

LOCUS OF CONTROL AND KNOWLEDGE
OF ECHOCARDIOGRAPHY

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CHAPTER I

INTRODUCTION

Coronary heart disease (CHD) is the leading cause of death in the United States, with 646,073 or 34 percent of all deaths in 1976 (American Heart Association 1978). New procedures or tools are being sought to aid in the evaluation and diagnosis of CHD. Echocardiography is becoming an increasingly useful noninvasive tool in the diagnosis and assessment of heart disease.

With the emphasis of health care changing from the diagnosis and treatment of disease to prevention of disease, nurses should become more concerned with the early screening of patients. A knowledge of a new procedure such as echocardiography is important for nurses to provide intelligible and reassuring information for patients. With the increasing use of echocardiography, nurses should be educated in the use and purpose of the technique.

Echocardiography, a noninvasive tool, can be used to assess cardiac performance in both asymptomatic individuals and CHD patients. As a screening tool, echocardiography is useful in determining the cardiac

function for large groups of individuals. The noninvasive technique permits serial evaluations of changes in cardiac performance in CHD patients as a consequence of the natural history of heart disease or in response to therapeutic intervention.

Nurses must understand the principles which underlie the use of echocardiography for diagnosis of cardiac diseases in order to enhance their knowledge of the effects of cardiac pathology on the structure and functions of the heart. Therefore, it is necessary and essential to identify the educational and learning needs of nurses. With the knowledge and understanding of echocardiography and its usefulness in assessing CHD, nurses and patients will both be better informed as to its purpose and importance in detecting CHD, the number one killer of people.

Statement of Problem

The problem for study was to determine if there is a difference between internal and external locus of control and nurses' knowledge about echocardiography.

Purposes

The purposes of this study were:

1. To identify locus of control of registered nurses who work with cardiac patients as measured by Rotter's Internal-External (I-E) Locus of Control Scale
2. To identify nurses' knowledge about echocardiography as measured by a Knowledge Questionnaire
3. To determine if a difference exists between internal and external locus of control and knowledge

Background and Significance

In today's world of highly sophisticated and advanced technology, a need exists for the nurses to be knowledgeable in the area of cardiovascular procedures because of the increasing prevalence of cardiovascular disease in society. Cardiovascular disease claims more American lives, 52 percent, than all other causes of death combined (American Heart Association 1978). Despite the significant overall mortality, an estimated 4,190,000 people have a history of heart attack, angina pectoris, or both (American Heart Association 1978). Nurses should know how to provide intelligible and reassuring information to these cardiac individuals about various cardiac diagnostic procedures.

Within the field of cardiology, specialized diagnostic procedures are being developed or changed constantly (Coats 1975). A relatively new procedure that is becoming an extremely useful noninvasive tool in the assessment and diagnosis of heart disease is echocardiography. In the past twenty years, the use of echocardiography has grown rapidly as a diagnostic procedure for heart disease for several reasons. These reasons include its noninvasive nature, its low cost, relative ease in performing the test, the reliability and reproducibility of the resulting information, and the wide range of clinical applicability of the procedure (Weyman and Feigenbaum 1977).

Echocardiography is being utilized increasingly in the evaluation of cardiac function. It assesses the heart's ability to contract or pump in response to changing blood volumes as expressed by right or left ventricular function curves. The measurements obtained from echocardiography, ejection fraction, and systolic time intervals are used in the assessment of cardiac function or ventricular function. Shors (1975) found these measurements to be accurate within 5 percent of the studies done by catheterization, dye dilution, and

thermistor techniques. The ejection fraction is the ratio of left ventricular stroke volume to end-diastolic volume. The systolic time intervals are the preejection (diastole) and ejection (systole) phases of the cardiac cycle. Both indices are useful in assessing left ventricular function. An understanding of both the mechanism and reasons for testing will allow nurses to adequately prepare the patient and assist him in interpreting the results (Henrick and Stephanides 1978). The patient should have a clear explanation of what the test will entail and why it is being done. Therefore, nurses must be knowledgeable about the procedure and the information that can be attained from the test.

Several studies examined the effect of locus of control on information-seeking behavior. Seeman and Evans (1962) studied tuberculosis patients and found that internal patients were more knowledgeable about their disease than external patients. In another study, Seeman (1963) found that internal prison inmates exhibited greater knowledge about attainment of parole than did external inmates. Both studies confirmed the fact that internals had significantly more knowledge regarding their personal conditions than did externals.

Other studies, which utilized nonpatients as subjects, confirmed Seeman's early findings. Davis and Phares (1967) studied college students and found that internal students sought significantly more information about the people they were expected to influence than external students. In another study, Phares (1968) found that internals were much more likely to utilize information than externals who were equally aware of the information.

Joe (1971) found that internally-controlled individuals exhibited a greater tendency to seek information and to adapt behavior patterns which utilize that information to control their environment. Wolk and DuCette (1974) studied intentional performance and incidental learning during an experimental task as it related to locus of control. They found that the internal subjects demonstrated an ability to use their cognitive system to extract information and then to use the information more efficiently than external subjects. Both authors suggested generic differences in perceptual and cognitive processes between the two groups.

The fact that locus of control has been shown to affect the degree of knowledge acquisition and

utilization makes it a variable of considerable interest to those who wish to explore knowledge or health behavior in regards to patient education. Health behavior relates to the amount of understanding the person has in a particular situation, and that person's ability to utilize knowledge to control a health situation. Numerous sources support the contention that patient education or teaching is an integral part of nursing practice. Not only is teaching part of the nurse's function, but the nurse is the best person to teach the patient (Winslow 1976).

A study conducted by Christensen, Lee, and Bugg (1979) found a negative relationship between locus of control and job performance in nurse practitioners. The study reflected that nurses who felt they were controlled by others "did what they were told to do." A positive relationship was found between hospital duties and external control. Hospital duties are more consistent with the duties of a nurse filling a more traditional role--that of experiencing external control. Perhaps nurses who feel controlled externally have less regard for their abilities to learn.

Theoretical Framework

Social learning theory was selected as the theoretical framework for this study because of its relevance to knowledge acquisition and an expected behavior. This theory is generally attributed to Rotter (1954), who first described and presented the theory in 1954. The theory was developed to explain complex human social behavior. Through utilization of an expectancy construct and an empirical law of effect or reinforcement, the theory explains human behavior in the acquisition and performance of skills and knowledge (Rotter 1966). Numerous studies conducted over the past twenty-five years have resulted in confirmation of the basic postulates derived from social learning theory and have refined and extended the theory.

A major assumption of social learning theory is the concept of expectancy. A person's behavior is determined by the nature or importance of goals or reinforcements and by the person's anticipation or expectancy that these goals will occur (Rotter, Chance, and Phares 1972). These expectancies are usually determined from past experiences, and they are believed to be the prime determinants of behavior.

Generalized expectancy can be represented by either internal or external control of reinforcement and does affect behavior. Those individuals who manifest an internal control of reinforcement believe that their life is dependent upon their own behavior and/or control; external individuals believe that luck, chance, fate, or powerful others control the surrounding reinforcements they receive (Rotter 1966). Knowledge of how an individual generally views the locus of control in his life may predict his behavior. This internal-external control of reinforcement is of major significance in understanding the nature of behavior outcome sequences in different kinds of learning situations (Rotter 1966).

The expectancy variable, locus of control, has implications for studying an individual's behavior in different clinical environments. Nurses are expected to know various procedures and disease-related information in order to provide patient education. Therefore, the concepts of social learning theory seem appropriate to nursing in examining whether an internally-controlled person seeks information about new procedures used in the clinical setting. The rationale for this expected outcome is based on the proposition that behavior is

a joint function of expectancy and reinforcement value (Rotter 1954).

This study was undertaken to determine the difference between nurses' knowledge of echocardiography in relation to CHD and the variable, locus of control. Based on previous findings, an internally-controlled nurse would be expected to show more knowledge or expose herself to more information about a new procedure than an externally-controlled nurse. If nurses do not seek the knowledge and information to provide to their patients, then they are neglecting a very vital and essential role in their practice of nursing.

Hypothesis

The hypothesis formulated for this study was the following: there is no significant difference between nurses who have internal locus of control and nurses who have external locus of control and their knowledge of echocardiography.

Definition of Terms

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

1. Locus of control--The degree to which an individual perceives that the reward follows from, or is

contingent upon, his own behavior or attributes versus the degree to which he feels the reward is controlled by forces outside of himself and may occur independently of his own actions (Rotter 1966); in this study it is operationalized by the score on the Rotter Internal-External (I-E) Locus of Control Scale (higher scores equal externality, lower scores equal internality)

2. Knowledge--The fact or condition of learning or having information about something with familiarity gained through experience or association (Webster 1977); in this study it is operationalized to knowledge of echocardiography

3. Echocardiography--The recording of pulsed high frequency sound waves (ultrasound) to study the movements and dimensions of cardiac structures during the cardiac cycle

4. Nurses--Individuals who are licensed as registered nurses to practice and care for patients

Limitation

The type of previous nursing education may have influenced the subject's knowledge of echocardiography and may have limited the conclusions of the study.

Delimitations

The delimitations presented in this study were:

1. The subjects must be registered nurses who work with cardiac patients
2. The institution where the subjects are employed must have an echocardiography unit

Assumptions

The assumptions basic to this study were:

1. There is a general lack of knowledge about echocardiography
2. An individual's learning process can be affected by the internal or external control of reinforcements or goals as well as the individual's anticipation or expectancy for these reinforcements or goals to occur (Rotter 1966)

Summary

Echocardiography has a promising future in cardiology; therefore, nurses need an understanding of the principles underlying its use in the diagnosis of cardiac diseases. This understanding will enhance the nurses' knowledge of the effects of cardiac pathology on the functions and structures of the heart and better assist the nurse in her role as a patient teacher. The problem

of this study was to determine the difference between internal and external locus of control and knowledge of echocardiography. The study compared the extent to which one will actively engage in cognitive activity, an internally-controlled individual, to the extent to which one will allow oneself to be swayed by others, an externally-controlled individual.

CHAPTER II

REVIEW OF LITERATURE

Nurses are expected to know about new procedures relating to the clinical area. Applying concepts of social learning theory (SLT) to the nursing profession, internally-controlled nurses are assumed to be highly motivated in learning new procedures or techniques related to their clinical specialty. A review of the literature has shown the effects of locus of control on information-seeking behavior in patients and college students. Only one study was found comparing locus of control and the professional development of nurse practitioners. Therefore, the concepts investigated for the purpose of this research were social learning theory and knowledge, operationally defined as knowledge of echocardiography in nurses working in the cardiovascular area.

Concepts of Social Learning Theory

Social learning theory postulates that human behavior in specific situations is contingent upon an individual's expectancy that a particular behavior will

be reinforced or rewarded (Rotter 1954). A key concept in social learning is locus of control; this is conceptualized as the degree to which an individual perceives that rewards are a function of his or her own actions, efforts, or characteristics as opposed to external forces. Through the concepts of expectancy and reinforcement, the social learning theory explains human behavior in the acquisition and performance of skills and knowledge.

There are several important assumptions of social learning theory which are concerned primarily with man and the nature of his behavior. The first assumption is the interaction of man and his environment as the unit of investigation for the study of personality (Rotter, Chance, and Phares 1972). A meaningful study of personality cannot be achieved without consideration of the environment within which behavior occurs, presently or in the past. Usually, the residual effects of past experiences affect a person's motivation to engage in new experiences.

The interaction of man and his environment has implications for research with nurses. A nurse often finds herself in situations where she has little or no preparation for patient teaching (Redman 1972, Pohl

1965, Streeter 1953). An additional factor which interferes with teaching is the physician's or patient's perception of nurses as teachers. Both past experiences and environmental influences exert a profound effect on a person's behavior. The environment is an essential component of behavioral analysis which has been observed within nursing (Rogers 1970, Neuman 1972); and in this respect, nursing beliefs are similar to social learning assumptions.

A second assumption of social learning theory is that personality has unity. Rotter (1954) defined unity in terms of stability and interdependence. He believed that personality becomes increasingly more stable as a person becomes more experienced. In other words, the individual selects new experiences and interpretations of reality based on past experiences and conceptualizations (Rotter, Chance, and Phares 1972). This assumption implies the need to understand previous experiences as a necessary requirement to understanding present and future behavior. When viewed in relation to a nurse, it is necessary to explore past experiences regarding nursing practices and knowledge as these may influence current and future nursing care.

In social learning theory, behavior is assumed to be goal-directed. "It is the directional nature of behavior, accounting for selective responses to cues and for choice behavior, which is the motivational focus of SLT" (Rotter, Chance, and Phares 1972, p. 8). This directionality of behavior can be used in determining the positive and negative reinforcements which influence an individual's behavior in a particular situation. Reinforcements should further facilitate the prediction of behaviors which are directed toward or away from specific goals in a nursing situation.

The terms "goals" and "needs" are defined as they relate to motivation and behavior.

. . . when we focus on the environmental conditions that determine the direction of behavior, we speak of goals or reinforcements. On the other hand, when we focus upon the person determining the direction, then we speak of needs. Both needs and goals are inferred from the same referents--the interaction of the person with his meaningful environment (Rotter, Chance, and Phares 1972, p. 10).

Both needs and goals affect an individual's behavior. The only difference between needs and goals is whether they exist internally or externally to an individual.

The fourth assumption to be discussed is the concept of expectancy. It is explained by stating:

. . . the occurrence of a behavior of a person is determined not only by the nature or

importance of goals or reinforcements but also by the person's anticipation or expectancy that these goals will occur. Such expectations are determined by previous experience and can be quantified (Rotter, Chance, and Phares 1972, p. 11).

The concept of expectancy which is central to social learning theory is believed to be the major determinant of behavior.

In addition to these four major assumptions, four basic concepts are utilized to predict behavior. "These concepts are behavior potential, expectancy, reinforcement value, and the psychological situation" (Rotter, Chance, and Phares 1972, p. 11). These concepts are defined as follows:

Behavior potential may be defined as the potentiality of any behaviors occurring in any given situation or situations as calculated in relation to any single reinforcement or set of reinforcements.

Expectancy may be defined as the probability held by the individual that a particular reinforcement will occur as a function of a specific behavior on his part in a specific situation or situations. Expectancy is systematically independent of the value or importance of the reinforcement.

The reinforcement value of any one of a group of potential external reinforcements may be ideally defined as the degree of the person's preference for that reinforcement to occur if the possibilities of occurrence of all alternatives were equal (Rotter, Chance, and Phares 1972, pp. 12-13).

The psychological situation is defined in terms of internal and external environmental stimuli to which an individual selectively reacts (Rotter, Chance, and Phares 1972, p. 13).

The relationship between expectancy and the reinforcement value of any given behavior in a specific situation may determine or predict an individual's final behavior. For example, there is a higher probability of a behavior occurring if an individual has a high expectancy for attaining a highly valued reinforcement or goal which may be related to the behavior. If an individual has a high expectancy for the occurrence of a behavior in a very low valued reinforcement, the person probably will not be motivated to display that behavior.

These essential concepts are important within nursing. For example, nurses are expected to learn about new procedures or practices related to nursing (expectancy) but may not exhibit the need or motivation to obtain this additional knowledge (reinforcement) based on their specific role within the nursing profession (psychological situation). A nurse who has a high expectation (expectancy) that her activities will result in a promotion (reinforcement) may be more highly

motivated to learn and implement new nursing practices within her clinical area depending on the nature of the situation (psychological situation).

From these concepts, the conclusion can be drawn that generalized expectancies do affect behavior. A generalized expectancy can be distinguished as an internal or external control of reinforcement. Internal controllers are those individuals who perceive themselves and their behavior as the prime determinants of the reinforcement; while external controllers are those who tend to see little if any relationship between their own actions and subsequent reinforcements (Rotter 1966). Knowledge of how a person generally views his locus of control or control of reinforcement in his life may be helpful in predicting his behavior. Besides understanding and predicting behavior, social learning theory emphasizes consideration of the reinforcement value and the psychological situation.

In summary, social learning theory explains human behavior and its significance in learning and personality. Several assumptions serve as the foundation for the four essential concepts--behavior potential, expectancy, reinforcement value, and psychological

situation. The interrelationship of these concepts form the basis of human behavior and essentially the control and prediction of behavior.

Research in Social Learning Theory

Social learning theory provides a theoretical framework for the development of knowledge in man and his behavior. Since 1954, numerous studies have been conducted using the concepts of SLT; also a few comprehensive reviews of the variables derived from the theory have been published (Rotter 1966, Lefcourt 1966, Joe 1971). Throop and MacDonald (1971) published an extensive bibliography on internal-external locus of control. Several studies which are relevant to understanding human behavior and its relationship to controlling and predicting behaviors in various situations will be reviewed. Major research conducted in relation to locus of control and health-related situations will be discussed first.

Locus of Control in Health Situations

Only one study was found in which the subjects were nurses. The purpose of the investigation was to examine the relationship of locus of control of nurse practitioners to amounts and types of professional

activities performed in a clinical setting (Christensen, Lee, and Bugg 1979). A negative relationship was found between the chance scale (externals) and total professional activities; the relationship was not significant. However, hospital duties were positively related to the chance scale (externals). An indication that nurses who feel they are externally controlled by others quietly do what they are told to do. The internal scale was positively related to all types of professional activities and significantly ($p < 0.08$) related to health screening. The authors concluded that perhaps externally-controlled nurses have less regard for their abilities and achievement in their job performance.

Several studies reviewed have a direct relevance to health behavior. One of these studies was conducted by Wallston, Maides, and Wallston (1976). The purpose of their investigation was to "show how social learning theory provided a theoretical perspective for studying individual differences in information-seeking regarding preventive health care" (p. 215). The subjects were classified as internals or externals regarding health locus of control and as having a high or low value of health. Results of the analysis revealed that the "internal-high health values group" scored significantly

higher on the number of health information pamphlets selected than the other group. These findings substantiate the predictions of the social learning theory-- that internally-controlled individuals who believe they can affect their health and who highly value health select more sources of health information than externals.

Lowery and DuCette (1976) investigated the relationships between a patient's response to diabetes and the variable locus of control. They predicted that internal diabetics would know more about their disease and would demonstrate more control over it. Internal diabetics were found to have significantly more information about their disease than did externals; this finding is consistent with results from earlier studies in which internally-controlled individuals were more active seekers of information than externals. Contrary to their prediction, however, internal diabetics showed no decrease in the number of problems associated with their disease over time than external diabetics. This finding was interpreted by the investigators as a possible result of the externals' greater dependence on and compliance with medical authority and regime.

The earliest study which confirmed the hypothesis that internals demonstrate more initiative, effort, and

success in controlling their environments through the utilization and acquisition of relevant knowledge or information than do externals was conducted by Seeman and Evans (1962). The authors studied hospitalized tubercular patients and found that internal patients were more knowledgeable about their disease than were external patients. The staff considered the internal patients to be more informed than the external patients.

In summary, these studies support the hypothesis of the social learning theory that internally-controlled individuals demonstrate more knowledge in health-related areas. The studies further showed that a person's behavior affected the health outcomes and the amounts of information sought in controlling the environment.

Additional studies, which are non-patient and non-health related, confirmed the findings that internals exhibit a more successful acquisition and synthesis of knowledge than externals. These studies will be reviewed in the following section.

Locus of Control and Information Acquisition and Utilization

A study in 1963 by Seeman further supported his findings of 1962. Using prison inmates as the subjects, he found that internal reformatory inmates

exhibited greater knowledge over external inmates in the amount of control-related information they possessed, especially those facts about parole attainment. Both of these studies by Seeman (1963) and Seeman and Evans (1962) provided evidence that internals attempt to gain a greater degree of control over their life situation through the acquisition of knowledge than do externals.

Gore and Rotter (1963) conducted a study on students in a southern Black college and found that Rotter's I-E Scale significantly predicted the type and degree of student behavior directed toward social change. This significant prediction of an internal's involvement in social change action might not have been achieved if the Black students had not been so highly motivated to attain civil rights. Strickland in 1965 replicated this study with nearly identical results.

In 1967, a study by Davis and Phares further corroborated these early findings. The investigators studied the effect of locus of control on the behavior of college students preparing to influence the attitudes of others concerning the war in Vietnam. They found the internal students to seek significantly more information about the people they were expected to influence than did the external students. The results indicate

that internals attempt to actively control their environment by obtaining the necessary information.

Phares (1968) conducted a study to determine if internals were more effective in the utilization of information than externals. He believed that internal individuals expected reinforcements to follow their efforts; therefore, they would utilize information properly as a means of reinforcement. Phares concluded that internals exhibited a greater potential for effectiveness in their environments by utilizing more information.

Joe (1971) presented a review of the research and evidence supporting the validity of Rotter's concepts in the social learning theory. The general conclusion of the review was that internals exhibited a greater tendency to seek and utilize information in adapting behavior patterns to control their environment.

Several studies demonstrated the difference in cognitive activity between internal and external people. DuCette and Wolk (1973) found that internal subjects were better than external subjects in a variety of situations that required extraction and utilization of information. Wolk and DuCette (1974) concluded that internals were more perceptually sensitive and displayed

a more attentive and organizing cognitive system than externals.

Seeman's (1971) review of the cognitive aspect of locus of control appeared to be the most appropriate. He stated, "for functional reasons, people who feel powerless simply do not believe that control-relevant knowledge can be put to any use, at least by themselves" (p. 94).

Several investigators (Ritchie and Phares 1969, Crowne and Liverant 1963, Doctor 1971, Biondo and MacDonald 1971) have generalized that an internal person will resist subtle attempts to influence his behavior, unless the activity is beneficial to accede. On the other hand, an external person is more passive and will comply with such influence attempts, especially if the manipulator is a person of high status.

These aspects of locus of control portray the different ways internal persons and external persons interact with their environment. Whether an internal seeks information when the information is part of his ongoing activities has not been clearly demonstrated or validated by these studies. However, any behavior related to cognitive activity can be assumed to be related to locus of control.

Echocardiography and Its Role in Nursing

Echocardiography is a relatively new procedure which is becoming valuable in the diagnosis of cardiac diseases. It is a noninvasive procedure which uses high frequency sound waves to visualize and study the movements and dimensions of the moving cardiac structures such as valves and chamber walls (Joffe 1978). Echocardiography is a time-motion study in which the ultrasound beam tracks the motion of the cardiac structures during the cardiac cycle.

The use of ultrasound as a diagnostic tool in most organs of the body has become widespread since the 1950s. Initial studies were conducted using echocardiography on the mitral valve and congenital heart disorders. The technique is now useful in establishing diagnosis and evaluating the severity of numerous cardiac disorders and lesions as well as assessing cardiac function.

Ultrasound refers to sound with a frequency greater than 20,000 cycles per second. This sound is inaudible but can be directed in a linear beam and is reflected by very small objects in its path. It cannot pass through air; that is why it must be in airless contact with the patient's body and cannot be used to visualize the lungs.

Ultrasound is transmitted through the chest wall by use of a piezoelectric transducer. A pulse of ultrasound is emitted from the transducer for a duration of .001 second, then the transducer acts as a receiver to permit the reflected sound waves to be recorded. The transducer then converts the ultrasound waves to electricity which can be displayed on an oscilloscope; permanent records are obtained from multi-channel recorders.

Echocardiography is a unique noninvasive procedure in that it can make visual intracardiac events. It is easily performed in a clinical setting or at an office; however, a well-trained technician, nurse, or physician must perform the procedure. It is a painless procedure which takes from thirty to sixty minutes to complete. Initially, the patient is in the supine position and the transducer is placed along the left sternal border at about the fourth intercostal space which serves as the window of the heart. An ultrasonic gel is applied to maintain airless contact between the skin and transducer. Certain patients present anatomical variations which make performance of an echocardiogram difficult. The only disadvantage is the echocardiogram cannot visualize the coronary arteries.

Echocardiography can evaluate left ventricular (LV) function by noninvasively measuring the volume of the LV cavity, stroke volume, cardiac output, and speed of myocardial fiber shortening. It can also obtain recordings of the motion of valve leaflets, the inter-ventricular septum, and chamber walls.

A primary role of the nurse when using echocardiography is to prepare the patient and his family in understanding the use of the procedure. The nurse must understand the procedure in order to instruct and provide intelligible and reassuring information to the patient (Coats 1975, Henrick and Stephanides 1978). Numerous studies support the contention that teaching is an integral part of nursing practice (Baden 1972, Palm 1971, Pohl 1965). Meyers (1964) demonstrated that less stress and fewer misconceptions are created for patients who experience an unfamiliar diagnostic procedure when given information with which they can structure their experience. Patient teaching has been defined as a professional responsibility and an independent function of the nurse (Baden 1972, Redman 1974, Winslow 1976). Minehan (1977) found the educational needs of nurses in health care settings increasing with the changes in medical knowledge and practice and with changes in the

organization of nursing care delivery. Therefore, nurses must be aware of new procedures and techniques occurring in the clinical area so that they may be effective patient educators.

An understanding of both the mechanism and reasons for an echocardiogram will allow the nurse to better prepare the patient and to alleviate any fears or anxiety the patient may express or exhibit. The nurse must also be supportive to the patient and his family before, during, and after the echocardiogram. In a survey conducted by Pohl (1965), the majority of nurses believed that teaching is a responsibility of nursing and is as important as other functions of their work.

Data from several studies (Redman 1972, Pohl 1965) have shown a lack of knowledge and inadequate preparation to teach as reasons why nurses do not teach. If the nurse is not confident she knows what to teach the patient or if she does not understand learning-teaching principles, she will not teach the patient (Winslow 1976). Winslow (1976) stated that the inclusion of education courses in inservice education or other nursing programs should help to improve the quality and quantity of patient education.

Nurses must realize that patient education as well as their own continuing education is a necessity if patients are to receive maximum benefits from today's knowledge of treatment, prevention, and control of disease. Various factors interfere with nurses conducting adequate patient teaching which might be related to the concepts of social learning theory. These obstacles must be overcome if nurses are to be effective in their role and if nursing is to make a significant contribution toward quality health care.

Summary

A summary of the research pertaining to social learning theory and its relation to knowledge has been presented in this chapter along with a review of echocardiography and its use in cardiology. Expectancy can be represented by either internal or external control of reinforcement and does affect behavior. An internal individual refers to the perception of positive or negative reinforcements as being the consequence of the individual's own action; an external individual refers to the perception of positive or negative goals as being unrelated to the individual's behavior in certain situations. The research findings conclude that internals

tend to exhibit a greater control and knowledge of information pertaining to their particular situation as opposed to an external person.

With the increasing use of echocardiography, nurses are expected to learn about the procedure. Nurses, however, may not exhibit the motivation to obtain the additional information which may lead to inadequate patient teaching. Teaching is an essential role of nursing and must not be neglected. This study examined the difference between nurses' locus of control and knowledge of echocardiography.

CHAPTER III

PROCEDURE FOR COLLECTION AND TREATMENT OF DATA

A descriptive-comparative design was used to determine the difference between nurses' knowledge of echocardiography and their locus of control. Four main tasks were involved in the preparation of the study-- determining the setting, population, and sample; descriptions of the instruments; development of the research instruments; and collection of the data and analysis of the data.

Setting

The study was conducted at two institutions in a large city located in the southwestern section of the United States. The city is the second largest in the state and is inhabited by more than 900,000 residents. One site of the study was a private hospital with approximately 450 beds. The other hospital was also a private institution with approximately 350 beds. Each institution had an echocardiography unit. The nursing staff was obtained from the units or floors that

admitted cardiac patients. A room was available for the participants to use in answering the research instruments.

Population and Sample

A convenience sample was obtained from the registered nurses employed at the two institutions. The nurses who voluntarily agreed to participate in the study were currently working with cardiac patients. A sample of thirty-seven nurses was derived from the available population. All the nurses were licensed in the state.

Protection of Human Subjects

Prior to the collection of data, approval from the Texas Woman's University Human Research Review Committee was obtained for this study. Upon written permission from the Human Research Review Committee of Texas Woman's University (appendix A) and from the agencies (appendix B), data collection began. Prior to administration of the instruments, the investigator presented an oral explanation of the purpose of the study to the subjects (appendix C). Those subjects who agreed to participate signed a written informed consent form (appendix D) before completing the instruments. The

participants were assured that their identity would remain anonymous in the data collection. Each subject was assured that she could withdraw from the study at any time. Privacy and confidentiality of test scores was emphasized to each subject. The investigator was willing to answer any questions. The test results were used only for the study and not discussed or given to the institution or anyone else. The consent forms were kept separate from the other research instruments so no association could be made between the two.

Instruments

Three instruments were administered for the collection of data: (1) a Demographic Questionnaire, (2) Rotter's Internal-External (I-E) Locus of Control Scale, and (3) a Knowledge Questionnaire. The Demographic Questionnaire (appendix E) was used to collect data to describe the sample. The data included age, sex, number of years of experience in cardiovascular nursing, and current level of nursing education (Associate Degree, Diploma, Baccalaureate).

The second instrument used was Rotter's Internal-External Locus of Control Scale, which measured the expectancy variable, locus of control. A description

of the development of this scale can be found in a monograph by Rotter (1966). The scale, which has a forced choice format, consists of twenty-nine items of which six items are fillers (appendix F). The score was tallied by totaling the number of external responses given; that is, the higher the score the more external the individual (Rotter 1966). The highest possible score is twenty-three.

The I-E scale is a measure of the generalized expectancy with which persons perceive contingency relationships between actions and outcomes. Construct and convergent validity of the I-E scale has been documented repeatedly over the past ten years and summarized in various literature reviews (Rotter 1966; Rotter, Chance, and Phares 1972; Joe 1971; Lefcourt 1972). Construct validity has varied from 0.55 to 0.61 in student populations (Rotter 1966). In obtaining construct validity, the internal-external scale was compared to either performance in laboratory tasks, attempts to control the environment, achievement motivation, or the variables independence, suggestibility, and conformity.

Reliability data are available for internal consistency and test-retest. Internal consistency

estimates range from 0.65 to 0.79 in various groups of college students (Rotter 1966). Test-retest reliability coefficients have ranged from 0.49 to 0.83 for varying periods of time in college students and prisoners (Joe 1971).

The third instrument utilized was a Knowledge Questionnaire that was developed by the investigator for this study. The instrument was designed as a true-false test to measure the subject's knowledge about the new, noninvasive cardiac technique, echocardiography (appendix G). The test included forty questions with scores ranging from zero to forty.

Content validity was obtained by an evaluation of the questions as to their relevance to the problem and purpose of the study. The reviewers consisted of a physician with a specialty in cardiology, a cardiovascular physiologist with a Ph.D. in Physiology, and a Clinical Nurse Specialist with a Master of Science Degree in Cardiovascular Nursing.

Following the review of the questionnaire by these experts, revisions were made to facilitate clarity. The reviewers found the content to be pertinent to the purposes of the study. A test for reliability was not performed.

Data Collection

Before administering the instruments, the investigator presented an oral explanation of the purpose of the study to the subjects. Those subjects who agreed to participate read and signed a written informed consent form.

A quiet room on each unit was available for the participants to answer the research instruments. The questionnaires were briefly described to the subjects and any directions accompanying the instrument were provided. Most subjects completed the questionnaires in twenty minutes. The response time varied from fifteen to thirty minutes.

Treatment of Data

The subjects were divided into an internal and external control group by a median split of the I-E scores. Subjects were also divided into a below-mean and an above-mean group according to their score on the Knowledge Questionnaire.

To determine whether the internal group and external group were homogeneous, a t-test was performed to determine if a significant difference existed between the two groups. This analysis was repeated for the

same reason on the two knowledge groups. The significance of the findings was determined at the 0.05 level.

A chi-square (χ^2) test was used to determine significant differences between two independent groups (Siegel 1956). The χ^2 analysis was selected to test the hypothesis because the data were nonparametric, and the test was appropriate to study the difference between two variables. The acceptance or rejection of the null hypothesis was based on the 0.05 level of significance.

Summary

This chapter outlined the methodology used in collecting and testing data needed to accept or reject the hypothesis. A description of the sample obtained from the population and the setting used in conducting the study were discussed. An explanation of the instruments utilized and the validation of the instruments were described in the chapter. The procedure and treatment of the data were summarized also.

CHAPTER IV

ANALYSIS OF DATA

A descriptive-comparative study was conducted to establish the difference between internal and external locus of control and knowledge of echocardiography. The Rotter's I-E Scale was used to measure locus of control and a Knowledge Questionnaire to ascertain level of information about echocardiography. Demographic data were collected to describe the sample. This chapter presents an analysis of the data. An interpretation of the statistical analysis is presented followed by a summary of the findings.

Description of the Sample

Thirty-seven female subjects participated in the study. The mean age of the participants was 29.5 years, a standard deviation of 5.1, with a range of twenty-two to forty-five years. Twenty-one subjects, 56.8 percent, were between the ages twenty to twenty-nine years; fifteen subjects, 40.5 percent, were between ages thirty to thirty-nine years; and one subject, 2.7 percent, was in the fourth decade. Years experience in cardiovascular

nursing varied from four months to fourteen years with an average of 4.3 years and a standard deviation of 3.6. Seven subjects, 19.0 percent, had associate degrees; twelve, 32.4 percent, of the subjects were diploma graduates; and the remaining eighteen subjects, 48.6 percent, had bachelor degrees in nursing.

Table 1 presents the age and years experience in cardiovascular nursing (CVN) of the sample according to current level of nursing education. The means and standard deviations for each variable are shown in the table. The associate degree nurses were older than the other two groups of nurses. Diploma nurses had more working experience with patients than either of the other two groups.

Findings

The median value on the Rotter's I-E scale was 10, and this score was used to split the population into an internal group and an external group. The I-E scores ranged from three to twenty-one with a mean value of 9.9. The mean value of 30.2 from the Knowledge Questionnaire was used to divide the subjects into a below-mean group and an above-mean group. The median value on the Knowledge Questionnaire was 30 with a range of twenty-three to thirty-six.

TABLE 1

COMPARISON OF AGE AND YEARS EXPERIENCE IN CARDIOVASCULAR NURSING BY CURRENT LEVEL OF NURSING EDUCATION

	Age (Years)		Experience (Years)	
	\bar{X}	$\pm SD$	\bar{X}	$\pm SD$
Associate degree (N = 7)	31.0	4.8	3.4	2.6
Diploma (N = 12)	30.2	4.5	6.2	3.6
Baccalaureate degree (N = 18)	28.5	5.6	3.4	3.6

N = 37

The hypothesis formulated for this study was the following: there is no significant difference between internal and external locus of control and knowledge of echocardiography. A two-by-two table or contingency table was used to illustrate the difference between internal and external locus of control and knowledge of echocardiography. Table 2 describes the sample according to the two variables.

The results of this analysis are not statistically significant at the 0.05 level ($\chi^2 = 0.232, p = 0.63$). Since there was no difference between internal and external locus of control and knowledge of echocardiography the null hypothesis was accepted.

TABLE 2

RELATIONSHIP BETWEEN INTERNAL AND EXTERNAL LOCUS OF CONTROL AND KNOWLEDGE OF ECHOCARDIOGRAPHY

Locus of Control	Knowledge Score	
	Below Mean	Above Mean
Internal	8 (21.6%)	9 (24.3%)
External	11 (29.7%)	9 (24.3%)

$$\chi^2 = 0.232$$

$$df = 1$$

$$p = 0.63$$

$$N = 37$$

Of the seventeen internal subjects, eight, 21.6 percent, scored below the mean; and nine, 24.3 percent, scored above the mean on the Knowledge Questionnaire. The distribution of the external group was eleven subjects, 29.7 percent, below the mean and nine, or 24.3 percent, above the mean.

Additional findings are included from the data analysis. A comparison of the scores on the I-E scale and Knowledge Questionnaire according to current level of nursing education is presented in table 3. Diploma nurses scored higher on the Knowledge Questionnaire as compared to the associate and baccalaureate degree nurses. The diploma nurses have the lowest I-E score as compared to the other two groups.

TABLE 3

COMPARISON OF SCORES ON ROTTER'S I-E SCALE AND
KNOWLEDGE QUESTIONNAIRE BY CURRENT LEVEL OF
NURSING EDUCATION

Test	Associate (N = 7)		Diploma (N = 12)		Baccalaureate (N = 18)	
	\bar{X}	\pm SD	\bar{X}	\pm SD	\bar{X}	\pm SD
Rotter's I-E Scale	10.9	1.7	7.1	2.5	11.4	4.2
Knowledge Questionnaire	27.9	3.6	31.1	3.1	30.5	3.2

N = 37

Table 4 presents a comparison of the mean scores on the two tests by age decade. The fourth decade has only one subject, which should be taken into account when comparing the three groups. The younger subjects have a higher I-E score as compared to the older subjects. The older subjects scored higher on the Knowledge Questionnaire than the younger subjects.

A comparison of age, experience, and scores on I-E scale and Knowledge Questionnaire between the internals and externals is presented in table 5. To determine whether the two groups were homogeneous, a t-test was used to determine if a significant difference existed between the two groups. Both groups are similar

TABLE 4

COMPARISON OF SCORES ON ROTTER'S I-E SCALE AND
KNOWLEDGE QUESTIONNAIRE BY AGE DECADES

Test	20-29 Years (N = 21)		30-39 Years (N = 15)		40-49 Years (N = 1)	
	\bar{X}	\pm SD	\bar{X}	\pm SD	\bar{X}	\pm SD
Rotter's I-E Scale	10.6	4.4	9.3	2.8	5.0	--
Knowledge Questionnaire	29.6	2.7	30.1	3.8	36.0	--

N = 37

TABLE 5

COMPARISON OF AGE, EXPERIENCE, AND SCORES ON ROTTER'S
I-E SCALE AND KNOWLEDGE QUESTIONNAIRE BETWEEN
INTERNAL AND EXTERNAL GROUPS

Characteristics	Internals (N = 17)		Externals (N = 20)	
	\bar{X}	\pm SD	\bar{X}	\pm SD
Age (years)	29.8	5.6	29.3	4.8
Experience (years)	4.6	3.1	4.1	4.0
Knowledge Score	31.0	2.8	29.5	3.6
Rotter's I-E Score	6.8	1.9	12.5	3.0

N = 37

in respect to age, nursing experience, and knowledge scores. For each t-test performed, the results were as follows: age ($t = 0.30$, $p = 0.76$), experience ($t = 0.50$, $p = 0.62$), and knowledge score ($t = 1.41$, $p = 0.17$). The three results were not significant at the 0.05 level.

Table 6 summarizes the comparison of age, experience, and scores on the two tests between the two knowledge groups. A t-test was performed on each variable to determine if the groups were homogeneous.

TABLE 6

COMPARISON OF AGE, EXPERIENCE, AND SCORES ON ROTTER'S I-E SCALE AND KNOWLEDGE QUESTIONNAIRE BETWEEN THE TWO KNOWLEDGE GROUPS

Characteristics	Below Mean (N = 19)		Above Mean (N = 18)	
	\bar{X}	\pm SD	\bar{X}	\pm SD
Age (years)	28.4	3.9	30.7	6.0
Experience (years)	3.4	2.9	5.3	4.1
Rotter's I-E Score	10.5	4.4	9.3	3.2
Knowledge score	27.6	2.3	32.9	1.6

N = 37

The above-mean group were older, had more years of experience, a lower I-E score, and a higher knowledge score than the other group. The results of the t-test

on each variable were the following: age ($t = -1.38$, $p = 0.18$), experience ($t = -1.62$, $p = 0.12$), and Rotter's I-E score ($t = 0.95$, $p = 0.35$). The three results were not significant at the 0.05 level.

In summary, the additional findings revealed that there was no difference between the internal group and the external group or the two knowledge groups. The groups are basically similar and homogeneous. These results conclude that a general lack of knowledge of echocardiography does not exist in these two groups of nurses.

Summary of Findings

A chi-square test was used to analyze the difference between internal and external locus of control and knowledge of echocardiography. The results of this analysis ($\chi^2 = 0.232$, $p = 0.63$) were not statistically significant at the 0.05 level, thus accepting the null hypothesis.

A summary description of the demographic data yielded the following information:

1. The sample consisted of thirty-seven females with a mean age of 29.5 years ranging from twenty-two to forty-five years

2. Current level of nursing education varied among the subjects--19.0 percent had associate degrees, 32.4 percent were diploma graduates, and 48.6 percent had bachelor degrees

3. Years of experience in nursing ranged from four months to fourteen years with an average of 4.3 years

4. Associate degree nurses were older and diploma nurses had more years of experience than the other two groups of nurses

The additional findings are summarized:

1. Previous nursing education did not influence level of knowledge

2. The younger subjects had a higher I-E score and lower knowledge score as compared to the older subjects

3. There were no differences between the internal group and the external group or the two knowledge groups

4. There were more external nurses than internal nurses

CHAPTER V

SUMMARY OF THE STUDY

A summary of the study and its findings are presented in this chapter. Some conclusions and implications were drawn from the results of the study. Recommendations for further study are presented also.

Summary

This study investigated the difference between internal and external locus of control and knowledge of echocardiography. Social learning theory was selected as the theoretical framework based on its relevance to knowledge acquisition and expected behavior. The study compared the extent to which one will actively engage in cognitive activity, an internally-controlled individual, to the extent to which one will allow oneself to be swayed by others, an externally-controlled individual.

The sample consisted of thirty-seven female nurses between the ages of twenty-two to forty-five who work with cardiac patients. Current level of nursing education varied among the subjects: associate degree (19.0 percent), diploma (32.4 percent), and baccalaureate

(48.6 percent). Nursing experience ranged from four months to fourteen years.

Three instruments were utilized in collecting the data. Demographic data were collected to describe the sample. Rotter's I-E Locus of Control Scale provided data for the internal-external score. The third instrument was developed by the investigator to measure knowledge of echocardiography.

The hypothesis was stated in the null: there is no significant difference between internal and external locus of control and nurses' knowledge of echocardiography. A chi-square (χ^2) statistic was utilized to analyze the difference between the two variables. The results of the analysis were not statistically significant at the 0.05 level ($\chi^2 = 0.232$, $p = 0.63$). Since there was no difference between the two variables, the null hypothesis was accepted.

Additional findings were yielded when the subjects were divided into two groups according to the I-E score and knowledge score. A t-test was used to determine if the groups were homogeneous for age, experience, I-E score, and knowledge score. The t-test scores for age, experience, and Knowledge Questionnaire between the internal group and the external group were 0.30 ($p = 0.76$),

0.50 ($p = 0.62$), and 1.41 ($p = 0.17$), respectively. The t-test score for age, experience, and I-E scale for the knowledge groups were -1.38 ($p = 0.18$), -1.62 ($p = 0.12$), and 0.95 ($p = 0.35$), respectively.

A comparison of the scores on the I-E scale and Knowledge Questionnaire by current level of nursing education found diploma nurses scored higher on the Knowledge Questionnaire as compared to the associate and baccalaureate degree nurses. Diploma nurses also scored the lowest on the I-E scale as compared to the other two groups. The younger subjects scored higher on the I-E scale and lower on the Knowledge Questionnaire than the older subjects.

Discussion of Findings

The results of this study did not support the prediction that a difference exists between nurses' locus of control and knowledge of echocardiography. This finding is contrary to those reported in the literature.

Research in social learning theory supported the prediction that internal subjects are more active seekers of information than external subjects (Seeman and Evans 1962, DuCette and Wolk 1973). Joe (1971) presented a review of the literature and concluded that internals

exhibited a greater tendency to seek and utilize information in adapting behavior patterns to control their environment.

Christensen, Lee, and Bugg (1979) examined the relationship of locus of control of nurse practitioners to amounts and types of professional activities performed in a clinical setting. A negative relationship was found between external nurses and professional activities. The authors concluded that externally-controlled nurses have less regard for their abilities and achievement in their job performance.

A study by Wallston, Maides, and Wallston (1976) supported the predictions of the social learning theory in a health situation. They found internal individuals who believe they can affect their health select more sources of health information than external individuals.

Wolk and DuCette (1974) found that repeated exposure to a task or extensive task structuring diminished or eliminated the difference between internal and external subjects' performance. Lowery and DuCette (1976) also found that over time internal diabetics showed no decrease in the number of problems associated with their disease than external diabetics.

The conclusions drawn from Wolk and DuCette (1974) and Lowery and DuCette (1976) studies may indicate a possible clue to the nonsignificant finding of this study. The number of years experience in cardiovascular nursing was similar between the internal and external group. This similarity may have diminished the difference between the internal and external subjects' knowledge of echocardiography.

Another reason for the nonsignificant result was the existence of an ongoing inservice education program in both hospitals. The availability of the inservice program may have diminished or eliminated any differences between the internal and external subjects' knowledge of echocardiography.

Conclusions and Implications

The following conclusions were made by the investigator:

1. A general lack of knowledge of echocardiography does not exist among these nurses
2. The nonsignificant finding may have been confounded by the existence of an ongoing inservice education program in both hospitals

3. The expectancy variable, locus of control, may be influenced by time factors, years of experience

An implication derived from this study may be the need to use more than one variable from social learning theory to establish a relationship or a stronger relationship with knowledge. If nurses are to be motivated and responsible for their own learning, then other variables must be examined to determine if their behaviors are due to interest in the subject area, perception of self as worthwhile, interest in continual learning, or availability and utilization of inservice programs.

Recommendations for Further Study

The following recommendations for further study are presented:

1. The study should be replicated with a larger sample and in a different setting

2. A comparison between male nurses and female nurses should be made with regard to locus of control and knowledge of echocardiography

3. Different populations of nurses should be compared with regard to locus of control and knowledge levels specific to their clinical area

4. The Knowledge Questionnaire should be tested for reliability

APPENDIX A

TEXAS WOMAN'S UNIVERSITY

Human Research Committee

Name of Investigator: Karen Ann Cook Center: Dallas
 Address: 7879 Riverfall Dr. #169 Date: 9/19/79
Dallas, Texas 75230

Dear Ms. Cook:

Your study entitled Locus of Control and Knowledge of Echocardiography has been reviewed by a committee of the Human Research Review Committee and it appears to meet our requirements in regard to protection of the individual's rights.

Please be reminded that both the University and the Department of Health, Education and Welfare regulations require that written consents must be obtained from all human subjects in your studies. These forms must be kept on file by you.

Furthermore, should your project change, another review by the Committee is required, according to DHEW regulations.

Sincerely,



Chairman, Human Research
Review Committee

at Dallas.

APPENDIX B

TEXAS WOMAN'S UNIVERSITY
COLLEGE OF NURSING
DENTON, TEXAS

DALLAS CENTER
1810 Inwood Road
Dallas, Texas 75235

HOUSTON CENTER
1130 M.D. Anderson Blvd.
Houston, Texas 77025

AGENCY PERMISSION FOR CONDUCTING STUDY*

THE St. Paul's Hospital

GRANTS TO Karen Cook, B.S.N.

a student enrolled in a program of nursing leading to a Master's Degree at Texas Woman's University; the privilege of its facilities in order to study the following problem:

The relationship between nurses' locus of control, a behavior outcome variable, and their knowledge of echocardiography.

The conditions mutually agreed upon are as follows:

1. The agency (may) (~~may not~~) be identified in the final report.
2. The names of consultative or administrative personnel in the agency (may) (~~may not~~) be identified in the final report.
3. The agency (~~wants~~) (does not want) a conference with the student when the report is completed.
4. The agency is (willing) (~~unwilling~~) to allow the completed report to be circulated through interlibrary loan.
5. Other: St. Paul Hospital requests a copy of the completed study
be submitted to the Education Coordinator. The hospital also requests
that ^{it} ~~is~~ has the privilege of deciding if the name of the agency may
be used in a published copy of the report.

Date

9/26/79

Sister Alison Mank
Signature of Agency Personnel

Karen Ann Cook
Signature of student

Beck C. Thompson - W. L. White, R.N., Ed.D.
Signature of Faculty Advisor

*Fill out and sign three copies to be distributed as follows: Original -- Student; first copy - agency; second copy - T.W.U. College of Nursing.

TEXAS WOMAN'S UNIVERSITY
COLLEGE OF NURSING
DENTON, TEXAS

DALLAS CENTER
1810 Inwood Road
Dallas, Texas 75235

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Houston, Texas 77025

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THE _____
GRANTS TO Karen Cook, B.S.N.

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3. The agency (wants) (does not want) a conference with the student when the report is completed.
4. The agency is (willing) (unwilling) to allow the completed report to be circulated through interlibrary loan.
5. Other: _____

Date 9/26/79

Karen Ann Cook
Signature of student

Signature of Agency Personnel
Beth C. Thompson, M.Ed., Ed.D.
Signature of Faculty Advisor

*Fill out and sign three copies to be distributed as follows: Original -- Student; first copy - agency; second copy - T.W.U. College of Nursing.

APPENDIX C

ORAL DESCRIPTION OF STUDY

My name is Karen Cook. I am a graduate student at Texas Woman's University and am doing a study on knowledge and learning. The results of my study may prove helpful in planning educational or information sessions on new diagnostic procedures being used on cardiac patients. The program may aid nurses in providing adequate patient teaching before the patient has his test. Your participation will be very helpful.

Your decision to take part in this study is entirely voluntary. If you agree to participate, there are three questionnaires that will need to be answered. The time required for the data collection will be approximately thirty to forty minutes. Your answers will be strictly confidential. The data will not be discussed or given to anyone in your institution. Your employment will not be affected by whether or not you participate. A summary of the answers will appear in a report of this study.

If you are willing and agree to participate in this study, I will ask you to sign a consent form indicating that you have agreed. The consent form will be kept separate from the questionnaires so no

identification can be made. If after you have agreed to participate you decide that you do not want to continue, you may withdraw at any time.

APPENDIX D

Consent Form
TEXAS WOMAN'S UNIVERSITY
HUMAN RESEARCH REVIEW COMMITTEE

Consent to Act as a Subject for Research and Investigation:

(The following information is to be read to or read by the subject):

1. I hereby authorize Karen Cook to perform the following investigation:

A study on knowledge and learning which will determine if a relationship exists between the two variables. The knowledge questionnaire is about a new cardiac technique being used on cardiac patients. The learning tool examines an individual's motivation to learn. My decision to take part in this study is entirely voluntary. If I agree to participate, I will answer three questionnaires: a Demographic Questionnaire, Rotter's Locus of Control Scale, and a Knowledge Questionnaire. If after I have agreed to participate, I decide not to continue, I may withdraw from the study. I understand that my answers will be strictly confidential and anonymous.

2. The procedure or investigation listed in Paragraph 1 has been explained to me by Karen Cook.
3. (a) I understand that the procedures or investigations described in Paragraph 1 involve the following possible risks or discomforts:

A potential risk is the failure to protect the privacy of the subjects' data and anonymity. Therefore, ID numbers will be assigned. To prevent public embarrassment, the results will appear only as group data. Consent forms will be kept separate from research tools. Improper release of data will be protected by the investigator as the only one to handle the data. The data will not be released or discussed with the subject's institution.

- (b) I understand that the procedures and investigation described in Paragraph 1 have the following potential benefits to myself and/or others:

A potential benefit of this study may be the initiation of more in-service educational or informational seminars for nurses on new procedures or techniques being used on cardiac patients.

4. An offer to answer all of my questions regarding the study has been made. If alternative procedures are more advantageous to me, they have been explained. I understand that I may terminate my participation in the study at any time.

Subject's Signature

Date

APPENDIX E

DEMOGRAPHIC QUESTIONNAIRE

(The information on this form is strictly confidential.)

ID Number: _____ Date: _____

Age: _____ Sex: _____

Nursing Education (Please check one):

_____ Associate Degree _____ Baccalaureate

_____ Diploma

Number of Years Experience in Cardiovascular Nursing:

_____ Months _____ Years

APPENDIX F

ROTTER'S INTERNAL-EXTERNAL LOCUS OF CONTROL SCALE

The following statements seek your opinions in areas of general social concern. Each item consists of a pair of alternatives lettered a or b. Please select the one statement of each pair (and only one) which you more strongly believe to be the case. Be sure to select either a or b on each item--do not leave any unanswered. Indicate your selection by drawing a circle around the letter a or b, whichever is closer to your own opinion.

1. a. Children get into trouble because their parents punish them too much.
b. The trouble with most children nowadays is that their parents are too easy with them.
2. a. Many of the unhappy things in people's lives are partly due to bad luck.
b. People's misfortunes result from the mistakes they make.
3. a. One of the major reasons why we have wars is because people don't take enough interest in politics.
b. There will always be wars, no matter how hard people try to prevent them.
4. a. In the long run people get the respect they deserve in this world.
b. Unfortunately, an individual's worth often passes unrecognized no matter how hard he tries.
5. a. The idea that teachers are unfair to students is nonsense.
b. Most students don't realize the extent to which their grades are influenced by accidental happenings.
6. a. Without the right breaks one cannot be an effective leader.
b. Capable people who fail to become leaders have not taken advantage of their opportunities.

7. a. No matter how hard you try some people just don't like you.
b. People who can't get others to like them don't understand how to get along with others.
8. a. Heredity plays the major role in determining one's personality.
b. It is one's experiences in life which determine what they're like.
9. a. I have often found that what is going to happen will happen.
b. Trusting to fate has never turned out as well for me as making a decision to take a definite course of action.
10. a. In the case of the well-prepared student there is rarely if ever such a thing as an unfair test.
b. Many times exam questions tend to be so unrelated to course work that studying is really useless.
11. a. Becoming a success is a matter of hard work, luck has little or nothing to do with it.
b. Getting a good job depends mainly on being in the right place at the right time.
12. a. The average citizen can have an influence in government decisions.
b. This world is run by the few people in power, and there is not much the little guy can do about it.
13. a. When I make plans, I am almost certain that I can make them work.
b. It is not always wise to plan too far ahead because many things turn out to be a matter of good or bad fortune anyhow.
14. a. There are certain people who are just no good.
b. There is some good in everybody.
15. a. In my case getting what I want has little or nothing to do with luck.
b. Many times we might just as well decide what to do by flipping a coin.

16. a. Who gets to be the boss often depends on who was lucky enough to be in the right place first.
b. Getting people to do the right thing depends upon ability, luck has little or nothing to do with it.
17. a. As far as world affairs are concerned, most of us are the victims of forces we can neither understand, nor control.
b. By taking an active part in political and social affairs the people can control world events.
18. a. Most people don't realize the extent to which their lives are controlled by accidental happenings.
b. There is really no such thing as "luck."
19. a. One should always be willing to admit mistakes.
b. It is usually best to cover up one's mistakes.
20. a. It is hard to know whether or not a person really likes you.
b. How many friends you have depends upon how nice a person you are.
21. a. In the long run the bad things that happen to us are balanced by the good ones.
b. Most misfortunes are the result of lack of ability, ignorance, laziness, or all three.
22. a. With enough effort we can wipe out political corruption.
b. It is difficult for people to have much control over the things politicians do in office.
23. a. Sometimes I can't understand how teachers arrive at the grades they give.
b. There is a direct connection between how hard I study and the grades I get.
24. a. A good leader expects people to decide for themselves what they should do.
b. A good leader makes it clear to everybody what their jobs are.
25. a. Many times I feel that I have little influence over the things that happen to me.
b. It is impossible for me to believe that chance or luck plays an important role in my life.

26. a. People are lonely because they don't try to be friendly.
b. There's not much use in trying too hard to please people, if they like you, they like you.
27. a. There is too much emphasis on athletics in high school.
b. Team sports are an excellent way to build character.
28. a. What happens to me is my own doing.
b. Sometimes I feel that I don't have enough control over the direction my life is taking.
29. a. Most of the time I can't understand why politicians behave the way they do.
b. In the long run the people are responsible for bad government on a national as well as on a local level.

ROTTER'S INTERNAL-EXTERNAL LOCUS OF CONTROL SCALE KEY

1. filler item	21. A
2. A	22. B
3. B	23. A
4. B	24. filler item
5. B	25. A
6. A	26. B
7. A	27. filler item
8. filler item	28. B
9. A	29. A
10. B	
11. B	
12. B	
13. B	
14. filler item	
15. B	
16. A	
17. A	
18. A	
19. filler item	
20. A	

Score is the number of external item responses chosen. The higher the score, the more external the locus of control.

APPENDIX G

KNOWLEDGE QUESTIONNAIRE

True False

- | | | |
|-------|-------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| _____ | _____ | 1. There are two phases of the cardiac cycle: systole and diastole. |
| _____ | _____ | 2. Stroke volume refers to the amount of blood ejected from the heart during each cardiac cycle. |
| _____ | _____ | 3. The cardiac valves can be visualized only by cardiac catheterization. |
| _____ | _____ | 4. Evaluation of left ventricular size, volume, and function are important indicators in diagnosing heart disease and can be obtained only through angiography. |
| _____ | _____ | 5. The "acoustic window" is the area overlying the heart from which echo tracings are obtained. |
| _____ | _____ | 6. Stroke volume, cardiac output, ejection fraction, left ventricular mass, and velocity of circumferential fiber shortening can be calculated from an echocardiogram. |
| _____ | _____ | 7. Echocardiography was first used in the mid-50s for studying mitral stenosis. |
| _____ | _____ | 8. Echocardiography is used to define functional anatomy and physiology of various abdominal structures. |
| _____ | _____ | 9. Echos cannot determine cardiac chamber size or left ventricular volume and function. |
| _____ | _____ | 10. Echos routinely use dye injections to visualize the heart and great vessels. |

True False

- _____ _____ 11. Echos have been used to diagnose abnormal intraventricular septal motion.
- _____ _____ 12. An echo can accurately depict volume changes during the cardiac cycle.
- _____ _____ 13. An electrocardiogram cannot be recorded simultaneously on every echo tracing.
- _____ _____ 14. A time motion echocardiogram presents a graphic image of a moving heart.
- _____ _____ 15. Echocardiography is an invasive diagnostic tool.
- _____ _____ 16. It is a relatively easy and safe procedure to perform.
- _____ _____ 17. Echocardiography is a diagnostic test which has a therapeutic value.
- _____ _____ 18. Ultrasound waves are only used for diagnosing cardiac problems.
- _____ _____ 19. Aortic stenosis and insufficiency can be assessed from an echocardiogram.
- _____ _____ 20. A transducer is used in propagating sound waves through a medium causing alternating compressions and expansions which result from transmitted sound energy.
- _____ _____ 21. Echo waves are displayed on an oscilloscope, recorded, and subsequently analyzed.
- _____ _____ 22. Time-motion echocardiography cannot evaluate the functional cardiac anatomy.
- _____ _____ 23. Echos have been used to assess the mobility of the mitral valve.
- _____ _____ 24. Standard time-motion echocardiography has no limitations.

True False

- _____ _____ 25. Serial echo examinations are useful in assessing the progression of cardiac disease.
- _____ _____ 26. Echocardiograms play a major role in the differential and etiologic diagnosis of systemic disease.
- _____ _____ 27. The following tools are necessary in working with high frequency sound waves: (1) oscilloscope, (2) transducer, (3) recording device, and (4) electronic circuitry.
- _____ _____ 28. Echos are useful in differentiating ventricular hypertrophy from ventricular dilatation.
- _____ _____ 29. Echocardiography has been established as the only useful tool in evaluating cardiac patients.
- _____ _____ 30. Pericardial effusions are a common complication after an echocardiogram.
- _____ _____ 31. Echos are used only in evaluating congenital heart disease.
- _____ _____ 32. A patient must be hospitalized to have an echocardiogram done.
- _____ _____ 33. The entire echocardiogram procedure takes about four hours.
- _____ _____ 34. In preparing the patient and his family, the nurse would review the procedure with them.
- _____ _____ 35. The patient is usually sedated before the test.
- _____ _____ 36. An informed consent form must be signed before the patient has the test done.
- _____ _____ 37. A complete echocardiogram examination may be performed on all patients.

True False

- _____ _____ 38. This procedure is extremely dangerous to the patient.
- _____ _____ 39. As a nurse, your role is to be supportive to the patient before, during, and after the test.
- _____ _____ 40. Nurses with training are usually able to record and interpret an echogram.

KNOWLEDGE QUESTIONNAIRE KEY

- | | |
|-----------|-----------|
| 1. True | 21. True |
| 2. True | 22. False |
| 3. False | 23. True |
| 4. False | 24. False |
| 5. True | 25. True |
| 6. True | 26. False |
| 7. True | 27. True |
| 8. False | 28. True |
| 9. False | 29. False |
| 10. False | 30. False |
| 11. True | 31. False |
| 12. True | 32. False |
| 13. False | 33. False |
| 14. True | 34. True |
| 15. False | 35. False |
| 16. True | 36. True |
| 17. False | 37. False |
| 18. False | 38. False |
| 19. True | 39. True |
| 20. True | 40. True |

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