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Breakfast Consumption In Female Adolescents: A Test Of The Health Belief Model.

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BREAKFAST CONSUMPTION IN FEMALE ADOLESCENTS: A TEST OF THE HEALTH BELIEF MODEL

by

Julia L. Perkins

A DISSERTATION

Submitted in Partial Fulfillment of the Requirements of Degree
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ABSTRACT OF DISSERTATION

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To promote healthy behaviors in school populations, nurses rely heavily on educational programs designed to influence the variables that bear upon these behaviors. Thus, an understanding of these variables would help nurses to design scientifically based health educational programs specific to the behavior.

The purpose of this study was to determine if the constructs of the health belief model predict breakfast consumption in female adolescents. Using the original formulation of the health belief model, the investigator examined the constructs of seriousness, susceptibility, benefits, and barriers in relation to their effects on breakfast consumption.

A Likert scale instrument was constructed to measure these beliefs. Reliability quotients for all subscales, as measured by the Cronbach alpha, were >.70 except for the susceptibility subscale. Construct validity, as measured by factor analysis, was

demonstrated for portions of the benefits, seriousness, and barriers subscales. A moderate degree of predictive validity, as measured by discriminant analysis, was demonstrated for all four constructs.

The sample consisted of 591 eleventh-grade females from an upper-middle socioeconomic, suburban community. Of this sample 38.9% reported consuming breakfast at least five times per week and 61.9% reported consuming breakfast four or less times per week.

The four constructs of the health belief model were found to correctly discriminate between consumers and nonconsumers of breakfast 74.62% of the time. Additionally, differences were found between consumers and nonconsumers of breakfast on the single health beliefs of seriousness, benefits and barriers. Consumers perceived ill health as more serious, reported more benefits to breakfast consumption, and perceived fewer barriers than did nonconsumers. There were no differences found in the two groups in relation to susceptibility.

Recommendations generated from the findings of this study include the alteration of the susceptibility subscale in an attempt to increase its reliability. Also, replications of the study should include other populations, additional social variables, and the dimension of quality as it relates to breakfast consumption. Finally, since the findings of this study suggest that the model is

appropriate for a qualitatively different behavior than those previously studied, exploratory studies should be attempted with other behaviors of a similar type.

Abstract Approved by: Committee Chairman _____

Program Director _____

Date 12/3/82 Dean of Graduate School _____

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CHAPTER I

THE PROBLEM

Introduction to the Problem

Historically, the health of human beings has been determined by their behavior, their food, and the nature of their environment. Half of the reduction in mortality rates over the past three centuries occurred before 1900 and was due in nearly equal measure to improved nutrition and reduced infectious diseases (Knowles, 1977). The provision of safe water and milk, the improvement of sanitation, and the control of airborne infection all contributed to this reduction.

With the discoveries of Koch and Pasteur in the late nineteenth century, more specific forms of prevention became possible. Health research fastened upon the simple, compelling idea of germ theory--one germ, one disease, one cure. Out of this research came the development of vaccines that drastically reduced the mortality and morbidity of the great killers of the world, such as smallpox, diphtheria, pertussis, tetanus, tuberculosis, measles, poliomyelitis, and some forms of pneumonia. Less specifically, but from the same theoretical base, health researchers developed antibodies that further reduced morbidity and mortality from a variety of other infectious diseases (Fuchs, 1974). At the same

time, the age-old factors of personal behavior aznd environmental conditions, while continuing to be recognized as health factors, were reduced to a lesser role (Klaxman, 1965).

As infectious illness and other unicausal disease declined, definitions of health, at least those utilized by health professionals, began to change. In place of health being defined narrowly as the prevention of disease, new definitions began to appear. Goldstein (1959) stated that health is related to the value an individual places on what is essential to his well-being and serves as a prerequisite for the realization of other goals. Increasingly, laymen also defined health as not only the absence of physical symptoms, but the ability to carry out the normal activities of life (Baumann, 1961; Natapoff, 1978). Parsons (1958) defined health as the optimum capacity of an individual for performing effectively his usual tasks and roles--a definition that implied the prevention of illness wherever possible. Arnold (1971) cited that moving away from the disease model would shift the focus of health to abilities as opposed to disabilities.

At the same time that expectations for health were rising, improvements in the delivery of health care via professionals had little effect on the traditional or perceived health status of the population (White, 1975). This lack of improvement took place even in the face of astronomically rising expenditures on health in this country, from $3.6 billion or $29.49 per capita in 1929 to $247 billion or $1067 per capita in 1980 (National League for Nursing, 1982). Fuchs (1974) stated that once basic levels of health

knowledge, personnel, and facilities are available, additional inputs of professional health care have little effect on the health of the populace. Without question the great scientific health advances of the last 150 years have increased the longevity and quality of life. However, the major health problems of today as well as further increases in longevity and quality of life are not amenable to the same single-causation, passive-preventive measures that were effective in the past. Health conditions such as cardiovascular disease, lung disease, cancer, accidents, and less than optimal physical and mental functioning have complex causes that are deeply rooted in the environment and lifestyles of individuals (Ennes, 1968; Lehmann, 1979). Fuchs (1974) stated:

> The greatest current potential for improving the health of people is to be found in what they do and don't do to and for themselves. Individual decisions about diet, exercise, smoking (and others) are of critical importance (p. 55).

Significance of the Problem

As a health profession, nursing has long been in the vanguard of health promotion and has advocated individual responsibility for health. For example, Henderson and Nite (1978) defined nursing as "assisting individuals with those activities contributing to health or its recovery that they perform unaided when they have the necessary strength, will, or knowledge" (p. 14). Orem (1978) emphasized individual responsibility when she defined self-care as the central focus of nursing. Orem's theory stated that self-care is a requirement of every individual since in its absence disease

or death will occur. In the context of this theory, the need for nursing is established when an individual's self-care demand outweighs self-care abilities. Thus, the goal of nursing is to return a person to the capability of caring for self.

Health behavior was defined by Kasl and Cobb (1966) and elaborated upon by Rosenstock (1966) as any behavior undertaken by an individual believing himself to be healthy for the purpose of preventing disease or detecting it in an asymptomatic state. This behavior is differentiated from illness behavior which is conceived of as any behavior undertaken by someone who believes himself ill for the purpose of getting well (Kasl & Cobb, 1966). Steele and McBroom (1972) elaborated on this original definition by relabeling it preventive health behavior inasmuch as it is for the assumed purpose of maintaining and improving one's health. Further emphasized was the notion that the concept was inclusive of a variety of behaviors that are health related, such as maintaining a proper diet, stepping on a scale, teeth brushing, preventive use of health professionals, utilization of accident prevention devices, taking vitamins, and eating patterns. Harris and Guten (1979) introduced the notion that individual perception of what is important for health is an important dimension of any preventive health behavior.

Reasons for engaging or not engaging in any particular preventive health behavior are varied and a source for much speculation. Knowles (1977) stated that the barriers to these behaviors are lack of knowledge about what is healthful and lack of

interest in what is preventable. Other authors found that knowledge has little effect on health behavior (Hochbaum, 1981). The Task Force on Consumer Health Education (1976) identified the affluent, indulgent American lifestyle, persistent conditions beyond the control of the individual, and a lack of professional consensus on specific causes for complex health conditions as common barriers to health behaviors. Other scientists identified individual attitudes and beliefs about one's personal relationship to specific diseases, health, and preventive health behaviors as possible factors (Rosenstock, 1974). These specific factors were collectively conceptualized by Rosenstock (1966) as the health belief model that purports to serve as a predictive model for a variety of preventive health behaviors.

Motivations for adolescents can be contributed to additional sources as well. Erikson (1968) defined the developmental crisis during adolescence as the development of a sense of identity. During this time the individual begins to look for opportunities to decide personally on the activities of life. A part of the process often involves rebellion against home- and society-dictated behaviors and norms as the price for developing a sense of self (Ausubel, 1954; Gallagher, 1953). Thus, assertion of the right to decide, regardless of parental influences, can serve as an additional motivating force for adolescents.

Nutritional behaviors are perceived by the public and health provider alike as being highly related to health. Harris and Guten (1979) found that in a study of 842 adults, 71.3% listed some form

of eating or nutritional behavior as an activity they performed to improve their health. Professional documentation of the association of health with nutritional behaviors includes: the relationship of obesity and high caloric intake to hypertension and coronary heart disease (Ashley & Kennel, 1974; Keys, 1973; Rabkin, Mathewson, & Hsu, 1977); salt intake with hypertension (Dahl, 1972; Reisen, Abel, & Modan, 1975); sugar intake with dental caries (Gustafson, 1954; McHugh, 1964, Zita, 1959); and eating patterns such as frequency of meals and omission of meals with obesity, elevated blood cholesterol levels, inadequacy of nutritional intake, and decreased performance on a variety of psychomotor tasks (Daum, Tuttle, Martin & Meyes, 1950; Fabry, Fodor, Hejb & Braun, 1964; Fabry, Hejda, Cerny, Osconova & Pechar, 1966; Hampton, Huenemann, Shapiro & Mitchell, 1967; Hueneman, Shapiro, Hampton & Mitchell, 1968; Kaufman, Poznanski & Guggenheim, 1975; Lathem & Cobos, 1971; Steele, Clayton, & Tucker, 1952; Tuttle, Wilson & Daum, 1949; Tuttle, Daum, Myers & Martin, 1950; Tuttle, Daum, Imig, Randall & Schamacher, 1952; Tuttle, Daum, Larsen, Galzana & Roloff, 1954; Tuttle & Hebert, 1960).

Nutritional behaviors have particular importance for adolescents. The rapid and extensive increase in height, weight, muscle mass, and sexual maturity of adolescence is accompanied by new and greater nutritional requirements (Whaley & Wong, 1979). Since nutritional needs are closely related to increase in muscle and red blood cell mass, the requirements for calories, protein, and iron are higher than at almost any other point in life (Whaley

& Wong, 1979). Studies show that a large percentage of adolescent diets are deficient in iron, ascorbic acid, calcium, vitamin A, and protein (Lee, 1978; Schorr, Sanjur, & Erickson, 1972; U.S. Department of Health, Education, and Welfare, 1980; Wharton, 1963).

In relation to a specific nutritional behavior, Bowes (1950) found omission of breakfast to be the poor food habit most frequently reported by adolescents. In a study of 1032 parents of young children five to seven years old, 99% rated eating breakfast as a very important topic to be covered in health education (Frankle, 1980). In a longitudinal study of 6,928 adults in California, eating breakfast was one of a number of preventive health behaviors correlated with perceived physical health and longevity (Belloc, 1973; Belloc and Breslow, 1972). Omission of breakfast has also been found to be correlated in adolescents with scholastic performance (Tuttle et al., 1954), obesity (Hueneman et al., 1968), and poor nutritional intake (Hardy & Price, 1975; Steele, Clayton, & Tucker, 1952; Warnick, 1963).

The importance of breakfast as a preventive health behavior was given official recognition by the Congress of the United States in 1966 when they passed the School Breakfast Program in the attempt to provide nutritious breakfasts to children from needy homes or to children who had to leave home early in the morning. The breakfast program was instituted for the purposes of increasing the daily nutritional intake of school children and improving attitudes, school attendance, and academic achievement. Participation in this program increased from 330,000 children in

its inception (Child Nutrition Program, 1974) to 3.1 million children in 1980 (Food Research and Action Center 1981).

While the federal government gave recognition to the barriers of time and insufficient income as factors in the omission of breakfast, research revealed that although these factors often influence breakfast consumption, there are other factors involved. For example, Todhunter (1948) reported that at least 1/7 of the children in Alabama missed breakfast at least once a week irrespective of income. Steele et al. (1952) reported that 13% of the boys and 20% of the girls in Rhode Island omitted breakfast on a habitual basis, and in Maine, 3% of the boys and 4% of the girls omitted breakfast. In more recent studies, Hueneman et al. (1968) reported that teenage boys missed at least 1.4 breakfasts per week and girls missed 1.2 breakfasts per week. A study of 401 mothers (Pratt, 1971) revealed that 20% of low-income mothers and 10% of middle- to high-income mothers failed to eat breakfast on a regular basis. Hayden (1974) found that 17% of all adults go to work with either no breakfast or just coffee. Greger, Higgins, Abernathy, Kirksey, deCorso and Baligar (1978) noted that 14% of the adolescent girls in Iowa habitually skipped breakfast. Additionally, Hardy and Price (1975) reported that 10% of the students in the state of Washington arrive at school without food or drink.

Statement of the Problem

Self-initiated behaviors are increasing in recognition as determinants of health status. Nutritional behaviors, including the consumption of breakfast, are recognized in the literature as important contributing determinants of health status particularly in adolescents (Daum et al. 1950; Fabry et al., 1964; Fabry et al., 1966; Hampton et al., 1967; Hueneman et al., 1967; Kaufman et al., 1975; Lathem & Cobos, 1971; Steele et al., 1952; Tuttle et al., 1949; Tuttle et al., 1950; Tuttle et al., 1952; Tuttle et al., 1954; Tuttle and Hebert, 1960). Although importance of breakfast consumption is documented and the breakfast consumption patterns of various population groups established to some degree, only three studies were found which dealt specifically with factors that influence the consumption of breakfast in adolescents (Cooksey & Ojeman, 1963; Hinton, Chelderdon, Eppright & Wolens, 1962; Hodges & Krehl, 1965). These studies are quite old and were exploratory in nature.

The period of adolescence is an important period for the establishment of life-long behavioral patterns (Whaley & Wong, 1979). Additionally, nutrition is of increased importance during this period due to the occurrence of rapid increases in height, weight, muscle mass, and, in females, the occurrence of menarche. Thus, a need exists to examine what variables influence the establishment of healthful nutritional behaviors in adolescents. Contributions to a body of knowledge related to a specific nutritional behavior, breakfast consumption, can be achieved by

studying variables that the literature suggests might influence adolescents in this behavior. The health belief model is one conceptualization of these variables. While data are available in the literature regarding the influence of the health belief variables upon a variety of preventive health behaviors, data regarding the health belief variables and breakfast consumption are not currently available. If a relationship between these variables could be demonstrated via research, this relationship would provide valuable information for the development of health education modalities for those nurses who are involved with the health of school populations. Additionally, further support would be provided for a theoretical model, the health belief model, that has significance for much of nursing practice. Thus, the problem with which this study was concerned was: Do the variables of the health belief model influence breakfast consumption in female adolescents?

Purpose of the Study

The purpose of this study was to determine if the variables of the health belief model predict breakfast consumption in female adolescents.

Hypotheses

In accord with the purpose of this study, the investigator proposed the following hypotheses:

Major Hypothesis

Health beliefs discriminate between female adolescent consumers and nonconsumers of breakfast.

Minor Hypotheses

1. There is a significant difference in the susceptibility beliefs of female adolescent consumers and nonconsumers of breakfast.

2. There is a significant difference in the seriousness beliefs of female adolescent consumers and nonconsumers of breakfast.

3. There is a significant difference in the benefits beliefs of female adolescent consumers and nonconsumers of breakfast.

4. There is a significant difference in the barriers beliefs of female adolescent consumers and nonconsumers of breakfast.

Definition of Terms

For the purpose of this study, the following terms were defined:

Health - optimum capacity of an individual for performance of his usual tasks including the avoidance of illness (Parsons, 1958).

Preventive health behavior - behavior undertaken by an individual perceiving himself to be well for the perceived purpose of maintaining his health state (Harris & Guten 1979; Kasl & Cobb, 1966).

Adolescent - a person between puberty and the time body growth ceases and emotional maturity is obtained (Pilliteri, 1981); operationally, a female who attends the eleventh grade in school.

Breakfast consumption - the intake of calories within one hour after arising in the morning, excluding the sole intake of coffee, tea, or diet sodas; operationally, the self-report by adolescents on the health belief questionnaire regarding frequency of breakfast consumption.

Health beliefs - a person's cognitive, subjective perception of his personal health status (Andreoli, 1979) and of his ability to affect his health status through his personal behavior; operationally, the combination of all subscale scores obtained on the health belief questionniare.

Barriers - an individual's perception that a given action is personally inconvenient, expensive, unpleasant, or painful (Rosenstock, 1974); operationally, the score obtained on the barriers section of the health belief questionnaire.

Benefits - an individual's perception that an action will be personally beneficial in reducing his susceptibility to disease or increasing his health status (Rosenstock, 1974); operationally, the score obtained on the benefits section of the health belief questionnaire.

Seriousness - an individual's perception of the amount of discomfort or inconvenience that disease or ill health will cause him (Rosenstock, 1974); operationally, the score obtained on the seriousness section of the health belief questionnaire.

Susceptibility - an individual's perception of the likelihood of his becoming ill or decreasing his health status (Rosenstock, 1974); operationally, the score obtained on the susceptibility section of the health belief questionnaire.

Assumptions of the Study

For the purpose of this study the following assumptions were made:

1. Consumption of breakfast is an important behavior that contributes to health.
2. Adolescents vary in their breakfast consumption behavior.
3. Adolescents have significant control over their breakfast consumption behavior.
4. Health is a valued life state for adolescents.
5. Behavior is motivated by an individual's subjective belief that a specific behavior will assist him in achieving a valued life state or avoiding an undesired life state.
6. Health belief variables exist and can be measured.

Limitations of the Study

Although health behavior is influenced by multiple factors, the focus of this study was the influence of the selected variables of a selected theoretical model, the health belief model. The sample was restricted to females in the eleventh grade who attended public high school in a largely upper-middle socioeconomic suburb of a large southeastern metropolis. It was recognized that this

sample was not representative of the population in general, and as a result the generalizability of the results was limited. Measurement of breakfast consumption was limited to self-report of the subjects regarding frequency of consumption and thus subject to errors of reporting. Finally, because of a lack of a statistically valid and reliable instrument that measured health beliefs, the investigator constructed a data collection instrument for use in this study. The reliability and validity of this instrument were established during the conduct of the study.

Organization of the Study

The report of this study consists of five chapters. In Chapter I, the specific problem to be explored and the significance of this problem are identified. Pertinent hypotheses, definition of terms, and assumptions basic to the study are delineated. Identified limitations are also presented.

Chapter II offers a review of literature relating to breakfast consumption and its importance both to health as well as to non-health-related variables. Also discussed are the theoretical formulations of the health belief model and an overview of studies substantiating the relationship of these beliefs to a variety to preventive health behaviors.

The design and methodology of the study including source and selection of the sample, procedures used, instrument development, and data analsysis are presented in Chapter III. Chapter IV consists of findings and analysis of data including the validity

and reliability of the developed instrument. Finally, Chapter V consists of the conclusions, discussions and recommendations generated by the findings.

Summary

Presented in Chapter I was an overview of the study including an introduction to the problem, the significance of the problem, and the purpose of the study. The pertinent hypotheses were stated along with the definitions and assumptions basic to the study. Finally, the identified limitations and the organization of the dissertation were presented.

CHAPTER II

REVIEW OF THE RELATED LITERATURE

The purpose of this chapter is to present a review of literature related to the preventive health behavior, breakfast consumption, and the theoretical perspective from which the behavior is approached. The review is subdivided as follows: breakfast and its importance to health, breakfast and non-health-related variables, the health belief model and its relationship to other preventive health behaviors, and the theoretical importance of the study for nursing practice.

Breakfast and Its Importance to Health

The original studies related to breakfast were sponsored by the Cereal Institute and performed under controlled conditions on a variety of populations for the purpose of studying the effects of various types of breakfast behaviors on male and female subjects from 12 to 65 years of age. Omission of breakfast was found to affect some parameters of late-morning performance such as work output, tremor magnitude, and decision-making time for all groups studied (Cereal Institute, 1976). In the case of 12- and 14-year-old males, maximum work rate was significantly decreased, and attitude and scholastic attainment somewhat decreased when

breakfast was omitted (Tuttle et al., 1954). Additional findings included: the content of the breakfast is not related to late-morning efficiency (Daum et al., 1950); coffee is not an effective substitute for breakfast in adult females (Tuttle et al., 1949); breakfast omission is not effective in inducing weight reduction in groups of all ages (Tuttle et al., 1954); and a mid-morning break that includes caloric intake does not make up for an omitted breakfast in terms of maximal work output (Tuttle & Hebert, 1960). Some of these same results were borne out in a survey of 3500 high school students that indicated when breakfast was omitted students took longer to make decisions, had more hand tremors, and had a lesser work output than when students consumed breakfast (U.S. Department of Agriculture, 1970). A 1967 study of adolescents by Hampton et. al., however, showed no relation between school performance and breakfast consumption.

Omission of meals, including breakfast, has been correlated with obesity in adolescents. In a study of California adolescents (Huenemann et al., 1968) results showed that more obese than normal-weight adolescents habitually skipped breakfast. The findings of a study of Kentucky teenagers revealed that meal-skipping in general was correlated with obesity (Lee, 1978). Israeli adolescents reported a decreased frequency of main meals among obese as opposed to normal-weight adolescents (Kaufman et al., 1975). Fabry et al. (1966) found that descrased meal frequency was related to an increased tendency toward fat formation in adolescent males and females.

Moreover, breakfast omission has been found to be associated with poor nutritional intake. In the state of Washington, the findings of 1900 students from ages 7 to 14 revealed that those students who skipped breakfast had diets that were significantly lower in total calories, calcium, phosphorus, riboflavin, and ascorbic acid than the diets of the students who consumed breakfast (Hardy & Price, 1975). The results of a study by Steele et al. (1952) showed that adolescents who eat breakfast more nearly consume the recommended daily allowance of all nutrients than those who miss breakfast once a week or more. Warnick and Zoehringer (1963) and Hampton et al. (1967) also reported a poor quality of diets in those adolescents who habitually skipped meals. Bowes (1959), in a study of 14- and 15-year-old students, reported that quality of diet was correlated with what was eaten in the early morning meal, whereas Eppright (1959) reported that only one subject in five who skipped breakfast ever obtained an adequate diet.

Other health factors found to be correlated with breakfast omission included midmorning hypoglycemia (Bryant, Martin, Schumacher, Daum, & Tuttle, 1952; Fabry et al., 1964), hypercholesterolaemia (Fabry et al., 1964), and smoking (Lee, 1978). One of the most recent findings concerning breakfast consumption was that of Belloc and Breslow (1972), and Belloc (1973), who reported in a study of 7000 adults in California that regular breakfast consumption along with a variety of other preventive health behaviors was correlated with both longevity of

life and perception of personal physical health as measured by a variety of parameters.

Breakfast Consumption and Non-Health-Related Variables

Most of the studies conducted in recent years have looked only at consumers of breakfast. Huenemann et al. (1968) reported that regularity of food intake was associated with socioeconomic status, with adolescents of high socioeconomic status having more regular eating behaviors than adolescents of low socioeconomic status. Similarly, the results of a study by Pratt (1971) revealed that fewer mothers of low socioeconomic status ate breakfast than mothers of high socioeconmic status.

Only two studies dealt with race as a variable. Hardy and Price (1975) reported that black and Mexican children came to school more frequently without breakfast than did white children. In a similar vein, the findings of a study by Lee (1978) showed that black teenagers skipped more meals than white teenagers.

Age has been found to be associated with breakfast consumption, but in an inconsistent manner. Eppright (1959) reported that teenagers skipped breakfast more often than younger children. In another study, however, 16-year-olds reported eating breakfast more often than older teenagers (Huenemann et al., 1968). Hardy and Price (1975) reported that children over 10 years skip breakfast more frequently than children under 10 years.

In looking at sex as a variable, the results of a study by Steele et al. (1952) revealed that boys ate a more nutritional

breakfast on a more regular basis than girls. Huenemann et al. (1968), however, reported that in California more boys than girls habitually skipped breakfast. Cooksey and Ojeman (1963) reported no differences between males and females in relation to frequency of breakfast consumption.

Thus, it appears that the evidence relating demographic variables to breakfast consumption is not only scant, but equivocal. Only in relation to race and socioeconomic status have the findings been consistent.

Hochbaum (1981) criticized nutritional research for looking at only the "who" not the "why" of nutritional behavior. In support of this criticism, only three studies were found that addressed adolescents' reported reasons for not eating breakfast. Hinton et al. (1962) reported that lack of hunger in the mornings and parental criticism of eating behavior were related to skipping meals. The employment status of the mother or sex role identifications were not related. The findings of an exploratory study by Cooksey and Ojeman (1963) revealed that eating alone, the inconvenience of self preparation, a lack of ready-to-eat foods, and a negative peer group attitude regarding the importance of breakfast were significantly negatively correlated with breakfast consumption in teenagers. These findings also showed that consumption of bedtime snacks, dislike of traditional foods, late bedtime hours, and employment status of the mother were not related to breakfast consumption. Hodges and Krehl (1965) reported

lack of hunger, late arising on school mornings, and lack of parental preparation as reasons cited by adolescents for omission of breakfast.

The Health Belief Model

A popular model widely utilized for explaining all types of preventive health behavior is the health belief model. This model is drawn from social psychological theory, most specifically that of Lewin (1935), and subsequently delineated by Rosenstock (1966). The original conception, proposed by Lewin, is that an individual exists in a life space composed of regions, some of which are positively valued or have a positive valence, some of which are negatively valued or have a negative valence, and some of which are neutral (Lewin, 1935). The valences are those that are subjectively perceived by the individual and may or may not be related to the observer's perception of reality. According to Rosenstock's Health Belief Model (1974), disease or the state of ill health, if perceived at all, is perceived as being a region of negative valence. Thus, the state of ill health exerts a force moving an individual away from this region unless all other regions exert an even greater negative pull. Conversely, the state of health is assumed to be a region of positive valence moving an individual toward that region unless another region exerts an even greater force. Daily behavior, under this model, is conceptualized as a process of being pushed and pulled by opposing forces.

The characteristics of the model are that for an individual to take actions to avoid disease or ill health, he must: 1) believe himself personally susceptible to ill health; 2) believe ill health would affect him seriously in some way; 3) believe that taking a particular action would be beneficial in decreasing his susceptibility to a disease or ill health or, if it occurred, its severity; and 4) believe that this action would not entail overcoming significant barriers of cost, inconvenience, embarrassment, pain, or a host of other possible barriers (Rosenstock, 1966). The acceptance of one's susceptibility to the serious state of ill health is thought to provide a force leading to action. The course of action is influenced by the perceived relative effectiveness of the actions available to him balanced by the perceived inconveniences or discomfort these actions might entail (Rosenstock, 1966). In other words, an individual who felt susceptible to ill health, perceived ill health as a serious condition, and saw an action that was beneficial in avoiding ill health that entailed low levels of discomfort or inconvenience would be likely to engage in that action.

Although health belief variables have not been studied in relationship to breakfast consumption, they have been studied in relationship to other preventive health behaviors. The remainder of this section consists of a literature review for the four variables of the health belief model: susceptibility, seriousness, benefits, barriers, and for the beliefs in combination.

Belief in Susceptibility

A variety of studies focused on the relation of belief in personal susceptibility to a given disease and preventive actions widely accepted to be related to that disease. Kegeles (1963a,b) reported that belief in susceptibility to dental disease was related to seeking preventive dental care. Beliefs in susceptibility to Asian influenza and poliomyelitis were reported to be correlated with seeking immunizations for these disease (Clausen, Geldenfeld, & Deasy, 1954; Glasser, 1958; Leventhal, Hochbaum, & Rosenstock, 1960). Beliefs in susceptibility to cancer, tuberculosis, and heart disease were reported to be related to participation in screening programs for these diseases (Fink, Shapiro, & Lewison, 1968; Haefner & Kirscht, 1970; Hochbaum, 1958). The findings of a study by Becker, Kabach, Rosenstock, and Rath (1975) revealed that parental belief in the susceptibility of their unborn children to Tay Sachs disease was correlated with participation in a screening program for Tay Sachs disease, although Ben-Sira and Padeh (1978) reported no relationship between the same variables. Suchman (1967) reported a positive correlation between belief in susceptibility to accidents and the use of an accident preventive device among sugar-cane cutters.

Findings from other studies showed beliefs in general susceptibility to illness to be correlated with preventive health behavior. Becker, Haefner, Maiman, Kirscht, and Drachman (1977) reported that mothers' belief in their children's general susceptibility to ill health was correlated with their children's

success on a weight reduction program. Findings of a study by Harris and Guten (1979) revealed that a belief in general susceptibility to ill health was related to a variety of adults' self-perceived preventive health behaviors. Gochman (1970, 1971, 1972) in a series of studies reported that belief in general susceptibility to illness was as related to children's intentions to seek preventive dental treatment as was their belief in susceptibility to dental disease. Langlie (1977), however, reported that the belief of 382 adults regarding their general susceptibility to ill health was not related to their reported performance of a variety of preventive health behaviors. These results were duplicated by Weisenberg, Kegeles, and Lund (1980) for children's belief in their general susceptibility to illness and their participation in a school preventive dentistry program. Thus, while the majority of literature does indicate support for the variable of susceptibility, the results are not unanimous.

Belief in Seriousness

Seriousness has been included in a number of studies. Belief in the seriousness of polio and Asian influenza has been reported to be a major factor in why people seek immunization for these diseases (Glasser, 1958; Leventhal, et al., 1960). Aho (1979) reported that more non-smokers and normal-weight people than smokers and obese people perceived smoking and obesity as a serious threat to health. Becker et al. (1977) reported perceived

seriousness of obesity as a health problem by mothers of obese children to be related to success of a weight reduction program for their children.

On the other hand findings of a study by Kegeles (1963a,b) showed perceived seriousness of dental disease in adults to be unrelated to the number of preventive dental visits. Clausen et al. (1954) reported that all parents perceived poliomyelitis to be a serious threat to health, whether or not they permitted their children to be vaccinated. Haefner and Kirscht (1970) reported that belief in seriousness of tuberculosis, cancer, and heart disease was not related to intention to seek preventive health services from a provider. Becker et al. (1975) found that belief in seriousness of Tay Sachs disease was negatively correlated with participation in a Tay Sachs screening program. Thus, the evidence for usefulness of the belief of seriousness as a predictor for preventive health behavior is mixed.

Belief in Benefits

Belief in benefits of the behavior under study has been more consistently correlated with a variety of preventive health behaviors including preventive dental visits (Kegeles, 1963a,b), seeking chest x-rays (Hochbaum, 1958), taking cancer screening tests (Fink, Shapiro, & Lewison, 1968; Kegeles et al., 1965), seeking genetic counseling (Becker et al., 1975), performance of exercise (Aho, 1979), preventive medical check-ups (Haefner & Kirscht, 1970), losing weight (Becker et al., 1977), general health

practices, such as nutrition and rest (Harris & Guten, 1979), nutrition and exercise (Langlie, 1977), and use of a safety glove by workers (Suchman, 1967). Researchers reporting negative findings for benefits included Harris and Guten (1979), who reported no relation between safety practices and beliefs in the benefits of these practices, and Gochman (1971), who reported beliefs in the benefits of preventive dental visits correlated with intention to make these visits only for those children for whom health was highly salient. Thus, the usefulness of belief in benefits as a predictor for preventive health behavior is supported by the majority of studies reviewed.

Barriers

Barriers have been included in studies less frequently than other beliefs. Suchman (1967) reported the presence of barriers to be the most important factor in predicting the use of a safety glove. Findings of a study by Clausen et al. (1954) revealed that the barrier of doubts regarding the safety of the poliomyelitis vaccine was the most important factor in whether parents consented to polio vaccination. Kegeles (1963a,b) found that past experience of anxiety and pain was related to frequency of preventive dental visits, but that appraisal of the competence of the dentist was not. Thus, it would appear that barriers do seem to correlate with the performance of preventive health behaviors.

Combined Health Beliefs

The health belief model postulates that it is the combination of all the variables of the model that are predictive of health behavior. Few studies have looked at these variables in combination. Three variables, susceptibility, seriousness, and benefits, were reported to be predictive for seeking screening for tuberculosis (Hochbaum, 1958); seeking preventive dental care (Kegeles, 1963a,b); and continued participation in a weight reduction program for children (Becker et al., 1977). Kirscht et al. (1966), however, reported the three variables to be nonpredictive in combination for a variety of preventive health behaviors. The combined influence of susceptibility and seriousness were reported to be the most effective in predicting influenza vaccinations (Leventhal et al., 1960) and participation in screening tests for tuberculosis, cancer, and heart disease (Haefner and Kirscht, 1970). Langlie (1977) found the combination of benefits and barriers to be predictive for a variety of preventive health behaviors. Thus, while some studies have reported limited combinations of beliefs as predictive of health behavior, no studies have considered all of the variables in combination.

The Theoretical Relevance to Nursing Practice

The results of these studies make it evident that breakfast consumption is an important nutritional behavior that contributes to the health of adolescents. The school is logically identified

as one of the best institutions to deliver health services and education to children of all ages (McNab & Candida, 1980). School nursing is essentially the field of health promotion and disease prevention, and one of the goals of the school nurse is to educate school populations toward positive health behaviors (Ridge, 1980). Identification of factors influencing adolescents toward unhealthy behavior would provide valuable information for those designing educational modalities to promote healthier behavior in the adolescent client.

Summary

In this review of related literature, an overview of studies related to the preventive health behavior, breakfast consumption, was presented. Also presented were an overview of the theoretical perspective of the health belief model and an overview of studies regarding the relationship of this model to a variety of preventive health behaviors. Lastly, the theoretical relevance of the study to nursing practice was included.

CHAPTER III

METHODOLOGY OF THE STUDY

The study proposed to determine if the variables of the health belief model influence breakfast consumption in female adolescents. Chapter III delineates the methods and procedures used to accomplish this purpose. Included in the discussion are sample selection, procedures used in data collection, instrument development, and statistical methods used to analyze the data.

Selection of Sample

Selected for the study were females attending the eleventh grade in three high schools in an upper-middle socioeconomic level suburb of a large southeastern city. The three schools were selected on the bais of the racial and socioeconomic homogeneity of the attendance areas that they served as defined by the administrative offices of the school district. In order to limit the variables that the literature suggested were systematically related to the health behavior under investigation, the sample was limited to white females of upper-middle socioeconomic status.

Procedures

To observe the ethical implications of research involving human subjects, application was made to the Institutional Review Board for Human Use at The University of Alabama in Birmingham. The application resulted in an exemption based on nonsensitive subject matter utilized in a survey design with nonidentified subjects (see Appendix A). Thus, written consent was not obtained from the participants.

Initial contact was made with the administrative office of the school system in Winter 1982 for permission to conduct research in the schools (see Appendix B). Permission for this research project was received in March 1982 (see Appendix C).

Data collection was arranged through personal contact of the investigator with the principals of the selcted schools. In two schools, a day and time convenient to the schools were selected, and all eleventh-grade, female students in attendance that day were invited to a central location to participate in a survey. Upon arrival in the central location the participants were given the Health Belief Questionnaire (HBQ) and informed that the purpose of the questionnaire was to determine what students their age felt about eating breakfast and about their health in general. The students were told that participation was voluntary and that anyone who did not wish to complete the questionnaire was not required to do so. All students attending chose to participate. The participants were then instructed to complete the questionnaire after reading the written instructions. No difficulties were

encountered during the administration interval. Ten to 20 minutes were required to complete the HBQ, with 374 participants completing the questionnaire from the first two schools visited. The investigator was available for questions during the administration interval, but no questions were asked.

In the third school the principal chose to have the eleventh-grade teachers administer the form to the eleventh-grade females in their homerooms. In order to assure as much consistency of instruction as possible, the investigator delivered the HBQ's to the school with a separate identical instruction sheet for each teacher (see Appendix D). No difficulties in administration were reported, with 217 participants completing the questionnaire at this school.

Limitations

It is recognized that the relatively uncontrolled setting in the third school could have substantially increased the amount of error variance in the questionnaires completed by these participants. Additionally, though the sample was drawn from a relatively homogeneous group in order to minimize known sources of systematic effect upon the health behavior of breakfast consumption, the participants were volunteer and some self-selection may have occurred. Finally, the specific schools utilized were a convenience sample; therefore, the findings of the study cannot be generalized beyond the sample.

The Instrument

The instrument constructed for use in this study was designed as a modified 5-point Likert scale. Likert scales or summated rating scales are most useful for the measurement of attitudes or beliefs. All items are considered of approximately equal value, and participants are allowed to respond to the items with degrees of intensity. The indicated item scores are then summed or averaged to yield a score for an individual (Kerlinger, 1973). A combination of items was used for each health belief subscale because sets of items are generally more reliable than single items (Nunnally, 1978). A limitation of this type of scale is response set variance. Individuals have differential tendencies to use certain types of responses; that is agree, disagree, extreme responses, or neutral responses (Kerlinger, 1973). An effort was made to minimize this set response by reversing the directions of some items.

The constructs included for measurement by the instrument were perceived barriers, perceived benefits, perceived seriousness, and perceived susceptibility. Additionally an item was constructed to measure frequency of breakfast consumption (see Appendix E).

Subscales

Breakfast Consumption. Data were collected on frequency of breakfast consumption by item one (see Appendix D) and coded (1) for consumes breakfast five or more times per week and (0) for consumes breakfast less than five times per week. The decision for

selection of five times weekly as the dividing point for the two groups was based upon similar definitions in previous studies (Belloc & Breslow, 1972; Steele et al., 1952; Huenemann et al., 1964). A definition of breakfast was included on the instrument to assure consistency in participant responses. The definition of breakfast utilized, that of the consumption of calories within a given time period, was based on prior studies that classified any early-morning caloric intake as breakfast (Duyff, Sanjur & Nelson, 1975; Steele et al., 1952).

Benefits. Data were collected on benefits by items two through eight (see Appendix E). Items 2, 3, 4, 5, and 8 represent benefits of breakfast that were supported by the literature (Belloc & Breslow, 1973; Hampton et al., 1967; Hardy & Price, 1975; Huenemann et al., 1968; Lee, 1978; Tuttle et al., 1954; Warnick, 1963). Item 6 was constructed by the investigator to represent a combination of benefits. Item 7 was constructed by the investigator based on informal comments from a variety of clients regarding the benefits of breakfast. All items were coded on a 5-point scale with 5 representing a high intensity of the belief and 1 representing a low intensity. The rating 3 generally represented a neutral attitude toward the item. The score for the subscale was the summed total of all items.

Barriers. Data were collected on barriers by items 9 through 17 (see Appendix E). Items 9 through 16 were constructed by the investigator and supported by the literature as reasons cited by

adolescents for not eating breakfast (Cooksey & Ojeman, 1963; Hinton et al., 1962; Hodges & Krehl, 1965). Item 17 was constructed by the investigator to represent a combination of barriers. All items were coded on a 5-point scale with 1 representing a low perception of the barrier and 5 a high perception of the barrier. The score for the subscale was the summed total of the individual items.

Susceptibility. Data were collected on susceptibility by items 18 through 30 (see Appendix E). Items 18 and 19 were modified from Becker's instrument to measure dietary compliance (Becker et al., 1977). Items 29 and 30 were modified from Sackett's Standardized Compliance Questionnaire (Sackett & Haynes, 1976). These items were coded on a 5-point scale with 1 representing the lowest level of perceived susceptibility and 5 representing the highest level. Items 20 through 28 (see Appendix E) were modified from Gochman's scale of perceived susceptibility to common disease conditions. Although no statistics were reported, this scale was utilized in a variety of studies (Gochman, 1970, 1971, 1972; Weisenberg et al., 1980) with various age groups. Scoring for items 20 through 28 ranged from 1 representing low susceptibility to 5 representing high susceptibility. These scores were then summed and a mean obtained which was calculated in the subscale as a score for a single item. This method of scoring is consistent with that described by Gochman (1972). The score for the subscale was the summed total for all items.

Seriousness. Seriousness was measured by items 31 through 36 (see Appendix E). Items 33 through 36 were adapted from Becker's instrument to measure dietary complicance (Becker et al., 1977). Item 32 was adapted from Brown's instrument to measure expectancies of costs and rewards in exercise (Brown, 1981). These items were coded on a 5-point scale with 1 representing the least serious and 5 the most serious. Item 31 was a rank order question, designed by the investigator, in which subjects were asked to rank the seriousness of ill health with other common undesirable conditions in the life of adolescents. The number used in scoring the item was the number the subject assigned to the not being healthy choice, with 1 being the least serious and 5 the most serious. The score for this subscale was also computed by summing the scores of the individual items.

Validity

The questionnaire was constructed through a procedure that allowed the investigator to address content validity. Whenever possible, items that were supported by the literature were utilized by the investigator. A total of 42 items was placed on index cards and mailed to three reviewers along with a prepared instruction sheet. Two reviewers were doctorally prepared persons who had both constructed instruments and conducted research pertaining to the health belief model. The third was a doctoral candidate who had had similar experiences. The reviewers were instructed to classify each item as to which component of the health belief model they

believed the item measured: perceived seriousness, perceived susceptibility, perceived benefits, or perceived barriers. Additionally they were asked to check one of the three categories that best described the item: (1) strong item, important to include, acceptable as worded; (2) good item, important to include but has problems as worded; and (3) weak item, doubt its appropriateness or effectiveness. The written instructions to the reviewers are found in Appendix F.

There was unanimous agreement among the reviewers regarding the classification of 38 items. The items on which there was disagreement as to classification were discarded. Eleven items were classified as weak items by one or more reveiwers and were discarded. The remaining 27 items were rated as strong items by at least two reviewers. Revisions in wording were made on 10 of the items as suggested by the reviewers. The items were then formulated into a questionnaire. Other measures of validity as well as measures of reliability were completed during the study and are reported in Chapter IV.

Reading Level

The reading level of the developed questionnaire was 5.4 grade level according to the Fog Reading Index (Gunning, 1968) and third grade level according to the Fry Readability Formula (Fry, 1972). This level was deemed by the investigator to be adequate for the purposes of this study.

Pretests

The questionnaire was given to 23 white, eleventh-grade females in a school setting whose attendance area was similar to that of the schools selected for the study. The students were told that the questionnaire was to determine how they personally felt about eating breakfast and about their health in general. They were told that their participation was voluntary and that the investigator would be interested in any comments they might have about the questionnaire itself. Completion time for these students ranged from 10 to 20 minutes. None of the participants had questions regarding any items. Upon completion of the questionnaire, each was asked if (1) the instruction was clear, and (2) the items were understandable. All participants replied in the affirmative; therefore, the questionnaire was retained without further modification.

Analysis of Data

The alpha coefficient of internal consistency was used to test the reliability of the questionnaire. Factor analysis and multiple discriminant analysis were utilized as measures of validity. Multiple discriminant analysis and the Mann Whitney U test were utilized to statistically evaluate the hypotheses. All tests were performed using portions of the Statistical Packages for the Social Sciences (Nie et al., 1975). All analyses were completed at the Rust Computer Center, Birmingham, Alabama.

Instrument Reliability

Data from the questionnaire were entered both for the total scale and for the subscales representing perceived benefits, perceived barriers, perceived seriousness and perceived susceptibility to assess the consistency with which the questionnaire measured the construct under question. The alpha coefficient of reliability, a measure of internal consistency, was chosen because in most situations it provides the best estimate of reliability since the major source of measurement error is due to the sampling of content (Nunnally, 1978).

Instrument Validity

Data obtained from the questionnaire were subjected to factor analysis to test for construct validity of the instrument. Construct validity refers to the degree to which the domain of selected items actually measures the construct under analysis. Factor analysis was chosen because it provides quantitative correlation data regarding both the internal statistical structure of variables said to measure a construct and the statistical cross-structures among the measures of the different constructs (Nunnally, 1978).

The data were subjected to multiple discriminant analysis for the purpose of determining predictive validity. Predictive validity is the degree to which the instrument is related to an outside criterion, identified in this study as the participant's self-reported frequency of breakfast consumption (Nunnally, 1978).

Multiple discriminant analysis was chosen for this technique because it weights and linearly combines the selected variables so that the groups are forced to be a statistically distinct as possible (Nie, et al. 1975). The technique handles multiple, interval-level, independent variables and a dependent variable measured on the nominal scale. Also, the technique measures the success of these independent variables in classifying or predicting the category of the dependent variable into which each participant's response falls.

Hypotheses

Major hypothesis. Data obtained from the subscales of the HBQ - perceived benefits, perceived barriers, percieved seriousness, and perceived susceptibility - were entered as independent or discriminating variables to analyze their collective contributions to the dependent variable, breakfast consumption, as measured by self report. The use of multiple discriminant analysis was deemed desirable because it allowed the optimum weighting for the combination of the independent variables, in classifying the participants into categories of the dependent variable, breakfast consumption. Moreover, the analysis allowed the most efficient combination of these variables to be delineated (Nie et al., 1975). Chi square was used to test the statistical significance of Wilks' lambda, a measure of ability of the discriminant function to differentiate between the two categories of breakfast consumers. An alpha level was established at .05. A classification percentage

was used to measure the ability of the discriminant function to predict at a level greater than chance.

Minor hypotheses 1, 2, 3 and 4. Data obtained from the HBQ were subjected to an overall analysis of variance to test for homogeneity of variance for the two groups, consumers and nonconsumers of breakfast. This assumption of homogeneity of variance is necessary for the use of parametric statistical procedures. When this assumption was not supported, the nonparametric Mann-Whitney U test was performed on the data to assess differences in the mean rank scores of consumers and nonconsumers of breakfast for perceived benefits, perceived barriers, perceived susceptibility, and perceived seriousness. An alpha level of .05 was established.

Summary

Presented in this chapter were the methods and procedures used to accomplish the purpose of the study. Sample selection, instrument development, procedures used in data collection, and techniques for analyzing data were discussed.

CHAPTER IV

PRESENTATION, ANALYSIS AND INTERPRETATION OF DATA

The purpose of this study was to determine if the variables of the health belief model predict breakfast consumption in female adolescents. In accord with this purpose the following null hypotheses were proposed:

1. Health beliefs do not discriminate between female adolescent consumers and nonconsumers of breakfast.

2. There is no signficiant difference in the susceptibility beliefs of female adolescent consumers and nonconsumers of breakfast.

3. There is no significant difference in the seriousness beliefs of female adolescent consumers and nonconsumers of breakfast.

4. There is no significant difference in the benefits beliefs of female adolescent consumers and nonconsumers of breakfast.

5. There is no significant difference in the barriers beliefs of female adolescent consumers and nonconsumers of breakfast.

Presented in this chapter are a description of the sample and data from the development of the instrument. Also presented are the findings related to the testing of the hypotheses.

Description of the Sample

The sample consisted of 591 eleventh-grade, white females who were enrolled in three high schools in an upper-middle socioeconomic suburb of a southeastern city. All participants were white. It was assumed that by their enrollment in the eleventh grade in these schools that all participants were members of the upper-middle socioeconomic class and were 15-19 years of age.

All participants were asked how frequently they ate breakfast. Of these participants, 224 or 38.1% reported consuming breakfast at least five times per week, while 367 or 61.9% reported consuming breakfast less than five times per week. Participant responses to the individual items of the Health Belief Questionnaire are found in Appendix G.

Instrument Development

Reliability

Coefficient alphas were determined to assess the internal consistency of the items on the Health Belief Questionnaire. These

coefficient alphas were determined for the scale as a whole and for each subscale: perceived benefits, perceived barriers, perceived seriousness, and perceived susceptibility. Although the coefficient alphas met the desired critieria of .70 for a newly developed instrument (Nunnally, 1978) for both the total instrument, and for the subscales of benefits, barriers, and seriousness, the coefficient alpha for the subscale of suceptibility did not. No substantial gains were made in the coefficient alphas by the deletion of any items (see Appendix H). The coefficients alphas of the total instrument and of the subscales along with the means and standard deviations are reported in Table 1.

Table 1

Reliability Coefficient for the Health Belief Questionnaire

Scale	Mean	Standard Deviation	Cronbach alpha
Total scale	297.52	171.79	.7298
Benefit subscale	23.66	4.50	.8068
Barrier subscale	27.19	6.78	.7514
Susceptiblity subscale	13.03	3.28	.5368
Seriousness subscale	20.13	5.25	.7735

Note. n = 591

Validity

The notion of content validity was addressed during the development of the instrument. This process was discussed in Chapter III.

The reliability coefficients for the subscales provided support to the notion of construct validity. This support is strongest for benefits, beliefs, and barriers and less strong for susceptibility. If participants tend to answer all subscale questions in a similar manner, the assumption is that all questions are samples out of the same domain. For example, if participants answer all items intended to measure perceived benefits in a consistent manner, the inference can be made that the items are measuring a single construct.

Closer examination of construct validity via factor analysis using an oblique rotation without definition of a specific number of factors tended to support a four-factor solution. A factor analysis using an oblique rotation and specifying a four-factor solution was then performed on the data. Based on a lack of agreement in the literature, a decision was made to include an item as a part of the factor if it loaded at >.35. With this criterion, construct validity can be said to be strongly demonstrated for all items intended to measure the construct of benefits, moderately demonstrated for five of the seven items intended to measure the construct of seriousness, and not demonstrated for the construct of susceptibility. Construct validity was also demonstrated for five

out of nine items intended to measure the construct of barriers. Two other questions intended as a part of the construct of barriers loaded strongly on a fourth factor, suggesting that the construct is bidimensional. This analysis is consistent with the findings related to reliability which yielded a low reliability coefficient for the construct of susceptibility. There is no evidence to determine if the lack of construct validity is due to testing error, to inadequate sampling of the domain represented by the construct, or to a weakness in the construct of susceptibility as conceived by the model. The item loadings for the four factors are found in Table 2. The low correlations between the factors support the notion that the constructs are separate entities. The correlations are shown in Table 3.

Table 2

Items Loading on Factors*

Factors	Item	Loading
Factor I Benefits	Do better work at school	.76521
	Have better diet	.59464
	Make you live longer	.58864
	Keep from getting sick	.69653
	No benefit	.58016
	Feel better	.75913
	Makes get fat	.42646
Factor II Seriousness	Effect on ill health	.37442
	Effect on desired lifestyle	.75182
	Effect on normal routine	.71449
	Effect on family	.38319
	Effect on schoolwork	.45009
Factor III Barriers	Don't like to get up	.59064
	Don't like breakfast food	.52079
	Have to leave for school too early	.59684
	Nothing at home I like	.59976
	Not hungry	.54435
	Difficulty of eating	.51366
Factor IV Barriers (Isolation)	Have to fix own breakfast	.58459
	Have to eat alone	.76891

Loading criteria for inclusion >.35

Table 3

Factor Correlation

	Factor 1	Factor 2	Factor 3	Factor 4
Factor 1	1			
Factor 2	.24553	1		
Factor 3	-.28569	.05746	1	
Factor 4	-.08521	-.12632	-.17928	1

Predictive validity was determined by the multiple discriminant analysis technique. Two separate discriminant analyses were run. In the first, a stepwise analysis consisting of four iterations indicated that 74.62% of the time the items of the questionnaire grouped into constructs correctly classified participants as consumers or nonconsumers of breakfast (see Table 4). Four constructs were included in the discriminant function: benefits, barriers, susceptibility, and seriousness. The standardized discriminant functions coefficients were: benefits, .6663; barriers, -.68712; susceptibility, .0920; and seriousness, .0854. The reported Eigenvalue of the function was .3880. The canonical correlation was .5287 indicating that 27.94% of the variance in breakfast consumption can be accounted for by the variables of the discriminant function. Wilks' lambda was .7205. When the Wilks' lambda was subjected to the chi square analysis,

the obtained values was 192.46 with 4 degrees of freedom, $p = .01$. Thus, there was little chance that a Wilks' lambda of this magnitude occurred by chance, and the discriminant function model is better than no model at all. Because all constructs were present for the items of the HBQ, a degree of predictive validity was present for the items of the HBQ.

In the second discriminant anlaysis, all items were included in the analysis without respect to the constructs. A stepwise analysis consisting of 27 iterations indicated this discriminant function correctly classified participants as consumers or nonconsumers of breakfast 78.34% of the time (see Table 5). The approximately equal ability of the two discriminant functions to classify suggests that the items are viewed as conceptually related by the participants. Therefore, conclusions regarding the predictive validity of the instrument were confined to the discriminant function using the items grouped into constructs. Complete information regarding the discriminant analysis without regard to constructs is found in Appendix I.

Table 4

Classification Results for Discriminant Function Using Items Grouped Into Constructs

	Nonconsumer*	Consumer**
Nonconsumer	267 (72.6%)	101 (27.4%)
Consumer	49 (22%)	174 (78%)

Percent correctly classified - 74.6%

*n = 367

**n = 224

Table 5

Classification Results for Discriminant Function Using Items Without Regard to Constructs

	Nonconsumer*	Consumer**
Nonconsumer	281 (76.4%)	87 (23.6%)
Consumer	41 (18.4%)	182 (81.6%)

Percent correctly classified - 78.34%

*n = 367

**n = 224

Testing of the Hypotheses

Major Hypothesis

Health beliefs do not discriminate between female adolescent consumers and nonconsumers of breakfast.

In testing this major hypothesis, a stepwise discriminant analysis using the four constructs benefits, barriers, susceptibility, and seriousness were used to classify participants into consumers and nonconsumers of breakfast. The results of this analysis are reported in the previous section dealing with instrument validity in this chapter. Though the Eigenvalue and the Wilks' lambda are not of an impressive magnitude, the classification percentage revealed that the four constructs included in the discriminant function predict at a level 24.62% greater than chance. Additionally, the significant chi square revealed that the model represented by the discriminant function is significantly better than no model at all. Thus, the hypothesis was rejected.

Minor hypotheses

All minor hypotheses were concerned with looking at the differences of consumers and nonconsumers of breakfast on individual health beliefs. This examination is generally accomplished by a parametric statistical test such as the oneway analysis of variance or a *t* test. Utilization of parametric statistics involves the assumption of homogeneity of variance. An

initial examination of the data for homogeneity of variance between consumers and nonconsumers revealed that this assumption was not supported (Bartlett Box F = 27.193, degrees of freedom 1,589, p = .001). As a result, analyses were performed using nonparametric tests that do not require this assumption.

Minor hypothesis I. There is no significant difference in the susceptibility beliefs of female adolescent consumers and nonconsumers of breakfast.

The Mann Whitney U, a nonparametric test for the difference in the mean ranks of two independent groups, was selected to test this hypothesis. The mean rank for breakfast consumers was 292.58 and for nonconsumers was 298.07. When these scores were subjected to the Mann Whitney U test, the obtained value of U was 40270.5 which was not significant at the .05 level, and the hypothesis was retained. The lack of significance can be explained by the small difference in the mean rank. The reader is reminded of the low level of reliability of the subscale items that measured this construct.

Minor hypothesis II. There is no significant difference in the seriousness beliefs of female adolescent consumers and nonconsumers of breakfast.

The mean rank for consumers was 320.51 and the mean rank for nonconsumers was 281.15. When these ranks were subjected to the Mann Whitney U test, the obtained U was 35566.5 which was statistically significant at the .01 level; therefore, the hypothesis was rejected. Though the Mann Whitney U test of

significance is a two-tailed test, the larger mean rank of the consumers indicates consumers have greater belief in seriousness than nonconsumers.

Minor hypothesis III. There is no difference in the benefits beliefs of female adolescent consumers and nonconsumers of breakfast.

The mean rank for consumers was 392.07 and the mean rank for nonconsumers was 237.78. When these ranks were subjected to the Mann Whitney U test, the obtained U was 19608 which was statistically significant at the .001 level. Thus, the hypothesis was rejected. Examination of the mean ranks revealed that consumers had higher benefit beliefs than nonconsumers.

Minor hypothesis IV. There is no significant difference in the barriers beliefs of female adolescent consumers and nonconsumers of breakfast.

The mean rank for consumers was 223 and for nonconsumers 362.73. When these mean ranks were subjected to the Mann Whitney U test, the obtained U was 16474.0 which was significant at the .0001 level; therefore, the hypothesis was rejected. Examination of the mean ranks revealed that nonconsumers perceived more barriers than did consumers.

Summary of the Findings

Analysis of the data generated from the Health Belief Questionnaire resulted in the following major findings regarding the instrument:

1. The health belief questionnaire was found to have acceptable levels of reliability for the instrument as a whole and for the subscales representing benefits, barriers, and seriousness. Acceptable levels of reliability were not demonstrated for the subscale of susceptibility.

2. A moderate level of predictive validity was demonstrated for the instrument as a whole. Construct validity was demonstrated for portions of the subscales of benefits, seriousness and barriers. No construct validity was demonstrated for the subscale of susceptibility.

The following findings were generated regarding the hypotheses:

1. The health belief variables in combination, as measured in this study, correctly discriminated the consumers and nonconsumers at a level considerably better than chance. Also the variables of the health belief model were found to predict the breakfast consumption behavior of adolescent females significantly better than no model at all.

2. Statistically significant differences existed between consumers and nonconsumers on the single health beliefs of perceived benefits, perceived barriers, and perceived seriousness. No significant difference was found for perceived susceptibility between consumers and nonconsumers.

CHAPTER V

SUMMARY, DISCUSSION, CONCLUSIONS AND RECOMMENDATIONS

Summary of the Study

This study was concerned with the variables that influence the performance of a preventive health behavior, breakfast consumption in female adolescents. The purpose of the study was to determine if the variables of the health belief model predict breakfast consumption in female adolescents.

The theoretical perspective of the study, the health belief model, postulates that for an individual to take action to avoid disease or ill health he must believe that:

1. he is personally suceptible to ill health;
2. ill health would affect him seriously in some way;
3. actions are available that are beneficial in avoiding ill health; and
4. these actions do not entail overcoming significant barriers such as cost, inconvenience, pain, or other such barriers.

Specifically these four beliefs were called perceived susceptibility, perceived seriousness, perceived benefits, and perceived barriers.

The following hypotheses were tested:

Major hypothesis

Health beliefs do not discriminate between female adolescent consumers and nonconsumers of breakfast.

Minor hypotheses

1. There is no significant difference in the susceptibility beliefs of female adolescent consumers and nonconsumers of breakfast.

2. There is no significant difference in the seriousness beliefs of female adolescent consumers and nonconsumers of breakfast.

3. There is no significant difference in the benefits beliefs of female adolescent consumers and nonconsumers of breakfast.

4. There is no significant difference in the barriers beliefs of female adolescent consumers and nonconsumers of breakfast.

The study sample consisted of 591 females, 224 of whom reported consuming breakfast on a regular basis and 367 of whom reported not consuming breakfast. Participants were obtained from the eleventh-grade students of three high schools in an upper-middle socioeconomic suburb of a southeastern city in the United States.

An investigator-constructed instrument, the Health Belief Questionnaire (HBQ), was used to collect data on frequency of

breakfast consumption, perceived benefits of breakfast consumption, perceived barriers to breakfast consumption, perceived susceptibility to ill health, and perceived seriousness of ill health. The process of instrument development was designed to demonstrate content validity.

Data derived from the HBQ were coded for computer processing. Statistical treatment to determine the validity and reliability of the instrument was accomplished through factor analysis, multiple discriminant analysis, and calculation of coefficient alpha. Statistical treatment of the hypotheses was accomplished by use of multiple discriminant analysis and the Mann-Whitney U test.

Summary of the Findings

Analysis of data from the HBQ resulted in the following major findings regarding the instrument:

1. The HBQ was found to have acceptable levels of reliability for the instrument as a whole and for the subscales representing benefits, barriers, and seriousness. Acceptable levels of reliability were not demonstrated for the subscale representing susceptibility.

2. A moderate level of predictive validity was demonstrated for the instrument as a whole. Construct validity was demonstrated for portions of the subscales representing benefits, seriousness, and barriers. No construct validity was demonstrated for the subscale of susceptibility.

The following findings were generated regarding the hypotheses:

1. The health belief variables in combination, as measured in this study, correctly discriminated the consumers and nonconsumers of breakfast at a level considerably better than chance. Also, these variables of the health belief model were found to predict the breakfast consumption categories of the participants significantly better than no model at all. The major hypothesis was rejected.

2. Statistically significant differences existed between consumers and nonconsumers of breakfast on the single health beliefs of benefits, barriers, and seriousness. No significant difference was found for the susceptibility beliefs between consumers and nonconsumers. Minor hypotheses 2, 3, and 4 were rejected. Minor hypothesis 1 was retained.

Discussion

The discussion of the findings of this study is divided into three sections: behavioral issues, theoretical issues; and issues related to nursing practice.

Behavioral Issues

The pattern of the health behavior of breakfast consumption reported by the participants in this study differs markedly from that reported in the most recent literature. Almost two-thirds of the participants reported they did not consume any breakfast on a

regular basis. A variety of causes could be postulated for this change. These causes range from cultural changes in eating patterns to increased demands on the time and energy of adolescents to changes involving health beliefs by the population group studied. Regardless of cause, this change in behavioral patterns implies that health personnel should be increasingly concerned with influencing adolescents in their performance of this particular preventive health behavior. This finding is of particular concern because of the limited parameters used in the definition of breakfast in this study.

Theoretical Issues

The health belief model has been extensively researched using a variety of populations and health behaviors. Recommendations regarding this research have dealt with, among others, the expansion of this model to encompass new behaviors, the development of consistent measurements to examine the contructs of the model, and the dissemination of the model for use by the providers and educators of the health care system as a whole.

This study addressed two of these three recommendations. The preventive health behavior of breakfast consumption has never been analyzed in relation to the decision-making process relative to its performance. Rosenstock (1974) postulated that perhaps these habitual types of behavior that were developed in early life, such as nutritional practices, were not amenable to the same motivational forces that guided adult behavior relative to the

avoidance of specific diseases. This study has offered tentative support to the expansion of the model in this area. The combined variables of the health belief model significantly predicted the breakfast consumption behavior of the participants at a level 50% greater than chance. Though the analyses show that the constructs of benefits and barriers play a relatively greater role in this prediction, seriousness and susceptibility also increase this predictive capability when the beliefs are considered in combination. This finding is strengthened when consideration is given to the low variability of the participants inherent in the design of the study.

The univariant relationships of the variables with the behavior of breakfast consumption support the multivariant findings except in relationship to susceptibility. This lack of a significant, univariant relationship for susceptibility is contrary to most findings reported in the literature. Breakfast consumption, however, is qualitatively different from many other preventive health behaviors. Eating breakfast, although supported popularly and in the literature as a health promoting behavior, is not believed to be specifically linked to a disease condition. Therefore, susceptibility was defined for this study as general susceptibility to the broad construct of ill health or to a host of common diseases not directly linked with the behavior. Though general susceptibility has been demonstrated to be as related to a specific disease condition as is specific susceptibility, the

construct of ill health is subject to a wide variety of interpretations. Thus, use of such a broodly defined construct may have contributed both to the lack of a significant relationship between susceptibility and breakfast consumption and to the low level of reliability and construct validity reported for this subscale.

Another factor involved could have been the developmental level of the participants. Major diseases and health problems are at a low incidence during this period, and perceived susceptibility to ill health may be realistically low for the age group as a whole. Consistent with the model and supported by this study is that susceptibility is a factor in the prediciton of health behavior only when considered in combination with benefits, barriers, and seriousness.

A second recommendation addressed by this study relates to the development of more consistent measurements of the variables of the model. A review of studies related to the health belief model (Rosenstock, 1974) revealed that no studies utilized identical questioning for determining the intensity of each belief. When dealing with susceptibility, for example, Hochbaum (1958) emphasized perceived probability; Kegeles (1963a,b) directed his questions at possibility; Rosenstock (1969) compared self-likelihood to likelihood of others your age; and Becker et al. (1977) compared self-likelihood to likelihood at a later time in life. This discrepancy raises the possibility that all of the cited studies might be measuring different constructs. A strength of this particular study is the process utilized in developing the

Health Belief Questionnaire. Accepted procedures were followed to address content validity. Additionally, a variety of items, many of which were used by other health belief researchers, were utilized to measure each construct in order to increase reliability (Nunnally, 1978). The reliability and validity measures obtained add viability to the results obtained, especially for the constructs of benefits, barriers, and seriousness. Further work is necessary for the measurement of the susceptibility construct.

No researcher suggests that the health belief model can effectively predict the performance of any health behavior 100% of the time. The results of this study demonstrate that for this relatively homogeneous group, one out of four predictions is incorrect, and that a low level of variance in the behavior is accounted for by the constructs of the model. In retrospect, a study that included other variables shown by the literature to be related to the performance of other conceptually similar behaviors could have increased the effective prediction percentage. For example, Kegeles (1963a,b) reported that one could best predict preventive dental behavior by assessing past performance of this behavior. Also, other authors (Williams, 1973) have reported the smoking behavior of the parents to be highly related to the smoking behavior of their children.

Issues Relevant to Nursing Practice

One of the aims of nursing, most specifically that of school nurses, is to increase the proportion of people who consistently,

rationally, and freely perform preventive health behaviors. Analysis of the decision-making process involved in these behaviors should enable the educational interventions of school nurses to be more relevantly designed. Findings of this study are particularly encouraging. The health beliefs, as defined by the health belief model, have been shown to be amenable to change (Haefner & Kirscht, 1970; Kegeles, 1969).

Findings of this study would indicate that the constructs of the health belief model are important determinants of breakfast consumption in adolescent females, and communications designed to promote the behavior should include these constructs, especially those of benefits and seriousness. Other efforts should be made toward the elimination of barriers. An example might be parental education of the importance of easy-to-prepare breakfast foods for today's adolescent. Another example includes participation in community-action programs to make available high-quality nutritional foods on the school campus for those adolescents who do not eat at home.

While the problem was not specifically addressed by this study, nurses must select from a variety of modalities available for educating adolescents regarding their health behavior. Additional research is necessary to delineate guidelines which will enable these nurse educators to make appropriate selections from among the communication patterns available to them.

Conclusions

Based on the findings of this study, the following conclusions can be drawn subject to the defined limitations:

1. The majority of female adolescents do not consume breakfast on a regular basis.

2. The health belief variables in combination correctly predict consumers and nonconsumers of breakfast at a level considerably better than chance.

3. Statistically significant differences exist between consumers and nonconsumers of breakfast on the single health beliefs of benefits, barriers and seriousness. No conclusion is drawn for the single belief of susceptibility because of the low measure of reliability and limited validity demonstrated for this subscale.

4. Factors in addition to those measured in this study influence breakfast consumption in adolescents.

Recommendations

Based on the findings of this study, the following recommendations are made:

1. Since the study was limited to participants from three schools in one suburban area, replication of the study in other populations is needed.

2. Further utilization of the instrument constructed during this investigation should include modification of the subscale susceptibility to increase its reliability.

3. Research regarding the predictors for engaging in breakfast consumption is quite limited; therefore, studies should be undertaken utilizing additional social variables such as parental behavior and prior behavior of the participants.

4. Breakfast consumption involves the dimension of quality as well as the dimension of frequency examined in this study; thus, future studies should attempt to examine the dimension of quality as well.

5. Because the findings of this study suggest the appropriateness of the health belief model as a predictive model for a qualitatively different type of health behavior, exploratory studies should be attempted with other health behaviors of a similar type.

6. Studies should be undertaken to examine the effectiveness of a variety of modalities in changing health beliefs.

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APPENDIX A

Exemption Form from Institutional Review Board for Human Use

The University of Alabama in Birmingham
Institutional Review Board for Human Use
205/934-3789

FORM 4: IDENTIFICATION AND CERTIFICATION OF RESEARCH PROJECTS INVOLVING HUMAN SUBJECTS

The Institutional Review Board (IRB) must complete this form for all applications for research and research training grants, program project and center grants, demonstration grants, fellowships, traineeships, awards, and other proposals which might involve the use of human research subjects independent of source of funding.

This form does not apply to applications for grants limited to the support of construction, alterations and renovations, or research resources.

PRINCIPAL INVESTIGATOR Julia L. Perkins

PROJECT TITLE Breakfast Consumption in Adolescents; A Test of the Health Belief Model

_____ 1. This is a training grant. Each research project involving human subjects proposed by trainees must be reviewed separately by the Institutional Review Board (IRB).

_____ 2. This application includes research involving human subjects. The IRB has reviewed and approved this application on _____, in accordance with UAB's assurance approved by the United States Public Health Service. The project will be subject to annual continuing review as provided in that assurance.
- _____ This project received expedited review. Human subjects will not be at risk.
- _____ This project received full IRB review. Human subjects will not be at risk.
- _____ This project received full IRB review. Human subjects will be at risk.

_____ 3. This application may include research involving human subjects. Review is pending by the IRB as provided by UAB's assurance. Completion of review will be certified by issuance of another FORM 4 as soon as possible.

X 4. Exemption is approved based on number(s) 3a.

2-19-82
Date

Wesley O. Young
Wesley O. Young, D.M.D., M.P.H.
Chairman, Institutional Review Board
The University of Alabama in Birmingham

APPENDIX B

Application for Permission to Do Research in the School System

COBB COUNTY PUBLIC SCHOOLS
DIVISION OF INSTRUCTIONAL SERVICES
MARIETTA, GEORGIA

APPLICATION FOR RESEARCH STUDY IN COBB COUNTY SCHOOLS

(please print or type information below)

NAME: Perkins, Julia L. PHONE: 926-9069 422-8770
Last First Mdl. Home Business

ADDRESS: 3840 Kensington Dr. Marietta, GA 30066
Number Street City State Zip

School of Nursing (Anticipated)
University of Alabama in Birmingham Jan. 80 June 83
College/Institution or Organization Represented Beginning Ending Dates

Synopsis of Research purpose, procedure, and anticipated result(s):

To determine if a predictive model of health beliefs will predict a health behavior breakfast consumption in adolescent females. The research will involve administration of an instrument designed to measure health beliefs. It is anticipated that health beliefs with discriminate breakfast consumers from non consumers.

POPULATION INVOLVED:

Teachera: Yes ___ No X Year/Grade _____ Number _____

Students: Yes X No ___ Age/Year/Grade 12th grade female Number 800

Others: Yes ___ No ___ Specify _____ Number _____

Identify characteristics of research subjects (English, Math, LD, BD, etc.) All 10th grade females in 3 selected schools

Specify amount of time needed per teacher, student, group or school: 20 minutes/student Instrument or questionnaire would be administered by the researcher to groups of students

Schools: Number 3 If you have a preference, list school(s) name: Walton, Wheeler, Sprayberry,

APPENDIX C

Permission Letter for Research in the School System

Cobb County Public Schools

March 24, 1982

Ms. Julia Perkins
3840 Kensington Drive
Marietta, GA 30066

Dear Ms. Perkins:

Your application for research study in the Cobb County schools (Walton, Wheeler, Sprayberry) has been approved.

If we can be of further service, feel free to call. Best wishes to you with your project.

Sincerely,

Emily T. Corcoran

Emily T. Corcoran
Supervisor of Assessment

lar

APPENDIX D

Instruction Sheet Utilized by Teachers in Administering the Health Belief Questionnaire

TO: HOMEROOM TEACHERS

FROM: JUDY PERKINS, GRADUATE STUDENT
UNIVERSITY OF ALABAMA IN BIRMINGHAM

Attached are the questionnaires for the eleventh grade girls in your homeroom. Please read the following instructions before distributing the questionnaire.

This questionnaire is for the purpose of determining how girls you age feel about eating breakfast and about their health in general. Completion of this questionnaire is voluntary. If you do not wish to participate you are not required to do so. If you wish to participate please read the instructions on page one before completing the form.

Thank you.

JP

APPENDIX E

The Health Belief Questionnaire

This questionnaire deals with some of your own feelings about eating breakfast. Please answer them as they apply to your. There are no right or wrong answers. Do not put your name on the questionnaire.

1. Breakfast is defined as eating or drinking anything except coffee, water, tea or diet soda within one hour after arising in the morning. Based on this definition how many times per week do you eat breakfast?
   ( ) 5 or more times
   ( ) less than 5 times

2. Eating breakfast helps you do better work at school.
   ( ) Strongly Agree
   ( ) Agree
   ( ) Neither Agree nor Disagree
   ( ) Disagree
   ( ) Strongly Disagree

3. When you eat breakfast, you usually have a better diet.
   ( ) Strongly Agree
   ( ) Agree
   ( ) Neither Agree nor Disagree
   ( ) Disagree
   ( ) Strongly Disagree

4. Eating breakfast is one of the things that can make you live longer.
   ( ) Strongly Agree
   ( ) Agree
   ( ) Neither Agree nor Disagree
   ( ) Disagree
   ( ) Strongly Disagree

5. Eating breakfast every day helps keep you from getting sick.
   ( ) Strongly Agree
   ( ) Agree
   ( ) Neither Agree nor Disagree
   ( ) Disagree
   ( ) Strongly Disagree

6. There is no particular benefit to eating breakfast.
   ( ) Strongly Agree
   ( ) Agree
   ( ) Neither Agree nor Disagree
   ( ) Disagree
   ( ) Strongly Disagree

7. Eating breakfast makes you feel better during the day.
   ( ) Strongly Agree
   ( ) Agree
   ( ) Neither Agree nor Disagree
   ( ) Disagree
   ( ) Strongly Disagree

8. Eating breakfast make you fet fat.
   ( ) Strongly Agree
   ( ) Agree
   ( ) Neither Agree nor Disagree
   ( ) Disagree
   ( ) Strongly Disagree

The following statements are sometimes made by people about why they do not eat breakfast. Please indicate whether these statements apply to you.

9. I don't like to get up early enough to eat breakfast.
   ( ) Strongly Agree
   ( ) Agree
   ( ) Neither Agree nor Disagree
   ( ) Disagree
   ( ) Strongly Disagree

10. Though somebody else usually prepares my other meals, I have to prepare my own breakfast.
   ( ) Never
   ( ) Hardly ever
   ( ) Some of the time
   ( ) Almost always
   ( ) Always

11. I don't like the foods usually eaten at breakfast.
   ( ) Strongly Agree
   ( ) Agree
   ( ) Neither Agree nor Disagree
   ( ) Disagree
   ( ) Strongly Disagree

12. I have to leave for school too early to eat breakfast.
   ( ) Strongly Agree
   ( ) Agree
   ( ) Neither Agree nor Disagree
   ( ) Disagree
   ( ) Strongly Disagree

13. Most of my friends don't eat breakfast.
    ( ) Strongly Agree
    ( ) Agree
    ( ) Neither Agree nor Disagree
    ( ) Disagree
    ( ) Strongly Disagree

14. I have to eat breakfast alone.
    ( ) Never
    ( ) Hardly ever
    ( ) Sometimes
    ( ) Almost always
    ( ) Always

15. There's never anything in my house that I like to eat for breakfast.
    ( ) Strongly Agree
    ( ) Agree
    ( ) Neither Agree nor Disagree
    ( ) Disagree
    ( ) Strongly Disagree

16. I'm not hungry when I get up in the morning.
    ( ) Strongly Agree
    ( ) Agree
    ( ) Neither Agree nor Disagree
    ( ) Disagree
    ( ) Strongly Disagree

17. How difficult is it for you to eat breakfast in the morning.
    ( ) Not difficult at all
    ( ) Slightly difficult
    ( ) Fairly difficult
    ( ) Somewhat difficult
    ( ) Very difficult

<u>The next group of questions deal with your general feelings about health and illness</u>.

18. Compared to other people your age how likely do you think you are to get sick.
    ( ) Much more likely
    ( ) More likely
    ( ) About the same
    ( ) Less likely
    ( ) Much less likely

19. When you are an adult, how much chance do you feel there is that you will be healthy.
( ) No chance at all
( ) A small chance
( ) A moderate chance
( ) A big chance
( ) Almost a sure thing

How much chance do you think there is of the following happening to you within the next 5 years:

	None	A small chance	A moderate chance	A big chance	Almost a sure thing
20. Broken arm					
21. Rash					
22. Fever					
23. Sore throat					
24. Flu					
25. Cold					
26. Upset stomach					
27. Headache					
28. Absent from work or school due to illness					

29. Whenever I read or hear about some disease, I think I may get it.
( ) Strongly Agree
( ) Moderately Agree
( ) Neither Agree nor Disagree
( ) Moderately Disagree
( ) Strongly Disagree

30. We live in a time when there is more danger from disease and poor health than ever before.
( ) Strongly Agree
( ) Moderately Agree
( ) Neither Agree nor Disagree
( ) Moderately Disagree
( ) Strongly Disagree

31. The following are things people your age generally don't want to happen to them. Please write in a number by each statement in the following manner.
Write "1" by the statement that would be the most serious to you.
Write "2" by the statement that would be the next most serious to you.
Write "3" by the statement that would be the third most serious to you.
Write "4" by the statement that would be the fourth most serious to you.
Write "5" by the statement that would be the least serious thing to you.
( ) Not being popular with girls
( ) Not being popular with boys
( ) Not being healthy
( ) Not getting along with my teachers
( ) Not getting along with my parents

32. If you were not healthy, how do you think it would affect you?
( ) It would not affect my routine at all.
( ) It would stop me from doing some of the activities I enjoy.
( ) It would stop me from doing many of the activities that I enjoy.
( ) It would stop me from doing all of the activities that I enjoy.
( ) It would eventually kill me.

33. In general, when you are sick how much does being sick keep you from doing what you want to do?
( ) A great deal
( ) A lot
( ) Moderately
( ) A little
( ) Not at all

34. How much would being sick interfere with your activities?
( ) Not at all
( ) Very little
( ) Moderately
( ) A lot
( ) A great deal

35. If if got sick it would be very bad for my family.
( ) Strongly Agree
( ) Agree
( ) Neither Agree nor Disagree
( ) Disagree
( ) Strongly Disagree

36. If I got sick, my school work would suffer.
    ( ) Strongly Agree
    ( ) Agree
    ( ) Neither Agree nor Disagree
    ( ) Disagree
    ( ) Strongly Disagree

APPENDIX F
Instruction Sheet for Item Reviewers

3840 Kensington Drive
Marietta, GA 30066
January

Dear Reviewer:

As a person who has done research utilizing the health belief model, I appreciate your consenting to serve as an item reviewer for a questionnaire I am developing regarding adolescents health beliefs in relation to breakfast consumption. The purpose of the research is to determine if adolescents' health beliefs, as defined in the health belief model, influence their breakfast consumption behavior.

As an item reviewer, I ask you to do the following:

1. Sort the enclosed items according to the health belief variable that you think they best represent:

   a. perceived seriousness of ill health;
   b. perceived susceptibility to ill health;
   c. perceived benefits of breakfast consumption;
   d. perceived barriers to breakfast consumption.

   Envelopes labeled with each variable are enclosed for your convenience.

2. Rate <u>each</u> item as to how effectively you think the item represents the variable you have selected. The rating scale is as follows:

   1 - Strong item, important to include; acceptable as worded.
   2 - Good item, important to include but has problems as worded.
   3 - Weak item, doubt its appripriateness or effectiveness.

3. If you rate an item as either "good item but has problems as worded" or "weak item, doubt its appropriateness or effectiveness", please add you comments or suggestions.

I appreciate your assistance in my research efforts and enclose a self-addressed, stamped envelope for your convenience in returning these materials.

Sincerely,

Julia L. Perkins
Doctoral Student
University of Alabama
School of Nursing

APPENDIX G

Descriptive Data from the Health Belief Questionnaire

Description of Items

Items	$\bar{X}$			S
	Total*	Consumer**	Nonconsumer***	
Better work at school	3.564	3.927	3.349	.851
Better diet	3.522	3.819	3.346	.93
Live longer	2.716	2.932	2.567	.813
Prevent sickness	3.008	3.454	1.737	.997
No benefit	3.64	4.004	3.435	.891
Feel better	3.64	4.003	3.402	.94
Get fat	3.49	3.879	3.298	.99
Get up too early	3.005	3.405	3.346	1.21
Fix my own	3.566	3.405	3.674	1.36
Don't like food	2.688	2.333	2.871	1.23
Leave too early	2.809	2.207	3.155	1.146
Friends don't eat	3.359	3.154	3.480	.968
Eat alone	3.23	3.198	3.274	1.293
No good food in house	2.671	2.256	2.910	1.109
Not hungry	3.205	2.444	3.695	1.27
Difficult to eat	2.292	1.560	2.761	1.34
Likely to get sick	2.576	2.555	2.559	.96
Healthy as adult	2.295	2.347	2.268	.99
Likelihood of common illness	3.398	3.387	3.406	.836
Think get what read	2.150	2.115	2.122	1.05
Danger from disease	2.455	2.352	2.453	1.23
Seriousness of ill health	4.169	4.280	4.086	1.11
How ill health affects routine	2.570	2.570	2.552	.96
What ill health prevents doing	3.019	3.178	2.889	1.07
How sick prevents doing	3.165	3.280	3.089	.97
Sick bad for family	2.925	2.966	2.871	.97
Sick hurts school work	3.61	3.719	3.570	1.08

* n = 591
** n = 224
*** n = 367

APPENDIX H

Reliability Analyses for the Health Belief Questionnaire

Table A

Reliability Analysis for Health Belief Questionnaire

Item	$\underline{\alpha}$ if item deleted*
Better work at school	.7303
Have better diet	.7317
Make live longer	.7290
Prevent sickness	.7288
No benefit	.7252
Feel better	.7205
Get fat	.7292
Get up too early	.7204
Fix my own	.7237
Don't like food	.7239
Leave too early	.7179
Friends don't eat	.7247
Eat alone	.7208
No good food in hours	.7205
Not hungry	.7327
Difficult to eat	.7274
Likely to get sick	.7205
Healthy as adult	.7241
Likelihood of illness	.7198
Get what read about	.7190
Danger from disease	.7215
Seriousness of ill health	.7260
How ill health affects routine	.7161
What ill health prevents	.7069
How sick prevents	.7117
Sick bad for family	.7122
Sick hurts school work	.7154

* α for total scale .7298

Table B

Reliability Analysis for
Subscale Benefits

Item	$\underline{\alpha}$ if item deleted*
Better work at school	.7627
Have better diet	.7837
Make live longer	.7949
Prevent sickness	.7778
No benefit	.7858
Feel better	.7562
Get fat	.8065

* α for total subscale .8068

Table C

Reliability Analysis for
Subscale Barriers

Item	$\underline{\alpha}$ if item deleted*
Get up too early	.7119
Fix my own	.7540
Don't like food	.7286
Leave too early	.7089
Friends don't eat	.7442
Eat alone	.7506
No good food in house	.7153
Not hungry	.7200
Difficult to eat	.7209

* α for total subscale .7514

Table D

Reliability Analysis for
Subscale Susceptibility

Item	$\underline{\alpha}$ if item deleted*
Likely to get sick	.4768
Healthy as adult	.4817
Likelihood of illness	.4654
Get what read about	.4613
Danger from disease	.5230

* α for total subscale .5368

Table E

Reliability Analysis of
Subscale Seriousness

Item	α if item deleted*
Seriousness of ill health	.8083
How ill health affects routine	.7386
What ill health prevents	.7015
How sick prevents	.7083
Sick bad for family	.7282
Sick hurts school work	.7442

* α for total subscale .7735

APPENDIX I

Discriminant Function Using Items of the Health Belief Questionnaire Without Regard to Constructs

Discriminant Function Using Items of the Health Belief Questionnaire Without Regard to Constructs

Variables included in the function:

Items		Standardized discriminant function coefficients
Item 3	Have better diet	-.0946
Item 5	Keep from getting sick	-.2671
Item 6	No benefit	-.1040
Item 8	Get fat	-.11217
Item 9	Get up early	.2313
Item 10	Prepare own	.1786
Item 11	Don't like food	-.1393
Item 12	Leave too early	.2569
Item 14	Eat alone	-.1263
Item 15	Nothing in house I like	.1741
Item 16	Not hungry	.3744
Item 17	Difficult to eat	.3394
Item 33	Effect of sick on desired activities	-.1386

Eigenvalue	Wilks' lambda	Canonical Correlation	X^2
.67782	.6356	.5960	276.08*

*p = .01

GRADUATE SCHOOL
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Name of Candidate: Julia L. Perkins

Major Subject: Maternal Child Health Nursing

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Date 10/12/82

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