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Reliability of Aukamp's Knowledge Scale for Diagnosing Knowledge Deficit of Third Trimester Pregnant Women

by

Susan J. Freeman

A Thesis
Submitted to the Faculty of
Mississippi University for Women
in Partial Fulfillment of the Requirements
for the Degree of Master of Science in Nursing
in the Division of Nursing
Mississippi University for Women

July 1989

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Reliability of Aukamp's Knowledge Scale
for Diagnosing Knowledge Deficit of
Third Trimester Pregnant Women

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Abstract

This methodological study addressed the question: What is the reliability of Aukamp's Knowledge Scale (1986) which is used in the identification of a defining characteristic for the nursing diagnosis of knowledge deficit among women in the third trimester of pregnancy? The purpose of this study was to add to the knowledge base for nursing diagnosis by ascertaining the reliability of an instrument to be used in the identification of a defining characteristic for the nursing diagnosis of knowledge deficit of women in the third trimester of pregnancy. This study was based on two conceptual frameworks: American Nurses' Association's Nursing: A Social Policy Statement and Aukamp's (1986) conceptual framework which included Rubin's (1984) theory for maternal identity and maternal experience. Aukamp's Knowledge Scale was a 14-item test based on the topics of common discomforts, nutrition and weight gain, length of pregnancy, complications of pregnancy, exercise, and fetal behaviors.

The Knowledge Scale was completed by 140 women who were 18 years or older and in their 30th to 37th week of pregnancy. Internal consistency reliability of the Knowledge Scale was ascertained by obtaining Cronbach's alpha

correlation coefficient. Childbirth Education Questions and selected demographic data were included in the study to determine if they had an effect on the Knowledge Scale score mean. In this study, a Cronbach's alpha of .4830 was obtained for Aukamp's Knowledge Scale. Childbirth Education classes, pregnancy risk status, and race had a significant effect ($p < .05$) on the Knowledge Scale score mean. Three conclusions are drawn: Aukamp's Knowledge Scale in its present form is not a reliable instrument to identify a defining characteristic for the nursing diagnosis of knowledge deficit in the third trimester of pregnancy; the Knowledge Scale should be lengthened, refined, and retested for validity and reliability; and childbirth education classes do provide relevant information for third trimester pregnant women.

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Chapter I

The Research Problem

Central to the development of a clinical science is the description of the phenomena of concern (Gordon & Sweeney, 1979).

> Nursing science is defined as a body of cumulative scientific knowledge, drawn from the physical, biological, and behavioral sciences, that is uniquely nursing. Fundamental to the development of a nursing science is the nurse's ability to make a nursing diagnosis. (Abdellah, 1969, p. 397)

Since nursing has been defined as the diagnosis and treatment of human responses to actual or potential health problems (Kelly, 1974), nursing science and nursing diagnoses are corequisites for the practice of nursing. This study was concerned with adding to the knowledge base for nursing diagnoses by determining the reliability of an instrument for a defining characteristic of knowledge deficit in third trimester pregnant women.

Introduction to the Problem

The concept of nursing diagnosis first appeared in nursing literature during the 1950s (Fry, 1953; Hornung, 1956; Johnson, 1959). Since then, it has been defined by

many nurses (Abdellah, 1957; Aspinall, 1976; Aukamp, 1984; Bircher, 1975; Carpenito, 1983; Chambers, 1962; McCain, 1965; Gebbie & Lavin, 1975; Gordon, 1976). Gordon (1976) defined the concept from three perspectives yielding conceptual, structural, and contextual definitions. The structural definition identified three essential components in a nursing diagnosis: the health problem (P), the etiological or related factors (E), and the defining characteristics or cluster of signs and symptoms (S). The components have been referred to as the PES format.

In a national study of the meaning of nursing diagnoses, Shoemaker (1984) found that nurses agreed on the following essential features:

> Nursing diagnosis is a clinical judgment about an individual, family, or community that is derived through a deliberate, systematic process of data collection and analysis. It provides the basis for prescriptions for definitive therapy for which the nurse is accountable. It is expressed concisely and includes the etiology of the condition when known. (p. 109)

No concerted effort for the identification of nursing diagnoses occurred for two decades following the introduction of the concept. With the formation of the National Conference Group for Classification of Nursing Diagnoses in 1973, the formal effort began to identify, develop, and classify nursing diagnoses (Gordon, 1982). The Group has since been renamed the North American Nursing Diagnosis Association (NANDA), and its purposes are to develop,

refine, and promote a taxonomy of nursing diagnostic terminology of general use to professional nurses (Kelly, 1985).

The first list of nursing diagnoses was published in 1975 (Gebbie & Lavin, 1975), and the list has been revised six times. Nursing diagnoses identified during the First National Conference on the Classification of Nursing Diagnoses in 1973 and continuing through the Fifth National Conference in 1982 were generated by the retrospective method. More specifically, these diagnoses were generated from past experiences with clients by a relatively small group of nurses. When a general consensus among the participants was reached, the diagnoses were placed on "the list" as being approved for clinical testing.

The identification of diagnostic labels along with proposed defining characteristics and etiologies should have been viewed only as hypotheses that required validation. However, a widespread misunderstanding emerged and nursing diagnoses were implemented in practice without having an established research base (Levin, Krainovitch, Bahrenburg, & Mitchell, 1989). At the Fifth National Conference, Gordon stated that the need for clinical validation of current nursing diagnoses is a most pressing issue for the next decade (Kim, McFarland, & McLane, 1984).

According to Gordon and Sweeney (1979), validation of a nursing diagnosis consists of providing evidence that the cluster of defining characteristics to which the label

refers actually occurs as an entity in clinical situations. As yet, few defining characteristics exist that nurses agree as commonly identifiable and suitable for labeling. Gathering evidence that nurses actually do identify common defining characteristics is the process of validation.

An important aspect of validation drawn from the research process was identified by Fehring (1987).

> In conducting studies, researchers often measure concepts or variables of an abstract nature. For the study to be scientifically sound, the tools to measure the variables of interest need to be valid and reliable. If the tools are not valid and reliable, then the study results would be suspect and the evidence generated would not hold up to criticism. A researcher cannot just assume that a tool is valid and reliable but must also provide evidence that can be understood by the scientific community. (p. 626)

Utilizing standardized methods of obtaining evidence for the reliability and validity of measurement instruments, then provides scientific confidence in the use of the instruments and in the results of the research study.

Gordon (1985) reviewed research on nursing diagnoses. Little research was found on the diagnostic process actually used by nurses. Also, the accurate, cross study summarizations of nursing diagnoses identified or validated in clinical settings were limited. According to Gordon, the refinement of diagnostic concepts, especially their defining characteristics, must assume the first priority of nurses.

Aukamp (1986) reviewed research done on nursing diagnoses for childbearing families. She found some nursing diagnoses formulated in conjunction with case studies (Ricketts & Roby, 1982) and a study which identified diagnostic labels for 189 childbearing families (Aukamp, 1984). Eleven of those nursing diagnoses were found to occur in the third trimester of pregnancy. Of these 11 nursing diagnoses, knowledge deficit and anxiety were the labels which occurred most frequently. Two of the nursing diagnoses during the third trimester had the causative factor of lack of knowledge that resulted in the nursing diagnosis of anxiety. Aukamp concluded that there was a lack of research related to the use of diagnostic labels with childbearing families and no apparent research on the validity and reliability of the use of nursing diagnoses.

Subsequently, Aukamp (1986) conducted an exploratory descriptive study to identify defining characteristics and contributing factors for the nursing diagnoses of anxiety and knowledge deficit in third trimester pregnant women. For the investigation concerning knowledge deficit, she developed a 14-item knowledge scale based on the topics of common discomforts, nutrition and weight gain, length of pregnancy, complications of pregnancy, exercise, and fetal behaviors (see Appendix A). The scale was used to obtain a measure of knowledge level. It was given to a sample population of 30 women, 18 years or older, in their 34th to 37th

weeks of pregnancy. Content and construct validity were obtained by the peer review process. The alpha coefficient for internal consistency, a measure of reliability, was calculated to be only 0.5498.

Purpose of the Study

Gordon (1987) has stated that there is a critical need to establish the degree of reliability and validity of each nursing diagnosis which is dependent on the data collection methods and tools. Therefore, the purpose of this study was to add to the knowledge base for nursing diagnosis by ascertaining the reliability of an instrument which is to be used in the identification of a defining characteristic for the nursing diagnosis of knowledge deficit in the third trimester of pregnancy.

Conceptual Framework

This study was based on a combination of two conceptual frameworks: (a) American Nurses' Association's Social Policy Statement (American Nurses' Association [ANA], 1980) and (b) Aukamp's (1986) conceptual framework which included Rubin's (1984) theory for maternal identity and maternal experience. An explanation of both frameworks in relation to this study is presented.

ANA's (1980) Social Policy Statement is

> . . . a statement affirming nursing's social responsibility, made in recognition of society's right to know how that responsibility is exercised

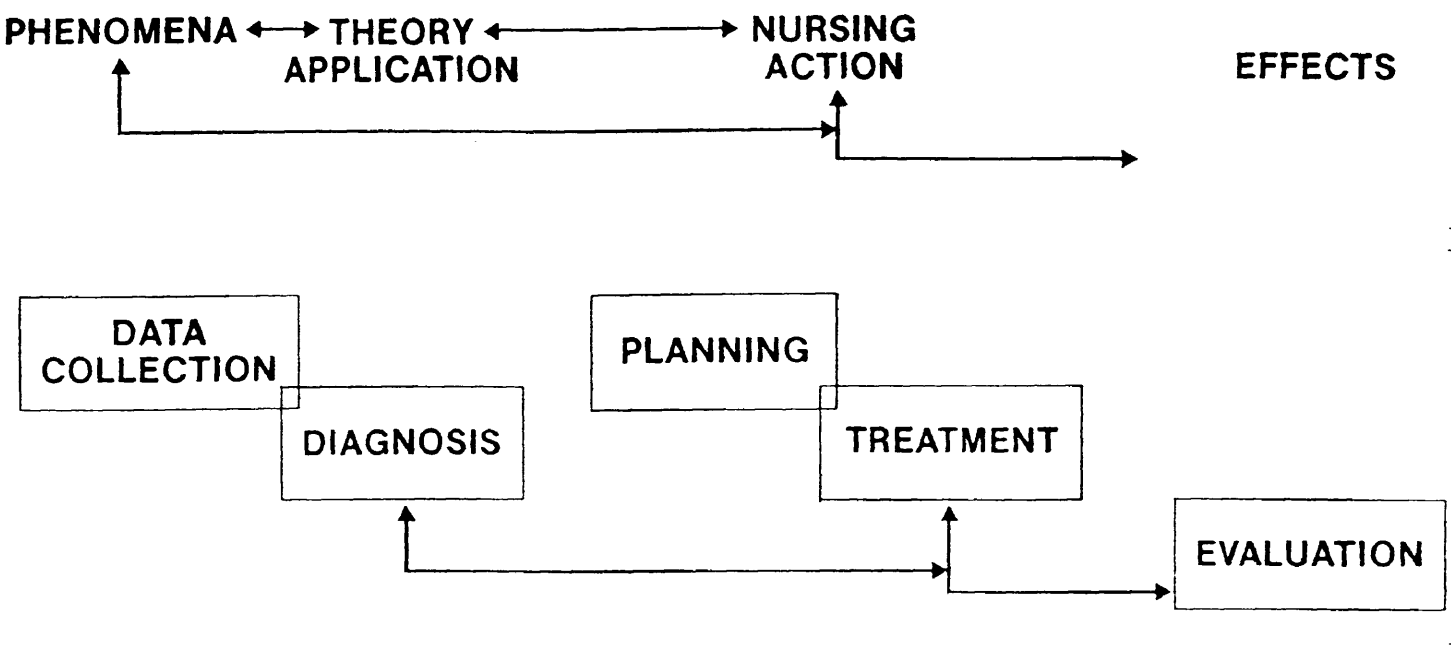
> in nursing practice . . . [and] providing a foundation that promotes unity in nursing in a basic and common approach to practice. (ANA, 1980, p. 1)

The statement presents a description of the nature and scope of nursing practice beginning with a definition of nursing. The definition presented has a historical orientation while also reflecting evolving nursing theory: "Nursing is the diagnosis and treatment of human responses to actual or potential health problems" (ANA, 1980, p. 9). This definition was based on four defining characteristics of nursing practice: phenomena, theory application, nursing action, and evaluation of effects of action in relation to phenomena. The defining characteristics of nursing practice in relation to the nursing process and some of the standards of nursing are depicted in Figure 1 (see Appendix B for reprint permission).

This study was primarily concerned with the first two defining characteristics of nursing practice, phenomena and theory application; the first two steps of the nursing process, data collection and diagnosis; and the first two standards of nursing practice.

> Phenomena: The phenomena of concern to nurses are human responses to actual or potential health problems. The nature of phenomena to which the actions of nurses are directed is ascertained by assessment in its various forms, such as observation, interviewing, measurement, and the like. Diagnosis is a beginning effort to objectify a perceived difficulty or need by naming it, as a basis for understanding and taking action to resolve the concern.

FIGURE 1. Defining Characteristics of Nursing Practice: Relationship to the Nursing Process and the Standards of Nursing Practice



DEFINING CHARACTERISTICS OF NURSING PRACTICE

NURSING PROCESS

STANDARDS OF NURSING PRACTICE

I. The collection of data about the health status of the client/patient is systematic and continuous. The data are accessible, communicated, and recorded.

II. Nursing diagnoses are derived from health status data.

III. The plan of nursing care includes goals derived from the nursing diagnoses.

IV. The plan of nursing care includes the priorities and the prescribed nursing approaches or measures to achieve the goals derived from the nursing diagnoses.

V. Nursing actions provide for client/patient participation and health promotion, maintenance, and restoration.

VI. Nursing actions assist the client/patient to maximize his health capabilities.

VII. The client's/patient's progress or lack of progress toward goal achievement is determined by the client/patient and the nurse.

VIII. The client's/patient's progress or lack of progress toward goal achievement directs reassessment, reordering of priorities, new goal setting, and revision of the plan of nursing care.

Note. From Nursing: A social policy statement (pp. 14-15) by American Nurses' Association, 1980, Kansas City, MO: American Nurses' Association. Copyright 1980 by ANA. Reprinted with permission.

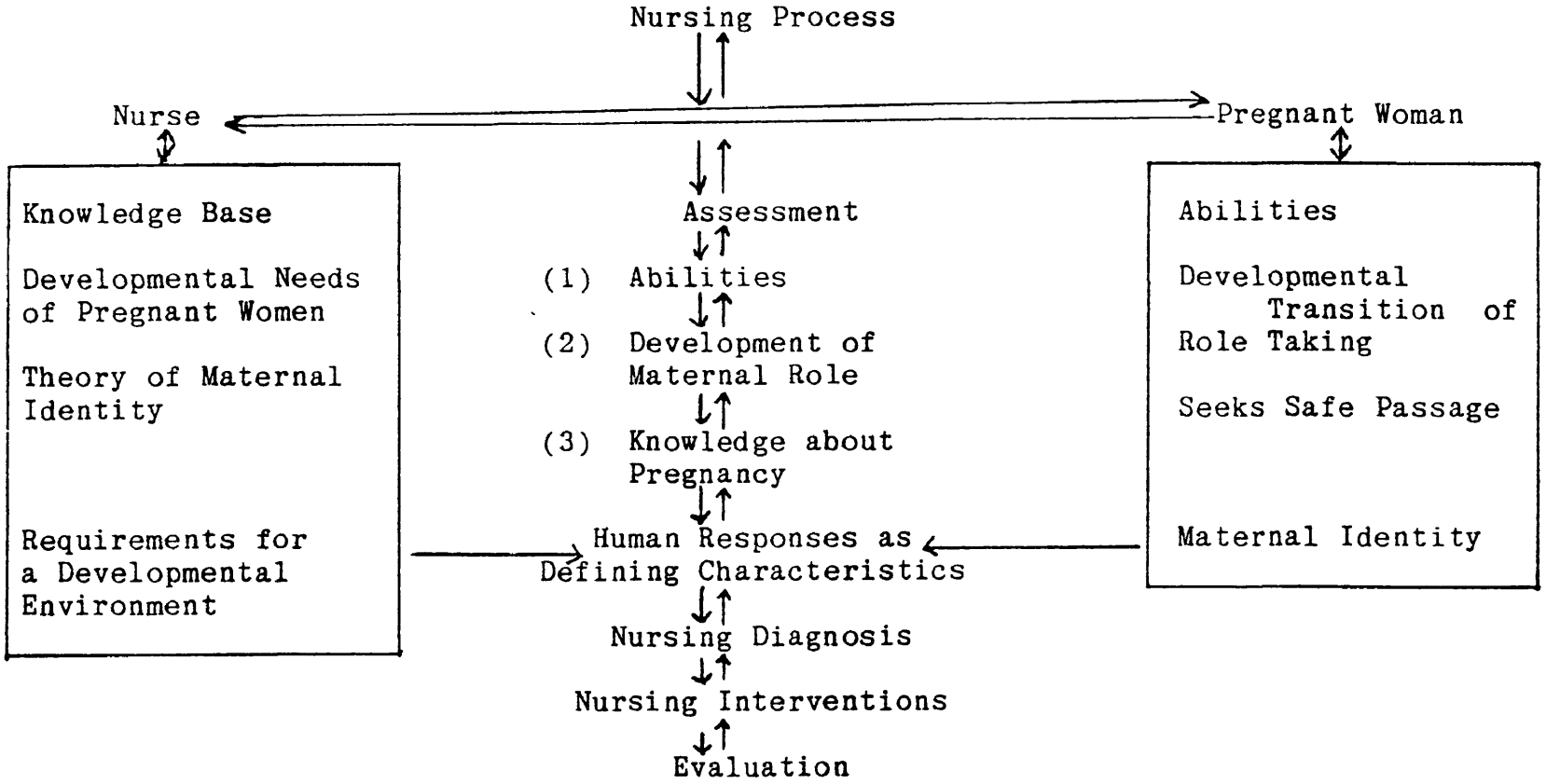
> Theory: Nurses use theory in the form of concepts, principles, process, and the like, to sharpen their observations and to understand the phenomena within the domain of nursing practice. Such understanding precedes and serves as a basis for determining nursing actions to be taken. (ANA, 1980, pp. 9-12)

The first two standards are relevant to the nursing process in that they describe valued and achievable conduct within nurse-client relationships.

Aukamp's (1986) conceptual framework included the defining characteristics of nursing practice and the nursing process in relation to the nurse and the pregnant woman. Rubin's (1984) theory of maternal identity provided the concepts of role taking, developmental transitions, and ending with a maternal identity. Seeking a safe passage for herself and her child causes the woman to decide to seek health care.

Aukamp (1986) suggested that nurses are uniquely concerned with the health care of pregnant women. The level of care provided is a reflection on how well the nursing process is utilized. Nurses who are skillful at assessment and diagnosis of their pregnant clients will provide a higher quality of care to their clients. Nurses need valid and reliable nursing diagnoses from which to draw. The framework for the study during which Aukamp developed the Knowledge Scale is illustrated in Figure 2 (see Appendix C for reprint permission).

Figure 2. Diagram of Aukamp's conceptual framework.



Note: From knowledge deficit and anxiety as nursing diagnoses in the third trimester of pregnancy: An exploratory study to identify the defining characteristics and contributing factors (p. 16) by Virginia Aukamp, 1986, Ann Arbor, Michigan: University Microfilms International Copyright 1986 by Aukamp, Virginia. Reprinted with permission.

Significance of the Study

This study of nursing diagnoses was a beginning effort in factor-isolating theory (Diers, 1979). Establishing the reliability of Aukamp's Knowledge Scale (1986) may provide confidence in the use of this tool for continuing research on the diagnosis of knowledge deficit in third trimester women. The results of this study may be used in a proposal for the acceptance of knowledge deficit in the third trimester of pregnancy as a nursing diagnosis by NANDA. Once the defining characteristic of "inaccurate performance on a test" can be validated through the use of this tool, the defining characteristic along with others could be used in nursing education to teach nursing diagnoses. This tool may also be used as an assessment tool in clinical practice indicating subject areas to be covered in a patient teaching plan.

Assumptions

The truths about this problem that were accepted without proof or verification were:

1. Nurses can utilize the diagnostic reasoning process (Carnevali, Mitchell, Woods, & Tanner, 1984) to determine nursing diagnoses for women in the third trimester of pregnancy.

2. Knowledge deficits of clients can be measured by nurses.

3. Development of reliable instruments is necessary and desirable.

Statement of the Problem

This study addressed the question: What is the reliability of Aukamp's Knowledge Scale which is used in the identification of a defining characteristic for the nursing diagnosis knowledge deficit for women in the third trimester of pregnancy?

Research Question

Is Aukamp's Knowledge Scale a reliable instrument for identifying a defining characteristic for the nursing diagnosis of knowledge deficit for women in the third trimester of pregnancy?

Definition of Terms

The following terms are critical to the understanding of the study and are therefore defined as follows:

Aukamp's Knowledge Scale is a device designed by Aukamp to assign a numerical score placing subjects along a continuum with respect to their awareness of facts regarding pregnancy. This 14-item scale was based on the topics of common discomforts, nutrition and weight gain, length of pregnancy, complications of pregnancy, exercise, and fetal behaviors (see Appendix A). Content and construct validity for this instrument were obtained through the peer review process.

Defining characteristics are signs and symptoms which permit discriminations between health problems and comprise the third component of a nursing diagnosis (Gordon, 1976). These characteristics are what the Social Policy Statement named human responses; they are behavioral cues (Barnard, 1984).

Nursing Diagnosis is a statement of actual or potential altered-health-related responses by individuals and families which can be influenced, improved, or alleviated by nursing interventions included in the domain of nursing science (Aukamp, 1984). The nursing diagnosis of concern to this study is knowledge deficit in the third trimester of pregnancy.

Reliability is the consistency, stability, and repeatability of a data collection instrument. Three methods of testing the reliability of research instruments are tests for stability, equivalence, and internal consistency. Reliability is necessary but not sufficient for validity. This study examined internal consistency, which refers to the extent to which all parts of the instrument measured the same concept (Brink & Wood, 1988).

Cronbach's alpha coefficient is the test most frequently used to establish internal consistency. Cronbach's alpha coefficient test was applied to Aukamp's Knowledge Scale. There is no standard for what a reliability coefficient should be. Furst (1985) suggested

that a good figure to use as a standard for a relatively important test is .90, with .80 as a minimum. A reliability coefficient of .80 or better was used as criterion for this scale.

Third trimester of pregnancy refers to the last three months of having a developing fetus in the human body after fertilization of the female egg by the male sperm (Olds, London, & Ladewig, 1984). In this study, the third trimester was limited to the 30th to 37th weeks of pregnancy.

Summary and Organization of the Study

This chapter presented the background of the problem and identified the purpose of the study. The conceptual framework was discussed. Assumptions underlying the design of the study were stated. The terms used within the study were defined theoretically and operationally.

The second chapter presents a review of selected literature related to the development of nursing knowledge in the area of nursing diagnosis. The areas reviewed include validation studies on instruments used for nursing diagnoses or defining characteristics, validation studies on defining characteristics for a nursing diagnosis, and validation studies on the nursing diagnosis of knowledge deficit. The design, methods, procedures for data collection, and instruments are explained in Chapter III. The results of the data analysis and interpretation of the

data are presented in Chapter IV. Results of the study are discussed, and recommendations for future studies are presented in Chapter V.

Chapter II

Review of the Literature

Selected literature related to the development of nursing knowledge in the area of nursing diagnosis published since NANDA's Fifth National Conference are reviewed in this chapter. The areas reviewed include validation studies on instruments used for nursing diagnoses or defining characteristics for a nursing diagnosis, validation studies on defining characteristics for a nursing diagnosis, and validation studies on the nursing diagnosis of knowledge deficit.

Instruments

No validation studies specifically for instruments for nursing diagnoses or defining characteristics were found. Researcher-developed instruments usually were tested as part of an overall study. The instrument discussion usually described in detail the method(s) employed to establish content or construct validity. The discussions, however, usually failed to provide strong evidence of instrument reliability. The following instrument development study presented at NANDA's Sixth Conference provided an example of

researchers failing to provide strong evidence of instrument reliability.

Lawson and Lackey (1986) developed an instrument to measure altered levels of awareness in significant others who have experienced psychological impact. The instrument was a 38-item, 4-point Likert-type scale. Content validity was established by the Q-sort method with a panel of experts, five professionals who have conducted research on altered levels of awareness. Reliability was established by the test-retest procedure. The instrument was completed twice by 30 persons who met the subject criteria for the study. The Pearson Product Moment Correlation obtained was 0.77. Also obtained was a coefficient alpha (or Cronbach's alpha) of 0.85. Although both calculations seemed to indicate a high degree of reliability, the number of subjects was insufficient. Polit and Hungler (1987) recommended a minimum sample size of 10 subjects for each item; therefore, a 38-item scale requires a minimum of 380 subjects.

Defining Characteristics

McLane and McShane (1986) reported an empirical validation study on the defining characteristics of constipation. Research on bowel elimination has been single-factor research focusing on inadequate fiber. The need for more accurate and reliable measures of constipation and the need for better explanations of the complex nature

of constipation were identified. The purposes of the study were to provide empirical support for the list of defining characteristics for constipation and to identify the etiologies of constipation from the perspective of the client. A researcher-designed questionnaire was used to conduct a survey of three groups of healthy individuals. The sample was composed of 300 individuals: 100 older adults, 100 middle-aged adults, and 100 adolescents. Description of the instrument, Health Practices Tool: Elimination: Client Perspective, was not provided. Construct validity was established as part of a qualitative study of healthy older adults who reported constipation. Content validity was established through a systematic review of the literature and a panel of experts. Although instrument reliability may have been tested in a previous study, no information on reliability was provided in this report. This study identified 22 defining characteristics and reported 10 etiological factors for constipation.

Riordan (1987) reported a validation study on the defining characteristics of the nursing diagnosis, "alteration in comfort: pain." The implication was that nurses do not have a reliable or valid method to gather and process the data related to using scientific knowledge to diagnose the problem. The purposes of the study were to: (a) identify the cues utilized by nurses in making the diagnosis of "alteration in comfort: acute pain," (b) identify the

cues utilized by nurses in making the diagnosis of "alteration in comfort: chronic pain," and (c) identify cues common to both categories of pain. A convenience sample of 86 registered nurses familiar with nursing diagnoses was utilized. The survey questionnaire, Alteration in Comfort: Pain Checklist, was modified from a graphic rating scale developed by another researcher. In the initial study, before modification, Cronbach's alpha was 0.740. In this study, Cronbach's alpha was 0.9779. The modified questionnaire consisted of two lists of the same 53 cues. The first list was categorized under acute pain, and the second list was categorized under chronic pain. For each cue, a percentage range was given indicating how often a cue was used in arriving at the diagnosis of "alteration in comfort: pain." Only one cue was reported as used in diagnosing acute pain, nearly always (80-100%) by over 75% of the subjects. One additional cue was utilized by more than 50% of the subjects in the same category. No chronic pain cue was reported as utilized by more than 75% of the respondents in the nearly always category. One cue was utilized by over 50% of the sample in the nearly always category for chronic pain. No cue was reported as used nearly always in diagnosing acute or chronic pain by 90% of the sample. This lends further support to McCaffery (1972), who defined pain as being what that patient says it is and exists whenever the patient says it does.

Baas, Allen, Sommers, and Beiting (1987) reported on the predictability of clinical indicators of infection. The problem area for this study was the lack of validation for the predictive value of traditional clinical indicators for infection, such as redness, tenderness, or presence of drainage. The purpose of this study was to validate the predictability of clinical indicators of infection in patients with invasive arterial and/or pulmonary arterial catheters. Ninety patients requiring hemodynamic monitoring in a medical and cardiac intensive care unit of a 600-bed teaching hospital over a 6-month period were studied.

Multiple methods of data collection were used. Chart review provided the highest daily body temperature and white blood cell counts (WBC). Inspection was made daily of the catheter insertion site for redness, tenderness, or the presence of drainage. Cultures of the tip and the inter-dermal segment of the catheter were obtained when the monitoring device was no longer required. A colony count of 15 or greater confirmed infection. The growth of the same bacteria on a catheter segment and on blood culture confirmed catheter-induced bacteremia.

A contingency table was developed. Vertically listed were the seven clinical indicators of redness, tenderness, drainage, temperature greater than 101.3 °F, WBC greater than 12.5, WBC less than 4.0, and [coexisting] drainage, tenderness, and redness. Horizontally listed were the

categories of true positive, false positive, false negative, true negative, sensitivity, specificity, and Bayes Probability.

Although the sample size was more than minimal, no reliability or validity information was provided for the various biophysical instruments used in the study. None of the clinical indicators dramatically increased the probability that the patient had an infection. The two best indicators were a WBC of less than 4.0 (thousand/ml^3) and the joint occurrence of drainage, tenderness, and redness.

Spilker and Semonin-Holleran (1987) reported on the use of a stroke scale to validate defining characteristics for the nursing diagnosis of "injury, potential for, related to sensory, or motor deficits." The purpose of this study was to validate the ability of the Cincinnati Stroke Scale (CSS) to measure defining characteristics of the nursing diagnosis of "injury, potential for, related to motor/sensory deficits from stroke." Thirty stroke patients were assessed with the Cincinnati Stroke Scale. Each patient was assessed a total of 10 times over a 3-month period. The 16-item CSS included a modified Glasgow Coma Scale, a partial cranial nerve exam, a motor exam, a sensory exam, an ataxia assessment, and a language assessment. No information concerning validity or reliability of the instrument was provided. No statistical data was provided in this report that supported the author's results.

Rossi, Fitzmaurice, Glynn, and Connors (1987) reported on the validation of the defining characteristics for "sleep pattern disturbance." The purpose of the study was to examine the incidence and nature of the nursing diagnosis, "sleep pattern disturbance in cardiac patients." The convenience sample consisted of 43 subjects hospitalized in a progressive coronary care unit. The subjects participated in a 45-minute structured interview designed to elicit information on the defining characteristics and etiologies of sleep pattern disturbance. Since the interview schedule was not described, it was not possible to determine if the sample size was adequate. Ninety-one percent of the subjects described a disturbance in sleep. An interrupted sleep pattern occurred among 85% of the subjects, difficulty falling asleep among 82%, not feeling well rested among 28%, and early awakening among 25%. Ninety-two of the 91% subjects presented with two or more of the above sleep pattern disturbances.

Knowledge Deficit

Pokorny (1986) studied the defining characteristics of the nursing diagnosis of "knowledge deficit." Although not a validation study, it was a descriptive study designed to identify the defining characteristics documented by nurses to support this nursing diagnosis. The random sample consisted of 120 discharged patient charts on which the diagnosis of "knowledge deficit" had been made. Data were

collected via retrospective chart review. The instrument for this study was designed in an unpublished master's thesis (Pokorny, 1984). The defining characteristics proposed by NANDA and Gordon (1982) were included in the instrument and were noted as absent or present. Space was provided to note any additional defining characteristics that were documented by the nurse. Content validity was established by a panel of nurse researchers. No information on the reliability of the instrument was provided. The verbalized statement of inadequate knowledge was the defining characteristic found most often (25% of all cases reviewed and in 60.8% of those cases in which any defining characteristic was given). No critical defining characteristics were found.

Copeland-Owen et al. (1987) reported on validation of the nursing diagnosis "knowledge deficit: restorative measures." The purpose of the study was to validate the defining characteristics and etiologies for this diagnosis with four chronically ill populations--persons with diabetes, peripheral vascular disease, cardiac disease, and renal disease. A convenience sample of 69 subjects in seven different agencies was collected. A short, objective questionnaire was used to address four specific defining characteristics and five corresponding etiologies. No reliability measures were established for the instrument. Face and content validity were established by literature

validation and content experts' reviews. In general, the four defining characteristics studied were found to be valid to support the diagnosis of "knowledge deficit: restorative measures" in the four chronically ill groups of subjects studied.

Aukamp (1986) studied knowledge deficit in third trimester pregnant women. This study was a descriptive study to identify the defining characteristics and contributing factors of knowledge deficit in the third trimester of pregnancy. Two samples were utilized. Sample one consisted of 30 pregnant women in the third trimester of pregnancy, and sample two consisted of 30 maternity nurses drawn from the membership of NANDA. A 14-item questionnaire developed by the researcher was given to the pregnant women during a structured interview. Content and construct validity were obtained by the peer review process. The Cronbach's alpha coefficient was 0.5498. The identified defining characteristics of "knowledge deficit" among pregnant women were verbalization of the problem and inaccurate performance on a test. These characteristics were identified by the pregnant women and then validated by maternity nurses. Five contributing factors were identified: lack of recall, information misinterpretation, lack of interest in learning, unfamiliarity with information resources, and cognitive limitations.

In summary, this chapter provided a review of the literature which was concerned with validation studies of the instruments used for defining characteristics of a nursing diagnosis or defining characteristics for a nursing diagnosis and the nursing diagnosis of knowledge deficit. This information emphasizes the continuing need for additional research in the area of instrument reliability and the continuing need for adequately sized samples.

Chapter III

The Design

The purpose of this study was to add to the knowledge base for nursing diagnoses by ascertaining the reliability of Aukamp's Knowledge Scale (1986), an instrument to be used in the identification of a defining characteristic for the nursing diagnosis of knowledge deficit in the third trimester of pregnancy.

Design of the Study

This was a quantitative, methodological study. A methodological study is used to addressed the development, validation, or evaluation of a research tool used to collect data about the phenomena of interest. Studies of a methodological nature are indispensable in any scientific discipline because it is virtually impossible to conduct outstanding and meaningful research with inadequate research instruments. An ideal research instrument is one that results in measures that are relevant, accurate, unbiased, sensitive, unidimensional, and efficient (Polit & Hungler, 1987). This methodological study addressed accuracy of a research instrument by investigating the question, "Is Aukamp's Knowledge Scale a reliable instrument for

identifying a defining characteristic for the nursing diagnosis of knowledge deficit for women in the third trimester of pregnancy?"

Only one threat of internal or external validity existed. The threat of history to the internal validity existed in the form of women who had participated or were participating in childbirth education classes. The Childbirth Education Question form (see Appendix D) was included in the participant package so that those who had taken classes could be compared with those who had not taken classes.

The weakness in this study was that the subjects had to be able to read. Since each subject was not tested individually for reading skills, the researcher had to depend on the staff members of the clinics to identify those women who could not read. The nurses in the clinics where data were collected do test the patients' reading abilities. This is done so that the nurses would know if they can send postcard messages to the patients' during their prenatal care. Any questionnaires that had been completed by a woman who had been identified as "unable to read" were not used in this study.

Setting, Population, and Sample

The sample of convenience consisted of 140 pregnant women in the third trimester of pregnancy in a seven-county area of Northeast Mississippi. The minimum sample size of

140 was based on the recommendation by Polit and Hungler (1987) of 10 subjects per item, and the Knowledge Scale consisted of 14 items. All subjects, including those receiving Medicaid benefits, were receiving prenatal care in private obstetrical clinics. The criteria for selection mandated that the women were 18 years or older and were in their 30th to 37th week of pregnancy.

This study was approved by the Committee on Use of Human Subjects in Experimentation at Mississippi University for Women prior to commencement of data collection (see Appendix E for letter of approval). The consents, which were the only documents with both the participant's name and code number, were kept secure by the researcher. The participants returned all forms in a sealable manila envelope. Demographic data were collected by the researcher only after the consent to participate was signed and dated.

Instruments for Data Collection

All of the instruments used in data collection are presented in this section. A description of the instruments used for the study is followed by the procedures performed and the methods used for data analysis. Most of the instruments utilized for data collection were in the participant packets. Along with the sealable manila envelope and one pencil imprinted with "Mississippi University for Women," the participant packets consisted of the following items:

Directions. The one-page of Directions were researcher-designed to be easily understood by the participants (see Appendix F).

Consent Form. The Consent Form was a modification of Aukamp's Consent Form for Pregnant Women (see Appendix G). Two copies were included, one to be returned and one for the participant to keep.

Childbirth Education Questions. The page of Childbirth Education Questions (see Appendix D) was included separately so they would not be overlooked on the Consent Form or modify the Knowledge Scale.

Aukamp's Knowledge Scale. The Knowledge Scale (see Appendix A) was designed by Aukamp (1986) to obtain a measure of the pregnant woman's knowledge, or lack thereof, during the third trimester of pregnancy. This 14-item scale was based on the topics of common discomforts, nutrition and weight gain, length of pregnancy, complications of pregnancy, exercise, and fetal behaviors. These topics were suggested in maternity textbooks as topics for patient teaching during the third trimester of pregnancy. Content and construct validity for this instrument were obtained through a peer review process. All items were close-ended statements with three choices: True, False, and Don't know. All responses of Don't know were scored as incorrect.

Demographic Data with Risk Factors. The Demographic Data with Risk Factors (see Appendix H) instrument was the

one instrument not included in the participant packets. This instrument was initially developed by Aukamp (1986) for use during a structured interview. The demographic part of the instrument was modified by this researcher so the information could be obtained from patient charts. The 13-risk factor items were drawn from an instrument developed by Hobel, Huvarinen, Okada, and Oh (1973). Each item was determined from the literature and clinical practice to be highly correlated with pregnancy outcomes. The 13 selected items were submitted to five maternity nurses for review. The nurses rated the items on whether or not the items indicated potential risks in pregnancy. All items were judged appropriate by the nurses. Reliability and validity were not calculated on this instrument as it was only used for description of the sample. Scoring of the items was done using Hobel et al.'s method. A score of 0 was assigned if the factor was not present. A score of 9 or less indicated the low-risk group, and 10 or over indicated the high-risk group.

Procedures

Thirteen obstetricians in the seven-county area were contacted to explain the study and employ their assistance in the study (see Appendix I). The researcher personally met with each of the physicians or their designated representative to complete the Memorandum of Agreement (see Appendix J). Potential participants, those pregnant women

in their 30th to 37th week of pregnancy, were identified from Estimated Date of Confinement (EDC) calendar lists maintained by the office staff. Participant packets were placed in the charts and collected from the charts from April 19, 1989, through June 21, 1989.

As the participant packets were returned, they were checked for completion of the Consent Forms, the Knowledge Scale, and the Childbirth Education Questions. If all were completed, the potential participant's age and the week of pregnancy during instrument completion were checked. The week of pregnancy was checked against EDC and sonogram date, if available, and the date on the Consent Form. Any responses by potential participants who were not 18 years of age or not within the 30th to 37th week of pregnancy were not included in the study. All responses by pregnant women 18 years or older and 30 to 37 weeks pregnant then were placed on the coding form.

Methods of Data Analysis

All data were coded as they were collected. Data processing was done through a statistical consultant.

Demographic data. The Demographic Data with Risk Factors form was utilized to identify the characteristics of pregnant women in the sample. Descriptive statistics were used to describe variables of interest within the sample. The Childbirth Education Question responses were placed into four possible categories of childbirth education: (a)

Never, (b) Before, (c) Now, and (d) Both before and now. To determine the effect of classes on the overall test score, analysis of variance (ANOVA) was used. ANOVA is an inferential statistical procedure used to compare three or more groups in terms of mean scores (Huck, Cormier, & Bounds, 1974).

Fischer's least significant difference (LSD) was used to identify the exact location of the significant differences among the groups. Fischer's LSD multiple comparison post hoc procedure was applied to the data for Childbirth Education categories and their Knowledge Scale score mean. This test was used to adjust the level of significance to reduce the influence of chance due to having more than just one comparison and to find a significant difference between two means that are relatively close together. This procedure analyzed each possible pair of means to determine if the two means were significantly different from one another (Huck et al., 1974).

Aukamp's Knowledge Scale. This study examined the internal consistency reliability of the Knowledge Scale. Internal consistency refers to the extent to which all parts of the instrument measured the same concept (Brink & Wood, 1988). The statistical methods to test internal consistency are based on the idea of split-half correlations. The scores on one half of a subject's responses are compared to scores on the other half. To provide a good measure of

reliability in an unbiased manner, random division of the halves is employed (Brink & Wood, 1988). Cronbach's alpha coefficient (1970) is the statistical test most frequently employed for this purpose. Internal consistency reliability (Cronbach's alpha) for Aukamp's Knowledge Scale was determined with SPSS subprogram RELIABILITY.

Chapter IV

The Findings

Analyses of the data from the study are presented in this chapter. The sample is described first, followed by a presentation of the research question and additional findings.

Description of the Sample

One-hundred eighty participant packages were distributed over the 2-month period. The number of women choosing not to participate totaled 19. Three packets were not returned by the end of data collection; investigation revealed these women had had miscarriages and their names had not been removed from the EDC calendar list. The sample selection criteria was not met by 18 respondents: 13 were under 18 years of age and 5 were identified as "unable to read." Therefore, the recommended sample size of 140 subjects was met.

Data were collected on 10 demographic variables. The age range of the women in the sample was from 18 to 40 years of age, with a mean age of 25.6 years. Seventy-eight subjects or 55.7% of the sample were White. Sixty-two subjects or 44.3% of the sample were Nonwhite. The sample

was further described in relation to frequencies and percentages for marital status, gravida, preterm infants, abortions, living children, pregnancy risk groups, race, and childbirth education classes in Table 1.

The responses of the 140 third trimester pregnant women on the 14-item Knowledge Scale ranged from 5 to 14 items correct. The total score mean was 10.5357 with a standard deviation of 1.7768. Of the 14 items, question 7 was most frequently missed (76.4%) while question 14 was answered correctly by all 140 women.

Results of Data Analysis

The purpose of this study was to add to the knowledge base for nursing diagnosis by ascertaining the reliability of an instrument which is to be used in the identification of a defining characteristic for the nursing diagnosis of knowledge deficit in the third trimester of pregnancy. Thus, this study addressed the following research question: Is Aukamp's Knowledge Scale a reliable instrument for identifying a defining characteristic for the nursing diagnosis of knowledge deficit in the third trimester of pregnancy?

Internal consistency reliability of this instrument was calculated by obtaining the correlation coefficient (Cronbach's alpha) which analyzes the extent to which all parts of the instrument measured the same concept. The a priori Cronbach's alpha was determined as 0.80 or better.

Table 1

Distribution of Sample Characteristics of Third Trimester Pregnant Women by Frequency and Percent

Characteristic	Frequency	Percent
Marital Status		
Single	44	31.4
Married	88	62.9
Widowed	3	2.1
Divorced	5	3.6
Gravida		
1	52	37.1
2	32	22.9
3	35	25.0
4	13	9.3
5	4	2.9
6	2	1.4
7	1	0.7
13	1	0.7
Preterm Infants		
0	129	92.1
1	10	7.1
2	1	0.7
Abortions		
0	115	82.1
1	20	14.3
2	3	2.1
3	1	0.7
4	1	0.7
Living Children		
0	51	40.7
1	41	29.3
2	33	23.6
3	5	3.6
4	2	1.4
5	1	0.7
11	1	0.7
Pregnancy Risk Groups		
Low	41	29.3
High	99	70.7
Race		
White	78	55.7
Nonwhite	62	44.4
Childbirth Education		
Yes	28	20.0
No	112	80.0

Note. N = 140.

As reported in Table 2, the Cronbach's alpha for Aukamp's Knowledge Scale obtained from this study was 0.4830. Under these conditions of measurement, the scale was judged to be an unreliable instrument for the identification of a defining characteristic for the nursing diagnosis of knowledge deficit in the third trimester of pregnancy.

Other Findings

A one-way analysis of variance (ANOVA) was used to analyze the data for childbirth education categories and their mean Knowledge Scale score mean. Significant differences occurring among the categories were demonstrated in Table 3.

The ANOVA only showed that there were differences between or among the categories (F = 7.6743, df = 3/136, $p < .05$). Fischer's LSD showed that the "Never" group (M = 10.1100) was significantly different from the "Both" category (M = 11.5000), the "Now" category (M = 11.5882), and the "Before" category (M = 11.6471). However, the three categories of "Both," "Now," and "Before" were not significantly different from each other.

Data were collected on the women attending or having attended childbirth education classes. Twenty-eight of the pregnant women in the sample had taken some childbirth education classes. Further description of the childbirth

Table 2

Reliability of Aukamp's Knowledge Scale (1986) for Third Trimester Pregnant Women Using Cronbach's Alpha Coefficient

Question	M	SD	Variance
1	0.7071	0.4567	0.2085
2	0.3929	0.4901	0.2401
3	0.9929	0.0845	0.0071
4	0.9429	0.2329	0.0542
5	0.9429	0.2329	0.0542
6	0.9286	0.2585	0.0668
7	0.2357	0.4260	0.1814
8	0.8286	0.3782	0.1430
9	0.8786	0.3278	0.1074
10	0.8143	0.3903	0.1523
11	0.4500	0.4993	0.2493
12	0.4571	0.4999	0.2499
13	0.9643	0.1862	0.0346
14*	1.0000	0.0000	0.0000
Total	10.5357	1.7768	3.1570

Note. N = 140. Cronbach's alpha = 0.4830.

*Question 14 has no variance and therefore is excluded in the calculation of Cronbach's alpha.

Table 3

ANOVA Summary Table for Childbirth Education Categories and Aukamp's Knowledge Scale

Source of Variation	df	SS	MS	F
Between groups	3	63.5314	21.1771	7.6743*
Within groups	136	375.2900	2.7595	
Total	139	438.8214		

*$p < .05$.

Education Categories is provided in Table 4. In each category, the greater percentage of women having taken childbirth education classes was White. The category "Never" had the lowest Knowledge Scale score mean.

The high and low pregnancy risk groups in relation to the Knowledge Scale score mean were significantly different from each other [$F(1, 138) = 8.4115$, $p = .0043$]. The two racial groups in relation to the Knowledge Scale score mean also were significantly different from each other [$F(1, 138) = 28.8754$, $p = .0000$]. These differences were demonstrated in Table 5.

The Knowledge Scale score mean was not significantly affected by the number of pregnancies [$F(7, 132) = 1.5732$, $p = .1487$]. ANOVA was not done for the other demographic variables.

Table 4

Childbirth Education Categories with Racial Composition and Knowledge Scale Score Means of Third Trimester Pregnant Women

Childbirth Education Category	f		Percent		Knowledge Scale Score	
	White	Nonwhite	White	Nonwhite	*M*	*SD*
Never	55	45	55	45	10.1100	1.8307
Before	17	0	100	0	11.6471	1.2217
Now	12	5	71	29	11.5882	1.0037
Both (before and now)	4	2	67	33	11.5000	.8367
Total	88	52	63	37	10.5357	1.7768

Note. *N* = 140.

Table 5

Summaries for Childbirth Education Categories and Race and Risk for Third Trimester Pregnant Women Using ANOVA

	f	Mean Scale Score	Mean Score Between Groups	Mean Score Within Groups	*F*	*p**
Race						
Combined	140	10.5357	75.9319**	2.6296***	8.8754	.0000
Nonwhites	62	9.7097				
Whites	78	11.1923				
Risk						
Combined	140	10.5357	25.2107**	2.9972***	8.4115	.0043
Low	41	11.1951				
High	99	10.2626				

*$p < .05$. **$df = 1$. ***$df = 138$.

Summary

The most important finding of the data analyses was a Cronbach's alpha of .4830 for Aukamp's Knowledge Scale. Another finding of interest was the childbirth education classes had a significant effect on the Knowledge Scale score mean. The Knowledge Scale score mean was also significantly affected by risk and race, but not by number of pregnancies. These findings will be discussed in the final chapter.

Chapter V

The Outcomes

Cronbach's alpha was the statistical measure used in this methodological study to test the reliability of Aukamp's Knowledge Scale (1986). The recommended sample size of 140 participants was met. A discussion of the findings is presented in this chapter.

Discussion

Aukamp's Knowledge Scale. In this study, the Cronbach's alpha obtained for Aukamp's Knowledge Scale was .4830. In Aukamp's original study, the Cronbach's alpha for the scale was .5498. The difference between the two Cronbach's alpha may be due to the differences in sample size and composition. Selected sample population characteristics from these two studies are compared in Table 6.

The low level of reliability of this instrument may be attributed to its length. The Knowledge Scale has only 14 items covering the six topics of common discomforts, nutrition and weight gain, length of pregnancy, complications of pregnancy, exercise, and fetal behaviors. Kerlinger (1964) stated that one method for increasing the reliability of a test was by lengthening the test with items

Table 6

Comparison of Selected Sample Characteristics of Third Trimester Pregnant Women

		Race (%)		Pregnancy Risk	
Study	N	White	Nonwhite	Low	High
Aukamp (1986)	30	90	10	50	50
Freeman (1989)	140	51	49	29	71

of equal kind and quality. Furst (1985) recommended using the Spearman-Brown prophecy formula to obtain an estimate of the length for a desired reliability. The formula is:

$$n = \frac{R\ (1-r)}{r\ (1-R)}$$

where n = number of times test is to be lengthened,

r = original reliability coefficient, and

R = desired reliability coefficient.

Inserting the values of .4830 and .80 for r and R, respectively, yielded $\underline{n}$ = 4.33. The number of items on the scale (14) is then multiplied by the n value. Thus, the test would need approximately 61 total items, an addition of 47 items. Addition of more items on the same topics may also increase the item-total correlation of the original 14 items (Furst, 1985).

Increasing the length of the Knowledge Scale to 61 items may increase nonparticipation by pregnant women because of the length of time required to take the test. The Knowledge Scale then would not be efficient. One aspect of efficiency is the number of items incorporated in the instrument. Application of the Spearman-Brown formula allows calculation of the number of necessary items for a comparable level of reliability and validity (Polit & Hungler, 1987). The formula is:

$$r^1 = \frac{kr}{1+ ([k-1]r)}$$

Where k is the factor by which the instrument is being decreased. Decreasing the scale to 50 items would yield a reliability coefficient of 0.78. This reliability is comparable to the desired level of 0.80.

Demographic characteristics and Aukamp's Knowledge Scale. Childbirth education significantly increasing the total score mean on the scale is very interesting. This phenomenon may be explained by the fact that the questions on the scale were based on the topics suggested in maternity textbooks for patient teaching during the third trimester of pregnancy and were similar to the content of the childbirth education course.

When considering the effect of pregnancy risk on the total Knowledge Scale score mean. The low risk group had the significantly higher score. This difference may be partially explained by two factors. First, the clinics used

the standardized Hollister forms for initial and ongoing risk assessment of pregnant women. These risk factors were different than those used in this study. The greatest difference was the risk assessment used in this study automatically placed the women receiving Medicaid in the high risk category. The second factor may be composition of the low risk group with regard to childbirth education. Nineteen of the 28 women (68%) who had taken these classes at some time were in the low risk group.

Race also significantly affected the total Knowledge Scale score. This difference may also be explained by the composition of the White group with regard to childbirth education classes. Twenty-one of the 28 women (75%) who had taken classes at some time were White.

The total Knowledge Scale score was not affected by the number of previous pregnancies. No explanation for this phenomenon exists. Further research in collaboration with Aukamp is recommended.

Conceptual framework. The conceptual framework for this study was based on ANA's Social Policy Statement (1980 and Aukamp's (1986) conceptual framework which included Rubin's (1984) theory of maternal identity. The Social Policy Statement is concerned with "providing a foundation that promotes unity in nursing" (ANA, 1980, p. 1). Nursing diagnosis is an attempt at such unification. This study, though not affirming the reliability of Aukamp's instrument,

does contribute to available information related to the focal nursing diagnoses. Use of valid nursing diagnoses contributes to quality clinical practice. In maternity nursing, Rubin (1984) considered a reason for pregnant women seeking health care is to have a safe passage for herself and her child. The nurse's responsibilities then include, but are not limited to, assessment and diagnosis of the woman's responses to her health problem(s). This responsibility provided the impetus for ascertaining the reliability of Aukamp's Knowledge Scale (1986). In its present form, the scale was judged to be unreliable. As a result of this finding, this author recommends the use of this framework to further refine and retest Aukamp's Knowledge Scale.

Conclusions

Three conclusions are drawn from this study. First, Aukamp's Knowledge Scale in its present form is not a reliable instrument to identify a defining characteristic for the nursing diagnosis of knowledge deficit in the third trimester of pregnancy. Second, the Knowledge Scale should be lengthened to at least 50 items, refined, and retested for validity and reliability. Third, childbirth education classes do provide relevant information for the third trimester pregnant woman.

Implications for Nursing

Nursing theory and research. Nursing research seeks to answer four levels of questions. The nature of the question determines the research design and results in a level of theory. Studies such as these may be considered as contributing to the body of nursing knowledge at a basic level or factor-isolating theory (Diers, 1979). Continued research at this level is necessary to delineate and validate nursing diagnoses and their defining characteristics. Methodological studies are an example of the basic type of question and answer. Nursing diagnosis and the related taxonomy development offers ample opportunity for basic research and theory development. Description of a nursing diagnosis and associated characteristics was a goal of Aukamp's (1986) research and her researcher-designed Knowledge Scale. Aukamp identified "inaccurate performance on a test" as a defining characteristic for the diagnosis of Knowledge Deficit among women in third trimester pregnancy. The results of this study did little to strengthen a proposal for the acceptance of knowledge deficit in the third trimester of pregnancy as a nursing diagnosis by NANDA. In its present form, the instrument is not useful as a research instrument for the validation of the defining characteristics of "inaccurate performance on a test."

Nursing education. Aukamp's Knowledge Scale, in its present form, should not be used in teaching nursing

diagnoses unless it can be used to teach the validation process for nursing diagnoses. The Knowledge Scale also could be used in nursing education as part of instrument refinement instruction or retested as part of nursing research at the graduate level.

Clinical practice. Nurses need reliable assessment instruments in clinical practice to provide a high quality of care. Until this instrument is modified, its use in clinical practice for assessment of pregnant women's level of knowledge of pregnancy is not recommended. However, a nurse clinician with a maternal-child health practice in a primary care setting, and, perhaps, in collaboration with Aukamp, would be in an excellent position to refine and retest the Knowledge Scale.

Recommendations for Future Research

The importance of methodological studies in nursing needs continuing emphasis. Instruments used in nursing research must be reliable and valid in order for nursing to build a scientific knowledge base. Continued instruction in the area of instrument development and refinement and reliability testing is recommended, especially in graduate programs for advanced nursing practice. Focus on nursing research to establish the reliability and validity of research instruments is essential for the progress of nursing science.

Nurses need valid and reliable assessment tools to make diagnostic decisions. The lengthening of and the retesting for validity and reliability of Aukamp's Knowledge Scale is recommended before it is used for teaching/learning nursing diagnosis or for assessment of pregnant women in clinical practice. Lengthening the Knowledge Scale would require retesting of the validity via the peer review process. Lengthening the Knowledge Scale from 14 items to 50 or 61 items would require an increase in the sample size from 140 to 500 or 610 subjects, respectively.

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Appendix A

Code No._____

Knowledge Scale

DIRECTIONS: Read each item carefully. Then, select one response to each item by placing an "X" by your response.

1. The length of a pregnancy is 40 weeks.
   True___ False___ Don't know____

2. The baby's heart beats 120-160 times per minute.
   True___ False___ Don't know____

3. Doctors tell pregnant women to eat more salty foods.
   True___ False___ Don't know____

4. Pregnant women are told not to exercise.
   True___ False___ Don't know____

5. During pregnancy, a woman should gain over 50 pounds.
   True___ False___ Don't know____

6. Swelling in the ankles is common in late pregnancy.
   True___ False___ Don't know____

7. Swelling of the hands and face is common in late pregnancy. True___ False___ Don't know____

8. Morning sickness is frequently seen in the later part of pregnancy. True___ False___ Don't know____

9. The best way to deal with morning sickness is to eat dry crackers before getting up.
   True___ False___ Don't know____

10. A pregnant woman needs to eat two times as much as a nonpregnant woman. True___ False___ Don't know____

11. A pregnant woman has a mental picture of the way her baby will look. True___ False___ Don't know____

12. Being tired occurs all through a pregnancy.
   True___ False___ Don't know____

13. Doctors tell pregnant women to stop drinking alcohol.
   True___ False___ Don't know____

14. A pregnant woman needs to take vitamins.
   True___ False___ Don't know____

Appendix B

Letter of Reprint Permission from American Nurses' Association

American Nurses' Association, Inc.
2420 Pershing Road, Kansas City, Missouri 64108
(816) 474-5720
Fax: (816) 471-4903

Lucille A. Joel, Ed.D., R.N., F.A.A.N.
President

Judith A. Ryan, Ph.D., R.N.
Executive Director

Washington Office:
1101 14th Street, N.W.
Suite 200
Washington, D.C. 20005
(202) 789-1800

January 27, 1989

Susan J. Freeman
115 Oak Ridge
Stakville, MS 39759

Dear Ms. Freeman:

You wrote asking permission to reprint Figure 1 from pages 14-15 of Nursing: A Social Policy Statement. We are pleased to grant you permission to do this, crediting ANA as the author of the publication. Best wishes in your thesis.

Sincerely,

Jane Stoever

Jane P. Stoever
Publications Specialist

ANA — An Equal Opportunity Employer

Appendix C

Letter of Reprint Permission from Aukamp

UNIVERSITY OF MISSOURI-COLUMBIA

SCHOOL OF NURSING

S235 Nursing School Building
Columbia, Missouri 65211
Telephone (314) 882-0254

December 20, 1988

Ms. Susan J. Freeman
115 Oakridge
Starkville, MS 39759

Dear Susan:

I received your letter dated December 3rd and I am pleased that you are doing the reliability on the Knowledge Scale. You have my permission to use Figure 1, Diagram of Conceptual Framework on p. 16; the Knowledge Scale on pages 172-173; and the demographics with risk factors on pages 159-160.

I wish you well with your thesis. Please let me know if I can be of any further assistance. May you have a joyous holiday season.

Sincerely,

Virginia Aukamp

Virginia Aukamp, PhD, RN
Assistant Professor

VA:jfb

an equal opportunity institution

Appendix D

Code No._____

Childbirth Education Questions

Are you attending any childbirth education classes?

Have you ever attended any childbirth education classes?
Yes____ No____. If so, when?

Appendix E

Institutional Review Board Approval from Mississippi University for Women

MISSISSIPPI UNIVERSITY FOR WOMEN
Columbus, MS 39701

Office of the Provost
P.O. Box W-1603
(601) 329-7142

April 4, 1989

Ms. Susan J. Freeman
Division of Nursing
Campus

Dear Ms. Freeman:

The Committee on Use of Human Subjects in Experimentation has recommended approval of your research proposal, and I am happy to approve their recommendation.

Sincerely,

Joyce Hunt

Joyce M. Hunt
Interim Provost

JMH:wr

pc: Mrs. Mary Pat Curtis
Dr. Annette Barrar

Appendix F

Directions

Please read the Consent Form.

If you choose to take part in this study,

1. Sign and date both Consent Forms.
2. Answer both pages of questions.
3. Keep one Consent Form for yourself.
4. Put the other signed Consent Form in the envelope.
5. Put both pages of answered questions in the envelope.
6. Seal the envelope and take it to the desk.
7. Do not talk about these questions with other pregnant women. The answers will be posted in this office when the study is finished.

If you do not want to take part in this study,

1. Put all pages back in the envelope.
2. Return unsealed envelope to desk.
3. Do not talk about these questions with other pregnant women. The answers will be posted in this office when the study is finished.

Appendix G

Consent Form

You are invited to participate in a study to evaluate a test that may help nurses provide a higher quality of care for pregnant women. You were selected as a possible participant in this study because you are in the 30th to 37th week of your pregnancy and Dr. _____ is cooperating with the selection of the women who are being asked to participate in this study. A minimum of 140 women are participating in this study.

If you decide to participate, you will answer a 14-question test about pregnancy and three additional questions about childbirth education. This can be completed within 15 minutes in the waiting room before you see your physician. There will be no risks to you or your expected baby.

Any information that is obtained in connection with this study that can be identified with you will remain confidential. No names will appear on the test. No names will be reported to anyone.

Your decision whether or not to participate is voluntary. Your decision will not affect your future relations with the agency where you have your baby, your physician, or Mississippi University for Women. If you decide to participate, you are free to discontinue participation at any time prior to data analysis without prejudice.

If you have any questions please ask me. I am a Graduate Nursing student at Mississippi University for Women in Columbus; however, you can write me at 115 Oak Ridge, Starkville, MS 39759 or telephone me at (601) 324-3460.

****

You are making a decision whether or not to participate. Your signature indicates that you have read the information provided above and have decided to participate in this study.

_____ Date

_____
Participant's Signature
Code No._____

_____
Signature of Investigator,
Susan J. Freeman, RNC

Appendix H

Code No._____
Consent_____
K Scale_____
CEQ_____

Demographic Data with Risk Factors

Age____ E.D.C._____ Race:_____ Years in School:___

Marital Status: S__ M__ W__ D__ Sep___

G____ T____ Pt_____ Ab_____ L_____

Does this woman have any preexisting medical condition or illness?_____

Condition	Risk Factors	
	No	Yes
Kidney Disease	___	10
Heart Disease	___	10
Urinary Tract Infection	___	10
Diabetes	___	10

During this pregnancy, has this woman had or now have any of the following:

High Blood Pressure	___	5
Protein in the urine	___	5
Sugar in the urine	___	10
Too much weight gain	___	10
Any infection (Each infection is 5)	___	5
Generalized edema	___	5
Estimate the clients' SES, if low (low if on Medicaid)	___	10
Poor pregnancy outcome (abortions, preterm, stillbirth)	___	10
High parity (five or more)	___	5
Add the risk factors which are circled	TOTAL	___

Appendix I

Letter of Explanation

115 Oak Ridge
Starkville, MS 39759
March 30, 1989

Dear _____:

As a student in the Master of Science of Nursing program at Mississippi University for Women, I am conducting a large, methodological study to ascertain the reliability of Aukamp's Knowledge Scale (1986) which is used for the nursing diagnosis of knowledge deficit in the third trimester of pregnancy. Aukamp's Knowledge Scale (1986) was designed to evaluate pregnant clients' awareness of facts regarding pregnancy. The sample population will be a minimum of 140 pregnant clients (18 years or older) in their 30th to 37th week of pregnancy who live in Oktibbeha County or one of its surrounding counties.

The data collection process requires a minimum of office staff time. Once your consent is given, I will place participant packets in the prospective participant's chart. The participant packet includes a 9 x 12 envelope, a consent form, a Demographic Data with Risk Factors form, and Aukamp's Knowledge Scale (1986) and the Childbirth Education Questions. The Demographic Data with Risk Factors form will be completed by me at a mutually convenient time prior to the prospective participant's appointment. When a prospective participant arrives, a staff member will merely need to give her the packet. Completion of the consent and Aukamp's Knowledge Scale will take approximately 20 minutes of your client's time while sitting in the waiting room before they are seen. The completed participant packets will be retrieved by myself on a weekly or biweekly basis.

Please return the Memorandum of Agreement, signed if you consent to the participation of your clients in this study; or unsigned if you are not giving your consent. If you would like more information, please feel free to call me at 324-3460. Please return the signed or unsigned Memorandum of Agreement as soon as possible, but no later than April 14, 1989. As soon as I receive your signed Memorandum of Agreement I will call you to arrange a day and time when I may visit your office, identify prospective participants, and complete the Demographic Data with Risk Factors forms.

Your cooperation in this study will make it one of the largest studies, conducted by a sole researcher, in 40 years of nursing research! Your assistance in this endeavor will be greatly appreciated.

Sincerely,

Susan J. Freeman, RNC

Enclosures

Appendix J

Institution or Agency's Memorandum of Agreement

Title of Study: Reliability of Aukamp's Knowledge Scale

Name of Institution or Agency:

_____

_____
Name of Researcher

_____
Name of Representative

Institution or Agency Involvement in Study: _____

_____

_____

Comments Concerning Agreement: _____

_____

_____

_____ _____
Date Representative's Signature

_____ _____
Date Researcher's Signature