DEVELOPMENT OF A SELF-CARE ASSESSMENT TOOL FOR HOSPITALIZED CHRONIC OBSTRUCTIVE PULMONARY DISEASE PATIENTS: A METHODOLOGICAL STUDY

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We hereby recommend that the dissertation prepared under our supervision by Cathleen L. Michaels entitled Development of a Self-Care Assessment Tool for Hospitalized Chronic Obstructive Pulmonary Disease Patients: A Methodological Study

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". . . it's really the process that's important. Enjoyment of the process is the secret that erases the myths of the Great Reward. . . ." (p. 112)

Hoff, B. (1982). The Tao of Pooh. New York: Penguin Books.

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CHAPTER 1

INTRODUCTION

The chronic obstructive pulmonary disease (COPD) patient admitted to the hospital for treatment of acute respiratory failure concentrates on breathing and does not participate in other self-care activity. Understanding this priority, the nurse initially performs self-care activities for the patient. Then, once the patient's condition is stabilized, the nurse helps the patient resume self-care. Successful patient transition from dependence to independence requires accurate nursing assessment and effective intervention. Moreover, under prospective payment, efficient nursing care is also required to speed the patient's return to self-care within a predetermined length of stay.

Self-care, as defined by Orem (1980), is "the practice of activities that individuals initiate and perform on their own behalf in maintaining life, health, and well-being" (p. 35). Like all individuals, COPD patients face generic self-care requirements related to biological, psychological, and developmental needs. But, unlike others with normal lungs, the breathing status of COPD patients

influences their ability to meet self-care requirements. Furthermore, COPD patients are required to perform select health-related activities to minimize shortness of breath on an intermittent or regular basis. Therefore, to evaluate the COPD patient's self-care ability, the nurse must assess physiological and psychological aspects of breathing, the relationship of breathing to developmental requirements of adulthood, and the health-related activities designed to control dyspnea. Developing these assessment areas into valid and reliable assessment tools enables nurses to evaluate patient self-care status and readiness to advance self-care activities and assists nurses to progress COPD patients effectively and efficiently.

Problem of Study

The problem of study was to test the validity and reliability of a researcher-developed self-care assessment tool for hospitalized COPD patients.

Justification of the Problem

Inadequate ventilation promotes self-care deficits, resulting in dependence of the hospitalized COPD on the nurse. During the initial phase of hospitalization, the nurse performs self-care activities for the patient. For example, the nurse coaches the patient to breathe slowly to avoid air trapping. The nurse paces patient

activity to conserve energy and minimize the work of breathing. The nurse maintains intravenous fluids for hydration and sputum mobilization, administers the medications and other treatments outlined in the medical plan of care, and monitors patient response to treatment. The nurse feeds and bathes the patient, and performs or helps the patient carry out other activities of daily living. The nurse structures a safe, calm environment and communicates for the patient, relaying information and concerns to family members, significant others, the physician, and other members of the health team.

Once the acute illness is stabilized, the patient may begin recuperation and resumption of self-care activities. The nursing role changes from doing for the patient to helping. Because self-care requires energy expenditure, the nurse recognizes that the COPD patient will need assistance to advance self-care activities and control dyspnea. It is not uncommon for COPD patients to maintain self-care deficits to avoid dyspnea despite improvement in their physical condition. But, once the patient accepts that it is safe to progress, the nurse can assist the patient to resume self-care.

Reliable assessment of self-care deficits and clinical judgment regarding self-care progression require nursing

consensus about what is assessed, how, and with what frequency. Without standardization nursing intervention can and does occur, but it cannot be as efficient or effective as collective action based on shared findings. Moreover, with the advent of prospective payment, efficiency and effectiveness are increasingly important. Nurses are challenged to intervene and advance a patient during the time limit specified by principal diagnosis and complications.

The development of a valid and reliable self-care assessment tool is pivotal to quality nursing care of hospitalized COPD patients. To assess the patient's ability to manage self-care at home, the tool must include measures of the patient's respiratory status, the degree of independence required to perform activities of daily living and the complexity and patient familiarity with health-related activities required to avoid or minimize dyspnea (Orem, 1980).

Theoretical Framework

Self-Care Model for Nursing

Orem's (1980) self-care model provided the conceptual framework for the content of the COPD self-care assessment tool. The model is based on three major concepts: health-problems, self-care, and nursing. To explicate the critical

relationships between these concepts, Orem proposed that the ability to care for oneself or self-care is jeopardized by health-related problems like illness. Orem deemed these self-care limitations or deficits as the responsibility of the nursing profession. Specifically, Orem held nurses accountable for identifying self-care deficits of patients and then acting to fulfill self-care requirements.

Requisites for Self-Care

To meet the self-care goals of maintaining life, health, and well-being, Orem postulated three types of self-care requirements or requisites: universal, developmental, and health-related. By definition, an individual unable to fulfill any of these requirements experiences a self-care deficit.

The eight universal requisites are general for all humans and range from needs for air, food, and water to prevention of hazards. Developmental self-care requisites, however, are individually determined. The developmental requirements, as conceptualized by Orem, relate either to environmental conditions that facilitate individual stage in life, from intrauterine existence to adulthood, or to conditions that prevent or limit human development, such as educational deprivation and terminal illness.

The third category of self-care requisites is health-related, intended for persons who are ill, injured, disabled, or under medical diagnosis and treatment. Orem categorized the health-related requisites into: (a) engaging medical assistance, (b) being cognizant of abnormal states, (c) adhering to the medical plan of care, (d) recognizing and managing the effects of medical intervention, (e) incorporating a change of health status into the self-concept, and (f) accepting restrictions.

According to Orem, singular inability to fulfill self-care requisites did not define individual need for nursing services. Orem identified two necessary conditions for legitimate patient status. A self-care deficit must be associated with a health problem. "Nurses . . . are willing to exercise their nursing abilities for the benefit of others with health-derived or health-related self-care deficits" (Orem, 1980, p. 93). Additionally, these health-related self-care deficits must result in individual dependence on others for life and well-being. "Persons with existing or projected care deficits are in, or can expect to be in, states of social dependency that legitimate a nursing relationship" (Orem, 1980, p. 27).

Therapeutic Self-Care Demand

Orem integrated the universal, developmental, and health-related self-care requisites of legitimate patients with nursing service through the concept of therapeutic self-care demand. "The totality of self-care actions to be performed for some duration in order to meet known self-care requisites by using valid methods and related sets of operations or actions is termed the therapeutic self-care demand" (p. 39).

Determination of the therapeutic self-care demand is a clinical judgment based on a series of nursing assessments. The nurse reviews individual ability to fulfill the universal self-care requisites, the current or potential impact of developmental and health related requisites, and interrelationships among the three requisite categories. Then, the nurse explores methods for meeting identified self-care requisites, as well as the potential for interference between methodologies. By synthesizing this assessment information, the nurse identifies the therapeutic self-care demand, outlining, for a given period of time, individual self-care requisites, existing deficits, and the most effective nursing methodologies to maximize fulfillment of all requisites.

Relationship of the Model and the Nursing Care of the Hospitalized COPD Patient

An early priority of the nurse who cares for the hospitalized COPD patient is assessment of self-care deficits. Since inability to maintain sufficient intake of air critically affects fulfillment of other self-care requisites, the nurse should be able to assess the degree of inadequate ventilation and predict the level of assistance required for the patient to meet universal self-care requirements.

Based on physiological principles of oxygen delivery and cellular metabolism, the less the ability to maintain sufficient intake of air or ventilation, the greater will be the self-care deficit and subsequent need for nursing services to be performed for the patient. However, the reverse of this statement does not necessarily follow. A greater ability to maintain ventilation is not necessarily associated with fewer self-care deficits. Although physiologic stability may increase potential for self-care, the COPD patient may elect not to participate in self-care due to fear of dyspnea. Therefore, assessment of patient performance of activities of daily living is as informational as assessing the degree of inadequate ventilation once the patient's respiratory insufficiency is under

control. This assessment area is representative of the developmental self-care requisites. Both the well-recognized dependency associated with COPD and the chronicity of obstructive lung disease limit fulfillment of adult developmental self-care requisites; and independent performance of activities of daily living represents one aspect of adulthood.

Equally important in assessing the hospitalized COPD patient is the evaluation of the health-related self-care requisites. The more the COPD patient is able to fulfill these requisites the greater will be the probability of maintaining optimal function outside the hospital. Two factors critical to meeting these requisites are (a) the complexity of the patient plan of care and (b) patient familiarity with the plan. Frequently, the plan of care for COPD patients is complex, for elements of the home regimen may include bronchodilator therapy, sputum mobilization measures, supplemental oxygen, a number of medications, diet modification, and exercise. Moreover, the COPD patient must learn to pace activity, regulate breathing and coughing, and use stress management techniques to minimize deleterious effects of stress on ventilation.

In the present study, the COPD self-care assessment tool was developed to guide the nurse in assessing COPD

patient ability to fulfill universal, developmental, and health-related self-care requisites. Emphasis was placed on assessing the adequacy of ventilation, patient performance of activities of daily living, the complexity of plan of care, and patient familiarity with the plan of care.

Dimensional Clinical Judgment

Bieri et al. (1966) provided the conceptual framework to evaluate self-care behaviors as continuous variables. Unlike categorical models, which limit measurement to identification and grouping of differences, a dimensional model allows judgment at ordinal and higher levels of measurement. Using the dimensional model, judgment tasks are represented by continuous variables called dimensions, and the dimensional magnitude is reflected by steps identified along the dimension line. Bieri et al. defined identification of dimensions as differentiation, and discrimination of dimensional steps as articulation.

Variation of Clinical Judgment

Bieri et al. identified four major variables that influence the ability of a judge to differentiate and articulate dimensions: complexity of the stimulus or input; limits placed on responses or output; characteristics of the judge, particularly the number of constructs the

judge has incorporated in a model of the clinical environment; and situational factors of setting and clinician-patient relationship. The clinical judge encounters a complex and multidimensional stimulus--the patient. According to Bieri et al. clinical judges will vary discrimination of the stimulus. A complex judge will identify a greater number of dimensions and dimensional steps, as compared to a less complex judge. But, whatever the judge's degree of complexity, the judgment decision must be communicated to others in an understandable form, such as diagnosis.

Dimensional Clinical Judgment of Hospitalized COPD Patients

The researcher-designed self-care assessment tool was based on a dimensional judgment model. Relevant dimensions were developed from the universal, developmental, and health-related self-care requisites identified by Orem: respiratory status, performance of activities of daily living, complexity, and patient familiarity with the plan of care. Previously identified behaviors reflecting COPD patient self-care progression were organized around the four dimensions and were also conceptualized as continuous variables with clinically significant steps. Quantitative measurement was theorized to reflect fluctuations in self-care, as the chronic disease exacerbated

or improved. Moreover, a quantitative approach was proposed to better limit variation in clinical judgment.

Psychometric Theory

Psychometric theory provided the theoretical framework for the measurement of self-care behavior. From a psychometric theoretical perspective, Nunnally (1978) defined a scaling model as an "internally consistent plan" by which new measurement is developed. Rating scales represent one model or method of measurement which is well utilized by behavioral science. Accordingly, Kerlinger (1973) defined rating scales as a "measuring instrument that requires the rater or observer to assign the rated object to categories or continua that have numerals assigned to them" (p. 547). Various properties of rating scales facilitate behavioral science measurement.

Properties of Rating Scales

Rating scales present known visual cues to the researcher, particularly when the scales are associated with a graphic line, called the graphic rating scale, or with a numbered line, known as the numerical rating scale. Nunnally described the physical appearance of rating scales as helpful in two ways: picturing increasing magnitude and simplifying response recording.

One critical visual cue is represented by scale steps, as the number of steps enables discrimination of magnitude along the scale. In addition, Nunnally reported that most studies demonstrated a direct relationship between the number of scale steps and reliability. Up to seven steps, reliability markedly increased, but after seven steps, there was minimal gain. The number of scale steps, however, is less an issue when related scales are summed to generate scores (Nunnally, 1978).

Visual cues, the number of scale steps, and the feasibility of summing related scales are properties to be considered when rating scales are used to measure behavior. The object being rated may also be considered a property of rating scales. Kerlinger (1973) described four scores of error when a human is the object of measurement. The halo effect was the most common source of error. "This is the tendency to rate an object in the constant direction of a general impression of the object" (Kerlinger, 1973, p. 548). Kerlinger identified three other sources of error as the tendency to rate low or high, respectively labeled errors in severity and leniency, and the tendency to avoid extremes in judgment or the error of central tendency.

The final rating scale property to be considered is the anchor or descriptor that accompanies the scale steps. Anchors may be numbers, percentages, degrees of agreement, adjectives, comparative stimuli, or labels reflecting actual behavior. Of all anchor alternatives, Nunnally (1978) identified behavioral anchors as most beneficial for rating people, but difficult to operationalize.

Observational Methodology and Rating Scales

Rating scales may be incorporated into observational methods of measurement to control systematic and random error. Rating scales provide a means of standardizing discrimination and recording behavior. Furthermore, rating scales can be developed to reflect a molecular rather than a molar approach, increasing reliability of behavioral measurement. Then construct validation can be used to determine how effectively specific measures align.

Interrelationship of Psychometric Theory, Judgment, and Self-Care Model

According to Bieri et al. (1966) judgment occurs "when an individual assigns one of a set of stimuli to one of two or more response categories" (p. 5). Rating scales represent the conceptual and physical measure for assignment of stimuli. And nursing theory identifies

the stimuli to be assigned and the measurement response categories. To maximize reliable measurement of self-care behavior of COPD patient, the rating scale methodology was adopted and various rating scale properties were incorporated. The numerical rating scale was selected to enhance the concept of measurement. Behavioral anchors were associated with scale numbers. Summated scale scores were developed; and scale steps were increased to a minimum of four steps.

Research Questions

The following research questions were posed:

1. What support for content validity can be determined by comparing subject preinstruction and postinstruction self-care assessment scores?

2. What support for construct validity can be provided by relating subject self-care assessment scores to length of hospitalization on a pulmonary rehabilitation unit?

3. What level of interrater reliability can be achieved among subjects using the self-care assessment tool?

4. What level of accuracy can be achieved by subjects using the self-care assessment tool?

5. What support for construct validity is yielded by comparing subject and self-care expert scores?

The following hypotheses were formulated:

1. There will be a significant difference between subject preinstruction and postinstruction self-care assessment scores.

2. There will be a significant correlation between subject self-care assessment scores and patient classification scores.

Assumptions

The following assumptions were formulated:

1. Hospitalized COPD patients generally progress from a more dependent condition to a less dependent condition during their hospital stay.

2. Assessment of respiratory status is sufficient to determine the degree to which the universal self-care requisites are being met.

3. Assessment of the degree of dependence in performing activities of daily living is sufficient to determine the degree to which the developmental self-care requisites are being met.

4. Assessment of the complexity of and the patient familiarity with the plan of care is sufficient to determine the degree to which the health-related self-care requisites are being met.

Definition of Terms

The following terms were defined:

1. (a) COPD patient--an individual with "a condition in which there is chronic obstruction to airflow due to chronic bronchitis and/or emphysema" (Ingram, 1979, p. 1355).

(b) Hospitalized COPD patient--a patient admitted to the hospital and diagnosed with COPD, chronic bronchitis, asthmatic bronchitis, and/or emphysema.

2. (a) Self-care--"the practice of activities that individuals initiate and perform on their own behalf in maintaining life, health, and well-being" (Orem, 1980, p. 35).

(b) Self-care for hospitalized COPD patients--the practice of breathing, performing activities of daily living, and carrying out health-related activities to control dyspnea.

3. (a) Self-care deficit--"limitations that render them [people] incapable of continuous self-care" (Orem, 1980, p. 27).

(b) Self-care deficits for hospitalized COPD patients--limitations in breathing, performance of activities of daily living, and practice of health-related activities to control dyspnea.

4. (a) Universal self-care requisite--requirement

> common to all human beings during all stages of the life cycle, adjusted to age, developmental state, and environmental and other factors. They are associated with life processes and with maintenance of the integrity of human structure and functioning. (Orem, 1980, p. 41)

(b) Universal self-care requisite for hospitalized COPD patients--breathing or ventilation as evaluated by respiratory distress, wheezing, requirements for supplemental oxygen, blood gas measurements, sputum production, and presence of fever.

5. (a) Developmental self-care requisite--requirement "associated with human developmental processes and with conditions and events occurring during various stages of the life cycle (e.g., prematurity, pregnancy) and events that can adversely affect development" (Orem, 1980, p. 41).

(b) Developmental self-care requisite for hospitalized COPD patients--dependence required for eating, bathing, dressing, grooming, toileting, bed mobility, room mobility, and mobility outside the room.

7. (a) Health-deviation self-care requisite--requirement "associated with genetic and constitutional defects and human structural and functional deviations and with their effects and medical diagnosis and treatment" (Orem, 1980, p. 41).

(b) Health-deviation self-care requisite for hospitalized COPD patients--the complexity and patient familiarity with the health-related activities required to control dyspnea. Complexity is defined by the number and associated frequency or variability of health-related activities. Familiarity is defined by patient understanding of the purpose for each health-related activity and ability to identify current health-related activities.

8. (a) Gold standard--that which is established by criterion to represent truth.

(b) Gold standard--the expert self-care assessment and classification modal scores.

Limitations

The following limitations may have affected the conclusions of the study:

1. The COPD patient assessment was artificially limited. Non-professionals simulated the scripted behavior of COPD patients on the day of admission, during convalescence, and on the day of discharge, and the assessment was completed from videotape, disallowing individual nurse-patient interview, clarification or expansion of response, and complete reference to standard written documentation.

2. One group of nurses from one hospital setting participated in the study.

3. Since the sample was not randomly selected, self-selection was considered as a bias.

Summary

Orem's self-care model provided a conceptual matrix for the construction of a self-care assessment tool for the hospitalized COPD patient. By conceptualizing Orem's self-care requisites as dimensions and operationalizing COPD self-care behaviors as continuous variables represented by numerical rating scales, the researcher-developed tool enabled standard and quantitative measurement of self-care.

Assessment of self-care and readiness for discharge has always been important for quality patient care, but assessment assumes greater significance under prospective pricing. Using a standard and quantifiable assessment, the professional nurse can more reliably identify fluctuations in self-care abilities and deficits. In turn, the nurse can design nursing intervention to minimize deficits and progress the patient. Or the nurse can teach others how to substitute for the patient. Thus, the professional nurse may better allocate time and resources to facilitate maximum self-care ability within a predetermined length of stay.

CHAPTER 2

REVIEW OF LITERATURE

According to Kerlinger (1973),

> methodological research is controlled investigation of the theoretical and applied aspects of measurement, mathematics and statistics, and ways of obtaining and analyzing data. (p. 703)

One branch of methodological research, measurement methodology, encompasses both conceptual and operational concerns for defining and measuring variables and establishing reliability and validity. Another branch of methodological research explores ways of collecting and analyzing data.

In the present study, an instrument designed by the researcher to assess the degree of self-care of hospitalized COPD patients was tested for interrater reliability and validity. Moreover, the method for data collection was standardized using direct patient observation and scheduled interview. To ensure sufficient literature review for this research, the following areas were identified: (a) instrument development, (b) rating scales, (c) observational method, (d) reliability, (e) validity, (f) self-care, (g) nursing assessment, and (h) the plan of care for hospitalized COPD patients.

Measurement

Instrument Development

Nunnally (1978) explored instrument development from a psychometric theoretical perspective. Nunnally differentiated between a scaling model for stimuli and a scaling model for people. Whereas scaling stimuli requires identification of the exact relationships between stimuli, scaling people does not. To scale people different measures of the same attribute need only demonstrate the same rank ordering of subjects, meaning an individual must score similarly on two scales measuring the same variable. Because of the differences between scaling stimuli and people, different labels have emerged. The term scaling is usually applied to discriminating stimuli attributes, whereas measurement and test construction is used for evaluating personal attributes. Most psychological research involves the measurement of people.

Nunnally categorized the types of responses required of subjects being tested into judgments or sentiments. A judgment response may be compared to other judgments for accuracy or appropriateness. Thus, a judgment may be verified. A response of sentiment, however, is subjective.

Because sentiment is generated from feeling, a response of sentiment may not be substantiated.

According to Nunnally, the most frequently used model for scaling people is the monotone model with an unspecified distribution form. Also known as the linear or summative model, three assumptions underlie the monotone model: (a) an item or stimuli demonstrates a monotonic trace line, (b) the sum of all trace lines is approximately linear, and (c) each item only measures one attribute. Scores for each attribute are then summed to provide valid measurement of the variables in question.

Nunnally cited three reasons for developing multi-item measures. One, a single item does not highly correlate with the attribute being measured. Moreover, a single item correlates with other attributes not being measured; and, a single item possesses a uniqueness that does not increase correlation with general attributes or constructs. Two, most single items only enable gross differentiation of responders, thereby limiting the sensitivity. And, three, single items are susceptible to measurement error, since there is an indirect relationship between error variance and the number of items. Multi-item measures enable more valid and reliable psychological testing.

Kerlinger (1973) also addressed the theoretical basis of measurement. "It is said that the measurement procedure and the number system are isomorphic to reality. The question is asked: Is this set of objects isomorphic to that set of objects?" (p. 430). We measure "indicants" of properties of objects, not the properties themselves, and from the indicants, properties are inferred. Indicants are operationally defined, such that the property may be measured. Then, numbers are assigned to the indicants. In this process, the scientist must assess the degree of isomorphism between the measurement and the assignment of numbers and reality.

Oppenheim (1966) explored the operational issues of survey instrument development. The major problems of survey methodology were identified: (a) conducting a survey of inadequate design, (b) interpreting correlation as a causal relationship, (c) determining whether a descriptive or analytic design is needed, (d) identifying dependent, independent, controlled and uncontrolled variables; and (e) determining the relationship between time and the survey.

According to Oppenheim, actual tool construction begins with decisions about the methods of data collection, protection of human rights, tool content and sequence, and the degree of openness allowed in responses. Emphasizing that

no one design will be effective in controlling error, Oppenheim advocated frequent pilot testing to identify survey and tool design weakness.

Oppenheim attributed the problems of questionnaire design to two sources. The first is related to data collection methodology; survey data may be collected from scheduled or nonscheduled interview or from a written questionnaire administered to individuals or groups. Generally speaking, the interview yields increased and complex data, but is highly susceptible to interviewer bias. The questionnaire, on the other hand, provides direct response, but the response rate is lower.

Oppenheim identified the second problem of questionnaire design as questionnaire sequence and type. Question sequence, or the order by which questions are posed, may bias the subject to respond in a certain manner. Pilot tests will identify question sequence that minimize bias.

Question type refers to whether a question is closed, offering the respondent a forced choice, or open, allowing the subject any response. Both closed and open questions may be factual or attitudinal. A type of closed question, the field-coded question is most susceptible to interviewer bias, because time is limited to discriminate ideal coding.

Rating Scales

Oppenheim (1966) discussed rating scales in conjunction with questionnaires, citing closed-type questions, check-lists, rating scales, inventories, attitude statements and scaling methods, projective techniques, sociometry, semantic differential, and diaries. Defining a rating scale as a technique of measurement by which a response is assigned a numerical value, Oppenheim viewed rating scales as useful for objective or subjective assessment of oneself or others.

According to Oppenheim, ratings are susceptible to serious error. Oppenheim recommended minimizing the error by ensuring the rater understand the purpose of evaluation, by labeling the scales in a positive, meaningful way, and by providing a frame of reference for measurement. The author believed that varying the direction of the rating scales and placing rating scales on separate pages may control the halo effect.

An advocate of defining each scale step, Oppenheim stated that individuals generally cannot discriminate more than 10-point scales. Moreover, Oppenheim doubted the validity of equal intervals between steps. Kerlinger and Oppenheim generally agreed about the definition of rating scales, research application, and methodological advantages and disadvantages.

In addition to checked lists and forced-choice instruments, Kerlinger (1973) categorized rating scales into three types: the category, the numerical, and the graphic rating scales. The category rating scale is the most simple of the three. It is a measure composed of category labels against which data are compared and grouped. The numerical rating scale is formed by adding numbers of the category labels. The addition of a line to the category labels and corresponding numbers, defines the measure as a graphic rating scale. Whereas responses to the category rating scale may only be measured at a nominal level, numerical and graphic rating scales responses may be measured at higher levels, since the graphic and number intervals are assumed equal.

Kerlinger identified the weakness of rating scales. Because the scales are relatively easy to construct, the scales may be overused without regard to their inherent limitations. Kerlinger stated that rating scales are susceptible to bias that may violate validity and described four major types of constant rating errors. The halo effect is the first type. The second error type is labeled the error of severity, defined by rater tendency to evaluate low across all scales. The error of leniency is the third type of rating error; the opposite of the error of severity,

the tendency is to rate high across all scales. The fourth error is one of central tendency in which the rater avoids selecting scale extremes. Despite the inherent limitations of constant rating errors, Kerlinger stated rating scales demonstrate efficiency of time, ease of construction, general applicability, and effectiveness for surveying large numbers of characteristics.

Objective tests and scales are composed of items, and Kerlinger differentiated two broad item types. Independent items are those in which one is free to choose any of the mutually exclusive available responses. Examples are true-false, agree-disagree, and Likert scales. Nonindependent items require forced choices. Response set bias is a major drawback to independent items, whereas forced-choice items minimize this phenomenon. The nonindependent items, however, lack independent contribution to the variance, are more complex to administer and respond to, and are time-consuming.

Polit and Hungler (1983) referred to the use of rating scales in combination with an observational method of data collection. These authors viewed rating scales as a measurement tool that requires the rater to assign observable phenomena along the points of a continuum. Examples of phenomena cited were verbal and nonverbal communication behavior,

skill attainment, and individual characteristics and conditions.

Citing wide application in psychometric research, Nunnally (1978) discussed rating scales in conjunction with measuring sentiment. Nunnally specifically described how rating scales are used to objectify the observational measurement of personality traits. Nunnally discussed psychometric properties of rating scales as the graphic format, the number of scale steps, the use of summated scales, and the types of anchors.

According to Nunnally, the graphic rating scale is preferable to the numerical scale which has numbers defined, but no accompanying physical line. Nunnally stated the graphic rating scale is conceptually familiar, as it resembles common measuring instruments. Furthermore, the graphic rating scale should lessen error in responding to each item. The presence of the line and number label visual cues, should enable the subject to formulate a valid and reliable response and align the conceptual response with a written response.

The issues related to scale steps focus on the total number of steps and the odd or even number of steps. Nunnally theorized a direct relationship between reliability and the total number of scale steps. The greater the number of steps, the better the reliability will be. Nunnally

also cited research demonstrating an increasing monotonic relationship between reliability and the number of scale steps. According to Nunnally, however, the maximum benefit is reached around seven scale steps, with a minimal increase in reliability after 11 steps.

The second issue concerning the number of scale steps considers if the steps should be odd or even in number. Proponents of the odd number contend that neutral responses are equally valid as non-neutral responses and should be measured. Nunnally believed a neutral response can be differentiated by increasing the number of scale steps without designating an odd number of scale steps. Overall, this issue is considerably minimized if summated scales are used.

Although summated scales increase reliability, Nunnally identified several factors that influence the degree of reliability. Summated scale reliability is a function of the correlations among scales limited in turn by the number of scale steps. The fewer the steps, the greater will be the correlational limit among scales, and thus, the less the reliability of the summated scales. Another variable is the total number of scales; the fewer the scales, the less the reliability will be. Over 20 summated scales, additional scale steps are generally unnecessary.

The final rating scale property Nunnally considered is the anchor or the definitional label associated with a scale step. Nunnally described several types of anchors: the numerical, the percentage, a continuum of agree-disagree, adjectives, actual behavior, and comparative stimulus. Frequently numerical anchors are used in conjunction with a second anchor type. According to Nunnally, the behavioral anchor is better suited for the rating of people than for rating sentiments and attitudes. Three problems associated with behavioral anchors are: (a) each scale requires unique anchors, (b) validity of degrees of the behavior represented by the anchors, and (c) how well the specified behaviors represent the more general behavior in question.

Observational Method

Nunnally (1978) reviewed the observational method as a means to measure personality traits. According to Nunnally, psychometricians have objectified the observational method by developing ways for observers to record perceptions, the rating scale a prime example. Nunnally viewed the observational method on a continuum of objectivity. The more molecular the behavior observed, the greater the objectivity will be. However, specific units of behavior must then be abstracted into a more meaningful measure of

personality traits, a process that calls for construct validation.

Nunnally described observation in daily life as the most frequently used observational method. Nunnally identified "other-desirability" as the major source of variance when others are rated. "Other-desirability" involves leniency which Nunnally defined as, "the tendency to say good or bad things about people in general" (p. 563). Simply stated, the more the rater likes the individual being observed, the better the ratings will be. In an applied setting, this kind of bias may influence decisions, and Nunnally cited examples of ratings of workers by supervisors and ratings of patients by nurses.

Kerlinger (1973) saw the observer as the major problem of the observational method. The observer must translate behavior into the concepts under study. Observer ability to translate will vary and represents a source of error. Moreover, the mere presence of the observer may alter the measurement situation, although Kerlinger stated the influence is minimal.

According to Kerlinger, the most critical step in the observational method is to clearly identify what is to be observed. Systems of observation will vary in several ways. One variation refers to the magnitude of the behavior being

observed. A molar approach looks at larger units of behavior, a molecular approach at smaller units. A second source of variance is the degree of inference required by the observer in evaluating the observed behavior. Kerlinger advocated a moderate degree of inference to avoid the drawbacks of ambiguity requiring a high degree of inference, as well as an inflexibility associated with a low degree of inference. Systems of observation may also vary in the ease of application to different settings.

Lastly, Kerlinger described a time variance for the observation method. Kerlinger conceptualized that observational systems may be operationalized on a time or on an event basis. Although event sampling may be more natural, time sampling ensures a more representative sample of behavior.

Polit and Hungler (1983) examined the advantages and disadvantages of a structured versus a nonstructured approach to observation. The authors stated that despite objective and systematic structuring, the observational method is more susceptible to error than other data collection procedures. To minimize error, Polit and Hungler advocated rigorous training of observers with frequent assessment of interrater reliability.

Reliability

Kerlinger (1973) stated that "synonyms for reliability are: dependability, stability, consistency, predictability, accuracy" (p. 442). From these synonyms Kerlinger described three major perspectives of reliability. The first perspective relates to reproducibility. If the measurement was repeated, would the results be the same? The second perspective focuses on true scores, questioning how well the measured score represents the true score. The inherent error variance in the measuring instrument will offset the true score, and the inherent error variance represents the third perspective of reliability.

Kerlinger identified steps to increase reliability. Overall, the goal is to decrease error variance. Items and instructions for completion should be clearly written, such that interpretation is standard. If reliability is still less than desired, items should be added. Lastly, measurement should take place under controlled and like conditions.

Magnusson (1966) viewed reliability as reproducibility and theoretically based the concept on the assumption that an individual score is an additive of a true score and an error score. It is the true score that is reproducible. The error score is assumed to vary over time, since error

originates from fluctuating individual and environmental factors. Statistically, then, Magnusson defined reliability as the correlation between two parallel tests administered under similar conditions. According to Magnusson, the reliability coefficient reflects, "the proportion of the total test variance for one of the tests which is made up of the variance of the true-score distribution" (p. 67).

Like Magnusson, Nunnally (1978) also related reliability to reproducibility. However, Nunnally advocated a theory of measurement error based on the domain sampling model. In this model, a measure or test is conceptualized as a random selection of items from a universal domain of items. A true score is viewed as the score generated by responding to all items in the domain, and reliability is conceptualized as the correlation between the score on a random selection of items and the true score. The greater the similarity of correlation coefficients, the greater the estimates of true score correlation, and thus, the more precise will be the estimate of reliability.

Nunnally discussed the variables that affect reliability as defined in the domain-sampling model. Because psychometrics is based on large-sample theory, Nunnally stated that the sampling error of people is minimized ($N \geq 300$). The basic concern of psychometrics is the sampling error related to items. But, according to Nunnally, even when

tests have as few as 10 items, estimates of reliability may be very accurate. The reason is that reliability is directly related to the average interitem correlation. As the number of items increases, the number of correlations among items increases at a greater rate. Thus, the greater the number of items, the less will be the error.

Nunnally identified other sources of random error in addition to the sampling of items, namely guessing, physiologic variables, environmental conditions, and errors in scoring. The psychometrician described how the domain-sampling model can account for these other sources of error by conceptualizing the sampling of situational factors from a domain of all situations. Nunnally stated that all error variance within a test can be accounted for with the domain-sampling model. Therefore, Nunnally believed this model to be the most useful for science. There are, however, three variables that occur between tests the model cannot accommodate: (a) non-random changes in test content, (b) subjectiveness of scoring, and (c) over time, change in judgment or sentiment related to the attribute being measured.

Nunnally concluded that at a minimum, two types of reliability estimates should be calculated. One should estimate the internal consistency of the measure, based on the

average interitem correlation, and the second should estimate correlation between alternate forms, measured at least 2 weeks apart.

Waltz and Bausell (1981) examined interrater reliability from norm-referenced and criterion-referenced perspectives. A measure is considered norm-referenced if the intent is evaluation of individual performance as compared to others. Criterion-referenced measures, however, assess individual performance with regard to a criterion or standard. Because of the individual orientation criterion-referenced data frequently demonstrate minimal variability. Thus, the usual statistical analysis may be inadequate to evaluate criterion-referenced interrater reliability.

Validity

Kerlinger (1973) stated, "The commonest definition of validity is epitomized by the question: Are we measuring what we think we are measuring?" (p. 457). According to Kerlinger, there are several types of validity: content, criterion-related, and construct. Kerlinger identified the underlying concept of the validity types in terms of variance and compared this to the variance expressed by reliability. Kerlinger stated that reliability is "the proportion of 'true' variance to total variance" (p. 469). Validity, however, is the proportion of common factor variance to total variance.

Magnusson (1966) introduced validity as the "second aspect of dependability" (p. 123), needed for scientific measurement, reliability being the first. According to Magnusson, validity is estimated by identifying a criterion variable and comparing an individual score from the distribution of scores on one measure to a second individual score from the distribution of scores on the criterion measure. Magnusson differentiated four types of validity: predictive, concurrent, content, and construct.

Magnusson differentiated between reliability and validity. Stated in terms of error variance, reliability is primarily concerned with random error, whereas validity reflects systematic error, error attributed by Magnusson to "properties of the method used" and "relevant characteristics of the individuals tested" (p. 134). According to Magnusson, it is the systematic, "variance which expresses the genuine validity of the ratings and which we wish to estimate as accurately as possible when testing validity" (p. 134).

According to Nunnally (1978), determining the validity of an instrument is "to inquire whether the instrument is useful scientifically" (p. 86). Nunnally stated that validity can be defined in three ways, emphasizing differences, rather than similarities: predictive, content,

and construct validity. Regardless of the type, validity testing should be repetitive and empirically based.

According to Nunnally, neither content nor predictive validation are adequate processes to estimate validity of many psychological measures. The more abstract the variables that compose a measure, the more difficult is the validation. Nunnally referred to abstract variables as constructs and advocated construct validation. Nunnally identified three necessary steps in construct validation. First, the domain of observables and observable relationships should be delineated. Second, the relationships among the outlined observables should be empirically investigated. This second step is a study of the internal consistency of a measure, a form of reliability.

> To the extent that the elements of such a domain show this consistency, it can be said that some construct may be employed to account for the data, but it is by no means sure that it is legitimate to employ the construct name which motivated the research. In other words, consistency is a necessary but not sufficient condition for construct validity. (Nunnally, 1978, p. 103)

The third step of construct validation completes the process; it is the examination of the relationship of the construct in question with other constructs, other variables, and experimental effects. With this process complete, common factor variance is measured.

Self-Care

Self-Care Definition

The self-care literature is not well delimited. For the purposes of this study, three areas will be reviewed: definitional criteria for self-care, self-care as addressed in the nursing literature, and the assessment of self-care as measured by performance of activities of daily living.

Self-care is broadly defined in the literature. In a 1981 Lancet article, self care encompassed

> from health maintenance and disease prevention, to self diagnosis and self treatment, to support and care, and to patient participation in professional care. ("Self-care--self-blame," 1981, p. 846)

From a medical perspective, self-care seemed to be viewed positively when it increases patient compliance, and negatively when the patient excludes the physician from diagnosis and treatment of illness ("Self-help--self blame," 1981). Physicians viewed self-care in terms of disease.

In contrast, a nursing perspective of self-care was described by McIntyre (1980). An advocate of nurses who teach consumers health screening, McIntyre aligned self-care with health maintenance, health promotion, and individual responsibility for health care. Nurses viewed self-care from the standpoint of health and patient education.

Other perspectives of self-care were reflected in the literature. Elderly ethnic individuals evaluated how well they could perform daily tasks (Linn, 1980). A group of psychologists statistically related mental status to self-care (Smyer, Hofland, & Jonas, 1979). In the proceedings of the first international self-care symposium (Levin, Katz, & Holst, 1976), acknowledged a multifaceted definition of self-care.

> At the root of many debates on the role of self-care--and the Copenhagen conference was no exception--is the lack of a universally agreed definition of the term. Although semantic confusion (e.g., between self-care, self-help, medical care, health care) undoubtedly operates, differences in the definer's discipline, special interests, professional goals, and political orientation appear to contribute as well. (Levin et al., 1976, p. 10)

Self-Care in the Nursing Literature

Self-care is a recurrent concept in the nursing literature. Habeeb and McLaughlin (1979) identified the hospital staff nurse as key for successful placement and easy transition of patient from the acute hospital to convalescent and extended care settings. The authors emphasized the utility of nursing data to assess patient readiness for discharge or transfer. Essential nursing observations include level of function for feeding, bathing, dressing, toileting, and ambulation, the level of independence for adherance to medical regimens and treatments, and the

level of understanding, coping ability, and acceptance of illness and required care.

Redman (1971) wrote of the educational function of nursing in relation to self-care. According to Redman, nurses are required to teach patients in order to maintain or return patients to an independent status. The nurse educator viewed nurse and physician teaching as complementary. Redman also acknowledged the importance of periodic evaluation of patient learning to tailor the teaching-learning process and maximize successful outcome.

Levin (1978) differentiated between patient education and self-care education. In the author's opinion, patient education originated from the sick role, focused on illness and treatment compliance, and encouraged professional dependency. Self-care education, however, was oriented toward health maintenance and promotion, aligned with self-determination, and fostered independence from professional care. Levin stated that both types of education are necessary, provided patient education promotes self-sufficiency.

Redman (1971) called for supportive documentation regarding the benefit of patient education. In a 1983 study, Barnett and Osborne reported that 23 of 29 selected studies of patient education concluded that patients had

gained additional knowledge, improved compliance, reduced stress, facilitated recovery, or increased self-care.

In discussing patient education, and nursing practice, Redman (1971) wrote of learning needs specific to illness. "Particular disease states may produce common physiologic learning deficits, pattern of psychosocial adaptation to illness, misconceptions, and learning tasks" (p. 578).

Ondrejka (1983) wrote about acute illness learning needs of industrial workers. To meet the nonoccuaptional injury health needs of a group of industrial workers at a time of nursing cutback, Ondrejka developed a self-care medication program. This program involved self-diagnosis of several common illnesses and subsequent self-medication with analgesics, decongestants, antacids, and upper respiratory palliative agents. Over 33 months this program decreased employee nonproductive time and conserved nursing time. Ondrejka reported a savings of 193 hours per month of employee time and 117 hours per month nursing time.

Other nursing authors have written about self-care in relationship to the learning needs of individuals with chronic diseases. McCorkle, Dodd, Benoliel, and Young addressed the self-care issues of cancer. McCorkle (1983) in an editorial, described the self-care movement, a process by which consumers are reclaiming personal responsibility

for primary health care. Specifying how an illness like cancer can demand new knowledge and skills for self-care, McCorkle supported Orem's belief that nurses can provide the necessary information for patients to learn about diseases and their treatment.

Dodd (1983) researched self-care behavior of cancer patients with respect to patient identification and management of chemotherapy side effects. Dodd found that cancer patients given information about the management of chemotherapy side effects increased performance of self-care behaviors. A statistically significant difference was found between patients who received information and those who did not ($p < .01$). No questionnaire validity or reliabiltiy was reported.

A third group of nursing authors who focused on cancer patients, Benoliel, McCorkle, and Young (1980) reported on the development of a social dependency scale to measure the degree to which cancer patients depend on others to carry out their lives. The construct of social dependency was analyzed to include three concepts: self-care, mobility, and social competence.

Diabetes is a second chronic disease that has received attention in the nursing self-care literature. Miller (1982) wrote of the categories of self-care needs of

ambulatory diabetic patients. Using participant-observer methodology, Miller identified categories of self-care needs for 65 ambulatory diabetic patients. Data were collected and organized into 10 broad categories of need.

Miller based initial and ongoing assessment of the ambulatory diabetic patients on Orem's self-care conceptual framework. A researcher-designed tool was used to record initial asessment data: growth and development state; self-concept; routine health practices; level of motivation; level of understanding; family functioning; resources utilized; problem-solving ability; previous coping style; personal factors; role mastery; locus of control; life change units; and other unique individual strengths. No reliability or validity was reported for this tool. After the initial assessment, each client and family was reassessed for adaptive life style changes.

The remaining articles reviewed on self-care and diabetes focused on diabetes education. Essig and Thielen (1983) evaluated hospital diabetes education programs in Ohio. By interviewing nurses and dietitians in the participating hospitals, the authors generally concluded that diabetes patient education is valued but not maximally effective. Morris (1979) described how to structure effective educational experiences for the diabetic patient.

Dries and Dizzia (1980) and an interdisciplinary team developed an individual diabetic teaching program, testing 53 diabetic participants before and after instruction with a 22-question test. T-tests on the difference score revealed a significant increase in knowledge about diabetes pathophysiology, symptoms, foot and skin care, and diet.

Hekelman and Phillips (1981) also related self-care and patient education. The focus, however, was self-dialysis training. Although the authors considered self-dialysis training a technical skill, Hekelman and Phillips viewed that skill as an important educational process of the patient.

The last group of nurse authors who associated self-care with a chronic disease are those who wrote about COPD. Perry (1981) studied the benefits of teaching COPD patients. Complex knowledge and skills needed by the COPD patient for disease management and health promotion, required educational programs to provide the necessary information and training. Perry established such an educational program to document the benefit of COPD patient self-care. Perry taught COPD patients to manage common respiratory symptoms associated with COPD. For 20 COPD patients, Perry found a significant decrease in the total number of reported symptoms after teaching (no total value

reported) and a significant increase in use of 7 of the 11 self-managed treatments ($p < .05$). Thus, Perry, like Dodd (1983), demonstrated the effectiveness of nurses teaching chronically ill patients how to manage common symptoms related to their disease or its treatment.

Ashikaga, Vacek, and Lewis (1980) compared the effectiveness of group teaching of COPD patients to the use of written educational materials. Both approaches focused on increasing understanding of COPD and modifying personal values related to chronic disease and its treatment. The educational topics considered essential for review were medication, complications, nutrition, effective coughing, breathing retraining, relaxation, mobility exercises, general conditioning, and respiratory anatomy and physiology. The researchers used a pre-workshop questionnaire, an abbreviated follow-up questionnaire at 4 months, and the complete questionnaire a second time at 1 year. Content and concurrent validity was established for the questionnaire. Three criteria were used to establish concurrent validity: hospital stay, physician communication, and days in bed. There was a significant correlation between the patient's perception of symptom severity and social disability and the three stated criteria ($p < .05$). Questionnaire reliability was established by interitem

correlation for those scales measuring sentiment, and for items measuring knowledge. A reliability coefficient was calculated using the split-half method.

The results of the pretest and 4-month posttest of the treatment group and control group were analyzed. The treatment group had received both written material and had participated in the 6-week educational workshop, whereas the control group had only received the written material. The researchers found that the treatment group or the workshop participants demonstrated increased knowledge about COPD and reported increased compliance with their treatment plan, as compared to the control group.

The final article reviewed on COPD and self-care was a description of the self-care behavior of 11 COPD patients. Barstow (1979) conducted a field study to determine how patients cope with COPD in the home environment. Barstow described patient perception of illness and adaptation to changes in life style, and self-management. All the COPD patients had been referred to the study from the American Lung Association, through which all had participated in an educational program. Data were collected through personal interview, utilizing an interview schedule.

In reviewing aspects of self-care with each patient, Barstow (1979) found that patients modified their plan

of care frequently without communication with physicians. Moreover, the patients modified activities of daily living to correspond to their level of energy, simplifying and/or slowing the pace of the activity. At times, the activity was entirely omitted. Spousal or significant other relationships increased in importance as the patient adjusted to disease limitations, while other social relationships appeared to be minimized. Based upon the length of time since diagnosis, Barstow conceptualized four stages of coping with the disease, from the submerged period with no awareness of the disease, through two middle stages of increasing awareness to the final stage, labeled the period of slow motion.

Activities of Daily Living

A patient's ability to perform activities of daily living (ADL), such as eating, bathing, and toileting, is directly related to the level of self-care. The more limited the ADL performance, the greater is the dependency on others for assistance. Rehabilitation specialists, in particular, have searched for valid and reliable measures of ADL performance. Therefore, the rehabilitation literature for the past 10 years was reviewed to identify the methodological issues of measuring performance in activities of daily living.

In 1973, Bruett and Overs reviewed 12 ADL scales identified from the rehabilitation literature since 1951. The authors found considerable variation in scale design, purpose, and meaningfulness of scores. Quantitatively, the functional areas measured ranged from 2 to 12. Qualitatively, activities ranged from eating to using a dial telephone. Eleven of the 12 scales included measures of transferring, eating, walking and wheelchair activity, and dressing, followed by toileting (10/12), writing (6/12), bathing (6/12), using a telephone (6/12), bowel and bladder continence (5/12), interpersonal relationships (3/12), reading (2/12), and putting on equipment(2/12).

In addition to the content variation of the 12 ADL scales, the level of measurement and the number of scale steps varied. The authors reported no validity or reliability for any of the 12 ADL scales, nor did they comment on these methodological standards.

Jette (1980) reported on the development of a functional status index based on factor analysis. Jette described development of a valid and reliable measure of functional status that is also efficient. Designed for individuals with multiple joint disability, this index was designed to measure three related but mutually exclusive dimensions: degree of dependence, degree of difficulty,

and the amount of pain experienced. Over a 3-year period, 1,089 individuals assessed their performance on 45 items x 3 dimensions, using a 5-point scale. Assessments averaged 1 to 1 1/2 hours to complete. The data yielded were factor analyzed. Statistical results demonstrated that 5 factors could represent degree of dependence, 6 factors, degree of pain, and 8 factors, degree of difficulty and respectively account for approximately 60% of each dimensional variance. Since there were factors in common across the three dimensions, Jette was able to limit the number of factors and, thus, the number of assessment items. Jette concluded that the assessment items could be reduced more than 50% without excluding significant data.

Klein and Bell (1982) presented an ADL scale designed to overcome the shortcomings of other scales. The Klein-Bell ADL scale is made up of 170 behavioral items that are scored as achieved or failed. The items cover 6 basic categories: dressing, mobility, elimination, bathing/hygiene, eating, and emergency telephone use. Without extensive training, there was 92% agreement between raters on all items (20 patients rated independently by two occupational therapists or two registered nurses). Validity was estimated by comparing Klein-Bell ADL scale scores during hospitalization with the number of hours of

assistance required by the 21 patients 5-10 months after discharge. The Pearson-product moment correlation coefficient was -0.86 ($p < .01$).

The authors identified the following as basic requirements for ADL scales: (a) valid and reliable measure of current level of functioning; (b) sensitivity to small changes; (c) appropriateness for patient progression and/or for patients with multiple diagnoses; (d) coverage of all ADL skills; (e) applicability to all diagnoses; (f) facilitative of communication for family, transfers, and other team members. The shortcomings of other scales were identified as (a) scales too globally stated; (b) assumption of need for devices or routines that do not generalize to all patients; (c) use of arbitrary point values that reduce interrater reliability; (d) difficulty in interpreting total scores; (e) time relationships; and (f) inclusion of too many functional areas in one scale (i.e., financial status included with ADL).

The functional status index and the Klein-Bell ADL scale represented two of the numerous ADL measures reported in the literature. From a historical perspective, the Kenny self-care evaluation, the Barthel Index, and the Katz Index of ADL were frequently referenced (Bruett et al., 1973; Donaldson, Wagner, & Gresham, 1973; Fortinsky,

Granger, & Seltzer, 1981; Jette, 1980; Kerner & Alexander, 1981). All three instruments were introduced in the literature in the early to mid-1960s. In 1973, Donaldson et al. incorporated the scales from these three classic instruments as well as other scales which had been described in the literature as tested, accompanied by a scoring mechanism, and relevant to rehabilitation patients. The researchers termed the outcome a unified ADL evaluation tool. One hundred patients were then evaluated on admission and 1 month later, and the data analyzed by a computer program that generated patient scores for the Katz, Barthel, and Kenny measures (Donaldson et al., 1973).

Computerized data analysis enabled the researchers to compare the three classic ADL measures. Sixty-eight sets of the total scores behaved similarly, while 32 sets behaved differently. Of those 32, Donaldson et al. expected 24 sets of the scores to deviate due to differences in measure content and the sensitivity with which activities were evaluated. Continence, for example, was measured with the Katz and Barthel indices, but not the Kenny self-care evaluation. Moreover, the Kenny self-care evaluation was considered most sensitive, because it was the most detailed, while the Katz Index of ADL was the least sensitive and the Barthel Index was positioned in between the two.

Nursing Assessment

The development of a nursing assessment tool directs literature review to nursing assessment, specifically evaluation of methodological issues and their impact on nursing diagnosis.

Gordon (1982) viewed assessment as data collection, diagnosis as interpretation of the assessment data into clinically useful information, and the two together as the diagnostic process. Gordon did not consider assessment and diagnosis mutually exclusive, but rather as overlapping processes, one focused on collection of data and the other on interpretation.

Gordon organized the need for assessing functional health patterns into four categories: the initial assessment, problem-focused assessment, emergency assessment, and timelapse reassessment. "All (categories) involve assessment of the client but differ in the probability of health problems, scope of data gathered, situational context, and immediate purpose" (Gordon, 1982, p. 123). The purpose of the problem-focused assessment is evaluation of the existing problem.

Grier (1981) critiqued the nursing diagnostic process. Nurses, according to Grier, cannot identify essential information for diagnosing patient problems. Therefore,

nurses do not collect relevant data. One method to maximize appropriate data collection is to use an assessment tool. Two researchers, Marshall and Fenney (1971) studied a structured and an intuitive approach to nursing assessment. With the structured approach, the nurse followed an open-ended questionnaire with established content validity and reliability. The intuitive-approach nurse conducted an interview without any tool or reference. Using both methods, 19 patients were interviewed. In all except one category, significantly more information was yielded using the structured approach, in about one-half the time, as compared to the intuitive approach.

Moritz (1979), however, opposed nursing history forms. Although Moritz did not define a nursing history, it is assumed analogous to the initial nursing assessment. Moritz stated that nurses need to make judgments, not follow instructions in taking and completing nursing histories. In the opinion of Moritz, research is the only justification for using checklists or short-answer completion as a nursing history.

Inzer and Aspinall (1981) explored the value of assessing patient care outcomes by goal attainment scaling. Using a 5-point scale, the authors organized a singular patient goal into a series of steps, step 1 reflecting

the patient's current status and step 5, the desired outcome. This process was then successfully taught to a group of surgical nurses. Nurses developed measurable patient outcomes and rating scales to assess patient progress.

McCourt (1981) measured patient performance of activities of daily living in a rehabilitation setting. Based on an earlier Health, Education, and Welfare (HEW) study, McCourt (personal communication, March 27, 1984) developed a 5-point scale which was applied to 17 functional areas of daily living, such as feeding and toileting. Although no methodological study had been conducted, McCourt and the New England Sinai Hospital interdisciplinary team have used the tool for more than 3 years. Patients are assessed with the 1984 tool revision on this 5-point scale across 15 categories of daily living on admission to the hospital, twice during hospitalization, on discharge, and 60 days postdischarge. McCourt expanded the two midpoints of the scale to increase instrument sensitivity to changes in self-care behavior during hospitalization.

In addition to using this problem-focused assessment tool to collect data, McCourt (personal communication, March 27, 1984) and others at New England Sinai Hospital have organized the interpretation of the data into five

nursing diagnoses. Four of these diagnoses specifically relate to feeding, bathing, dressing, and toileting. A fifth diagnosis, total self-care deficit, encompassed all four self-care deficits. Each diagnosis was accompanied by assessment criteria and etiological factors.

Plan of Care for COPD Patients

Chronic obstructive pulmonary disease is a diagnostic label used to describe adult patients who demonstrate varying degrees of bronchitis and emphysema. A progressive disease, COPD disrupts the normal respiratory process. Bronchitis, an inflammation of the airways, results in sputum production and resistance to air flow. Chronic bronchitis is defined as cough and sputum production occurring 3 months of the year for at least 2 consecutive years. Emphysema is the distention of the alveoli or air sacs. With this loss of elasticity, air fills the air sacs, but alveolar walls do not efficiently return to their undistended position. Air is trapped in the alveoli and cannot be exhaled. Thus, obstruction to airflow occurs either from secretions in the bronchial tubes or from alveolar distention and subsequent air trapping (Ingram, 1977).

Medical treatment of COPD is focused on bronchial hygiene which includes bronchodilator therapy, avoidance

of bronchial irritants, deep breathing, percussion, and postural drainage, breathing retraining, physical conditioning, supplemental oxygen therapy, and patient education (Miller, 1971; Neff & Petty, 1971; Petty, Neff, Finigan, Brink, & Corsello, 1969). Petty et al. reported on a 2-year treatment period for 182 COPD patients, the purpose of which was evaluation of a standardized interdisciplinary plan of care. Petty et al. reported no change in the natural course of the disease.

Nursing management of the problems associated with COPD was also addressed in the literature. In 1981, the American Thoracic Society Section on Nursing (Abraham, Atkinson, Boyce, Briggs, & Kim, 1981) published the standards for nursing care of patients with COPD. Twelve nursing diagnoses common to COPD patients were identified: ineffective breathing patterns, ineffective airway clearance, impaired gas exchange, self-care deficit, impaired mobility, nutritional alteration, excess fluid volume, sleep pattern disturbance, noncompliance with therapy, sexual dysfunction, and disturbance in self-concept. Each diagnosis was related to signs and symptoms, etiological factors, nursing intervention and outcome criteria.

Edlund and Wheeler (1980) discussed the nursing management of breathlessness or dyspnea from an adaptation

perspective. Using a case study approach, they identified the adaptive and nonadaptive behaviors of 12 functional health areas. The nonadapative behaviors were incorporated into a care plan which identified a goal and nursing interventions.

Plans of care for COPD patients need to address the psychosocial components of the disease. Greenberg (1985) reviewed the literature to summarize the psychological and neuropsychological effects of COPD. It was concluded that COPD may be associated with emotional, personality, and neuropsychological pathology. Dudley and Sitzman (1979) also researched the psychosocial variables associated with COPD. Dudley and Sitzman described the defense mechanisms of the disabled COPD patient as repression, denial, and isolation. They hypothesized these defenses to be adaptive or premorbid.

Summary

Summarizing the self-care literature, several conclusions may be reached. In the first place, there was no universal definition of self-care. Secondly, nurses were effective facilitators of patient self-caring behaviors. Nurses singularly or as health-care team members have intervened to increase patient knowledge and/or skills necessary for self-care. Thirdly, the most frequent

nursing intervention cited was patient education. And, finally, nurses have most frequently written about nursing intervention and self-care in conjunction with chronic disease.

Nursing assessment of selected aspects of self-care behavior was supported by the concept of problem-focused assessment. Key methodological issues can be summarized with a series of questions. Within the nursing domain, what are the observables, the data that should be collected and assessed? What method(s) of data collection will provide accurate data yet enable an efficient collection process? What method(s) of data collection will facilitate assessment of patient outcomes and changes in patients over time? Would the development of nursing tests and scales assist in effective, efficient data collection? The methodological research literature suggests that self-care data collection standardized by rating scales and the observational method may increase interrater reliability and accuracy of clinical judgment.

CHAPTER 3

PROCEDURE FOR COLLECTION AND TREATMENT OF DATA

A methodological design and descriptive-comparative-correlational methods of research were used to standardize data collection and establish validity and reliability for the COPD self-care assessment tool. Following inter-rater reliability training, registered nurse subjects assessed the self-care ability and classified simulated COPD patients from videotape. Data collected from inter-rater reliability training sessions were used to describe the sample, evaluate the instructional effect of training and determine support for content validity. Postinstruction data were analyzed for interrater reliability and construct validity.

Setting

The study was conducted in a large metropolitan area in the Southwestern United States. A 400-bed medical center served as the study site.

Population and Sample

To participate in this study, subjects had to:

1. Provide proof of current Texas licensure as a registered nurse.

2. Document a minimum 6 months acute hospital experience as a registered nurse.

3. Be a staff member of an in-patient medical-surgical unit or an adult critical care unit.

Registered nurses employed on hospital in-patient medical-surgical units and adult critical care units constituted the population. No randomization was performed to sample the population. A convenience sample of 43 subjects was used for interrater reliability training and 39 subjects for postinstruction assessment of simulated COPD patients. Registered nursing staff assigned to in-patient medical-surgical units and adult critical care units who met the criteria were invited to participate.

Subjects were viewed as an aggregate based on participation in direct patient care on their assigned unit. Beyond this minimal requirement, the job titles and respective responsibilities varied. In the research setting, seven types of registered nurse staff could have been assigned to a unit: Level I staff nurse, Level II staff

nurse, Level III staff nurse, staff nurse not yet placed into the levels system or member of the float pool, clinical nurse specialists, and nurse managers. Educational preparation was not a requirement of any unit-assigned position, except the clinical nurse specialist position which required a master's degree.

When subjects are not randomized into samples, self-selection may occur. In the present study, self-selection represented one potential source of bias and was addressed by identifying this limitation, analyzing the demographic data, comparing the data to the medical-surgical registered nurse population, and discussing the results.

Protection of Human Subjects

Approval to conduct the study was obtained from Texas Woman's University Research Review Committee (Appendix A), from the graduate school (Appendix B), and from the medical center Nursing Research Committee (Appendix C). Registered nurses who met the criteria were invited to participate in the research. The nurses were informed about the nature of the study, associated personal benefits and risks, and the significance of the research for professional nursing practice (Appendix D). Participation in both research phases required an average time of 3 hours per nurse. Completion of questionnaires and tools served

as voluntary consent to participate. At the completion of the data collection, subjects received research credit documentation for job performance and/or promotion. Non-participation or withdrawal did not affect employment status. Anonymity and confidentiality of subjects were preserved, and research findings were documented by groups, not by individuals.

Instruments

Self-Care Assessment Tool

Initial Pilot Study

A tool composed of 59 numerical rating scales was tested in the initial pilot study. Conceptually, the tool originated from extensive interdisciplinary discharge planning team discussion of which COPD patient behaviors the nurse should observe to monitor patient progression from dependence to independence. The selected behaviors were conceptualized as continuous variables and formatted as numerical rating scales and categorized into five areas of self-care: medical stability, complexity of medical regimen, extent of required learning, nutritional stability, and home support. Tool completion time was estimated to be 10-15 minutes, given previous knowledge of the patient being assessed.

Using this 59-scale self-care assessment tool, untrained registered nurses assigned to a pulmonary rehabilitation unit assessed 15 COPD patients. In general, the nurses perceived the tool as informative and useful. Several nurses acknowledged the value of the tool to gather self-care data for weekly interdisciplinary discharge planning conferences. Analysis of the completed tools, however, revealed a high frequency of non-response to 50% of the rating scales. Of the five areas, the highest response rates were associated with complexity of medical regimen and extent of learning needs. Nutritional stability and home support garnered the lowest response rates.

Based on these findings, the tool was modified. Orem's (1980) self-care construct was integrated into the theoretical framework. The rating scales were organized around the self-care construct, and underlying dimensions were operationalized for each group of scales. Scales with no logical fit were deleted, decreasing the number of scales from 59 to 34.

Rating scales related to medical stability were re-focused on clinical indications of respiratory distress that nurses assess, rather than on medical diagnostic findings. The extent of required learning was subdivided into learning needs and levels of function, separating

knowledge about the disease process and treatment from activities of daily living. The New England Sinai Hospital Functional Assessment Tracking System was modified to measure COPD patient performance of activities of daily living (A. McCourt, personal communication, March 27, 1984). The complexity of the medical regimen was expanded to include non-physician prescribed components. Nutritional stability rating scales were limited to observation of diet type and amount of food consumed and subsumed under the complexity of the plan of care. The home support area was deleted. Lastly, scale steps were scrutinized and modified as needed for clarification, and instructions for each scale were developed, indicating the nature and source of the requested measurement, as well as the time limits in which the measurement should be made.

Second Pilot Study

A second pilot study was conducted on the revised tool. Several patients were assessed by two registered nurses, and self-care scores compared. Results indicated two major problems. The first problem identified was disagreement in evaluating learning needs. The intent of this section was evaluation of patient familiarity with the plan of care. Could the patient identify and explain the purpose of the current plan of care? To better

measure familiarity, the tool was modified to format complexity of plan of care scales with familiarity scales and revise the steps of the familiarity scales. Subsequent testing demonstrated less disagreement.

The second problem focused on self-care assessment scores from the first day as compared to the third day of hospitalization. One first-day score did not reflect the extent of physiologic instability. Consequently, the first-day score revealed less of a self-care deficit despite the patient being more ill than did another patient on the third day. Incorporating two additional rating scales into the respiratory status section eliminated the discrepancy.

Face Validity

The 43-scale COPD patient self-care assessment tool was shared with a panel of four nursing experts to determine face validity. The experts consisted of the pulmonary rehabilitation unit nurse manager, clinical nurse specialist, and two baccalaureate-prepared staff nurses, each of whom had worked with hospitalized pulmonary rehabilitation patients a minimum of 3 years. All experts validated that the four self-care areas organized into 43 numerical rating scales represented the key self-care concerns for COPD patients.

Description of the Final Self-Care Assessment Tool

The final tool (Appendix E) was composed of 43 numerical rating scales categorized into four composite self-care scales: respiratory status, level of function, complexity of the plan of care, and patient familiarity with the plan of care. The number of scale steps ranged from 4 to 6. The first scale step was 0 which representd a normal value or a not applicable status. Each step from 0 was associated with consecutive whole numbers. Thus, self-care assessment scores for each scale could have ranged from 0 to 4, 5, or 6. As the scale numbers increased, the associated behavioral descriptors reflected increasing self-care deficits.

Because every scale did not apply to each patient, the four composite scale scores were calculated as ratios and expressed as percentages, 100% representing total dependence. The ratio numerator represented the patient's composite scale score, while the denominator represented the total points possible, excluding non-applicable scales. The overall self-care assessment score was then calculated by averaging the four composite scale percentages. High composite scale scores reflected high self-care deficits.

Demographic Data Tool

A seven-question tool was designed to collect sample demographic data (Appendix F). Information requested included basic and advanced nursing preparation, job title, years of experience as a registered nurse, major clinical area, age, and sex of the subject. The Demographic Data Tool required 2 to 3 minutes to complete.

Instructional Slide-Tape

A 25-minute instructional slide-tape (Appendix G) was utilized to teach subjects how to use the self-care assessment tool to evaluate hospitalized COPD patients. While the tape reviewed the self-care assessment tool composite scales, general tool, specific scale instructions, and pulmonary concepts, the slides depicted gas exchange,[1] cartoons of children,[2] and sketches of adults following

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[1]From Shortness of breath: A guide to better living and breathing (p. 7) by K. M. Moser, C. Archibald, P. Hansen, B. Ellis, & D. Whelan, 1983, St. Louis: C.V. Mosby. Copyright 1983 by C. V. Mosby. Reprinted by permission.

[2]From Misery by S. Heller, 1965, New York: Paul S. Eriksson, and More misery by S. Heller, 1965, New York: Paul S. Eriksson. Copyright 1965 by S. Heller. Reprinted by permission.

a COPD plan of care.[3,4] Five registered nurses piloted the self-care assessment of a simulated COPD patient from videotape (Patient #4) before and after the instructional slide-tape. Based on their comments, wording was clarified to better align the written tool and scale instructions with the instructional slide-tape.

Videotapes of Simulated COPD Patients

Four videotapes of simulated COPD patients were used for data collection, enabling subjects to assess standard stimuli (Appendix H). Videotape scripts were written to depict a registered nurse reviewing self-care activity with four COPD patients at select times during hospitalization. The videotapes, ranging from 10 to 12 minutes in length, were professionally filmed in a TV studio. The actors, however, were not professional. The registered nurse was portrayed by a pulmonary clinical nurse specialist, and the patients were portrayed by individuals who have COPD and have experienced multiple hospitalizations.

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[3]From Help yourself to better breathing by M. Bowers, 1980, American Lung Association. Copyright 1980 by American Lung Association. Reprinted with permission.

[4]From The asthma handbook by M. Bowers, 1984, American Lung Association. Copyright 1984 by American Lung Association. Reprinted with permission.

One videotape script was developed to represent a patient with an acute respiratory problem and a high self-care deficit on the day of hospital admission (Patient #1). A second script was written to depict a patient with low self-care deficits on the day of discharge (Patient #3). The remaining two scripts were developed to portray patients with moderate self-care deficits in the early convalescent period or about the third day of hospitalization. One of the early convalescent patients was scripted to be cautious (Patient #2) and the other to be bold about advancing self-care activity (Patient #4).

Simulated COPD Patient Videotape Pilots

Five registered nurses piloted the self-care assessment tool to evaluate a simulated COPD patient from videotape (Patient #4) before and after the instructional slide-tape, and one registered nurse piloted the self-care assessment tool to evaluate all four simulated COPD patients from videotape without slide-tape instruction. Pilot subjects reported an inability to track the volume of information communicated in each videotape. Therefore, changes were made to assist subjects to manage the information. An accompanying kardex was developed for each videotape and a simulated patient report was added to each videotape. All pilot subjects experienced difficulty recalling patient

information for the assessment. The addition of a written kardex and a videotaped patient report assisted the pilot subjects to organize and process the clinical information presented during the videotaped nurse-patient interactions. Lastly, to aid subjects in orienting to the tool format and assessment rating scales, tools were delivered to each subject prior to data collection. A patient case study was included with the assessment tool. The subjects then had the option of orienting to the tool by individual review and/or completion of the case study, or the subjects had the option of doing neither.

The research design called for assessing the simulated COPD patients from videotape using the self-care assessment tool and classifying the patients using the Medicus patient classification tool (Appendix I). Two registered nurses piloted the classification of videotaped COPD patients. Revisions were then made in the wording of written directives on the patient kardexes to more closely align the kardexes with the terminology used in the videotaped report and the videotaped nurse-patient interaction.

Patient Classification Tool

The Medicus patient classification tool[1] was designed to group patients into five types based on patient nursing

[1]Permission granted by Medicus Systems Corp., Chicago.

need. Type I is the least dependent on nursing assistance, and Type V is the most dependent. One score is established per patient every 24 hours.

Data Collection

Data were collected to enable several measurements. Demographic data were collected to describe the sample and the experts. Preinstruction and postinstruction data were collected to evaluate the instructional effect of interrater reliability training and content validity. Postinstruction self-care assessment and classification data were collected to measure interrater reliability and to determine support for construct validity.

Subject Data Collection

Data were collected in two sessions: interrater reliability training and postinstruction assessment of simulated COPD patients. At least 2 days prior to interrater reliability training, subjects received a self-care assessment tool with an accompanying patient case study to orient them to the tool format and measurement process.

In the interrater reliability training session, demographic data were collected to describe the sample and preinstruction and postinstruction data were collected to evaluate support for content validity and the instructional effect of sucessive assessment of a simulated COPD

patient (Patient #4) and a slide-tape explanation of the tool.

Two weeks later (10 to 18 days), postinstruction data were collected, consisting of the self-care assessment and classification of three additional simulated COPD patient (Patients #1, #2, and #3). Postinstruction data were analyzed for norm-referenced and criterion-referenced interrater reliability and construct validity.

Prior to Subject Data Collection

The following procedure was used prior to interrater reliability training:

1. Registered nurse candidates were screened by the researcher or assistant according to the established subject criteria. Subjects selected a training session from pre-established dates and times or requested a more convenient date and time.

2. To orient to the tool prior to interrater reliability training, subjects received the self-care assessment tool and an accompanying patient case study. Subjects had the options of reviewing the tool and/or assessing the COPD patient described in the case study. Or, subjects had the option of doing neither.

Interrater Reliability Training Session

The following procedure was used to collect data:

1. Demographic data related to age, sex, academic preparation, current position, and length of nursing experience were collected.

2. Preinstruction data were collected from subjects who evaluated a simulated COPD patient (Patient #4) from videotape and an accompanying kardex using the self-care assessment tool.

3. Subjects then reviewed a 25-minute slide-tape explanation of the self-care assessment tool.

4. Following the slide-tape, postinstruction data were collected from subjects who reassessed the simulated COPD patient (Patient #4).

5. Subjects selected a postinstruction session from pre-established dates and times 10 to 18 days later or requested a more convenient date and time within the 10 to 18 day limit.

Postinstruction Session

The following procedure was used to collect data:

1. Ten to 18 days after completing interrater reliability training, subjects reviewed the 25-minute slide-tape explanation of the self-care assessment tool.

2. Subjects assessed three additional simulated COPD patients (Patients #1, #2, and #3) from videotape and accompanying kardexes using the self-care assessment tool.

3. Subjects also classified each simulated COPD patient immediately following self-care assessment using the Medicus Patient Classification tool.

Self-Care Expert Data Collection

Five nursing experts were used to establish the gold standard self-care assessment scores for the simulated COPD patients (Patient #1, #2, #3, and #4). Expert data collection followed the same procedures as the subjects.

Classification Expert Data Collection

Five nursing experts were used to establish the gold standard classification scores for the simulated COPD patients (Patient #1, #2, and #3). The experts consecutively classified the patients after reviewing the videotape and accompanying kardexes.

Treatment of Data

Data collected from interrater reliability training sessions were used to describe the sample and to evaluate the instructional effect of training and support for content validity. Postinstruction data were collected

to investigate norm-referenced and criterion-referenced interrater reliability and construct validity.

Demographic data were analyzed to identify ranges and mean values for age and registered nurse years of experience. Percentages were calculated to describe sample proportions of basic and advanced nursing educational preparation, major clinical area, job title, and years of experience. Job title was further analyzed by comparing sample proportions to medical center medical-surgical registered nurse population proportions.

For each patient assessment, five derived scores were calculated: a respiratory status score, a level of function score, a complexity of plan of care score, a familiarity with the plan of care score, and a self-care assessment score. All derived scores were calculated as simple averages and expressed as percentages. The four composite scale scores were calculated by summing the component scale scores and dividing by the total score possible for the patient. The self-care assessment score was calculated by averaging the four composite scale percentages. The subject derived scores were averaged and summarized by bar graph.

To evaluate the instructional effect of interrater reliability training and support for content validity,

a two-tailed t-test for dependent samples was calculated on preinstruction and postinstruction self-care assessment score means (Glass & Stanley, 1970). Significance was set at the .05 level. Instructional effect was also used to analyze support for content validity.

Self-care interrater reliability was determined by calculating a modal percentage (Shelley, 1984) for individual scales and averaging the percentages for individual patients, composite scales, and the patient group. The frequency of scales not achieving .80 average modal percentage was summarized.

Comparison of the subject mode with the self-care expert mode determined criterion-referenced interrater reliability. The ratio of subject gold standard mismatch to the 127 total comparisons was expressed as a percentage. When no expert mode could be identified, the gold standard score selected was associated with the self-care expert who deviated least frequently from all the gold standard scores for that patient.

Classification interrater reliability was determined by percentage agreement. Agreement was summarized by frequency and by patient categorization.

Z tests were performed on modal percentages to determine if the subjects and self-care experts were from two

homogeneous populations (Glass & Stanley, 1970). The statistical test was performed on four scales, representing the four composite scales and demonstrating the widest difference between subjects and self-care experts.

Subject self-care assessment and classification scores were correlated using the Pearson product-moment correlation (Glass & Stanley, 1970). Simulated COPD patient scores were correlated individually and together.

CHAPTER 4

ANALYSIS OF DATA

A methodological study employing descriptive, correlational, and comparative methods of research was conducted to establish reliability and validity for the Self-Care Assessment Tool for Hospitalized COPD Patients. Following interrater reliability training, subjects evaluated three simulated COPD patients from videotape using the self-care assessment tool and the Medicus patient classification tool. Interrater reliability and postinstruction data were analyzed to yield estimates of instructional effects, interrater reliability, content validity, and construct validity.

Forty-three subjects participated in the interrater reliability training; the training data were used to measure the instructional effects of a slide-tape presentation and successive assessment of a simulated COPD patient, as well as to evaluate support for content validity. Subsequently, 39 of the 43 subjects assessed 3 additional simulated COPD patients and from these data, interrater reliability and construct validity were estimated. Data collected from the sample and experts are presented and

interpreted in this chapter. Summary statements of the findings are also included.

Description of Data

Subject Demographic Data

The sample consisted of 43 subjects who were considered as an aggregate based on minimal requirements. Each subject was a registered nurse assigned to an adult critical care or noncritical care medical-surgical unit, and because of unit assignment participated in direct patient care. Beyond these minimum requirements, however, subject title, job responsibility, and degree of participation in direct patient care varied.

Demographic data were collected on basic and advanced nursing preparation, current position, experience as a registered nurse, major clinical teaching or practice area, age, and sex. Forty-three subjects participated in the interrater reliability training session and 39 of these subjects also participated in postinstruction data collection approximately 2 weeks later. Of the 43 subjects, 42 were female and 1 was male. Subjects' ages ranged from 23 years to 61 years, with a mean age of 33.93 years.

The basic nursing education of 19 (44%) of the subjects of the sample was baccalaureate preparation. Of the remain-

ing 24 subjects, 10 (23%) were diploma graduates, and 14 (33%) were associate degree graduates. The highest nursing degree held was a master's degree; 6 (14%) subjects of the sample were master's prepared. Fifteen (35%) of the sample reported the baccalaureate degree and 14 (33%) reported the associate degree to be the highest nursing degree held. No information was asked regarding degrees held outside nursing.

Current positions of the 43 subjects were limited to in-patient medical-surgical and adult critical care units. Twenty-five (58%) subjects of the sample reported medical units as their major practice area, while 12 (28%) and 5 (12%) subjects, respectively, identified surgical units and critical care units as their major practice area. One subject marked both medical and surgical units as the major practice area; this response was not summarized.

Within the in-patient medical-surgical and adult critical care units, the 43 subjects represented three levels of the staff nurse levels program, clinical nurse specialists, and nurse managers. Ten (23%) subjects of the sample were Level I staff nurses, 17 (40%) were Level II staff nurses, and 2 (5%) were Level III staff nurses. Six (14%) of the sample were clinical nurse specialists and 5 (12%) were nurse managers. Three subjects selected

the category staff nurse to identify their current position. This category was intended for staff nurses, who had not yet been placed into the levels system or for medical-surgical float nurses. The 3 nurses represented 7% of the subject sample.

The experience of the 43 subjects as registered nurses ranged from less than 2 years to 21 or more years. The highest percentage of subjects had been registered nurses 6 to 10 years, while the lowest percentage had been registered nurses less than 2 years. The respective percentages were 28% or 12 subjects and 7% or 3 subjects.

Self-Care Expert Demographic Data

Five nursing experts were selected to establish the self-care assessment gold standard scores. Selection criteria consisted of minimal academic preparation at the baccalaureate level, past or current experience with the care of pulmonary patients, patient rehabilitation, and/or self-care. Additionally, expert representation from nursing service and nursing education was achieved. One expert who worked as a clinical nurse specialist in a medical-surgical adult critical care unit, had previously functioned as a pulmonary clinical specialist for a pulmonary rehabilitation unit. A second expert, who had been a staff nurse on a pulmonary rehabilitation unit,

was at the time of the study the nurse manager for the unit. A third expert worked as the coordinator for a hospital-based pulmonary rehabilitation program. A fourth expert developed a cardiac rehabilitation program, served as nursing education director, and explicated diagnostic criteria for self-care deficits. And, a fifth expert was an educator whose teaching efforts were primarily focused at a medical-surgical and critical care graduate level.

All five self-care experts were female. Ages ranged from 26 to 42 years, and the mean age was 35. Four experts were prepared at the baccalaureate level and one at the diploma level. Comparing the highest degree held, 2 experts had attained a Ph.D. in nursing, 2 were master's prepared, and 1 was baccalaureate prepared. Three experts identified the care of medical patients as their major clinical area and 2 identified critical care. Experience as a registered nurse ranged from 4-5 years to 21 years or more.

Classification Expert Demographic Data

Five nursing experts were selected to establish the classification gold standard scores. The selection criterion used was a minimum of 2 years nursing leadership experience with the Medicus patient classification tool. Two experts, a clinical nurse specialist and a nurse

manager, worked together on a medical patient unit to ensure that staff-developed patient classification scores were valid and reliable. A third expert, a medical center nurse educator, was responsible for teaching staff to use the tool, participated in validity testing, and served on a task force to review the classification system. A fourth expert was a newly appointed nurse manager for the pulmonary rehabilitation unit and as a former staff nurse, had oriented new nurse employees to the classification system. A fifth expert, as the nursing education and management information systems director, had directed implementation of the classification system, monitored the system, and served as the formal liaison with the Medicus Corporation.

The classification experts were all female. The mean age was 38 years and the range extended from 26 years to 43 years of age. Three experts were basically prepared at the baccalaureate level, one at the associate degree level, and one at the diploma level. Three experts identified the baccalaureate degree as the highest nursing degree held, and 2 identified the master's degree. One expert had functioned as a registered nurse 4-5 years, 3 experts 6-10 years, and 1 expert had 21 years or more. Three classification experts identified care of medical patient

and 2 identified the care of surgical patients as the major clinical area.

Instructional Effect Data

Forty-three subjects participated in interrater reliability training: using the self-care assessment tool to evaluate a simulated COPD patient from videotape (Patient #4), reviewing a slide-tape explanation of the tool, and reassessing the simulated COPD patient. Self-care assessment scores were used to compare the difference between preinstruction and postinstruction simulated COPD patient assessment. The preinstruction score mean was .57, while the postinstruction mean was .59. The gold standard mean was .62. The preinstruction standard deviation was .06 and the postinstruction .05.

Postinstruction Self-Care Assessment Data

Subjects

Approximately 2 weeks after interrater reliability training, 39 of the original 43 subjects participated in evaluating 3 additional simulated COPD patients (Patients #1, #2, and #3) from videotape. Table 1 illustrates the subject self-care assessment scale ranges and means for each simulated COPD patient. Table 2 depicts the group self-care assessment score and composite score ranges and means for each patient.

Table 1

Subject Postinstruction Scale Score Ranges and Means for Simulated COPD Patients 1, 2, and 3

Scale	Patient 1-Admission		Patient 2-Convalescence		Patient 3-Discharge	
	Range	Mean	Range	Mean	Range	Mean
Respiratory status						
1. Respiratory distress	4-5	4.1	3-5	3.2	0-3	1.0
2. Wheezing	2-4	3.1	2-4	2.3	0-1	0.1
3. Oxygen delivery	2-2	2.0	1-2	1.6	0-0	0.0
4. Room air po_2	0-5	4.5	0-3	0.1	0-3	2.9
5. Supplemental oxygen po_2	0-5	3.9	0-4	2.8	0-0	0.0
7. Volume of Sputum	0-4	1.1	3-3	3.0	1-2	1.1
8. Characteristics of sputum	0-4	3.6	2-4	2.1	1-2	1.4
9. Fever	0-2	0.3	0-2	0.9	0-1	0.1
Level of function						
10. Eating	0-4	2.3	0-3	2.5	0-0	0.0
11. Bathing	3-4	3.8	0-3	2.8	0-0	0.0
12. Dressing	2-4	3.7	0-3	2.5	0-0	0.0
13. Grooming	0-4	3.6	0-3	2.5	0-0	0.0
14. Toileting	3-4	3.0	0-3	2.6	0-0	0.0
15. Bed mobility	0-4	1.4	0-3	1.0	0-1	0.0
16. Mobility inside room	3-4	3.7	1-3	2.7	0-1	0.2
17. Mobility outside room	3-4	4.0	3-4	3.6	0-1	0.4
Complexity of plan						
18. Supplemental oxygen	3-5	4.9	4-5	4.1	0-0	0.0
19. Inhaled bronchodilators	0-3	2.7	0-3	2.5	0-2	1.2
20. Frequency inhaled bronchodilators	0-3	2.4	0-3	1.8	0-3	1.2
21. Oral/IV bronchodilators	4-5	4.7	1-5	2.6	0-2	1.1
22. Sputum mobilization measures	0-4	3.6	3-4	3.8	0-4	1.0
23. Steroids	0-3	2.8	0-3	1.6	0-1	0.1
24. Medications	0-1	0.9	1-2	1.0	1-2	1.0
25. Diet	0-2	1.0	0-2	1.8	0-2	1.6
26. % diet eaten	0-4	3.1	2-3	2.0	0-1	0.0

(table continues)

Scale	Patient 1-Admission		Patient 2-Convalescence		Patient 3-Discharge	
	Range	Mean	Range	Mean	Range	Mean
27. Cough retraining	2-3	2.1	0-3	1.9	1-3	1.9
28. Breathing retraining	1-2	2.0	1-3	2.0	0-2	1.1
29. Energy conservation	0-3	2.2	0-3	1.9	1-1	1.0
30. Stress management	0-3	2.3	0-3	1.7	0-2	1.2
31. General conditioning	0-3	1.0	0-3	1.9	0-2	1.1
Familiarity with plan of care						
18F Supplemental oxygen familiarity	0-3	1.8	0-1	0.2	NOT APPLICABLE	
19F Inhaled bronchodilator familiarity	0-3	1.9	0-3	0.5	0-1	0.1
21F Oral/IV bronchodilator familiarity	0-3	2.1	0-3	0.5	0-1	0.3
22F Sputum mobilization familiarity	0-3	1.9	0-2	0.7	0-3	1.2
23F Steroid familiarity	0-3	2.1	0-2	0.7	NOT APPLICABLE	
24F Medication familiarity	0-3	2.1	0-2	0.4	0-2	0.9
25F Diet familiarity	0-3	2.0	0-2	0.9	0-1	0.3
27F Cough retraining familiarity	0-3	1.7	0-3	0.8	0-1	0.6
28F Breathing retraining familiarity	0-3	1.5	0-2	0.3	0-2	0.8
29F Energy conservation familiarity	0-3	2.0	0-2	1.0	0-1	0.1

N = 39.

Table 2

Subject Postinstruction Composite Scale and Self-Assessment Score Ranges and Means for Simulated COPD Patients 1, 2, and 3

	Patient 1-Admission		Patient 2-Convalescence		Patient 3-Discharge	
Assessment	Range	Mean	Range	Mean	Range	Mean
Respiratory status	.49-.70	.61	.38-.63	.51	.13-.31	.21
Level of function	.56-.94	.80	.31-.78	.64	0 -.06	.02
Complexity of plan of care	.51-.84	.73	.47-.71	.62	.22-.51	.34
Familiarity with plan of care	.03-1.0	.64	0 -.57	.20	0 -.42	.18
Self-care assessment	.46-.84	.70	.42-.61	.50	.12-.26	.19

N = 39.

The self-care assessment score mean for Patient #1--Admission was .70, for Patient #2--Convalescence, .50; and for Patient #3--Discharge, .19. The widest range of self-care assessment scores occurred for Patient #1, followed by Patient #2, and Patient #3.

The range of composite scale score varied considerably. The widest range of scores was demonstrated by Familiarity with the Plan of Care Scales, averaging .65 difference for the three simulated COPD patients. The remaining composite scales were not associated with the same degree of variability, averaging a .30 difference for the Level of Function, .29 for the Complexity of the Plan of Care Scales, and .21 for the Respiratory Status Scales.

Modal percentages, reflecting interrater agreement, were calculated for each scale and averaged to yield levels of agreement for composite scales, for individual patients, and for the group of patients. The modal percentage data are first described by individual scale and by individual patient and then by composite scale and three patient averages.

Respiratory Status Scales and Patient Modal Percentages

The first section of the self-care assessment tool is composed of nine rating scales designed to measure

ease of breathing. The higher the respiratory status score, which ranges from 0 to 4 or 5, the greater the work of breathing should be. Table 3 depicts the Respiratory Status Scale modes, modal frequencies, modal percentages, and modal percentage averages for scales and the three simulated COPD patients.

The scale with the highest average modal percentage was Scale 4--Room Air pO_2 (.93), and the lowest was Scale 1--Respiratory Distress (.72). The scales that did not achieve an average modal percentage $\geq$ .80 were Scale 1--Respiratory Distress (.72) and Scale 8--Characteristics of Sputum (.79). Table 4 illustrates the Respiratory Status Scales which did not achieve .80 average modal percentages and the associated patient frequency.

The simulated COPD patient associated with the highest average modal percentage was Patient #3--Discharge (.85). Patient #1--Admission and Patient #2--Convalescence, both achieved identical average modal percentages (.84). The Respiratory Status Scale modal percentages ranged .54 for Patient #3, .38 for Patient #2, and .28 for Patient #1.

Table 3

Subject Respiratory Status Scale Modes, Modal Frequencies, Modal Percentages, and Modal Percentage Averages for Scales and Simulated COPD Patients 1, 2, and 3

Respiratory status scales	Patient 1 Admission			Patient 2 Convalescence			Patient 3 Discharge			Scale average modal %
	Mode	Modal frequency	Modal %	Mode	Modal frequency	Modal %	Mode	Modal frequency	Modal %	
1. Respiratory distress	4	35	.90	3	31	.79	2	18	.46	.72
2. Wheezing	3	33	.85	2	29	.74	0	37	.95	.85
3. Oxygen delivery	2	38	.97	2	24	.62	0	38	.97	.85
4. Room air po_2	5	34	.87	0	37	.95	3	38	.97	.93
5. Supplemental oxygen po_2	4	33	.85	3	35	.90	0	39	1.0	.92
6. pco_2	2	32	.82	3	33	.85	3	34	.87	.85
7. Volume of sputum	1	27	.69	3	39	1.0	1	35	.90	.86
8. Character-istics of sputum	4	33	.85	2	36	.92	1	23	.59	.79
9. Fever	0	28	.72	1	32	.82	0	36	.92	.82
Patient average modal %			.84			.84			.85	

N = 39.

Table 4

Self-Care Assessment Scales Not Achieving 80% Average Modal Percentage and the Associated Simulated COPD Patient Frequency

Composite Scale	Scale	Patient Frequency	
		Subjects	Self-care experts
Respiratory status	1. Respiratory distress	2	0
	2. Wheezing	1	1
	3. Oxygen delivery	1	0
	4. Room air po_2	0	0
	5. Supplemental oxygen po_2	0	0
	6. pco_2	0	0
	7. Volume of sputum	1	0
	8. Characteristics of sputum	1	1
	9. Fever	1	0
Level of function	10. Eating	2	2
	11. Bathing	0	0
	12. Dressing	2	0
	13. Grooming	2	0
	14. Toileting	0	0
	15. Bed mobility	2	1
	16. Mobility inside the room	2	3
	17. Mobility outside the room	2	1
Complexity of plan of care	18. Supplemental oxygen	0	0
	19. Inhaled broncho-dilators	2	0
	20. Frequency inhaled bronchodilators	3	2

(table continues)

Composite Scale	Scale		Patient Frequency	
			Subjects	Self-care experts
	21.	Oral/IV broncho-dilators	3	1
	22.	Sputum mobilization measures	2	0
	23.	Steroids	1	1
	24.	Medications	0	0
	25.	Diet	1	0
	26.	% diet eaten	1	0
	27.	Cough retraining	1	1
	28.	Breathing retraining	1	0
	29.	Energy conservation	2	2
	30.	Stress management	3	1
	31.	General conditioning	3	2
Familiarity with the plan of care	18F	Supplemental oxygen familiarity	2	2
	19F	Inhaled broncho-dilator familiarity	2	2
	21F	Oral/IV bronchodilator familiarity	3	3
	22F	Sputum mobilization familiarity	3	2
	23F	Steroid familiarity	2	2
	24F	Medication familiarity	3	2
	25F	Diet familiarity	3	3
	27F	Cough retraining familiarity	3	2
	28F	Breathing retraining familiarity	3	1
	29F	Energy conservation familiarity	3	2
	30F	Stress management familiarity	3	2
	31F	General conditioning familiarity	3	3

N = 39. N = 5.

Level of Function Scales and Patient Modal Percentages

The Level of Function Section is composed of eight rating scales to evaluate performance of select activities of daily living. The scores range from 0 representing independence to 4 representing dependence. The higher the score, the more dependent the patient should be. The Level of Function scale modes, modal frequencies, modal percentages, and modal percentage averages for scales and the three simulated COPD patients are depicted in Table 5.

The scale with the highest average modal percentage was Scale 14--Toileting (.93) and the lowest was Scale 17--Mobility Outside the Room (.73). The scales not associated with average modal percentage $\geq$ .80 were Scale 10--Eating (.79), Scale 15--Bed Mobility (.77), Scale 16--Mobility Inside the Room (.77), and Scale 17--Mobility Outside the Room (.73). Of the remaining scales, three scales met the $\geq$ .80 criterion because the 100% agreement for Patient #3 offset modal percentages for Patients #1 and #2. Table 4 illustrates the Level of Function scales which did not meet an .80 average modal percentage and the associated patient frequency.

Table 5

Subject Level of Function Scale Modes, Modal Frequencies, Modal Percentages, and Modal Percentage Averages for Scales and Simulated COPD Patients 1, 2, and 3

Level of function scale	Patient 1 Admission			Patient 2 Convalescence			Patient 3 Discharge			Scale average modal %
	Mode	Modal frequency	Modal %	Mode	Modal frequency	Modal %	Mode	Modal frequency	Modal %	
10. Eating	3	24	.62	3	29	.74	0	39	1.0	.79
11. Bathing	4	32	.82	3	35	.90	0	39	1.0	.91
12. Dressing	4	29	.74	3	28	.72	0	39	1.0	.82
13. Grooming	4	29	.74	3	29	.74	0	39	1.0	.83
14. Toileting	3	38	.97	3	32	.82	0	39	1.0	.93
15. Bed mobility	1	24	.62	1	29	.74	0	37	.95	.77
16. Mobility inside the room	4	26	.67	3	33	.85	0	31	.79	.77
17. Mobility outside the room	4	38	.97	4	23	.59	0	24	.62	.73
Patient average modal %			.77			.76			.92	

N = 39.

Patient #3--Discharge was associated with an average modal percentage of .92, since five scales, Scale 10-Scale 14, achieved 100% consensus. In comparison, Patient #1--Admission averaged .77 modal percentage and Patient #2--Convalescence, .76. Modal percentages for the Level of Function scales ranged .38 for Patient #3, .35 for Patient #1, and .31 for Patient #2.

Complexity of Plan of Care Scales and Patient Modal Percentages

The 14 rating scales in the section entitled Complexity of Plan of Care identify the components that comprise each patient's plan of care. Scores range from 0 to 4 or 5, and the higher the score, the greater should be the number of components and/or component frequency. Table 6 lists the Complexity of Plan of Care scale modes, modal frequencies, modal percentages, and modal percentage averages for scales and the three simulated COPD patients.

The scale with the highest average modal percentage was Scale 18--Supplemental Oxygen (.97), and the scale with the lowest average modal percentage was Scale 20--Frequency of Inhaled Bronchodilators (.56). Nine of the 14 scales did not achieve an average modal percentage of > .80: Scale 19--Inhaled Bronchodilators (.75), Scale 20--Frequency of Inhaled Bronchodilators (.56), Scale

Table 6

Subject Complexity of Plan of Care Scale Modes, Modal Frequencies, Modal Percentages and Modal Percentage Averages for Scales and Simulated COPD Patients 1, 2, and 3

Complexity of plan of care scales	Patient 1 Admission			Patient 2 Convalescence			Patient 3 Discharge			Scale average modal %
	Mode	Modal frequency	Modal %	Mode	Modal frequency	Modal %	Mode	Modal frequency	Modal %	
18. Supplemental oxygen	5	37	.95	4	37	.95	0	39	1.0	.97
19. Inhaled bronchodilators	3	33	.85	3	28	.72	1	27	.69	.75
20. Frequency inhaled bronchodilators	3	27	.69	2	21	.54	1	18	.46	.56
21. Oral/IV bronchodilators	5	28	.72	2	17	.44	1	24	.62	.59
22. Sputum mobilization measures	4	28	.72	4	29	.74	1	36	.92	.79
23. Steroids	3	35	.90	1	20	.51	0	35	.90	.77
24. Medications	1	37	.95	1	37	.95	1	37	.95	.95
25. Diet	1	34	.87	2	34	.87	2	29	.74	.83
26. % diet eaten	4	19	.49	2	37	.95	0	38	.97	.80
27. Cough retraining	2	36	.92	2	33	.85	1 or 2	14	.36	.71
28. Breathing retraining	2	38	.97	2	31	.79	1	32	.82	.86
29. Energy conservation	2	24	.62	2	30	.77	1	38	.97	.79

(table continues)

Complexity of plan of care scales	Patient 1 Admission			Patient 2 Convalescence			Patient 3 Discharge			Scale average modal %
	Mode	Modal frequency	Modal %	Mode	Modal frequency	Modal %	Mode	Modal frequency	Modal %	
30. Stress management	2	20	.51	2	24	.62	1	27	.69	.61
31. General conditioning	0	23	.59	2	23	.59	1	34	.87	.68
Patient average modal %			.77			.74			.78	

N = 39,

21--Oral/IV Bronchodilators (.59), Scale 22--Sputum Mobilization Measures (.79), Scale 23--Steroids (.77), Scale 27--Cough Retraining (.71), Scale 29--Energy Conservation (.79), Scale 30--Stress Management (.61), and Scale 31--General Conditioning (.68). Table 4 illustrates the Complexity of Plan of Care scales which did not achieve .80 average modal percentage and the associated number of patients.

The highest average patient modal percentage was Patient #3--Discharge, .78; Patient #1--Admission, .77; and Patient #2--Convalescence, .74. The Complexity of Plan of Care scale modal percentages ranged .64 for Patient #3, .51 for Patient #2, and .48 for Patient #1.

Familiarity with the Plan of Care Scales and Patient Modal Percentages

Familiarity With the Plan of Care is the fourth section of the self-care assessment tool. Composed of 12 rating scales, this section is designed to evaluate patient understanding of the plan of care. Each familiarity scale ranges 4 steps from 0 to 3. The higher the score, the less familiar the patient should be with the plan of care. Table 7 depicts the Familiarity With the Plan of Care scale modes, modal frequencies, modal percentages, and

Table 7

Familiarity with the Plan of Care Scale Modes, Modal Frequencies, Modal Percentages and Modal Percentage Averages for Scales and Simulated COPD Patients 1, 2, and 3

Familiarity with the plan of care scales	Patient 1 Admission			Patient 2 Convalescence			Patient 3 Discharge			Scale average modal %
	Mode	Modal frequency	Modal %	Mode	Modal frequency	Modal %	Mode	Modal frequency	Modal %	
18F Supplemental oxygen familiarity	2	13	.33	0	31	.79	NOT APPLICABLE			.56
19F Inhaled bronchodilator familiarity	3	13	.33	0	23	.59	0	34	.87	.60
21F Oral/IV bronchodilator familiarity	3	12	.31	0	25	.64	0	26	.67	.54
22F Sputum mobilization familiarity	3	13	.33	1	19	.49	1	22	.56	.46
23F Steroid familiarity	3	12	.31	1	19	.49	NOT APPLICABLE			.40
24F Medication familiarity	2	15	.38	0	22	.56	1	23	.59	.51
25F Diet familiarity	2	18	.46	1	21	.54	0	27	.69	.56
27F Cough retraining familiarity	1 or 2	12	.31	1	20	.51	1	22	.56	.46
28F Breathing retraining familiarity	1	15	.38	0	28	.72	1	26	.67	.59
29F Energy conservation familiarity	3	13	.33	1	19	.49	0	35	.90	.57

(table continues)

Familiarity with the plan of care scales	Patient 1 Admission Mode	Modal frequency	Modal %	Patient 2 Convalescence Mode	Modal frequency	Modal %	Patient 3 Discharge Mode	Modal frequency	Modal %	Scale average modal %
30F Stress management familiarity	3	10	.27	1 or 2	14	.36	0	24	.62	.54
31F General conditioning familiarity	2	16	.41	1	16	.41	0	31	.79	.54
Patient average modal %			.35			.55			.69	

N = 39

modal percentage averages for scales and the three simulated COPD patients.

The scale with the highest average modal percentage was Scale 19F--Inhaled Bronchodilator Familiarity (.60), and the lowest was Scale 23F--Steroid Familiarity (.40). None of the 12 Familiarity With the Plan of Care scales achieved average subject modal percentage $\geq$ .80: Scale 18F--Supplemental Oxygen Familiary (.56), Scale 19F--Inhaled Bronchodilator Familiarity (.60), Scale 21F--Oral/IV Bronchodilator Familiarity (.54), Scale 22F--Sputum Mobilization Familiarity (.46), Scale 23F--Steroid Familiarity (.40), Scale 24F--Medication Familiarity (.51), Scale 25F--Diet Familiarity (.56), Scale 27F--Cough Retraining Familiarity (.46), Scale 28F--Breathing Retraining Familiarity (.59), Scale 29F--Energy Conservation Familiarity (.57), Scale 30F--Stress Management Familiarity (.54), and Scale 31F--General Conditioning Familiarity (.54). Table 4 illustates the Familiarity With the Plan of Care scales which did not meet an .80 modal percentage and the associated patient frequency.

The highest average patient modal percentage was .69 for Patient #3--Discharge, followed by .55 for Patient #2--Convalescence, and .35 for Patient #1--Admission. The Familiarity with the Plan of Care scale modal percentage

ranges were .43 for Patient #2, .34 for Patient #3, and .19 for Patient #1.

Composite Scale Average Modal Percentages for Individual Patients and the Three-Patient Group

Table 8 summarizes the interrater agreement for the self-care assessment of simulated COPD Patients #1, #2, and #3. For all patients, the highest subject average modal percentages occurred with the Respiratory Status scales, followed by the Level of Function scales, the Complexity of the Plan of Care scales, and the Familiarity with the Plan of Care scales.

Individually, Patient #1--Admission demonstrated the highest modal percentage for the Respiratory Status scales (.84), the lowest for the Familiarity with the Plan of Care scales (.35) and equal modal percentages for the Level of Function and the Complexity of Plan of Care scales (.77). Patient #2--Convalescence achieved the highest modal percentage for the Respiratory Status scales (.84), followed by Level of Function (.76), Complexity (.74), and Familiarity with the Plan of Care scales (.55). And, Patient #3--Discharge achieved the highest modal percentage for the Level of Function scales (.92), followed by Respiratory Status (.85), Complexity (.78), and Familiarity with the Plan of Care scales (.69).

Table 8

Subject and Self-Care Expert Average Modal Percentages for Composite Scales, Simulated COPD Patients 1, 2, and 3 and the 3-Patient Group

	Subjects*					Self-Care Experts**				
Patients	Respiratory status	Level of function	Complexity	Familiarity	Self-Care	Respiratory status	Level of function	Complexity	Familiarity	Self-Care
Patient 1										
Admission	.84	.77	.77	.35	.68	.98	.78	.86	.48	.78
Patient 2										
Convalescence	.84	.76	.74	.55	.72	.89	.83	.74	.55	.75
Patient 3										
Discharge	.85	.92	.78	.69	.81	.93	.90	.93	.74	.88
3-Patient										
Average Modal %	.84	.82	.76	.53		.93	.84	.84	.59	

*N = 39.

**N = 5.

Patient #3--Discharge achieved the highest patient modal percentage as represented by the self-care modal percentage (.81), and Patient #1--Admission the lowest modal percentage (.68). But the difference in levels of agreement only ranged .13. Patient #2--Convalescence was associated with a .72 average modal percentage.

Self-Care Average Modal Percentages for Three Patients

The average modal percentage for the self-care assessment of three simulated COPD patients was .74. Table 9 compares the average modal percentage for the subjects with the self-care experts.

Self-Care Experts

Five nursing experts evaluated three simulated COPD patients (Patients #1, #2, and #3) from videotape. The expert modal score was used to establish the gold standard score for estimates of interrater accuracy.

No mode could be identified for 12% of the 127 expert scores. In one occurrence, an expert did not evaluate any of the 12 familiarity scales on Patient #1--Admission, an omission which affected consensus on 8 familiarity scales. In general, lack of expert consensus was limited to the familiarity scales, particularly Scale 31--General Conditioning. When no mode existed, the gold standard

Table 9

Subject and Self-Care Expert Average Modal Percentage for Three Simulated COPD Patients

Assessment	Subject Average Modal %*	Self-Care Expert Average Modal %**
Self-care assessment score	.74	.80

*$\underline{N}$ = 39.
**$\underline{N}$ = 5.

score selected was that of the most reliable expert. Highest reliability was assigned to the judge who deviated least frequently from the expert mode for the patient being assessed. Table 4 presents the expert self-care assessment scales which did not achieve a .80 modal percentage and the associated patient frequency as compared to subjects.

Table 10 illustrates the self-care experts Respiratory Status Scale modes, modal frequencies, modal percentages, and modal percentage averages for scales and simulated COPD Patients #1, #2, and #3. Analogous data are depicted in Table 11 for the Level of Function scales, Table 12 for the Complexity of Plan of Care scales, and Table 13 for the Familiarity with the Plan of Care scales.

The highest average modal percentages for the self-care experts occurred with the Respiratory Status scales and the lowest percentages with the Familiarity with the Plan of Care scales. The Complexity of Plan of Care scales ranked equally with the Level of Function scales.

Patient #3--Discharge achieved the highest modal percentage (.88), followed by Patient #1--Admission (.78), and Patient #2--Convalescence (.75). Table 8 illustrates the subject and self-care expert average modal percentages

Table 10

Self-Care Expert Respiratory Status Scale Modes, Modal Frequencies, Modal Percentages and Modal Percentage Averages for Scales and Simulated COPD Patients 1, 2, and 3

Respiratory Status Scales	Patient 1 Admission			Patient 2 Convalescence			Patient 3 Discharge			Scale average modal %
	Mode	Modal frequency	Modal %	Mode	Modal frequency	Modal %	Mode	Modal frequency	Modal %	
1. Respiratory distress	4	4	.8	3	5	1.0	2	5	1.0	.93
2. Wheezing	3	5	1.0	2	3	.6	0	4	.8	.80
3. Oxygen delivery	2	5	1.0	1	5	1.0	0	5	1.0	1.00
4. Room air po_2	5	5	1.0	0	4	.8	3	5	1.0	.93
5. Supplemental oxygen po_2	4	5	1.0	4	4	.8	0	5	1.0	.93
6. pco_2	2	5	1.0	3	4	.8	3	5	1.0	.93
7. Volume of sputum	1	5	1.0	3	5	1.0	1	5	1.0	1.00
8. Characteristics of sputum	4	5	1.0	2	5	1.0	1	3	.6	.87
9. Fever	0	5	1.0	1	5	1.0	0	5	1.0	1.00
Average patient modal %			.98			.89			.93	

N = 5.

Table 11

Self-Care Expert Level of Function Scale Modes, Modal Frequencies, Modal Percentages, and Modal Percentage Averages for Scales and Simulated COPD Patients 1, 2, and 3

Level of Function Scales	Patient 1 Admission			Patient 2 Convalescence			Patient 3 Discharge			Scale average modal %
	Mode	Modal frequency	Modal %	Mode	Modal frequency	Modal %	Mode	Modal frequency	Modal %	
10. Eating	3	3	.6	3	3	.6	0	5	1.0	.73
11. Bathing	4	4	.8	3	5	1.0	0	5	1.0	.93
12. Dressing	4	4	.8	3	5	1.0	0	5	1.0	.93
13. Grooming	4	4	.8	3	4	.8	0	5	1.0	.87
14. Toileting	3	5	1.0	3	4	.8	0	5	1.0	.93
15. Bed mobility	1	3	.6	1	4	.8	0	5	1.0	.80
16. Mobility inside the room	4	3	.6	3	3	.6	0	3	.6	.60
17. Mobility outside the room	4	5	1.0	4	5	1.0	1	3	.6	.87
Patient average modal %			.78			.83			.90	

N = 5.

Table 12

Self-Care Expert Complexity of Plan of Care Scale Modes, Modal Frequencies, Modal Percentages, and Modal Percentage Averages for Scales and Simulated COPD Patients 1, 2, and 3

Complexity of Plan of Care Scales	Patient 1 Admission			Patient 2 Convalescence			Patient 3 Discharge			Scale average modal %
	Mode	Modal frequency	Modal %	Mode	Modal frequency	Modal %	Mode	Modal frequency	Modal %	
18. Supplemental oxygen	5	5	1.0	4	5	1.0	0	5	1.0	1.00
19. Inhaled bronchodilators	3	5	1.0	3	5	1.0	1	5	1.0	1.00
20. Frequency of inhaled bronchodilators	3	5	1.0	2	3	0.6	2	3	0.6	.73
21. Oral/IV bronchodilators	5	4	0.8	2	2	0.4	1	5	1.0	.73
22. Sputum mobilization measures	4	5	1.0	4	5	1.0	1	5	1.0	1.00
23. Steroids	3	5	1.0	1	3	0.6	0	5	1.0	.87
24. Medications	1	4	0.8	1	5	1.0	1	5	1.0	.93
25. Diet	1	4	0.8	2	4	0.8	2	4	0.8	.80
26. % diet eaten	4	4	0.8	2	5	1.0	0	5	1.0	.93
27. Cough retraining	2	4	0.8	2	4	0.8	3	3	0.6	.73
28. Breathing retraining	2	5	1.0	2	4	0.8	1	5	1.0	.93
29. Energy conservation	2	3	0.6	2	3	0.6	1	5	1.0	.73

(table continues)

Complexity of Plan of Care Scales	Patient 1 Admission			Patient 2 Convalescence			Patient 3 Discharge			Scale average modal %
	Mode	Modal frequency	Modal %	Mode	Modal frequency	Modal %	Mode	Modal frequency	Modal %	
30. Stress management	2	4	0.8	2	2	0.4	1	5	1.0	.73
31. General conditioning	0	3	0.6	2	2	0.4	1	5	1.0	.67
Patient average modal %			.86			.74			.93	

N = 5.

Table 13

Self-Care Expert Familiarity with the Plan of Care Scale Modes, Modal Frequencies, Modal Percentages, and Modal Percentage Averages for Scales and Simulated COPD Patients 1, 2, and 3

Familiarity with the plan of care scales	Patient 1 Admission			Patient 2 Convalescence			Patient 3 Discharge			Scale average modal %
	Mode	Modal frequency	Modal %	Mode	Modal frequency	Modal %	Mode	Modal frequency	Modal %	
18F Supplemental oxygen familiarity	3	2	.5	1	3	.6	NOT APPLICABLE			.55
19F Inhaled bronchodilator familiarity	3	2	.5	0	3	.6	1	4	.8	.63
21F Oral/IV bronchiodilator familiarity	3	2	.5	1	3	.6	1	3	.6	.57
22F Sputum mobilization familiarity	3	2	.5	1	3	.6	1	4	.8	.63
23F Steroid familiarity	3	2	.5	2	2	.4	NOT APPLICABLE			.45
24F Medication familiarity	3	2	.5	0	3	.6	1	5	1.0	.70
25F Diet familiarity	3	2	.5	1	3	.6	0	2	.4	.50
27f Cough retraining familiarity	1	1	.25	1	2	.4	1	5	1.0	.55
28F Breathing retraining familiarity	1	3	.75	0	4	.8	1	4	.8	.78

(table continues)

Familiarity with the plan of care scales	Patient 1 Admission			Patient 2 Convalescence			Patient 3 Discharge			Scale average modal %
	Mode	Modal frequency	Modal %	Mode	Modal frequency	Modal %	Mode	Modal frequency	Modal %	
29F Energy conservation familiarity	3	2	.5	1	3	.6	0	4	.8	.63
30F Stress management familiarity	3	2	.5	2	2	.4	0	4	.8	.57
31F General conditioning familiarity	2	1	.25	1	2	.4	0	2	.4	.35
Patient average modal %			.48			.55			.74	

N = 5.

for composite scales, simulated COPD Patients #1, #2, and #3, and the three-patient group.

The expert self-care average modal percentage for three patients was .80. Table 9 contrasts the self-care expert average modal percentage with the subjects.

Comparison of Subject and Self-Care Expert Modes

The subject mode did not match the gold standard or the self-care expert mode in 16 or 13% of the 127 self-care assessment scales. Thus, the subjects demonstrated an 87% agreement with the experts. Or, stated in terms of criterion-referenced reliability, subjects achieved an 87% level of accuracy.

Thirteen occurrences of gold standard mismatch were associated with the Familiarity with the Plan of Care scales. Eight occurred with Patient #1--Admission, 4 with Patient #2--Convalescence, and 1 with Patient #3--Discharge. The remaining instances of mismatch were associated with Patient #3--Discharge (Scale 1--Respiratory Distress, Scale 17--Mobility Outside the Room, and Scale 27--Cough Retraining).

Postinstruction Classification Data

Subjects

Thirty-nine subjects classified three simulated COPD patients (Patients #1, #2, and #3) from videotape according

to nursing need. Classification immediately followed self-care assessment of each simulated patient. Based on the patient classification score, patients may be placed into one of five categories, ranging from lowest nursing need to (Category I) to highest nursing need (Category V). Subjects achieved 100% agreement classifying Patient #1--Admission into Category III, 87% agreement classifying Patient #3--Discharge into Category I, and 69% agreement classifying Patient #2 into Category III. Table 14 illustrates the level of subject agreement for patient classification as compared to the classification experts. Despite disagreement in patient categories, 36 of the 39 subjects allotted the highest number of points to Patient #1, the second highest to Patient #2, and the least number of points to Patient #3. One subject evaluated the nursing needs of Patient #1 and Patient #3 as equal, and two subjects assessed the nursing needs of Patient #2 to be greater than Patient #1.

The range of points for the three simulated COPD patients was the widest for Patient #2 (56), followed by Patient #1 (46), and Patient #3 (35). The highest percentage agreement was 100% and the lowest 3%. Table 15 depicts the frequency and level of agreement for subjects as compared to classification experts. Thirty-one percent

Table 14

Subject and Classification Expert Percentage Agreement for Categorization of Simulated COPD Patients 1, 2, and 3

	Subjects*					Classification Experts**				
Patient	Category I	Category II	Category III	Category IV	Category V	Category I	Category II	Category III	Category IV	Category V
Patient 1										
Admission			1.0					1.0		
Patient 2										
Convalescence		.31	.69				.60	.40		
Patient 3										
Discharge	.87	.13				1.0				

*N = 39.
**N = 5.

Table 15

Subject and Classification Expert Frequency of Percentage Agreement for Classification Indicators of Simulated COPD Patients 1, 2, and 3

Percentage agreement	Frequency					
	Patient 1 - Admission		Patient 2 - Convalescence		Patient 3 - Discharge	
Class Intervals	Subject	Classification expert	Subject	Classification expert	Subject	Classification expert
.01-.10	6	0	7	0	9	1
.11-.20	1	2	1	1	2	0
.21-.30	0	0	0	0	0	0
.31-.40	2	0	1	1	0	0
.41-.50	0	0	1	0	0	0
.51-.60	1	3	0	2	2	2
.61-.70	2	0	1	0	0	0
.71-.80	1	3	1	1	0	2
.81-.90	1	0	1	0	2	0
.91-1.0	6	5	6	6	1	1

or 17 of the 55 indicators achieved $\geq$ .80 subject agreement.

Classification Experts

Five nursing experts classified three simulated COPD patients from videotape (Patient #1, #2, and #3) according to nursing need. All five experts concurred that Patient #1--Admission merited Category 3 and Patient #3--Discharge merited Category 1. Two experts evaluated Patient #2--Convalescence as Category 3 and three experts as Category 2. Table 14 compares the expert percentage agreement for categorizing the patients, as compared to subjects. Despite category disagreement for Patient #2, each expert allotted the highest number of points to Patient #1, the second highest to Patient #2, and the lowest number to Patient #3.

For Patient #2 the difference between the highest and lowest points was 21, whereas the point range for Patient #1 was 15 points and for Patient #3, 16 points. The highest percentage agreement among experts was 100% and the lowest was 20%. Table 15 depicts the frequency and level of expert agreement for the simulated COPD patients. Eighteen or 60% of the 30 nursing need indicators for three patients achieved $\geq$ .80 agreement.

Findings

Five instruments were used in this study to test the hypotheses and respond to the research questions related to reliability and validity of the Self-Care Assessment Tool for Hospitalized COPD Patients: the self-care assessment tool, the instructional slide-tape, four videotapes of simulated COPD patients, the Medicus Patient Classification tool, and a Demographic Data Tool. The instructional slide-tape presented during interrater reliability training, explained use of the tool. The self-care assessment tool was used to evaluate and record the videotaped simulated COPD patient self-care behavior. And, the Medicus Patient Classification tool was used to identify simulated COPD patient nursing needs enabling comparison with the patient's assessed self-care ability.

Research Questions

Research Question 1 stated: What support for content validity can be determined by comparing subject preinstruction and postinstruction self-care assessment scores? Statistical analysis revealed a significant difference between subject preinstruction and postinstruction self-care assessment scores, a finding which supports content validity. A two-tailed *t*-test for dependent samples was used to analyze the data. The group preinstruction self-care

assessment score mean was .57 with a standard deviation of .06, and the postinstruction mean was .59 with a standard deviation of .05. The t (42) = 2.42, with a p = .05. Furthermore, there was a smaller difference between the group postinstruction self-care assessment score mean (.59) and the gold standard mean (.62), as compared to the preinstruction mean (.57).

Research Question 2 stated: What support for construct validity can be provided by relating subject self-care assessment scores to length of hospitalization on a pulmonary rehabilitation unit? Figure 1 demonstrates an inverse relationship between the average self-care assessment scores of three simulated COPD patients and time hospitalized on a pulmonary rehabilitation unit. The relationship supported construct validity. Patient #1--Admission was associated with a mean self-care assessment score of .70, Patient #2--Convalescence with .50, and Patient #3--Discharge with .19.

Research Question 3 stated: What level of interrater reliability can be achieved among subjects using the self-care assessment tool? Moderate levels of interrater reliability were demonstrated. The average self-care assessment modal percentage for the three simulated COPD patients was .74. The average Respiratory Status composite scale

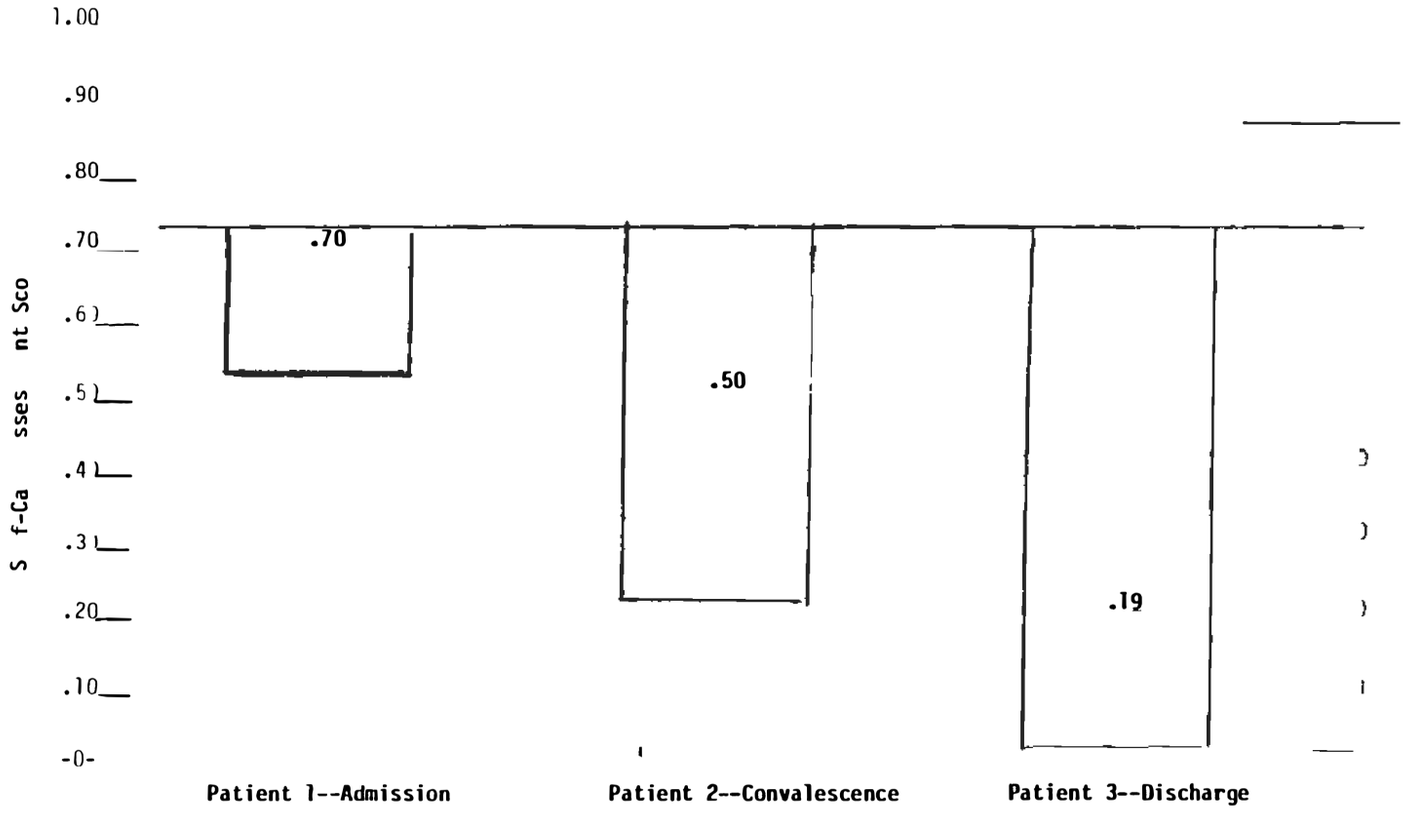


Figure 1. Average self-care assessment scores for simulated COPD Patients 1, 2, and 3.

modal percentage was .84, Level of Function, .82; Complexity of Plan of Care, .76; and Familiarity With the Plan of Care, .53.

Research Question 4 stated: What level of accuracy can be achieved by subjects using the self-care assessment tool? Moderate levels of mastery were achieved by subjects. Of 127 self-care assessment scales used to assess three simulated COPD patients, there were 16 instances in which the subject mode did not match the gold standard score. This represented 13% of the self-care assessment. Thirteen (10%) of the mismatch with the gold standard score occurred with the familiarity scales, 8 with Patient #1--Admission, 4 with Patient #2--Convalescence, and 1 with Patient #3--Discharge.

Research Question 5 stated: What support for construct validity is yielded by comparing subject and self-care expert scores? The self-care experts averaged higher average modal percentages than subjects with differences of .09 for the Respiratory Status scales, .08 for the Complexity of Plan of Care scales, .06 for the Familiarity with the Plan of Care scales, and .02 for the Level of Function scales. Overall, the difference between the self-care experts average self-care modal percentage and

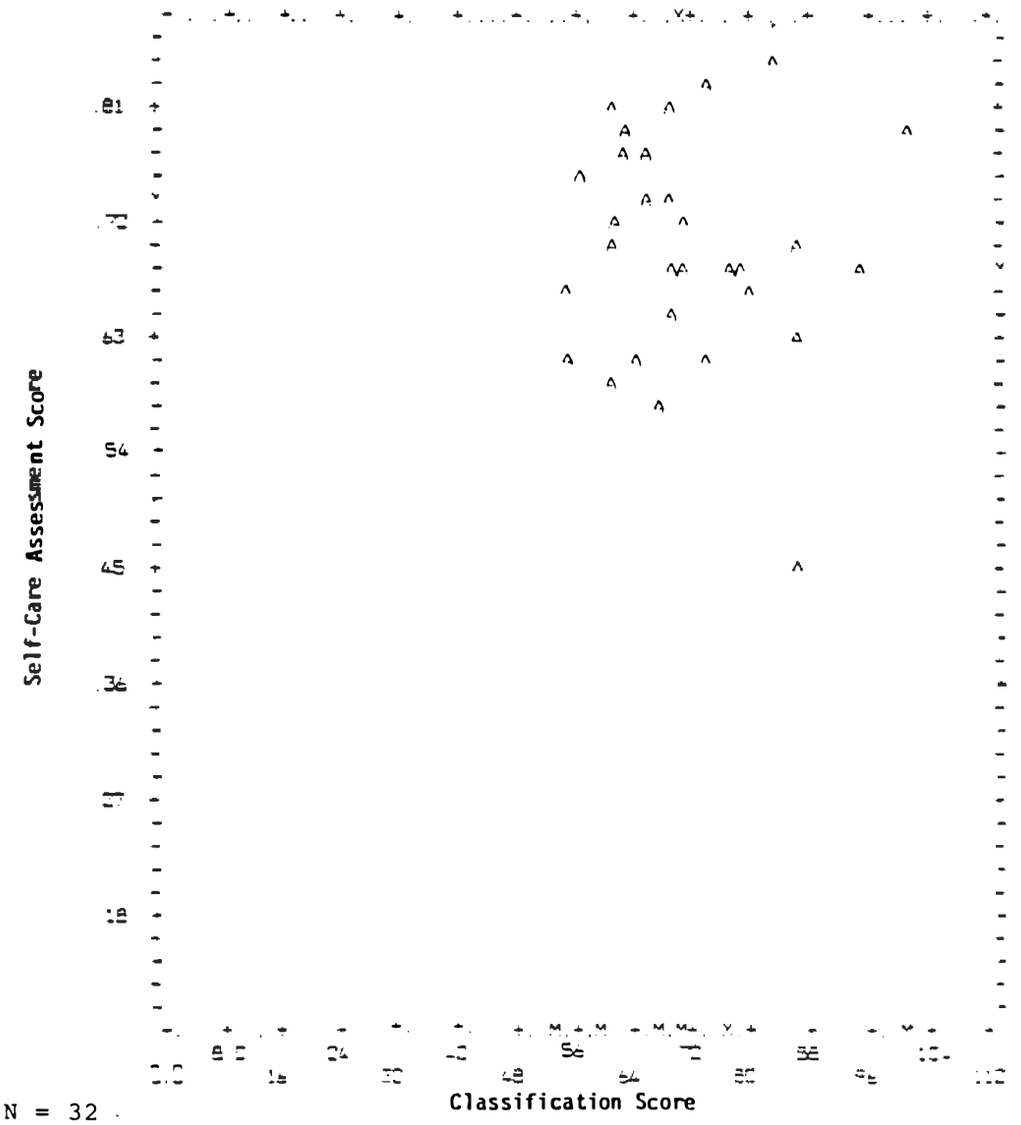
the experts was .06, clinically insignificant. The finding was not supportive of construct validity.

Test of Hypotheses

Hypothesis 1 stated: There is a significant difference between subject preinstruction and postinstruction self-care assessment scores. A two-tailed *t*-test for dependent samples demonstrated a statistically significant difference between subject preinstruction and postinstruction scores. The t (42) = 2.42, with a p = .05. Therefore, the research hypothesis was accepted.

Hypothesis 2 stated: There is a significant correlation between self-care assessment scores and patient classification scores. Statistical analysis using Pearson product-moment correlation demonstrated no significant correlation between self-care assessment scores and classification scores for the individual simulated COPD patients (Patient #1--Admission, r = -.0639, p = .7215; Patient #2--Convalescence, r = .0240, p = .8885; and Patient #3--Discharge, r = -.2569, p = .1372).

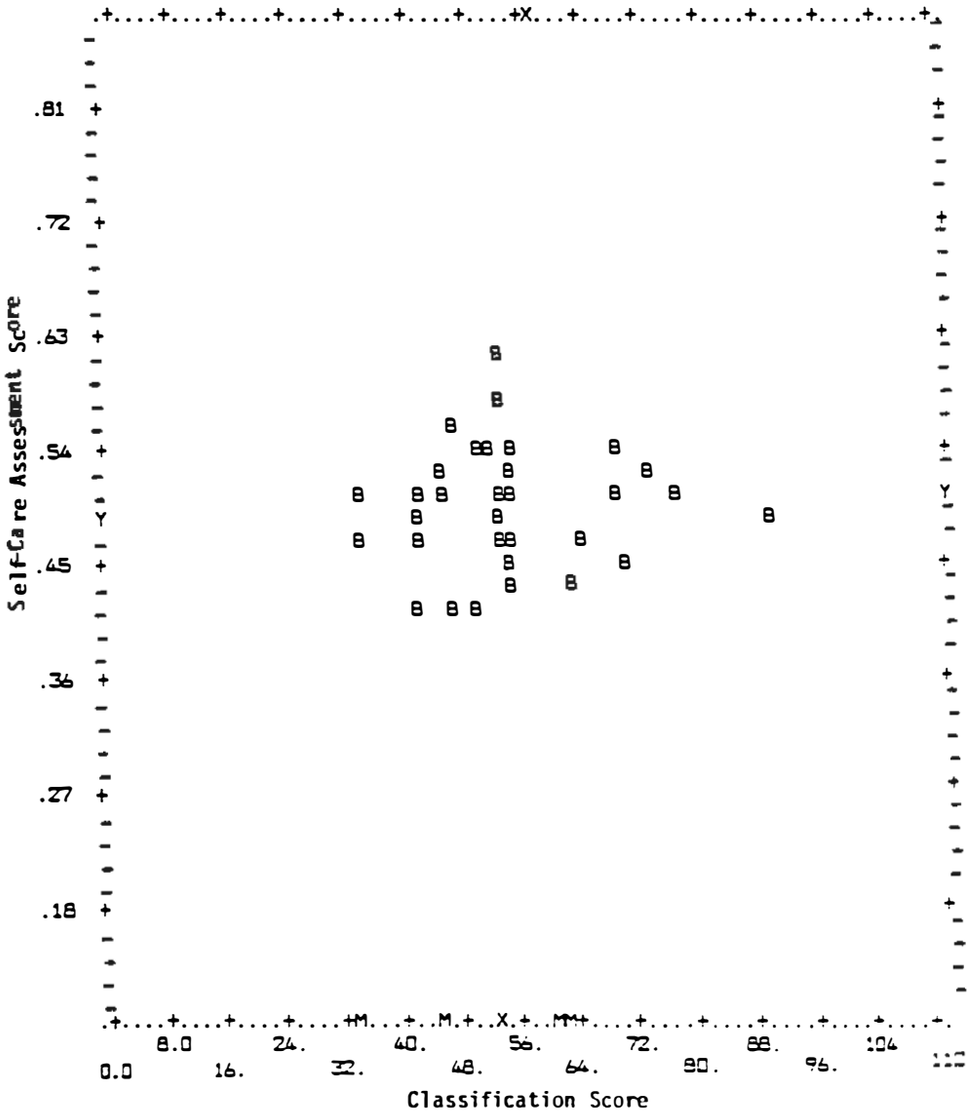
However, a strong positive correlation was yielded by correlating self-care assessment and classification scores of all three simulated COPD patients (r = .8667, p = .001). Figures 2, 3, 4, and 5 illustrate the correlations.



N = 32
R = -.0639
P(R) .7215

	Mean	St. Dev.	Regression Line	Res. MS.
X	71.844	11.911	X = -9.2159*Y+ 78.286	146.01
Y	.69907	.08264	Y = -444E-6*X+ .73094	.00703

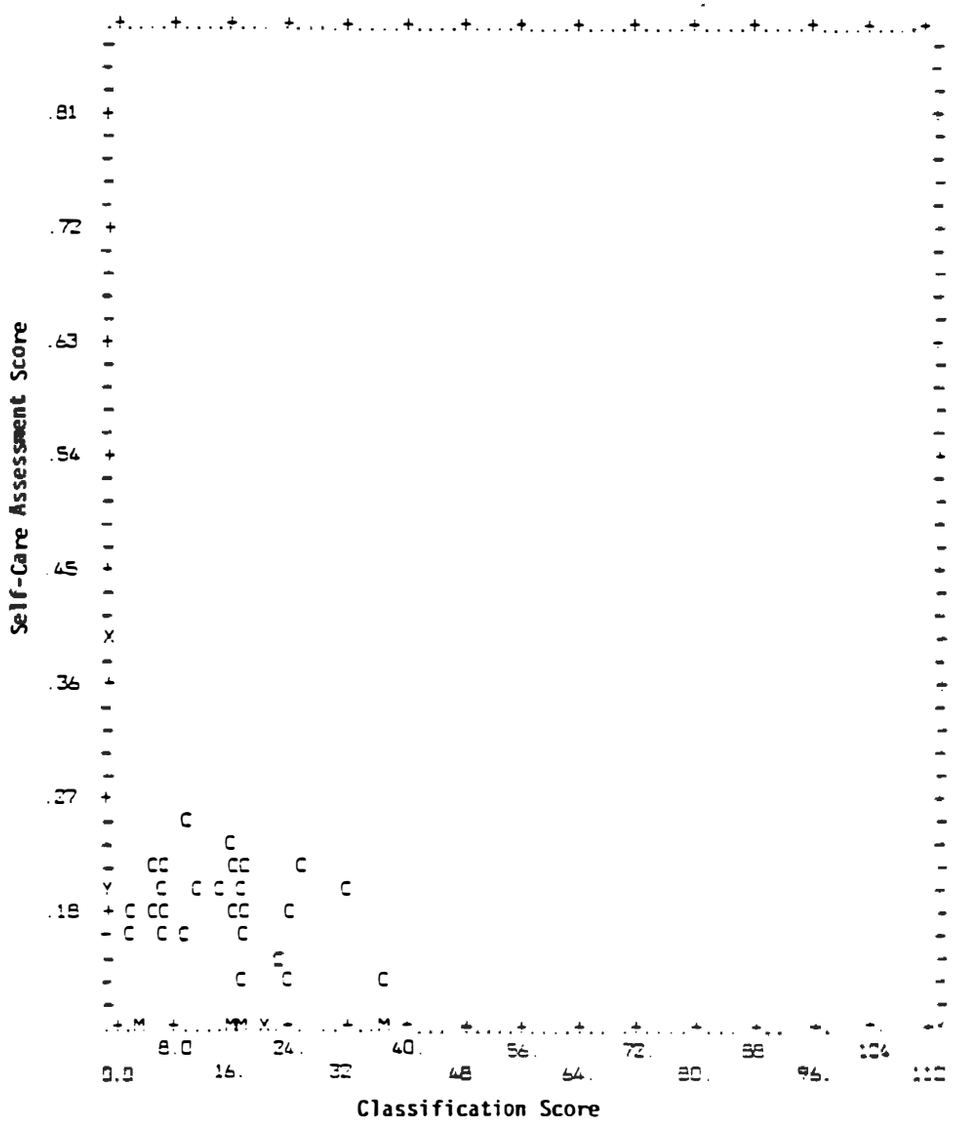
Figure 2. Scattergram depicting self-care assessment and classification scores of simulated COPD Patient 1--Admission.



N = 35
R = .0240
P(R).8885

	Mean	St. Dev.	Regression Line	Res. MS.
X	54.657	12.233	X = 6.1163*Y+ 51.623	154.09
Y	.49600	.04810	Y = 946E-7*X+ .49084	.00238

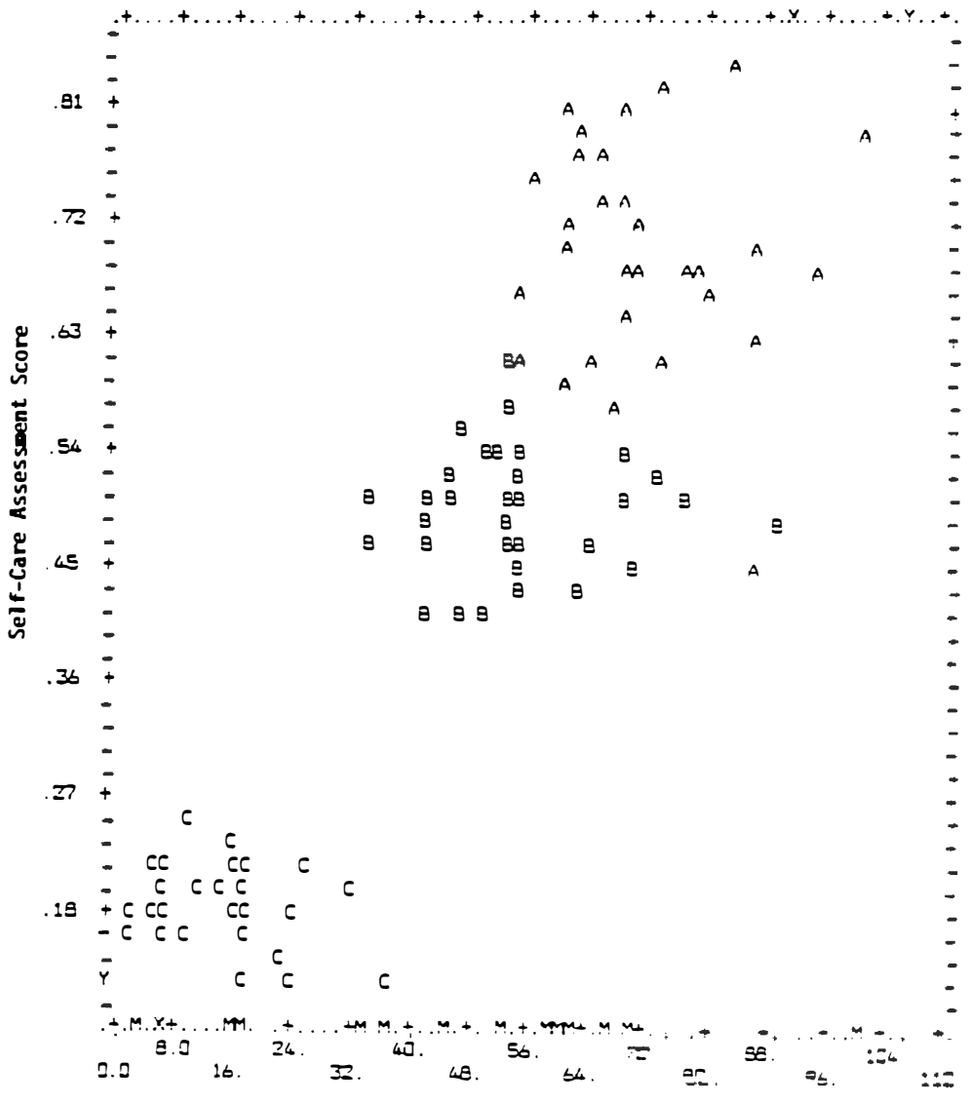
Figure 3. Scattergram depicting self-care assessment and classification scores of simulated COPD Patient 2--Convalescence.



N = 33
R = -.2569
P(R) .1372

	Mean	St. Dev.	Regression Line	Res. MS
X	13.545	8.7753	X = -71.085*Y+ 26.906	74.244
Y	.18795	.03171	Y = -928E-6*X+ .20053	970E-6

Figure 4. Scattergram depicting self-care assessment and classification scores of simulated COPD Patient 3--Discharge



N = 100
R = .8667
P(R)0.000

	Mean	St. Dev.	Regression Line	Res. MS.
X	46.590	26.718	X = 106.97*Y-2.5457	179.42
Y	.45933	.21647	Y = .00702*X+ .13216	.01178

Figure 5. Scattergram depicting self-care assessment and classification scores for three simulated COPD patients.

Additional Findings

1. There were twice as many nurse managers and clinical nurse specialists and approximately two-thirds more Level II staff nurses in the sample, as compared to the medical center medical-surgical nurse population.

2. The self-care experts and the subjects modal percentages did not differ to the degree expected. The z-test for homogeneity of two populations was used to compare the self-care experts and subjects. The scale that demonstrated the widest difference between the self-care expert and subject average modal percentage was used from the Respiratory Status scale, $z = -2.28$, the Level of Function scale, $z = -1.79$; the Complexity of the Plan of Care scale, $z = -1.71$; and the Familiarity With the Plan of Care scale, $z = -1.41$. At the .05 significance level, the null hypothesis $P_1 = P_2$ was not rejected, except for the Respiratory Status scales. Since the Respiratory Status scale's widest difference was marked, a second z test was performed on the next widest difference. The $z = -1.71$, falling within the .05 level of acceptance region and supporting acceptance of the null hypothesis.

3. The Familiarity With the Plan of Care modal percentages achieved the lowest level of agreement among the self-care experts and the subjects: .58 for experts

and .52 for subjects. In particular, evaluation of Patient #1--Admission demonstrated average modal percentages of .48 for the experts and .35 for the subjects.

4. The Familiarity With the Plan of Care scales did not vary over time as closely as the other composite scales do. Figure 6 illustrates this finding. Patient #2--Convalescence achieved a mean .20 for the Familiarity With the Plan of Care scales, while Patient #3--Discharge achieved a .18.

5. Several methodological characteristics of the self-care assessment tool complicate scoring and analysis. Two scales contain an artificial zero. All scales do not apply to every patient. Scales do not have equal steps; and, some scales lack discriminability.

Summary of Findings

The findings of this study are summarized as follows:

1. A statistically significant difference was demonstrated between subject preinstruction and postinstruction self-care assessment scores.

2. Content validity was supported by the statistically significant difference between subject preinstruction and postinstruction self-care assessment scores, as well as by the closer approximation of the postinstruction score mean with the gold standard mean.

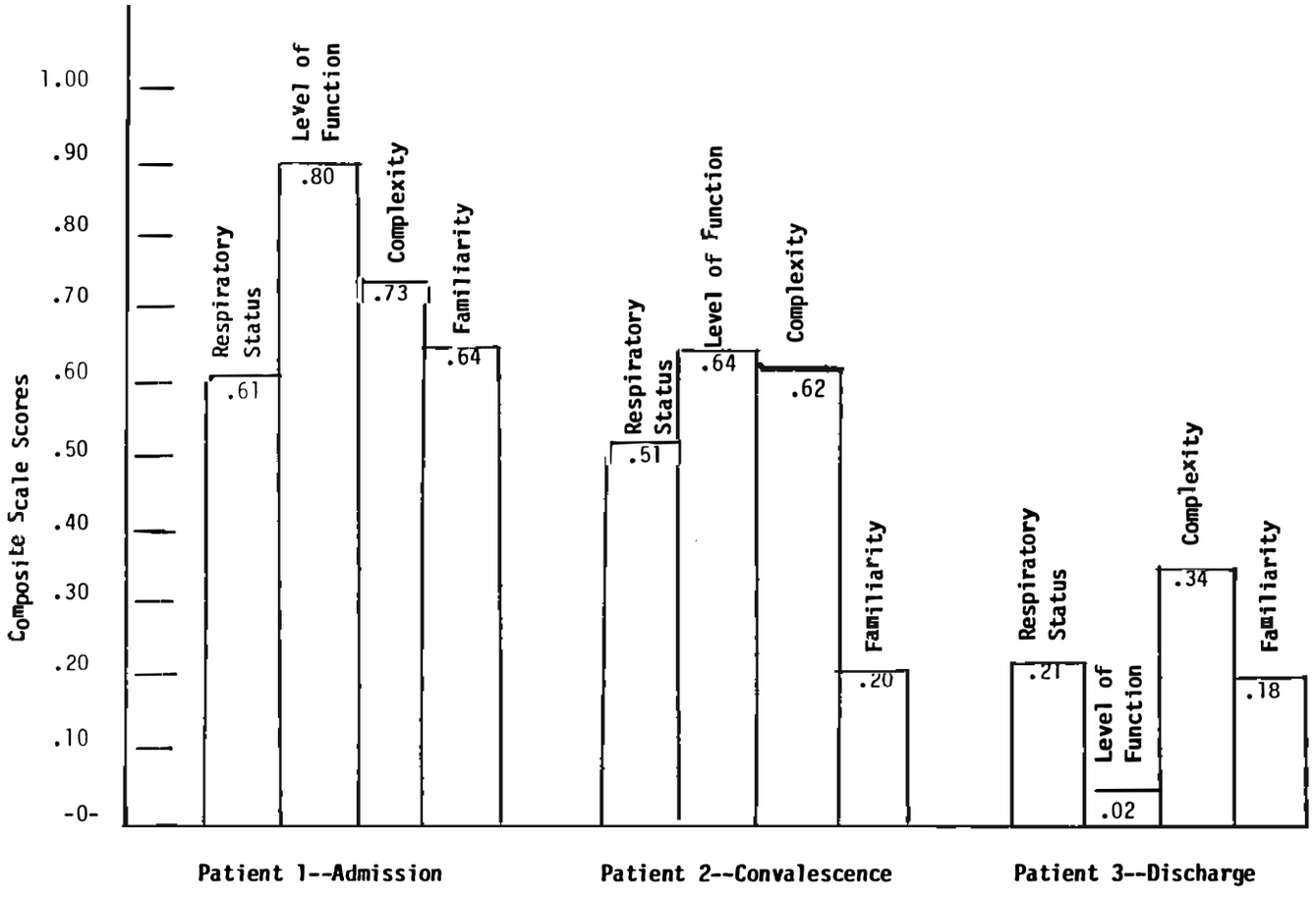


Figure 6. Average composite scale scores for simulated COPD Patients 1, 2, and 3.

3. Self-care construct validity was supported by the inverse relationship between self-care assessment scores of three simulated COPD patient and time.

4. Moderate levels of subject interrater reliability were achieved using the self-care assessment tool to evaluate three simulated COPD patients.

5. Moderate levels of accuracy were achieved using the self-care assessment tool to evaluate three simulated COPD patients.

6. Comparison of self-care expert and subject scores provided no support to self-care construct validity.

7. There were no statistically significant correlations between individual simulated COPD patient self-care assessment scores and classification scores.

8. There was a strong positive and statistically significant correlation between self-care assessment and classification scores of three simulated COPD patients.

9. There was a higher proportion of nursing leaders in the sample, as compared to the general medical-surgical registered nurse population at the medical center.

10. The self-care experts and subjects were statistically supported being from two homogeneous populations.

11. The Familiarity With the Plan of Care scales and the third scale step--unable to respond--represented

the most frequent source of disagreement in the assessment of three simulated COPD patients.

12. The Familiarity With the Plan of Care scales did not vary with time as did the other composite scales, Respiratory Status, Level of Function, and Complexity of Plan of Care.

13. Scoring and analysis of the self-care assessment tool was complicated by several measurement characteristics.

CHAPTER 5

SUMMARY OF THE STUDY

In this methodological study, reliability and validity measures were investigated for the researcher-designed Self-Care Assessment Tool for Hospitalized COPD Patients. This chapter summarizes and discusses the findings. Conclusions are provided, implications identified, and recommendations for further study offered.

Summary

A methodological study was conducted using descriptive, comparative, and correlational research methods to establish reliability and validity for a Self-Care Assessment Tool for Hospitalized COPD Patients. Interrater reliability training data were used to evaluate support for content validity and the instructional effects of a slide-tape presentation and successive assessment of a simulated COPD patient. And, postinstruction data, the assessment and classification of three additional simulated COPD patients, was analyzed for evidence of norm-referenced and criterion-referenced interrater reliability and construct validity.

The theoretical framework for the study was provided by Orem (1980), Bieri et al.'s (1966), and psychometric theories. Orem's self-care concepts were operationalized as the four dimensions or sections of the self-care assessment tool: Respiratory Status, Level of Function, Complexity of the Plan of Care, and Familiarity With the Plan of Care. Each dimension was further operationalized based on Bieri et al.'s dimensional model of clinical judgment. Variables related to each dimension were identified and conceptualized as continuous. The variables were then formatted as numerical rating scales, a scaling model or method of measurement described in psychometric theory (Nunnally, 1978).

Descriptive, correlational, and comparative techniques were used to describe the demographic, instructional, and postinstruction self-care assessment and classification data. The instructional effect of interrater reliability training was investigated by statistically analyzing the difference between preinstruction and postinstruction scores. Moreover, the instructional effect was also used to evaluate support for content validity. Norm-referenced interrater reliability was measured by modal percentages calculated for individual scales and individual patients and averaged for composite scales and patients.

Criterion-referenced interrater reliability was evaluated by comparing subject scores to a gold standard score represented by the self-care expert mode.

Construct validity was investigated by several methods. The self-care assessment scores of the three simulated COPD patients were compared to time and self-care expert scores compared to subject scores. Additionally, subject scores for the self-care assessment tool were correlated with subject scores for the patient classification tool to evaluate the relationship of the two measures and the underlying constructs.

The sample for the study was comprised of 43 subjects for interrater reliability training and 39 subjects for postinstruction assessment of three simulated COPD patients. All subjects were in-patient medical-surgical registered nurses who held Texas licensure and had a minimum 6-months acute hospital experience.

Five instruments were used in the study. The researcher-designed Self-Care Assesment Tool for Hospitalized COPD Patients was used by subjects and self-care experts to evaluate simulated COPD patients. The Medicus patient classification tool was used by subjects and classification experts to assess nursing needs of simulated COPD patients. Four videotapes of simulated COPD patients and accompanying

kardexes were used to present the simulated patient behavior for assessment. An instructional slide-tape was produced by the researcher for interrater reliability training. Lastly, a Demographic Data Tool was used to collect data to describe the sample.

Description of the demographic, instructional effects, and postinstruction data were presented. Subjects were described by age, sex, basic and advanced nursing preparation, years of experience as a registered nurse, current position, and major practice area. Instructional effects data were described by subject preinstruction and postinstruction group means and standard deviations. Subject self-care assessment postinstructional data were presented by self-care assessment score ranges and means, and subject and self-care expert modal percentages were described for individual scales and patients and averaged for composite scales and patients. Subject and classification expert patient classification data were described by percentage agreement.

Five research questions related to reliability and validity were posed. The first research question examined support for content validity from differences in preinstruction and postinstruction scores. The second research question explored the relationship between self-care

assessment scores and time. Norm-referenced and criterion-referenced interrater reliability were scrutinized in the third and fourth research questions by comparing modes and modal percentages for individual scales and patients, and averages for composite scales and patients. Lastly, the fifth research question compared self-care expert and subject scores to determine support for validation of the self-care construct. The _z_-test for the homogeneity of two populations was performed on the self-care expert and subject sample data.

Two hypotheses were tested. Statistical analysis was performed on subject preinstruction and postinstruction scores to determine the instructional effect of interrater reliability training. The results were t (42) = 2.42, significant at the .05 level, and the first research hypothesis was accepted. Pearson product-moment correlation was performed on subject self-care assessment scores and the patient classification scores. The results were r = .8667. The second research hypothesis was accepted at the .001 level.

Discussion of Findings

The findings of the study are discussed in relationship to instructional effect, reliability, validity, and additional findings.

Instructional Effect

A statistically significant difference was demonstrated between subject interrater reliability training preinstruction and postinstruction self-care assessment scores. Postinstruction scores were associated with less variability than preinstruction scores, as evidenced by a smaller standard deviation. Moreover, the postinstruction group mean more closely approximated the gold standard mean than the preinstruction mean. Thus, following an initial simulated COPD patient assessment and a slide-tape explanation of the tool, subjects reassessed the patient with increased reliability and accuracy. Although it is unclear what each instructional component contributed to the total effect, the interrater reliability training improved assessment of the simulated COPD patient.

Interrater Reliability

Subject interrater reliability for the self-care assessment of three simulated COPD patients achieved moderate levels of consensus in the initial testing of the Self-Care Assessment Tool for Hospitalized COPD Patients. Although the scores lack normal distribution, interrater reliability was examined from norm-referenced as well as from criterion-referenced perspectives. From a normative reference, the highest composite scale average modal

percentage was demonstrated by the Respiratory Status scales, followed by Level of Function, Complexity of Plan of Care, and Familiarity With the Plan of Care scales. Ranking of composite scale interrater reliability was not altered by a criterion-referenced perspective, because the preponderance of subject gold standard mismatch occurred with the Familiarity With the Plan of Care scales. Moreover, the lowest levels of subject or self-care expert agreement were demonstrated by the Familiarity scales, particularly for Patient #1--Admission, which included instances where no mode could be identified.

Content Validity

Content validity was supported by the statistically significant difference between subject preinstruction and postinstruction self-care assessment scores and the closer approximation of the gold standard mean following instruction. According to Nunnally (1978),

> if the test is intended to measure progress in training, scores should increase from before to after, and the improvement in scores on individual items can be considered evidence for the validity of those items. (p. 94)

Although the self-care assessment tool is not designed to measure subject progress per se, it is intended to measure the self-care activity of hospitalized COPD patients, as assessed by subjects. Therefore, instruction in use

of the tool should increase the reliability and accuracy of assessment.

Construct Validity

According to Nunnally (1978), three methodologies underlie construct validation. The initial method should define the observables or variables from theory. Thus, four variables were operationalized from Orem's self-care theory: respiratory status from the universal self-care requisite, level of function from the developmental requisite, and complexity of and familiarity with the plan of care from the health-related requisite. Subsequently, a number of observables were aligned with the four major variables.

The second method of construct validation relates measures of the clearly delineated observables. In the present study, the observables were related to time or length of hospitalization and comparison of self-care experts and non-experts. And, the third validation method, comparing different constructs, was accomplished by correlating self-care assessment scores with patient classification scores. The self-care assessment serves as a measure of the self-care construct, and the classification scores, a measure of nursing need construct.

The present study findings lend limited support to validation of the self-care construct. To begin with the self-care construct validation process is based on the artificial assessment of three stereotypic simulated COPD patients. Therefore, all findings and conclusions must be qualified. Assessment of the simulated patients did demonstrate the highest self-care score on Patient #1--Admission, followed by Patient #2--Convalescence, and Patient #3--Discharge. Thus, an inverse relationship between the self-care assessment scores and time was demonstrated for the three simulated COPD patients.

Construct validity is supported by all measures of the construct varying together. The Familiarity With the Plan of Care scales did not vary as closely together as the other composite scales, thereby offering less support to construct validity. Both the variables, Complexity of and Familiarity With the Plan of Care, were operationalized from the health-related requisite. A single variable was operationalized from the two other self-care requisite types. Perhaps, Complexity of and Familiarity With the Plan of Care scales are interdependent to the degree that requires a more integrated measurement.

An additional finding of the present study suggested that the self-care experts and the subjects were sampled

from two homogeneous populations. This finding did not lend support to construct validity. An expert should be better able to evaluate the observables of a construct as compared to a non-expert.

The relationship between the self-care and the nursing need constructs was analyzed by correlating self-care assessment scores with classification scores. Patients who were dependent scored high on both measures, and patients who were independent scored low on both. Patient #1--Admission scored the highest on both measures, followed by Patient #2--Convalescence, and Patient #3--Discharge.

When the individual simulated COPD self-care assessment scores were correlated with the classification scores, there was limited variability in the data and hence a negligible correlation. Correlation requires variation of the data to describe the relationship between two variables. For example, Patient #1--Admission scored high on both self-care assessment and classification, resulting in the data clustering together and a correlation of -.0639. When, however, scores from all three patients were correlated, marked variation of the data was introduced since the simulated patients range from dependent to independent, and a strong positive statistically significant correlation was demonstrated.

The Medicus patient classification tool is a measure of the nursing need construct. To the degree the self-care assessment tool is a measure of the self-care construct, the strong correlation between the two measures reflect the relationship between the two constructs, nursing need and self-care.

Additional Findings

1. The high proportion of nurse managers, clinical nurse specialists, and Level II staff nurses represented a leadership bias in the sample. If nursing leaders tend to be older, more mature, and more professionally experienced, as compared to the general staff nurse, then it is logical to assume that the results of the study would be positively biased.

2. Statistical analysis supported the self-care experts and the subjects being sampled from two homogeneous populations. Several factors may be hypothesized to explain the similar performance. The simulated patient assessment data may have been unclearly communicated, introducing such a degree of systematic error that neither experts nor subjects were able to discriminate the essential information and accurately evaluate the patient. This explanation would seem most likely if overall agreement had not achieved acceptable moderate levels.

A second explanation for similar performance between self-care experts and subjects may be attributed to the high proportion of nurse leaders in the subject sample. However, none of the nurse managers, clinical nurse specialists, or Level II staff nurses were pulmonary nursing experts. Perhaps, being a medical-surgical registered nurse is adequate preparation for expert status.

Or the similar performance may be explained by the structure and format of the self-care assessment tool which enabled a standard assessment and equalized the self-care assesment ability of experts and subjects. It is a well-known fact that the greater the subjectivity of an instrument, the greater the variability will be. It follows then, that greater variability would be expected between experts and subjects if the self-care assessment tool were not highly structured. Furthermore, the expert is skilled in the conceptual differentiation and articulation of pertinent clinical judgment dimensions. With the self-care assessment tool, the dimensions were identified and articulated, establishing a standard assessment and enabling both experts and subjects to utilize similar clinical judgment. Moreover, instruction focused subjects on key clinical judgments for hospitalized COPD patients.

3. The Familiarity With the Plan of Care scales were associated with the lowest levels of interrater reliability and represented limits to construct validation. Because both Complexity of and Familiarity With the Plan of Care scales were operationalized from the health-related self-care requisite type, the degree of integration between the two types of assessment scales needs to be critically examined.

4. The Familiarity With the Plan of Care scales did not vary with time as compared to the other three composite scales. As discussed under construct validity, this was not supportive of construct validity.

5. Increased complexity of scoring and analyzing self-care assessment data presents a drawback to use of the tool.

Conclusions and Implications

The conclusions and implications for the study were as follows:

1. Without the integrated theoretical framework of the self-care model, the dimensional clinical judgment model, and the rating scale measurement model, the Self-Care Assessment Tool for Hospitalized COPD Patients would not have achieved the same degree of interrater reliability and validity. The theoretical underpinnings enabled a

highly structured meaningful and quantitative measure. With initial methodological testing, subjects and self-care experts alike were able to reliably and accurately evaluate simulated COPD patient ability to meet self-care requirements expressed in three of four operationally defined dimensions. Moderate reliability and validity in initial testing calls for continued methodological development.

2. Orem's self-care model was supported by the study in several ways. Using the self-care assessment tool, nurses discriminated self-care strengths and limitations of simulated COPD patients, the assessment domain for which Orem holds nursing accountable. Secondly, Orem proposed that self-care is disrupted by health-related problems like illness. In this study, the simulated patient who was most ill, was assessed with the greatest disruption in self-care and the patient who had recovered with the least disruption. The direct relationship between degree of illness and disruption of self-care was not only observed for the self-care assessment score, but also for each of the composite self-care dimensions: respiratory status, level of fucntion, and complexity of and patient familiarity with the plan of care.

Lastly, Orem's self-care model was supported by the strong positive correlation between the self-care assessment

scores and the classification scores. Orem contended that the greater the health-related self-care deficit, the greater the need for nursing assistance would be. In the present study, propositional support was represented by similar scores for simulated patients on the self-care assessment tool, a measure of self-care deficits, and on the patient classifiction tool which measures patient's nursing needs.

The degree to which a model is empirically supported is indicative of how effectively the model represents reality and guides questions about conceptual relationships and consequences. Orem's self-care model seemed to closely approximate the empirical nursing concerns and activities related to the care of hospitalized COPD patients. Moreover, the model served to organize the COPD patient self-care behavior into four logically relevant dimensions. The self-care model appeared to be a highly relevant theoretical framework for nursing assessment of hospitalized COPD patients. It logically follows that the model's relevance may extend to medical-surgical hospital nursing.

3. The dimensional clinical judgment and rating scale models were empirically supported in this study. Without standardization of clinical judgment, nurses will vary in developing criteria by which to judge. In this

study clinical judgment was standardized with a dimensional approach and predetermined differentiated and articulated dimensions format as numerical rating scales. The interrater reliability and accuracy achieved empirically supported this clinical judgment measurement approach and, thus, the models on which the approach is based. It appears that this method of measuring clinical judgment may be useful for other kinds of nursing assessment.

4. The artificial nature of the study represented a limitation. However, the limitation applied to all who participated, both subjects and experts. Assessment of legitimate COPD patients may affect interrater reliability and accuracy. If the opportunity to clarify and confirm patient verbal and nonverbal responses is more closely associated with measurement of the true self-assessment score, interrater reliability and accuracy should increase. If, however, due to lack of interviewing skill or familiarity with the self-care content, raters cannot equally obtain the desired patient response to evaluate, interrater reliability and accuracy should decrease.

5. The self-selection of nursing leaders in the sample represented a second limitation in the study. Although it is unclear to what degree the results may have been influenced by the high proportion of leaders

in the sample, the leadership bias limits generalization of the study results.

6. In the current state of development, the self-care assessment tool may be used to evaluate legitimate COPD patients. Under artificial conditions, the tool demonstrated sufficient interrater reliability and validity to conclude that it is a meaningful measure. Based on subject ability to discriminate simulated patients, similar discrimination would be expected for legitimate patients. This expectation has meaning for routine use of the tool to facilitate efficient and effective self-care progression of COPD patients and discharge planning.

7. Following interrater reliability training, the self-care assessment tool may be used by medical-surgical registered nurses without pulmonary experience to obtain reliable and valid self-care measurements of hospitalized COPD patients. This implication may be particularly useful in settings where COPD patients are not grouped on a special unit, but on a general medical-surgical unit. The nurse may not know what guidelines to use to advance the COPD patient. Or, because of dyspnea, the COPD patient and the nurse may be hesitant to progress self-care. The self-care assessment tool provides a way to quantify relevant self-care behavior such that the nurse can identify patient

improvement. The greater the degree of improvement, the more ready the patient is to progress self-care activity.

8. The Familiarity With the Plan of Care dimension needs further development, with regard to the relevance of the scale steps, and the integration with the complexity of the plan of care scales. As currently operationalized, the Familiarity With the Plan of Care scales may lack sufficient inegration with the health-related self-care requisite and, thus, represent an inadequate measure of the self-care construct.

9. The methodological limitations of the self-care assessment tool need to be resolved. The greater the ease of using and scoring the self-care assessment tool, the greater will be the likelihood of the tool being used to progress COPD patients in self-care.

Recommendations for Further Study

The following recommendations for further study were identified:

1. This study could be replicated in other settings to compare interrater reliability, accuracy, and instructional effect. However, subjects could be coded so that performance could be analyzed by job title, educational preparation, and experience.

2. This study could be replicated using several groups that represent varying levels of nursing expertise to further investigate construct validity: beginning nursing students, graduating nursing students, and registered nurses. Patient classification would have to be excluded, since there is no universal system.

3. A methodological study using descriptive comparative and correlational methods of research could be conducted using a large sample of legitimate patients to continue construct validation.

4. Interrater reliability training could be investigated by randomly assigning subjects to four levels of instruction: no instruction, successive assessment of a simulated COPD patient only, slide-tape presentation only, and successive assessment and slide-tape presentation.

APPENDIX A

TEXAS WOMAN'S UNIVERSITY
COLLEGE OF NURSING

PROSPECTUS FOR DISSERTATION

This prospectus proposed by: Cathleen L. Michaels, R.N., M.N.

_____ and entitled:

Development of a Self-Care Assessment Tool for Hospitalized COPD Patients:

A Methodological Study

Has been read and approved by the members of (his/hers) Research Committee.

This research is (check one):

xx Is exempt from Human Subjects Review Committee review because the study requirements are within Category I (no risk) according to the guidelines published in the Federal Register, January 26, 1981, Part X, effective July 27, 1981.

_____ Requires Human Subjects Review Committee review because _____

Research Committee: 3/11/85

Chairperson Helen A. Burch

Member _____

Member Margie N. Johnson

Member David D. Marshall

Member Jack C. Vaughan-Wilson

APPENDIX B

TWU Texas Woman's University
P.O. Box 22479 Denton, Texas 76204 (817) 383-2302, Metro 434-1757, Tex-An 834-2133
THE GRADUATE SCHOOL

May 22, 1985

Ms. Cathleen L. Michaels
3701 Turtle Creek Blvd., #8-D
Dallas, TX 75219

Dear Ms. Michaels:

I have received and approved the Prospectus for your research project. Best wishes to you in the research and writing of your project.

Sincerely yours,

Leslie M. Thompson

Leslie M. Thompson
Provost

tb

cc Dr. Helen Bush
Dr. Anne Gudmundsen

APPENDIX C

TEXAS WOMAN'S UNIVERSITY
COLLEGE OF NURSING

AGENCY PERMISSION FOR CONDUCTING STUDY*

THE

GRANTS TO Cathleen L. Michaels, R.N., M.N.
a student enrolled in a program of nursing leading to a Doctoral Degree at Texas Woman's University, the privilege of its facilities in order to study the following problem.

Development of a Self-Care Assessment Tool

for Hospitalized COPD Patients: A Methodological Study

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 The agency would like a copy of the completed dissertation

3/26/85
Date

Signature of Agency Personnel

Cathleen L. Michaels
Signature of Student

Helen A. Bush, Ph.D., R.N.
Signature of Faculty Advisor

*Fill out & sign 3 copies to be distributed: Original-student; 1st copy-Agency; 2nd copy-TWU School of Nursing

APPENDIX D

Subject Information

My name is Cathy Michaels. As a doctoral student in nursing at Texas Woman's University, I am developing an assessment tool to evaluate the self-care ability of hospitalized chronic obstructive pulmonary disease (COPD) patients.

Under prospective pricing, we nurses must learn to be more effective and efficient to maintain quality patient care and meet the time limits of a predetermined hospital stay. I believe that a self-care assessment tool will help us. The tool in this study is intended for COPD patients. To be clinically useful, this tool must be tested for reliability and validity.

In this research study, your participation would include viewing a slide-tape presentation to instruct you in the use of the COPD Self-Care Assessment Tool and assessing simulated COPD patients by videotape. You would be asked to complete a series of COPD self-care assessment tools and Medicus Patient Classification tools.

Your participation is voluntary. Your job will not be influenced. You may choose to withdraw from the study at any time. If you do participate, you will remain anonymous. There is no risk associated with this study.

Your completion of the information sheet and the assessment tools will indicate your voluntary consent.

A copy of the completed study will be kept in the Nursing Education Department for your review. Thank you.

APPENDIX E

RETURN OF THIS QUESTIONNAIRE WILL BE CONSIDERED TO BE YOUR CONSENT TO BE A RESEARCH SUBJECT IN THIS STUDY.

Methodist Medical Center
Self-Care Assessment Tool
For Hospitalized COPD Patients

General Information:

1. Mark the number on the scale that reflects the best match between your assessment of the patient and the scale description.

2. Unless instructed otherwise, assess the patient from 3 P.M. yesterday up to 3 P.M. today, the day of assessment. If the patient is newly admitted, assess the patient from the time of admission up to 3 P.M. today.

3. If you find that more than one description matches your assessment of the patient, mark the description associated with the highest number.

4. There are scales that will not apply to every patient. When that occurs, mark the 0 associated with not applicable.

ASSESSMENT OF RESPIRATORY STATUS

1. Respiratory Distress:

   Based on one or more of the following: dyspnea, tachypnea, or respiratory rate >20/min., and use of accessory muscles. If no indications with rest or activity, mark 0.

2. Presence of Wheezing:

   Indicator for bronchospasm, assessed by auscultation, unless wheezing audible without a stethoscope during normal respirations. Whether wheezing is continuous or intermittent, as during asthma attacks, select the description associated with the highest number.

3. Current O_2 Delivery:

   If patient on intermittent or continuous O_2, select delivery that corresponds to the highest oxygen concentration.

4. Current pO_2 on Room Air:

   Use most recent ABG unless 72 hours has elapsed since test completed. If not done or falls outside time limits, mark 0.

5. Current pO_2 on Supplemental Oxygen:

   Use most recent ABG on supplemental O_2 unless 72 hours has elapsed since test completed. If ABG not done or falls outside time limits, mark 0.

ASSESSMENT OF RESPIRATORY STATUS

1. Respiratory Distress

0	1	2	3	4	5
Without respiratory distress	With treadmill and bicycle	With walking in hall	With walking in room	At rest	Prevents sleep

2. Presence of Wheezing

0	1	2	3	4
Clear	Clear but distant breath sounds	Wheezing on forced expiration	Wheezing with normal respiration	Audible

3. Current O_2 Delivery

0	1	2	3	4	5
21% O_2 No added O_2	22-28% O_2 or 1-2 L/Min	29-35% O_2 or 3 L/Min	36-42% O_2 or 4-5 L/Min	43-49% O_2 or 6 L/Min	>49% O_2 Requires O_2 by mask

4. Current pO_2 on Room Air

0	1	2	3	4	5
Not Applicable	>79 mmHg	70-79 mmHg	60-69 mmHG	50-59 mmHg	<50 mmHg

5. Current pO_2 on Supplemental Oxygen

0	1	2	3	4	5
Not Applicable	>79 mmHg	70-79 mmHg	60-69 mmHg	50-59 mmHg	<50 mmHg

ASSESSMENT OF RESPIRATORY STATUS (continued)

6. Current pCO_2:

Use most recent ABG on room air or supplemental oxygen, unless 72 hours has elapsed since test completed. If not done or falls outside time limit, mark 0. Normal range is 35-45 mmHg.

7. Volume of Sputum:

Measured from 3 P.M. yesterday to the time of today's assessment. If patient is productive of sputum, but has not expectorated into a sputum jar, mark 1.

8. Sputum Character:

Select the description associated with the highest number.

9. Presence of Fever:

Mark the highest recorded oral or rectal temperature from 3 P.M. yesterday to the time of today's assessment. Add 1 degree to each oral temperature to establish rectal temperature, i.e., 98.6 po = 99.6 R.

ASSESSMENT OF RESPIRATORY STATUS (continued)

6. Current pCO_2

0	1	2	3	4	5
Not applicable	<35mmHg	35-45 mmHg	46-56 mmHg	57-67 mmHg	>67 mmHg

7. Volume of Sputum

0	1	2	3	4
0 cc	1-25 cc	26-50 cc	51-75 cc	>75 cc

8. Sputum Character

0	1	2	3	4	5
No Sputum	Thin	Beige, Yellow or Green	Plugs	Thick	Bloody

9. Presence of Fever

0	1	2	3	4
<98.7 PO	98.7-99.7 PO	99.8-100.8 PO	100.9-101.9 PO	>101.9 PO

ASSESSMENT OF LEVEL OF FUNCTION

Instructions:

Mark the number that corresponds to the following code:

0 = Full self-care

Requires no assistance

1 = Requires use of equipment or device

Dependent on equipment or device to carry out activity, like oxygen.

2 = Requires supervision or assistance

Dependent on another person to carry out these activities. Examples include the patient who needs assistance to open packages on meal tray and the patient who needs bathing supervision to coach breath control or pace activity.

3 = Requires both supervision or assistance and equipment or device

Dependent on both to carry out activities. Example is the patient who is on supplemental oxygen and needs help to eat.

4 = Dependent

Dependent on others to carry out total activity. Examples are the comatose patient, the newly admitted patient who is short of breath at rest, and the patient who needs two nurses to transfer from the bed to the chair.

10. Eating

Method by which food is ingested.

11. Bathing

Oral and body hygiene.

ASSESSMENT OF LEVEL OF FUNCTION

10. Eating

0	1	2	3	4
Fully independent	Needs equipment	Needs assistance	Needs equipment & assistance	Dependent

11. Bathing

0	1	2	3	4
Fully independent	Needs equipment	Needs assistance	Needs equipment & assistance	Dependent

ASSESSMENT OF LEVEL OF FUNCTION (continued)

Instructions:

Mark the number that corresponds to the following code:

0 = Full self-care
1 = Requires use of equipment
2 = Requires assistance
3 = Requires use of equipment and assistance
4 = Dependent

(Turn to previous page of instructions for examples.)

12. Dressing

Ability to put on and take off hospital gown or own bed clothing.

13. Grooming

Limited to combing or brushing hair and shaving.

14. Toileting

Method of elimination for urination and defecation.

0 = No oxygen and use of bathroom
1 = Oxygen and use of bathroom
2 = No oxygen, use of bathroom, and nursing assistance for bladder and/or bowel training
3 = Use of toileting equipment with or without oxygen or use of oxygen and nursing assistance in the bathroom
4 = Foley or condom catheter and/or regular enemas

ASSESSMENT OF LEVEL OF FUNCTION (continued)

12. Dressing

0	1	2	3	4
Fully independent	Needs equipment	Needs assistance	Needs equipment & assistance	Dependent

13. Grooming

0	1	2	3	4
Fully independent	Needs equipment	Needs assistance	Needs equipment & assistance	Dependent

14. Toileting

0	1	2	3	4
Fully independent	Needs equipment	Needs assistance	Needs equipment & assistance	Dependent

ASSESSMENT OF LEVEL OF FUNCTION (continued)

Instructions:

Mark the number that corresponds to the following code:

0 = Full self-care
1 = Requires use of equipment
2 = Requires assistance
3 = Requires use of equipment and assistance
4 = Dependent

(Turn to previous page of instructions for examples.)

15. Bed mobility

Ability to turn and position in bed. Mark a 4 if patients must be turned and positioned by the nurse.

16. Mobility inside room

Ability to ambulate or locomote within room. Mark a 4 for patients who choose or who are prescribed bedrest.

17. Mobility outside room

Ability to ambulate or locomote in hallway. Mark a 4 for patients who choose or whose activity is limited to the room or bed.

ASSESSMENT OF LEVEL OF FUNCTION (continued)

15. Bed mobility

0	1	2	3	4
Fully independent	Needs equipment	Needs assistance	Needs equipment & assistance	Dependent

16. Mobility inside room

0	1	2	3	4
Fully independent	Needs equipment	Needs assistance	Needs equipment & assistance	Dependent

17. Mobility outside room

0	1	2	3	4
Fully independent	Needs equipment	Needs assistance	Needs equipment & assistance	Dependent

ASSESSMENT OF COMPLEXITY AND FAMILIARITY WITH PLAN OF CARE

Instructions for Familiarity Scale:

Mark the number that corresponds to the following code. If, however, the prescription is not included in the plan of care, disregard the familiarity scale.

0 = Well informed

Identifies component and generally explains its purpose. Details do not need to be exact, but should be descriptive.

1 = Some information

Identifies component or explains its purpose.

2 = Little or no information

Cannot identify component or explain its purpose.

3 = Unable to respond

Due to cognitive dysfunction and/or physiologic stability, unable to communicate information, i.e., extreme dyspnea, coma, disorientation.

18. Supplemental oxygen

Mark the oxygen delivery that corresponds to the last order written. If supplemental oxygen is not used or was discontinued, mark 0.

Familiarity

Can the patient explain why supplemental oxygen is needed and what the current oxygen prescription is?

19. Type of inhaled bronchodilator therapy

If the patient receives more than one type of inhaled bronchodilator therapy, mark the type associated with the highest number. If inhaled bronchodilator therapy not ordered, mark 0.

Familiarity

Can the patient explain the purpose of inhaled bronchodilator therapy and identify the current modality (modalities)?

ASSESSMENT OF COMPLEXITY AND FAMILIARITY WITH PLAN OF CARE (continued)

18. Supplemental oxygen

0	1	2	3	4	5
Not Applicable	With exercise only	Intermittent at variable flow	Intermittent at same flow	Constant at variable flow	Constant at same flow

0	1	2	3
Well informed	Some information	Little or no information	Unable to respond

19. Type of inhaled bronchodilator therapy

0	1	2	3
Not applicable	Metered dose	Unassisted	Assisted

0	1	2	3
Well informed	Some information	Little or no information	Unable to respond

ASSESSMENT OF COMPLEXITY AND FAMILIARITY WITH
PLAN OF CARE (continued)

Instructions for Familiarity Scale:

Mark the number that corresponds to the following code. If, however, the prescription is not included in the plan of care, disregard the familiarity scale.

0 = Well informed
1 = Some information
2 = Little or no information
3 = Unable to respond

20. Frequency of inhaled bronchodilator therapy

QID or less frequent refers to waking hours while Q4H means around the clock. Count PRN and routine treatments if PRN treatments are received. For those patients on QID treatments who require one or more PRN treatments, mark 2. If inhaled brochodilator therapy not ordered, mark 0.

21. Oral/IV bronchodilator medication

Mark the number that corresponds to the last order written. Mark 5, however, if Aminophylline initiated or mark 3 if Aminophylline discontinued since 3 p.m. yesterday.

Familiarity

Can the patient explain the purpose for bronchodilators and identify which bronchodilator(s) is (are) currently prescribed?

22. Sputum mobilization measures

If patient is being treated with more than one measure, mark the description associated with the highest number. Mark 0 if the patient is non-productive. All IV fluids count except IV piggyback.

Familiarity

Can the patient explain why sputum mobilization is important and identify what modalities are included in the plan of care?

ASSESSMENT OF COMPLEXITY AND FAMILIARITY WITH PLAN OF CARE (continued)

20. Frequency of inhaled bronchodilator therapy

0	1	2	3
Not applicable	QID	Q4H	<Q4H

21. Oral/IV bronchodilator medication

0	1	2	3	4	5
No bronchodilators	1 oral bronchodilator	2 oral bronchodilators	Discontinued IV Aminophylline	Continuous IV Aminophylline	IV Aminophylline initiated

0	1	2	3
Well informed	Some information	Little or no information	Unable to respond

22. Sputum mobilization measures

0	1	2	3	4
Not applicable	Oral fluids	Mist	Percussion & postural Drainage	IV fluids

0	1	2	3
Well informed	Some information	Little or no information	Unable to respond

ASSESSMENT OF COMPLEXITY AND FAMILIARITY WITH
PLAN OF CARE (continued)

Instructions for Familiarity Scale:

Mark the number that corresponds to the following code. If, however, the prescription is not included in the plan of care, disregard the familiarity scale.

0 = Well informed
1 = Some information
2 = Little or no information
3 = Unable to respond

23. Steroid therapy

Maintenance and tapered doses are oral. Maintenance steroids are constant doses administered QD or BID.

Familiarity

Can the patient explain the rationale for steroid therapy and identify what steroid therapy is currently prescribed?

24. Number of routine medications

Based on the number of different types of prescribed routine medications, not number of doses. Count all IV medications, like Aminophylline, but not inhaled bronchodilators.

Familiarity

Patient may refer to notes or handouts. Can the patient identify the names and purposes of all prescribed medications? If not, and the patient can provide the name or the purpose for all medications, mark 1. Medication names may be given so the patient can respond to purpose. If the patient cannot respond about all medications, mark 2 unless the patient is unable to respond.

ASSESSMENT OF COMPLEXITY AND FAMILIARITY WITH
PLAN OF CARE (continued)

23. Steroid therapy

0	1	2	3
Not applicable	Maintenance	Tapered	IV

0	1	2	3
Well informed	Some Information	Little or no information	Unable to respond

24. Number of routine medications prescribed

0	1	2	3
Not applicable	1-5	6-10	>10

0	1	2	3
Well informed	Some information	Little or no information	Unable to respond

ASSESSMENT OF COMPLEXITY AND FAMILIARITY WITH
PLAN OF CARE (continued)

Instructions for Familiarity Scale:

Mark the number that corresponds to the following code. If, however, the prescription is not included in the plan of care, disregard the familiarity scale.

0 = Well informed
1 = Some information
2 = Little or no information
3 = Unable to respond

25. Type of diet

Mark that part of the patient's diet associated with the highest number. If, for example, the patient receives a regular diet and enteral feedings, mark 3. Added snacks and/or supplements should be marked only if a requirement of nutritional plan.

Familiarity

Can the patient identify current nutritional plan and explain the purpose for the plan?

26. Percentage diet taken by mouth

Average the percent documented in the nursing notes since 3 P.M. yesterday. If documentation is unavailable, mark 0. Mark 4 if patient is receiving enteral feedings or total parenteral nutrition.

ASSESSMENT OF COMPLEXITY AND FAMILIARITY WITH PLAN OF CARE (continued)

25. Type of diet

0	1	2	3	4
Regular	Modified	Added snacks and/or supplements	Enteral feeding	Total par-enteral nutrition

0	1	2	3
Well informed	Some information	Little or no information	Unable to respond

26. Percentage diet taken by mouth

0	1	2	3	4
100%	75%	50%	25%	0

ASSESSMENT OF COMPLEXITY AND FAMILIARITY WITH
PLAN OF CARE (continued)

Instructions for Familiarity Scale:

Mark the number that corresponds to the following code. If, however, the prescription is not included in the plan of care, disregard the familiarity scale.

0 = Well informed
1 = Some information
2 = Little or no information
3 = Unable to respond

27. Cough retraining

Mark the number that best matches the patient's use of controlled cough technique. Mark 0 if the patient has no cough.

Familiarity

Can the patient explain why uncontrolled coughing is hazardous and describe or demonstrate a controlled coughing technique?

28. Breathing retraining

Mark the score that best describes the patient's use of pursed-lip breathing. Mark 0 if the patient does not require pursed-liped breathing to avoid dyspnea while performing activities of daily living and/or walking short distances.

Familiarity

Can the patient explain why pursed-lip breathing is beneficial and demonstrate pursed-lip breathing?

ASSESSMENT OF COMPLEXITY AND FAMILIARITY WITH PLAN OF CARE (continued)

27. Cough retraining

0	1	2	3
Not applicable	Independently uses controlled cough technique	Uses controlled cough with supervision	Difficulty in using controlled cough despite supervision

0	1	2	3
Well informed	Some information	Little or no information	Unable to respond

28. Breathing retraining

0	1	2	3
Not applicable	Independently uses pursed-lip breathing	Uses pursed-lip breathing with supervision	Difficulty in using pursed-lip breathing despite supervision

0	1	2	3
Well informed	Some information	Little or no information	Unable to respond

ASSESSMENT OF COMPLEXITY AND FAMILIARITY WITH
PLAN OF CARE (continued)

Instructions for Familiarity Scale:

Mark the number that corresponds to the following code. If, however, the prescription is not included in the plan of care, disregard the familiarity scale.

0 = Well informed
1 = Some information
2 = Little or no information
3 = Unable to respond

29. Energy conservation

Mark the score that best describes the patient's pacing of daily activities. Mark 0 if the patient does not need to pace activities of daily living and/or walking short distances to avoid dyspnea.

Familiarity

Can the patient describe the relationship between energy expenditure and the work of breathing? Can the patient identify how to pace activities to conserve energy?

30. Stress management

Mark the number that best describes the patient's use of relaxation to manage stress and avoid or minimize dyspnea. Mark 0 if stress management not required to avoid dyspnea to perform activities of daily living and/or walk short distances.

Familiarity

Can the patient explain the relationship between feeling stressed and ease of breathing? Can the patient identify one relaxation technique?

ASSESSMENT OF COMPLEXITY AND FAMILIARITY WITH
PLAN OF CARE (continued)

29. Energy conservation

0	1	2	3
Not applicable	Independently paces activity	Paces activity with supervision	Difficulty in pacing activity despite supervision

0	1	2	3
Well informed	Some information	Little or no information	Unable to respond

30. Stress management

0	1	2	3
Not applicable	Independently uses relaxation techniques	Uses relaxation techniques with supervision	Difficulty in using relaxation techniques despite supervision

0	1	2	3
Well informed	Some information	Little or no information	Unable to respond

ASSESSMENT OF COMPLEXITY AND FAMILIARITY WITH
PLAN OF CARE (continued)

Instructions for Familiarity Scale:

Mark the number that corresponds to the following code. If, however, the prescription is not included in the plan of care, disregard the familiarity scale.

0 = Well informed
1 = Some information
2 = Little or no information
3 = Unable to respond

31. General conditioning

Mark the number that best describes the patient's participation in physical exercise. Mark 0 if the patient's activity is restricted to resting in bed.

Familiarity

Can the patient explain how exercise can benefit his breathing and identify what current level of exercise is prescribed?

ASSESSMENT OF COMPLEXITY AND FAMILIARITY WITH PLAN OF CARE (continued)

31. General conditioning

0	1	2	3
Not applicable	Independently exercises	Exercises with supervision	Difficulty in exercising despite supervision

0	1	2	3
Well informed	Some information	Little or no information	Unable to respond

APPENDIX F

COMPLETION AND RETURN OF THIS QUESTIONNAIRE WILL BE CONSTRUED AS INFORMED CONSENT TO ACT AS A SUBJECT IN THIS STUDY

1. Basic nursing preparation (check one, please)

_____Diploma _____Baccalaureate degree

_____Associate degree

2. Highest nursing degree held (check one, please)

_____Diploma _____Baccalaureate degree

_____Associate degree _____Master's degree

3. Experience as a Registered Nurse

_____less then 2 years _____11-15 years
_____2-3 years _____16-20 years
_____4-5 years _____21 years or more
_____6-10 years

4. Current position (check one, please)

_____ Staff Nurse
_____ Level I Nurse
_____ Level II Nurse
_____ Level III Nurse
_____ Clinical Nurse Specialist
_____ Nurse Manager
_____

5. Major clinical teaching or practice area (check one, please)

_____ Critical Care
_____ Medical
_____ Surgical
_____

6. Sex: _____ Female _____ Male

7. Age: _____

APPENDIX G

The instructional slide-tape was researcher-designed.

Information regarding the slide-tape may be obtained from:

Cathleen L. Michaels, M.N., R.N.

National Commission on Nursing
Implementation Project

3401 S. 39th Street

Milwaukee, Wisconsin 53215

APPENDIX H

The simulated COPD patient videotapes are copyrighted by Dallas Area Hospital Television System and Cathleen L. Michaels, M.N., R.N. Information regarding the videotapes may be obtained from:

Dallas Area Hospital Television System
University of Texas Health Science Center
5323 Harry Hines Blvd.
Dallas, TX

APPENDIX I

The Medicus Patient Classification tool is copyrighted by Medicus Systems Corp. Information regarding the tool may be obtained from:

Medicus Systems Corp.
990 Grove Street
Evanston, Illinois 60201

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