as itself undesirable, and doubt that the action will reduce the threat of disease). Sometimes the element of fear is included in this paradigm. However, its impact is not clear. Some investigators state that great fear immobilizes action, some state that little fear inhibits participation, and still others hold that moderate fear affords the optimal motivation for participation (Levine, 1962).

Of eleven different studies cited in Becker, Haefner, Kasl, Kirscht, Maiman and Rosenstock (1977), which used one or more of the Health Belief Model variables to predict preventive health behavior, nine demonstrated that susceptibility was a significant factor (Flach, 1960; Leventhal et al., 1960; Kegeles, 1963a, 1963b, 1969; Suchman, 1967; Haefner & Kirscht, 1970; Tash, O'Shea & Cohen, 1969; Becker, Kaback, Rosenstock & Ruth, 1975).

Research findings to date are inconsistent regarding the influence of either positive or negative beliefs regarding the seriousness of a disease or the benefits of taking action. Seriousness of illness was measured in ten studies (Hochbaum, 1958; Rosenstock et al., 1959; Leventhal et al., 1960; Kegeles, 1963a, 1963b; Kirscht, Haefner, Kegeles & Rosenstock, 1966; Suchman, 1967; Tash et al., 1969; Haefner & Kirscht, 1970; Becker, et al, 1975). In only five of these did the variable

emerge as an important influence on health action (Leventhal et al., 1960; Kegeles, 1963a; Suchman, 1967; Tash et al., 1969; Haefner & Kirscht, 1970). Perceived benefits were measured in ten studies. In six, this factor was found to be a significant predictor of health action (Flach, 1960; Kegeles, 1963a, 1969; Suchman, 1967; Haefner & Kirscht, 1970; Becker et al., 1975). In the remaining investigations, perceived benefits were nonpredictive of action (Hochbaum, 1958; Rosenstock et al., 1959; Kirscht et al., 1966; Tash et al., 1969). The health belief variable, barriers, was examined in only five studies. One was by Rosenstock et al. (1959), two by Kegeles (1963a, 1963b), one by Suchman (1967), and the last by Tash et al. (1969). Two of these revealed a positive relation between barriers and health action (Kegeles, 1963a, 1963b; Tash et al., 1969). The impact of fear is not clear.

Recently, Becker and Maiman (1975) have incorporated another set of dimensions into the original Health Belief Model. Among their "modifying factors" is a "cue to action." This cue can be categorized as internal (e.g., signs and symptoms of disease) or external (e.g., mass media campaigns, advice from friends, reminder postcards from health professionals, or illness within the family or friendship network). Other modifiers (Becker et al., 1977) include such variables as sex, race, ethnicity, personality traits, social class, and peer and reference group pressures. Modifying factors are not believed to cause health action directly, but rather to

influence an individual's health motivation, which must reach a specific level before health action is taken.

One shortcoming common to all these health action models is the tendency to conceptualize health behavior as a kind of entity (Steele & McBroom, 1972). The models imply that health behaviors are interrelated and integrated, so that a person who performs one kind of health behavior will tend also to perform others. Doubt has been cast on this basic assumption with the accumulation of evidence that individuals do not act consistently in these matters. Therefore, health behavior may well be multi-dimensional (McKinley, 1972; Steele & McBroom, 1972).

Health Belief Model Applied to Cancer

Research regarding the delay of patients with cancer symptoms in seeking professional help dates back to 1917 or 1918 (Simmons, Dalland & Wallace, 1933). These early studies documented the public's general lack of knowledge of cancer and its risk factors. In response, various educational programs were initiated. These did not, apparently, effect long-lasting changes, in that Harms, Plaut and Oughterson reported in 1943 that lack of knowledge was the major factor in the failure of persons to undergo cancer screening. Since then, broad educational campaigns have been launched through the mass media to acquaint Americans with the signs, symptoms, risk factors, and treatment of cancer. Still, the impact of

these campaigns has not been as great as hoped for. The question remains as to why some individuals take preventive actions, and others do not. How useful are the variables identified by the Health Belief Model in explaining such actions?

First, a sense of susceptibility to cancer did appear to differentiate participants from non-participants in one large scale cancer screening study (Fink, Shapiro & Lewis, 1968). Haefner and Kirscht (1970) were also able to demonstrate that feelings of susceptibility could be modified through the viewing of films, and thereby lead to a significant increase in preventive health behavior.

Second, the value of seriousness of predicting health action should be minimal in that virtually everyone in our society concedes the seriousness of cancer (Kegeles, Kirscht, Haefner & Rosenstock, 1965; Haefner & Kirscht, 1970). However, within the narrow range of scores obtained, Fink et al. (1968) did find that a concern with the seriousness of the disease distinguished participants from non-participants in a breast cancer screening program.

Third, the benefits from early detection have been well substantiated. Thus, a breast cancer screening project by the Health Insurance Plan of Greater New York has been ongoing since 1963. Results from 1963 to 1975 indicated a 30% reduction in mortality among persons seeking routine preventive check-ups (Shapiro, 1966). Nevertheless, it is clear that a large segment of the population does not believe early screening

is beneficial. Kirscht et al. (1966), for example, found that more than half of the 1500 subjects in his study did not accept the view that early detection of cancer would help. It is also apparent that a belief in benefits is only weakly related to health action. Thus, Kegeles (1969) reported that while women affirming the value of early detection obtained pap smear tests more frequently than women denying the usefulness of early detection; still 40% of women acknowledging the benefits of screening failed to participate.

What, then, are the barriers to preventive health behavior? Gold (1964) attributed the delay in seeking medical attention of women with symptoms both to their lack of information and to underlying psychological factors as modesty and shyness. Pack and Gallo (1938) concluded that ignorance and difficult financial circumstances served as barriers. In attempting to explain why one of every two persons with cancer symptoms failed to seek early medical care, Hammerschlag, Fischer, DeCosse and Kaplan (1964) identified the doctor-patient relationship and "body image boundary" as significant obstacles to preventive action. In his opinion, persons who were independent, forceful and who handled stress with ease sought medical intervention less frequently, and delayed longer when symptoms were present than those persons with less independent, less strong personalities. Hammerschlag et al. speculated that the stronger individual regarded submission of one's body to the physician for care as a surrender of individuality.

The role of fear in motivating health action is difficult to assess in the instance of cancer. It appears that fear generates the defense mechanism of denial, which can assume the form of suppression. Suppression, in turn, may dim the reality of the seriousness of the disease, or may foster fatalism. Goldsen (1963) and Hackett, Cassem and Raker (1973) found that "cancer worriers", people who were generally anxious about cancer, delayed longer when given more health information regarding cancer than those who were not worriers.

Insofar as cues are concerned, symptoms may tend to delay action, at least under some circumstances. Thus, the person with a family history of cancer may delay longer in seeking medical aid after the appearance of symptoms than the person without such a family history (Green, 1974; Hackett et al., 1973; Rosenstock, 1966). Again, the effect on health actions of cues such as messages in the mass media, is not clear. In an experimental study, Kegeles (1969) communicated messages concerning detection and benefits to an experimental group, but not to a control group. There were no differences between the groups in subsequent beliefs. Kegeles speculated that communications might serve as triggers for later action.

Finally, certain results may be reported concerning the "modifying" factors in the Health Belief Model. In the investigation by Fink et al. (1968) younger, married, and better educated women participated in breast cancer screening

tests more frequently than did older, unmarried, or less educated women. Simmons et al. (1933) and Hackett et al. (1973) indicated that the better educated responded more positively to health action than did the less well educated. They found no significant differences by age or sex.

In summary, although various studies have assessed the influence of individual variables on health behavior, it is apparent that much work needs to be done before health behavior may be predicted with any accuracy. The multiplicative or additive effect of these variables needs to be determined, as does the contribution of each to a total explanation of the variance in health behavior. Systematic studies dealing with specific types of health actions and with specific health problems would seem particularly useful at this point in time. The present field study is designed as one such systematic attempt to help in understanding the factors which influence participation in cancer screening tests.

Statement of the Problem

Cancer is unique in that it is the most dreaded disease today (Horn, 1964). It remains one of the major unsolved health problems of our time and is the second major cause of death in America. It is estimated that over 395,000 Americans will die of cancer in 1979 and that approximately 765,000 new cases will be diagnosed. In the state of Oregon alone, it is estimated that over 4,200 persons will die of

cancer, and that 8,100 new cases of cancer will be uncovered in 1979 (American Cancer Society, 1978, p. 3, 12).

It should be noted, however, that "preventive cancer programs" are not usually directed toward preventing cancer. Rather, they are directed toward early detection of the disease, on the assumption that early treatment provides the greatest possibility of averting almost certain death. Therefore, motivating individuals to seek cancer checkups is a peculiarly difficult task for health officials. It is not surprising that individuals who feel well, and who are unaware of symptoms should be reluctant to take action which may result in changing their definition of self from "well" to "sick". This is especially understandable when no cure for the disease is known, and where fear, pain and disfigurement may be anticipated in the drastic surgical, chemotherapeutic, and radiological treatments customary. This is a very different situation from one in which the participant may reasonably expect, for a small cost, some immunity from a serious illness. Perhaps, if medical science should produce such immunization agents for cancer, participation in cancer "prevention" programs might be overwhelmingly great!

In view of the unique situation presented by cancer at the current stage of medical knowledge, to what extent may the same variables be invoked to explain participation in cancer detection programs as are predictive for other types of health behaviors, such as fluoride treatments to prevent

dental carries, polio immunizations, and Asian influenza immunizations? Are the variables of the Rosenstock model useful in the explanation of differences among individuals with respect to cancer screening? It is the purpose of the present study to answer this question. Specifically, an attempt will be made to assess the relative importance of the variables of susceptibility, benefits, barriers, fear, cues, and other "modifying factors" in influencing health action with respect to cancer. Additionally, the relative usefulness of the Rosenstock Health behavior model for explaining the differences in health actions of men and women will be assessed.

CHAPTER II

METHOD

Setting

In the fall of 1972 a cancer detection clinic was established in the southeast section of Portland, Oregon. While accepting clients from the entire metropolitan area, the clinic director viewed as the target population the residents of a low income area bounded by the Banfield Freeway on the north, the Willamette River on the west, Clackamas County on the south and 82nd Avenue on the east. According to statistics from the Office of Economic Opportunity the population of the target area at that time numbered 174,000 persons. Of these roughly 40,000 (23%) reported annual incomes of less than $3,000 and over 16,000 (9%) received welfare benefits. About 15% of the male heads of households were unemployed. Twenty percent of these residents were over 65 years of age.

The walk-in clinic established for this low income group was funded through contributions from a private institution and a grant from the Regional Medical Program of Oregon. Services of the clinic were free for patients below the poverty level, which in that year was set at $3,600 annual income. A nominal fee on a sliding scale was requested from those with an income of over $300 a month. However, the fee was

not mandatory. The clinic was open two evenings a week for two hours. It was staffed by volunteers, one physician and two to five registered nurses nightly. The physician examined all male patients, and instructed the nurses in diagnostic assessment. The nurses performed complete physical examinations, and taught the signs and symptoms of cancer, and the technique of breast self-examination to all female patients. Diagnostic tests conducted in the clinic ranged from pap smears, performed by the nurses, to simple biopsy or sigmoidoscopy examination by the attending physicians. Xray and laboratory examinations at no or low cost, were scheduled with the sponsoring institution for patients who required additional tests.

Analysis of the records of the clinic from October 1972 to June 1973 revealed the following characteristics of the clients. Persons examined were evenly distributed among three age groups of 15-34, 35-54, and 55-75 years. Seventy-five percent of the patients were female. Sixty percent were married, 14% single, 17% divorced, and 9% widowed. With respect to education, 32% had not completed high school, 29% had graduated from high school and 39% had attended or completed college. With respect to income, 46% of the patients reported an average income below $300 a month; and an additional 17% reported incomes between $300 to $400 a month.

In 1973 a cut in federal funds eliminated the grant monies available from the Regional Medical Program. The private

institution was unable to fund the program in total, so the clinic was closed after eight months of operation.

Subjects

The subjects for this study were selected from the population ostensibly served by the clinic. Inasmuch as the purpose of the investigation was to assess the influence of the selected factors on health action, it was essential to obtain a range of values on this dependent variable. It appeared to the investigator that inclusion of both attenders at the clinic and non-attenders would maximize the probability of obtaining such variability in health action. It was also necessary to include males and females in the sample in order to compare the strength of the selected variables in predicting health action for the two sexes. Consequently, the strategy adopted was to select married males and females who attended the clinic and then contact their spouses. It may be noted that this procedure controlled for such extraneous variables as socioeconomic status, marital status, age, education and number of dependents, in the analysis of the differential effects on the sexes of the Health Belief Model variables.

All married persons between the ages of 18 and 65, who attended the clinic during a four-month period from June to October, were asked to participate in this study, and all agreed. Their spouses were then contacted and all of them

also agreed to participate.

The original plan to include equal numbers of attenders and non-attenders was disrupted by the unexpected and sudden closing of the clinic in October of 1973. Hence this sample of convenience included 54 persons, 27 married males and 27 married females. Of this group, 36 persons (13 males, 23 females) were attenders and 18 (14 males, 4 females) were non-attenders at the clinic.

Data and Data Gathering Instrument

The data for this investigation were obtained through the administration of a questionnaire, so constructed as to yield measures of the variables identified by the Rosenstock paradigm as influential in the taking of health actions. Thus, information was requested regarding the respondent's health actions with regard to cancer; the respondent's perceptions of benefits from, and barriers to such actions; the respondent's perceptions of personal susceptibility to, and the fear of cancer; and perceptions of cues to take action, both internal in the form of symptoms and external in the form of social pressure to undergo cancer tests. At the time of this study there were no valid or reliable instruments which measured systematically each of the variables of the Rosenstock model with preventive action against cancer as the focus of concern. Questions, therefore, were constructed to measure these independent variables. Where feasible,

questions were derived and modified from previous investigations pertaining to other diseases.

Measurement of the Dependent Variable

The dependent variable of this study was health action with relation to cancer. The strength of health action was determined for each subject by the fact of attendance or non-attendance at the cancer screening clinic, and the subject's responses to Items #1, 2 and 3 of the questionnaire. (See Appendix A for a copy of the questionnaire). These questions revolved about the frequency with which the respondent had undergone cancer testing, and the reasons for such action. For the purposes of this investigation it was assumed that participation in cancer screening, because it "was a good idea," even in the absence of symptoms, reflects a stronger motivation to act than does participation due to a work requirement, or due to the presence of symptoms.

From these responses, a Health Action score was calculated for each subject, ranging from 0 (no action) to 4 points (most action taken). The precise technique utilized to arrive at these scores is presented in Appendix B.

Measurement of the Independent Variables

Susceptibility. The individual's perception of his susceptibility to cancer was estimated from responses to seven questions (Items #19, 20, 21, 22, 23, 24 and 25). These questions

concerned the subject's perceived vulnerability to cancer based on his views of the causal role in cancer of environmental pollution, infection, and familial transmission. Susceptibility scores could in principle vary from 0 to 16 points, with higher scores indicating greater perceived risk. (See Appendix B for scoring code for this and the following independent variables).

Benefits. According to the Rosenstock model, the tendency for a person to take health action will depend in part on that person's belief in the effectiveness of health action. Three items (#17, 18, and 31) addressed the individual's assessment of such benefits of cancer screening as preventing cancer, or improving the chances of cure. The score for the Benefits factor could range from 0 points (signifying the individual attributes no benefits to health action) to 9 points (signifying maximum expectation of benefits).

Barriers. The individual's opinions of his personal susceptibility to cancer, and of the potential benefits of cancer screening determine his readiness to act. However, even if ready to act on the basis of these two factors, the individual may nonetheless fail to act should he perceive negative consequences to action. The behavior of the individual depends, then, on the balance of the benefits and barriers perceived. Items #7, 10, and 12 attempt to estimate the extent of barriers such as financial cost, inconvenience, inaccessibility and anticipated discomfort of the cancer

examination. Barriers scores could range from 0 to 6 points, with the higher scores indicating stronger barriers.

Fear. Even though readiness to act may be strong as indicated by the individual's view of his vulnerability to the disease, and by his belief in the benefits of cancer testing, still fear of cancer, or of the pain, disfigurement and interference with normal living attendant on the disease, may render the individual incapable of taking preventive action. Items #26, 27, 28, 29, and 30 probe this aspect of fear. Fear scores could vary from 0 to 20 points with the higher scores indicating greater fear.

Symptoms. When an individual is ready to act, admitting to his susceptibility to cancer, and recognizing that the benefits of cancer screening outweigh the barriers, a cue may still be needed to trigger action. The strength of the cue needed presumably is inversely related to the level of readiness. Internal cues in the form of symptoms may constitute very potent triggers that impel the individual to act even in the face of relatively low readiness. Item #4 and 5 concern symptoms. The Symptom scores could vary from 0 (no symptoms) to 5 points (symptoms of over one year's standing).

Social Pressures. Pressures applied by significant others provide triggers to action. Likewise, media communications regarding the immediate availability and importance of cancer tests may serve as cues. Depending on the number and

strength of such external cues experienced (Items #13, 14, 15 and 16), a Social Pressure score from 0 to 6 points was assigned to each respondent.

Additional Data

Each respondent reported his or her age, number of dependent children, amount of family income, educational level achieved, and occupational position (See Background Data Collection Form, Appendix C). Socio-economic status was estimated by Hollingshead's (1957) Two-Factor Index of Social Position, which combines education and occupation. This information was solicited inasmuch as such variables are included in a recently expanded version of the Health Belief Model (Becker et al., 1977).

Procedure

After the questionnaire was constructed, it was pretested for ambiguity and understandability on a group of nurses. Next, it was tested on a group of thirteen patients attending the clinic during two consecutive sessions. The research was conducted at clinic sessions between June and October of 1973.

All patients were routinely required to give a medical history before the physical examination was given. At this time, patients between the ages of 18 and 65 years, married and living with their spouses, were requested to participate

in a study which dealt with various attitudes and feelings concerning the disease of cancer. Upon agreement, the questionnaire was administered. Then appointments were scheduled to visit their homes for the purpose of administering the questionnaires to their spouses.

Analysis of Data

It was the purpose of the analysis to assess the effect on the dependent variable of each of the predictor variables, while simultaneously controlling for the influence of others. To this end, the technique of stepwise multiple regression analysis was used. The advisability of employing this technique with ordinal data has been criticized by some statisticians, but supported by others on the grounds that the advantages of powerful and critical analysis outweigh the error introduced (Blalock, 1964; Cohen, 1965; Labovitz, 1967, 1971; Mayer, 1971).

CHAPTER III

RESULTS AND DISCUSSION

Description of the Sample

In Table 1, selected demographic characteristics of the sample as a whole are presented. It is evident that the subjects of this research were mature, in their early forties, and of an age at which the risk of cancer begins to rise precipitously. Most subjects had completed high school, and were engaged in working class occupations producing relatively low incomes. They were all married and living with their spouses, and the majority had dependents. The subjects of this study were somewhat younger than the general clinic population (mean age of 41.6 vs. 44 years), and slightly more affluent (median income of $500 monthly vs. $300). This greater affluence might be attributed to the fact that the sample drew only married persons, who tend to be more stable and more economically successful than the single, divorced, or widowed.

When husbands and wives are considered separately, as subsamples, the two groups are of course identical in marital status, number of dependents, socioeconomic status, and income, as well as in place of residence and many other aspects of their life-style. As might be anticipated in view of

Table 1

Social and Demographic Characteristics of Subjects

Characteristics	Total Sample (N = 54)
Age (years)	
Range	23 - 62
Mean	41.6
S.D.	12.0
Number of Dependents	
Range	0 - 9
Mean	1.8
S.D.	1.9
Social Position Score[a]	
Range	29 - 65
Mean	49.0
S.D.	9.1
Income	
Range	$300 - $800
Mean	$440
S.D.	9.5
Education (years)	
Range	8 - 16
Mean	12.1
S.D.	1.8

[a]Score on Hollingshead's (1957) Two Factor Index of Social Position

national norms, husbands were slightly older than wives (mean age of 42.3 vs. 40.8 years), and the wives were slightly better educated (mean educational level, 11.7 years for husbands and 12.4 for wives).

Scores on Rosenstock Model Variables

Although the sample consisted of husbands and wives, this matching did not appear to affect health action or health beliefs. Scores of husbands and wives on the variables represented in the Rosenstock model were completely unrelated, with correlation coefficients ranging from .01 to .08. This finding ran counter to the expectation of similar beliefs based on the tendency toward homogamy in America. Apparently the tendency for like to marry like does not extend to the sharing of health beliefs.

The health beliefs and health action of the 27 males and 27 females are compared in Table 2. From that table, it may be seen that females took significantly more health action than did males. This finding accords with the general consensus that women engage in preventive health behavior more than do men (Nathanson, 1977a, 1977b). Andersen and Anderson (1967) observed that men were most likely to seek physical examinations to fulfill a requirement for work or insurance, whereas women tended to seek examinations voluntarily, in response to symptoms or as a preventive measure. Results were similar in this research. Fifteen of the 27 men reported

Table 2

Scores of 27 Males and 27 Females on

Rosenstock Model Variables

Variables	Males	Females	t[a]
Health Action (0-5)[b]			
Actual Range	0-4	0-4	
Mean Score	1.93	3.30	3.74**
S.D.	1.54	1.41	
Susceptibility (0-16)			
Actual Range	1-8	1-10	
Mean Score	3.19	4.16	1.66
S.D.	1.86	2.80	
Benefits (0-19)			
Actual Range	4-9	4-9	
Mean Score	7.44	8.30	2.36*
S.D.	1.72	1.38	
Barriers (0-6)			
Actual Range	0-5	0-5	
Mean Score	2.37	1.57	1.77*
S.D.	1.78	1.42	
Fear (0-20)			
Actual Range	4-14	1-14	
Mean Score	9.26	10.70	1.97*
S.D.	2.96	2.95	
Symptoms (0-5)			
Actual Range	0-4	0-5	
Mean Score	.41	1.52	2.66**
S.D.	1.19	1.95	
Social Pressure (0-6)			
Actual Range	0-5	0-6	
Mean Score	2.26	1.67	1.40
S.D.	1.63	1.62	

[a] t-test for related samples

[b] Possible range of scores is noted in parentheses after each variable

* $p < .05$

** $p < .01$

cancer screening at a previous time, and of these, nine indicated that the test had been mandatory. Three obtained a test because of symptoms, and three because it was a "good idea." Of the 27 women, 22 reported an earlier cancer test. Of these, only four indicated testing was mandatory, five indicated symptoms as the reason, and 13 that the test was sought simply because "it was a good idea."

From Table 2, a number of conclusions may be drawn regarding the health beliefs of the sample. First, women viewed screening as beneficial to a significantly greater extent than did men ($t = 2.36$, $p < .05$). However, both males and females viewed cancer testing as only moderately beneficial. This is congruent with the findings of Rosenstock, Hochbaum, and Leventhal (1960), and of Kirscht, et al. (1966) that belief in benefits are weak. Second, barriers to taking preventive action against cancer were generally judged to be low. Again, women viewed barriers as significantly fewer than did men. Third, fear of cancer appeared to be only moderate. This finding is surprising in view of the common assertion that cancer is the most dreaded disease today (Horn, 1964), and is accompanied by an aura of power, pain and threat (Jenkins & Zyzanski, 1968). Women in this sample expressed more fear than men, as was anticipated in light of other literature (Nathanson, 1977b). Fourth, the mean Symptoms score was lower for men than for women. This finding was anticipated in that women are generally considered to be more sensitive

to symptoms of illness (Nathanson, 1977b). Fifth, the sexes did not differ significantly in Social Pressures to take preventive health measures. For both sexes, such pressures tended to be weak.

Finally, most subjects, whether male or female, apparently did not feel vulnerable to cancer. Perhaps the low Susceptibility scores are due, in part, to the fact that the mean age of the respondents was 41.6 years, and cancer is generally considered to be a disease of late middle age and old age (Jenkins, 1966). Nevertheless, the low level of scores remains surprising in light of Jenkins's (1966) finding that roughly a third of his probability sample of individuals, aged 20 to 39, replied they had a "big chance" of getting cancer.

Although the mean Susceptibility score for women was slightly higher than that for men, the difference was not significant. Again, this finding runs counter to expectation. According to Nathanson (1977b), women believe themselves to be more susceptible to disease generally than men; and according to Anderson and Phelps (1971) in their Oregon survey of attitudes to cancer, the public believes that women are more likely to get cancer than are men. In the instance of both male and female subjects, perhaps the low sense of vulnerability here noted was attributable to their perceived freedom from symptoms.

Rosenstock Model as an Explanation of Health Action

As mentioned earlier, previous studies of preventive health action have dealt with one or a few of the variables included in the Rosenstock model, but never all together. Hence, the relative importance of the variables has not been ascertained. Additionally, no previous study, to the author's knowledge, has considered males and females separately. Conceivably, the paradigm might be more useful in explaining the health behavior of one sex than of the other.

In this research, stepwise multiple regression analysis was used to assess the relative effects of each of the predictor variables--susceptibility, benefits, barriers, fear, symptoms, social pressures--on cancer screening. The results of the analyses for male and female subjects are presented in Table 3. In the first column, the independent variables are presented in the order of their emergence from the regression analysis. In the second column are listed the zero-order correlations of each independent variable and health action. In the third column is the multiple correlation coefficient (R) of all variables listed to that point; and in the last column, the standardized beta values of the designated variables are entered.

The following conclusions and interpretations may be drawn from the data appearing in Table 3.

1. The predictive power of the selected variables for

Table 3

Multiple Regression of Six Variables on Health Action of 27 Females and 27 Males: A Test of the Rosenstock Model

Independent Variables	Zero-Order Correlation	Multiple R	Cumulative Variance	Beta Coefficient
		Females (N = 27)		
Susceptibility	.39	.39	.15	.50
Barriers	-.30	.49	.25	-.44
Symptoms	-.14	.59	.34	-.34
Social Pressures	.01	.61	.36	-.17
Benefits	.09	.61	.38	.09
Fear	.10	.61	.38	--
		Males (N = 27)		
Barriers	-.37	.37	.14	-.27
Social Pressures	.27	.42	.18	.24
Fear	.22	.46	.21	.11
Symptoms	.29	.48	.23	.14
Benefits	.03	.49	.24	.09
Susceptibility	.11	.49	.24	.06

health action differed substantially across the sexes, explaining 38% of the variance for the females, but only 24% for the males. The order in which the variables emerged in the analysis also differed radically across the sexes. Most notably, Susceptibility was the single most important factor for females, but the least for males. Spearman's rho was only .14 between the two rankings. These observations suggest the utility of studying the health actions of men and women separately, and also the utility of seeking explanations in different sets of variables.

2. In the case of females, Susceptibility, Barriers and Symptoms were the most important predictors (beta weights of .50, -.44, and -.34). These three variables explained 34% of the variance in health action. Social Pressures and Benefits improved prediction by only 4%. The last variable, Fear, did not emerge in the analysis at all. This may be due to the fact that Fear correlated significantly with Susceptibility ($r = .36$), with Social Pressures ($r = .44$), and with Benefits ($r = .40$). (See Appendix D for complete correlation matrix). Therefore, when the effects of those variables on health action had been taken into account, what was unique to Fear could not add appreciably to the explanation. It is also possible that Fear bears a curvilinear, not a linear, relationship to health action, and this relationship would be obscured by the regression analysis. Both Goldsen (1963) and Hackett et al. (1973) have claimed

that moderate fear may motivate preventive action, but too little or too much fear may deter such action. Finally, it is possible that fear is not systematically related to health action. It may spark denial in many individuals, deterring them from health action, but it may motivate others to act. As stated earlier, previous findings regarding the relation of Fear to health action have been ambiguous. The present findings are no exception, suggesting that Fear may not be a useful element in the Rosenstock Model.

3. In the case of males, Barriers, Social Pressures, Fear and Symptoms explained 23% of the variance in health action. Benefits and Susceptibility added only 1%, and might, for all practical purposes, be eliminated. Possibly the lack of importance of the factor of Benefits was due to its strong correlation with Social Pressures ($r = -.47$). Similarly, the lack of importance of the factor of Susceptibility may have been due to its correlation with Benefits ($r = .42$) and with Fear ($r = .28$).

Expanded Rosenstock Model as an Explanation for Health Action

In that the six Rosenstock variables left 62% of the variance in health action unexplained for females, and 76% for males, what may be some of the other determinants of such action? Additional analyses were performed, involving the expanded Rosenstock model, through the inclusion of the "modifying" variables of age, social class position, and

number of dependents. These results are presented in Table 4.

1. It may be seen that prediction improved with 51% of the variance explained for males (up from 24%) and 54% explained for females (up from 38%), thus clearly demonstrating the superiority of the modified over the simple model.

2. As may be seen from Table 4, the order in which the variables emerged was quite different across the sexes. Spearman's rho was only .45.

3. As might be expected, the ordering of the six Rosenstock variables was quite different with the inclusion of the three demographic variables. However, for females, Susceptibility remained the most important single factor. It might be mentioned that Fink et al. (1968), Kegeles (1969) and Flach (1960) all indicated that susceptibility was an important consideration in leading individuals to take preventive action. Those authors investigated participation by females in screening tests for breast and uterine cancer.

4. For males, Barriers remained the variable with the greatest independent impact on health action. Number of dependents, and age emerged as the second and third most important variables. Social Pressures as a factor fell from second to last place, possibly because all its influence was now carried by the new variable, Number of Dependents, making Social Pressures redundant as a factor.

Table 4

Multiple Regression of Nine Variables on Health Action of 27 Females and 27 Males: A Test of the Expanded Rosenstock Model

Independent Variables	Multiple R	Cumulative Variance	Beta Coefficient
		Females (N = 27)	
Susceptibility	.39	.15	.69
Class	.53	.28	.25
Dependents	.59	.35	.28
Barriers	.64	.41	-.37
Fear	.68	.47	-.23
Symptoms	.70	.49	-.24
Age	.71	.51	-.22
Social Pressures	.73	.53	-.21
Benefits	.73	.54	.08
		Males (N = 27)	
Barriers	.37	.14	-.43
Dependents	.48	.23	.45
Age	.55	.31	.43
Susceptibility	.63	.40	.39
Symptoms	.69	.47	.18
Class	.70	.48	.21
Benefits	.71	.50	-.13
Fear	.71	.51	.08
Social Pressures	.71	.51	.06

5. For both sexes, three of the top four variables were identical: Dependents, Barriers, and Susceptibility. These variables then should presumably be retained in future investigations.

6. The expanded Model indicates that those males will be most likely to take health action who perceive few barriers to such action, who have dependents, who are older and who may believe themselves susceptible. Those females will be most likely to take action who believe themselves susceptible, who occupy a higher social position, who have dependents, and who perceive fewer barriers.

From the preceding discussion, it would appear that the Rosenstock Model in its simple form did not explain very satisfactorily the health actions of this specific sample of lower middle class individuals. It is possible this failure is attributable not to the inadequacy of the theoretical formulations, but to the inadequacy of the methodology of this research. Perhaps the instrument did not measure sensitively and validly the variables of health action, benefits, susceptibility, symptoms, fear, barriers, and social pressures. Perhaps the items selected did not adequately tap the domains of these variables. Perhaps a more heterogeneous sample of individuals from diverse backgrounds and lifestyles would have provided a greater range of values on the various components of the Model. However, it must be remembered that the addition of just three demographic variables--age,

social class, and number of dependents--greatly improved prediction of health action. Therefore, it seems logical to recommend that future research incorporate into the Health Belief paradigm, the "enabling" or "modifying" variables identified by Becker (1974).

The first conclusion from this research is, then, that the Rosenstock Model needs expansion for maximum utility. The second conclusion is that women take health action more readily than men. The third conclusion is that the determinants of health action differ between the sexes. These differences apparently are manifested even when the men and women being compared are married couples, sharing the same culture and lifestyle and living in the same environment.

CHAPTER IV

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

As the second major cause of death, cancer is one of the principal health problems in the United States today. Its etiology is not clearly understood, and sure preventive measures are not available. The best defense against the disease remains early detection and treatment. However, it has proved difficult to induce large numbers of the public to participate regularly in screening programs where detection might occur. It would seem, then, of utmost importance for health care workers to learn the reasons why people do or do not obtain cancer tests. Based on such knowledge, health professionals and educators might plan more effective intervention strategies.

A number of explanations have been advanced for health behavior. Of these, the Rosenstock Health Belief Model is perhaps the best known. This paradigm identifies certain social psychological factors as of primary significance in inducing or inhibiting health action. The Model predicts that individuals will be more likely to engage in health actions when they (1) perceive themselves as susceptible to a serious disease; (2) perceive more benefits in taking health action than in permitting the disease to run its

natural course; (3) do not perceive barriers to taking the action; (4) perceive cues to take action, both internal (in the form of symptoms) and external (in the form of social pressures); and possibly (5) fear the disease moderately. Sometimes the Rosenstock paradigm has been expanded to include personal characteristics such as age, sex, knowledge, general coping ability, socioeconomic status, all of which are viewed as modifying individual health motivations and perceptions.

While in the past numerous studies have examined the effect of one or more components of the Health Belief Model with respect to cancer screening, few, if any, have atempted to test the utility of the Model as a whole. The purpose of the present research was to assess the predictive value of the Model for explaining differences among individuals in the extent of their health actions to detect cancer. Additionally, it was the purpose of this study to examine the relative usefulness of the Model for explaining differences in the health actions of related samples of men and women.

Subjects for this investigation were selected from the target population ostensibly served by an existing cancer screening clinic in a low-income metropolitan area. All married persons, between the ages of 18 and 65, who attended the clinic during a 4-month period, and all their nonattending

spouses were asked to participate in the research. All agreed. This convenience sample consisted of 27 wives and 27 husbands. Data were collected through administration of a questionnaire designed to measure the core Rosenstock variables of perceived susceptibility, benefits, barriers, fear, symptoms, social pressures, and extent of health action. The questionnaire also provided information on the modifying variables of age, number of dependents, and socioeconomic status.

The relative value of each of the independent variables for predicting health action was assessed by means of step-wise multiple regression. The analysis revealed considerable differences between the sexes in the explanatory value of the several variables. The most important predictors for females were perceived susceptibility, barriers and symptoms, in that order, and for males, barriers, social pressures, and fear. Apparently males and females are motivated to take health action in somewhat different ways. Moreover, the Model proved more useful in the case of females than of males. Taken altogether, the Model variables explained 38% of the variance in health action for wives, and only 24% for their husbands.

Somewhat better results were obtained through use of the expanded Rosenstock Model, with the addition of the modifying variables of age, socioeconomic position, and number of dependents. The nine variables accounted for 54% of the

variance in health action for females, and 51% for males. The expanded model suggests that females are more likely to obtain cancer tests if they feel susceptible to cancer, if their socioeconomic status is higher, if they have dependent children, and if they perceive few barriers to action. Males seek action more readily if they perceive fewer barriers, have dependent children, are older, and believe themselves susceptible to cancer.

Comparisons of the beliefs of husbands and wives indicated that (1) wives had taken significantly more health action than husbands; (2) both husbands and wives viewed cancer screening as only mildly beneficial; (3) both perceived barriers as minor; (4) both sexes expressed only a moderate fear of cancer; (5) both perceived social pressures as relatively weak; and (6) both males and females believed themselves only slightly susceptible to cancer.

From these analyses, it was concluded that the Rosenstock Model needs expansion for maximum utility, and that somewhat differing models should be elaborated for males and females. It would appear that the determinants of health action differ between the sexes, and that women are more likely than men to participate in cancer screening. These facts seem true even for married couples, who share a common culture, lifestyle, and living environment.

A number of recommendations may be made for further study and evaluation of the Health Belief Model as a predictive

tool. First, the instrument developed here to operationalize the Model's variables needs considerable refinement. In particular, the domain of each variable should be intensively explored, and the most useful items selected. Then the reliability and validity of the revised instrument should be determined. Second, generalizations drawn from this study must be considered only suggestive in nature. The sample utilized here was one of convenience, and limited to a low-income population. Investigations are needed of more representative samples both of the poor, and of other categories and classes of the population. It is possible that the Rosenstock Model might prove of quite different utility when applied to an upper or middle-class population than to a lower-class population. It is also possible that the somewhat restricted range of values found on some variables in this study (e.g., susceptibility and benefits) was due to the homogeneous nature of the sample. Variability on these variables might be greater in other groups, and the effects of these variables on health action might likewise be more pronounced.

Third, it is clear that additional factors affect decisions to take health action than those emphasized to date by the Rosenstock paradigm. These variables need to be identified and incorporated into the Model. Possible variables include coping style, salience of health values, incidence of cancer in the immediate family, knowledge, etc.

Fourth, it is recommended that prospective investigations be undertaken, with experimental manipulation of factors such as perceived susceptibility, perceived barriers, and social pressures in order to determine their causal effects on health action.

Finally, a few comments are in order regarding the implications for practice to be derived from this study. These findings suggest the advisability of mounting different campaigns and strategies for different subgroups of the population in order to maximize participation in cancer testing. For example, with respect to lower-class women, educational campaigns might emphasize susceptibility. At the same time, barriers should be eliminated insofar as possible. For, while barriers were not perceived as great, apparently even minor barriers may be sufficient to inhibit action. With lower-class men, the importance of eliminating barriers would seem to be even more important. In their case, social pressures might also be manipulated, particularly for men without dependent children. Perhaps the best strategies would involve making screening programs available through men's organizations, lodges, unions, place of work, and immediate neighborhoods. Finally, the positive effect of dependent children on parental participation in screening programs might be further increased through educational efforts directed at children in the schools. Such educational efforts stressing the potential benefits of voluntary health action might

result not only in increasing preventive health behavior on the part of the children themselves, but might increase the health action of their parents through the social pressure exerted on parents by children.

The possibility of effective interventions should increase as our knowledge increases regarding the particular combinations of motives and beliefs which bring specific target populations to undertake recommended health actions. Physicians, nurses, and health educators should be involved in developing and applying this knowledge. For, until a cure is found for cancer, the greatest advances in the fight against cancer will be made through manipulating those factors which motivate or impede behavior leading to early detection and treatment.

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APPENDIX A

Questionnaire

QUESTIONNAIRE

NAME_____

1. To your knowledge have you ever had an examination for cancer?

   _____Yes
   _____No

2. If you answered "yes" to the above question, indicate "why" you had the examination or test for cancer.

   _____Just thought it was a good idea, I had no symptoms
   _____Had a symptom I thought might be cancer
   _____Required for work, insurance, social security, armed forces or _____

3. Indicate how often you have had a test or examination for cancer.

   _____Once only over five years ago
   _____Once within the past five years
   _____Regularly every year

4. Do you have a sign or symptom now that you feel might be cancer?
   _____Yes
   _____No

5. If you feel you have a sign or a symptom of cancer, when did you first notice it?

   _____Less than one week ago
   _____Less than a few weeks ago
   _____Less than 3 months ago
   _____Less than 6 months ago
   _____More than one year ago

6. When did you first learn of the Cancer Alert Clinic (this clinic)?

   _____Just heard about it
   _____A few weeks ago
   _____One or two months ago
   _____Three or more months ago
   _____Shortly after it opened in October 1972

7. Before you learned of this clinic, did you know of any other clinic or doctor's office where you could get a cancer examination?

_____Yes Where _____
_____No

8. If you answered "yes" to the above question, why did you not go to them for the cancer examination?

_____You would have to be away from your home or job too long
_____Transportation and the distance to the clinic or office is a problem
_____The clinic or office is not open at the right time for you
_____It costs too much
_____If none of the above apply, indicate the reason_____

9. Which one of the above was the major reason for not going for the examination?

_____You would have to be away from your home or job too long
_____Transportation and the distance to the clinic or office is a problem
_____The clinic or office is not open at the right time for you
_____It costs too much
_____If none of the above apply, indicate the reason_____

10. Check the answers below if the same problems apply to your coming to our clinic (Cancer Alert Clinic).

_____You have to be away from your home and job too long
_____Transportation and the distance to the clinic are problems
_____The clinic is not open at the right time for you
_____The cost is too much
_____If none of the above apply, indicate the reason_____

11. Which one of the above problems was the major reason?

_____You have to be away from your home and job too long
_____Transportation and the distance to the clinic are problems
_____The clinic is not open at the right time for you
_____The cost is too much
_____If none of the above apply, indicate the reason_____

12. Some people think a cancer examination is uncomfortable and unpleasant. To what degree to you feel this is true?

_____Extremely uncomfortable and unpleasant
_____Moderately uncomfortable and unpleasant
_____Somewhat uncomfortable and unpleasant
_____Not uncomfortable and unpleasant at all

13. Did anyone suggest or urge you to come to the clinic for a cancer examination?

_____Yes Who was it? _____A Friend
_____No _____A Spouse
_____A Parent
_____A Neighbor
_____Other _____

14. How much pressure did it take to get you to come to the clinic?

_____Great amount
_____Over a moderate amount
_____Small amount
_____None

15. If you came with your spouse, whose idea was it mainly?

_____My spouse's idea
_____My own idea

16. Were any of the following responsible for getting you to come to the clinic?

_____American Cancer Society Volunteers information
_____Newspaper Ads or information
_____T.V. or radio announcements or information
_____Clinic circular in the mail or from the school
_____Saw a poster or a sign about the clinic
_____Heard people talking about the clinic
_____Other Indicate: _____
_____None

17. Do you agree with the statement "You can have cancer and not know it?" "That is, you can have cancer even if you feel well and notice nothing wrong."

_____Very much agree
_____Somewhat agree
_____Somewhat disagree
_____Very much disagree

18. Do you agree with the statement, "Early treatment of cancer gives a person a better chance of cure?"

_____Very much agree
_____Somewhat agree
_____Somewhat disagree
_____Very much disagree

19. To what extent do you believe you are more or less likely to get cancer than most people?

_____Much more likely than other people
_____More likely
_____About the same
_____Less likely
_____Much less likely

Why do you feel this way? Check reasons below.

_____Have poor health
_____Cancer runs in the family
_____You smoke
_____Have had a tumor
_____Age group gets cancer more
_____Work in polluted area
_____Have good health
_____Have frequent cancer test
_____Do not smoke
_____Live a clean life
_____Age group does not get cancer
_____Work in non-polluted area

20. Do you have a family member who has or has had cancer?

_____Yes
_____No

21. To what degree do you believe that cancer runs in families?

_____Very greatly
_____Greatly
_____Moderately
_____Slightly
_____Not at all

22. Do you have a friend or close acquaintance who has or has had cancer?

_____Yes
_____No

23. To what extent do you believe that cancer is contagious (can be caught from another person)?

_____Very greatly
_____Greatly
_____Moderately
_____Slightly
_____Not al all

24. To what extent do you believe that pollution in the environment causes cancer?

_____Very greatly
_____Greatly
_____Moderately
_____Slightly
_____Not at all

25. Do you believe that you live or work in a polluted environment which can cause cancer?

_____Yes
_____No

26. How much pain do people suffer who are beyond the beginning stages of cancer?

_____Very great amount
_____Great amount
_____Moderate amount
_____Slight amount
_____Not at all

27. To what extent do you feel cancer is sooner or later likely to disfigure the body?

_____Very greatly
_____Greatly
_____Moderately
_____Slightly
_____Not at all

28. To what degree do you feel cancer interferes with living a normal life, at work, at home, etc.

_____Very greatly
_____Greatly
_____Moderately
_____Slightly
_____Not at all

29. "If I had cancer I'd rather not know about it as long as possible." To what degree do you feel this way?

_____Very greatly
_____Greatly
_____Moderately
_____Slightly
_____Not at all

30. How much do you fear cancer compared to other people?

_____Much more
_____Somewhat more
_____Just the same as other people
_____Somewhat less
_____Much less

31. To what extent do you believe that coming to a cancer clinic like this can prevent cancer or lessen the likelihood of getting cancer in the future?

_____Very greatly
_____Greatly
_____Moderately
_____Slightly
_____Not at all

APPENDIX B

Key For Scoring The Health Belief Model Variables

HEALTH BELIEF MODEL VARIABLES SCORING KEY

I DEPENDENT VARIABLE: HEALTH ACTION

Scores range from 0-5 points.

Nonattenders, who answer NO to Question 1 are assigned "0" score. These respondents have never had a cancer test, and did not come to the clinic.

Attenders are assigned "1" point for attending the clinic. Other points are added for each question as follows:

Questionnaire Item	Content	Points
#1	To your knowledge have you ever had an examination for cancer?	
	_____Yes	1
	_____No	0
#2	If you answered "yes" to the above question, indicate "why" you had the examination or test for cancer.	
	_____Just thought it was a good idea, I had no symptoms	1
	_____Had a symptom I thought might be cancer	0
	_____Required for work, insurance, social security, armed forces or _____	0
#3	Indicate how often you have had a test or examination for cancer.	
	_____Once only over five years ago . . .	0
	_____Once within the past five years . .	1
	_____Regularly every year	2

NOTE: Nonattenders and attenders can obtain 1 - 4 points if they ever had a cancer test, past or present.

II INDEPENDENT VARIABLES

Scores are assigned and points added for each question as follows:

A. Susceptibility: Scores range from 0 to 16 points

Questionnaire Item	Content	Points
#19	To what extent do you believe you are more or less likely to get cancer than most people?	
	_____Much more likely than other people	4
	_____More likely	3
	_____About the same	2
	_____Less likely	1
	_____Much less likely	0

Why do you feel this way? Check reason below.

_____Have poor health

_____Cancer runs in the family

_____You smoke

_____Have had a tumor

_____Age group gets cancer more

_____Work in polluted area

_____Have good health

_____Have frequent cancer test

_____Do not smoke

_____Live a clean life

_____Age group does not get cancer

_____Work in non-polluted area

#20 Do you have a family member who has or has had cancer?

_____Yes

_____No

NOTE: If answered "YES" proceed to Question 21 0

If "NO' ignore Question 21 0

#21 To what degree do you believe that cancer runs in families?

_____Very greatly 4

_____Greatly 3

_____Moderately 2

_____Slightly 1

_____Not at all 0

#22 Do you have a friend or close acquaintance who has or has had cancer.

_____Yes

_____No

NOTE: If answered "YES" proceed to Question 23 0

If "NO" ignore Question 23 0

#23 To what extent do you believe that cancer is contagious (can be caught from another person)?

_____Very greatly 4

_____Greatly 3

_____Moderately 2

_____Slightly 1

_____Not at all 0

#24 To what extent do you believe that pollution in the environment causes cancer?

_____Very greatly 4

_____Greatly 3

_____Moderately 2

_____Slightly 1

_____Not at all 0

#25 Do you believe that you live or work in a polluted environment which can cause cancer?

_____Yes

_____No

NOTE: If answered "YES" give points for Question 24 0

If "NO" ignore Question 24 . . 0

B. BENEFITS: Scores range from 0 - 9 points:

Questionnaire Item	Content	Points
#17	Do you agree with the statement "You can have cancer and not know it?" "That is, you can have cancer even if you feel well and notice nothing wrong."	

_____Very much agree 3

_____Somewhat agree 2

_____Somewhat disagree 1

_____Very much disagree 0

#18 Do you agree with the statement, "early treatment of cancer gives a person a better chance of cure?"

_____Very much agree 3

_____Somewhat agree 2

_____Somewhat disagree 1

_____Very much disagree 0

#31 To what extent do you believe that coming to a cancer clinic like this can prevent cancer or lessen the likelihood of getting cancer in the future?

_____Very greatly 3

_____Greatly 3

_____Moderately 2

_____Slightly 1

_____Not at all 0

NOTE: "Very greatly" and "Greatly" collapsed, both given 3 points.

C. BARRIERS: Scores range from 0 - 6 points

Following scores are for attending and nonattending respondents who knew of the clinic.

Questionnaire Item	Content	Points
#7	Before you learned of this clinic, did you know of any other clinic or doctor's office where you could get a cancer examination?	
	_____Yes Where_____ . . .	0
	_____No	1
#10	Check the answers below if the same problems apply to your coming to our clinic (Cancer Alert Clinic).	
	_____You have to be away from your home and job too long	
	_____Transportation and the distance to the clinic are problems	
	_____The clinic is not open at the right time for you	
	_____The cost is too much	
	_____If none of the above apply, indicate the reason_____	
	NOTE: If respondent checked or mentioned a reason	1
	If respondent checked more than one reason or all	2
#12	Some people think a cancer examination is uncomfortable and unpleasant. To what degree do you feel this is true?	

_____Extremely uncomfortable and unpleasant 3

_____Moderately uncomfortable and unpleasant 2

_____Somewhat uncomfortable and unplesant 1

_____Not uncomfortable and unpleasant at all 0

D. FEAR: Scores range from 0 - 20 points

Questionnaire Item	Content	Points
#26	How much pain do people suffer who are beyond the beginning stages of cancer?	
	_____Very great amount	4
	_____Great amount	3
	_____Moderate amount	2
	_____Slight amount	1
	_____Not at all	0
#27	To what extent do you feel cancer is sooner or later likely to disfigure the body?	
	_____Very greatly	4
	_____Greatly	3
	_____Moderately	2
	_____Slightly	1
	_____Not at all	0
#28	To what degree do you feel cancer interferes with living a normal life, at work, at home, etc.	
	_____Very greatly	4
	_____Greatly	3
	_____Moderately	2

_____Slightly 1

_____Not at all 0

#29 "If I had cancer I'd rather not know about it as long as possible." To what degree do you feel this way?

_____Very greatly 4

_____Greatly 3

_____Moderately 2

_____Slightly 1

_____Not at all 0

#30 How much do you fear cancer compared to other people?

_____Much more 4

_____Somewhat more 3

_____Just the same as other people . . . 2

_____Somewhat less 1

_____Much less 0

E. CUES, Symptoms: Scores range from 0 - 5 points

Questionnaire Item	Content	Points
#4	Do you have a sign or symptom now that you feel might be cancer?	
	_____Yes	0
	_____No	0
	NOTE: If question answered "YES" go to Question 5	
	If question answered "NO"	0

#5 If you feel you have a sign or a symptom of cancer, when did you first notice it?

_____Less than one week ago 1

_____Less than a few weeks ago 2

_____Less than 3 months ago 3

_____Less than 6 months ago 4

_____More than One year ago 5

F. CUES, Social Pressure: Scores range from 0 - 6 points

Questionnaire Item	Content	Points
#13	Did anyone suggest or urge you to come to the clinic for a cancer examination?	
	_____Yes	1
	_____No	
	Who was it? _____A Friend	
	_____A Spouse	1
	_____A Parent	
	_____A Neighbor	
	_____Other _____	
	NOTE: Add 1 point if spouse checked.	
#14	How much pressure did it take to get you to come to the clinic?	
	_____Great amount	3
	_____Over a moderate amount	2
	_____Small amount	1
	_____None	0

#15 If you came with your spouse, whose idea was it mainly?

_____My spouse's idea

_____My own idea

NOTE: Validates question 13.

If "SPOUSE" checked in Question 13 - "0"

If "SPOUSE" not checked in Question 13 but checked here "SPOUSE'S IDEA" - "1"

#16 Were any of the following responsible for getting you to come to the clinic?

_____American Cancer Society Volunteers information

_____Newspaper Ads or information

_____T.V. or radio announcements or information

_____Clinic circular in the mail or from the school

_____Saw a poster or a sign about the clinic

_____Heard people talking about the clinic

_____Other Indicate:_____

_____

_____None

NOTE: If "ONE" or "ALL" checked 1

None checked 0

APPENDIX C

Background Data Collection Form

Name (Last, First)	Age
Occupation	Last Grade Completed
Spouse's Name	Age
Occupation	Last Grade Completed
Address (No. Street, Area)	Home Phone
Monthly Wage - Income	No. Children Living in the home
-300 300-400 400-500 500-600 600-700 800+	

___Female with Spouse Preventive Action
___Male with Spouse Preventive Action
___Female Action Alone
___Male Action Alone
___Female No Action
___Male No Action

APPENDIX D

Correlation Matrices of the Health Belief Model Variables For Male and Female Subjects

Correlation Matrix of the Health Belief Model Variables for Male Subjects

	1	2	3	4	5	6	7	8	9	10
1	1.00	.42	.28	-.02	.16	-.19	-.29	-.17	-.24	.11
2		1.00	-.008	-.12	-.09	-.47	.01	.09	-.07	.03
3			1.00	-.08	.22	.13	.10	-.29	-.10	.22
4				1.00	-.26	-.14	.73	.37	.02	-.37
5					1.00	.24	-.95	.75	-.18	.29
6						1.00	-.04	-.003	.27	.27
7							1.00	.01	-.17	.20
8								1.00	.17	.04
9									1.00	.30
10										1.00

Code for variables: (1) Susceptibility; (2) Benefits; (3) Fear; (4) Barriers; (5) Symptoms; (6) Social Pressures; (7) Age; (8) Class; (9) Dependents; (10) Health Action

Correlation Matrix of the Health Belief Model Variables for Female Subjects

	1	2	3	4	5	6	7	8	9	10
1	1.00	-.16	.36	.03	.17	.14	.06	-.37	-.06	.39
2		1.00	.40	-.17	-.12	.15	-.26	.49	-.08	.09
3			1.00	-.03	.12	.44	-.38	.14	.16	.11
4				1.00	-.29	-.25	1.00	-.12	-.05	-.30
5					1.00	.02	.003	-.28	-.05	-.14
6						1.00	-.38	-.05	.20	.01
7							1.00	-.42	-.16	-.22
8								1.00	-.10	.18
9									1.00	.19
10										1.00

Code for variables: (1) Susceptibility; (2) Benefits; (3) Fear; (4) Barriers; (5) Symptoms; (6) Social Pressures; (7) Age; (8) Class (9) Dependents; (10) Health Action

AN ABSTRACT OF THE CLINICAL INVESTIGATION

LAVONNE ZIPRICK

For The: MASTER OF NURSING

Date of Receiving this Degree:

Title: HEALTH BELIEF MODEL AS AN EXPLANATION OF PARTICIPATION IN CANCER SCREENING

Approved: [redacted]
Julia Brown, Ph.D. Advisor

The purpose of this research was to assess the adequacy of Rosenstock's Health Belief Model for explaining differences among men, and also differences among women, in the extent of health action undertaken to detect cancer.

Married persons, between the ages of 18 and 65, who attended a cancer screening clinic in a low income area were asked to participate in this study, as were their nonattending spouses. The sample, then, consisted of 27 wives and 27 husbands. Data were collected through the administration of a questionnaire constructed to measure the Health Belief Model's core variables of susceptibility, benefits, barriers, fear, symptoms, social pressures, and health action, and also the Model's "modifying" variables of age, socio-economic status, and number of dependents.

The value of each independent variable for predicting health action was assessed by the means of stepwise multiple

regression. The analysis revealed considerable differences between the sexes in the explanatory value of the variables. For the females, the most important predictor variables were susceptibility, barriers and symptoms; for the males, barriers, social pressure and fear were the most important. The Model proved to be more useful in explaining health action for females (38% of the variance) than for the males (24% of the variance). When the Model was expanded to include three demographic "modifying" variables, its predictive power for health action was improved, accounting for 54% of the variance in health action for females, and 51% for males.

It was concluded that the Health Belief Model needs expansion for maximum utility, and that differing models should be considered for males and females. It appeared that health action differed between the sexes, that women were more likely to participate in cancer screening than men, even when culture, lifestyle and living environment were shared in common.