THE RELATIONSHIP BETWEEN EDUCATIONAL LEVEL, CRITICAL THINKING, AND CLINICAL JUDGMENT

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CHAPTER 1

INTRODUCTION

The nursing process is an adaptation of the scientific method which is an objective method of making a decision. This process generally involves four sequential steps: assessment, planning, intervention, and evaluation.

The cognitive skills necessary for utilizing the nursing process include the ability to think critically in order to formulate a clinical nursing judgment. Clinical judgment is both a process and a product. As a process it is the method by which the data of the client are organized; a process that involves critical thinking. Clinical judgment is also a product, a summary statement that has been derived from analysis of the client's assessment data.

All nurses are expected to make clinical nursing judgments when planning care for/with a client. Therefore, the skills necessary to make clinical judgments should be taught during basic nursing educational preparation, whether it is in associate degree, baccalaureate, or registered nurse diploma programs.

Since each type of nursing program has a different focus, it can be assumed these differences will result in graduates of each program type that have varying abilities

in certain areas. Two of these areas are critical thinking ability and the ability to make clinical judgments. This study investigated the role that basic educational preparation plays in development of critical thinking ability and the ability to make clinical judgments.

Problem of Study

The problem for this study focused on the following question: Is educational preparation related to critical thinking ability and the ability to make clinical judgments?

Justification of the Problem

Students in all basic nursing education programs--associate degree, baccalaureate degree, and diploma--are being educated to function as registered professional nurses. The Board of Nurse Examiners for the State of Texas has identified these functions in its rules and regulations. Included in the 1980 Revision of Rules and Regulations Relating to Professional Nurse Education, Licensure, and Practice is the statement that:

> The registered professional nurses shall: . . . (4) make nursing judgments and decisions about nursing care for the patient/client by using assessment data to formulate and implement a plan of goals and objectives; and to evaluate the patient/client response(s) to the nursing care; (5) be responsible for accurate reporting and documentation of the patient's/client's symptoms, responses, and progress. (Board of Nurse Examiners, 1980, p. 30)

Professional nurses, no matter what their level of preparation, are expected to make nursing judgments. This expectation is reflected in many of the roles and responsibilities of the professional nurse. However, differences exist in the focus of each of the three types of basic nursing educational preparation. Although all three programs teach the skills necessary to make clinical judgments, differences exist in the depth and breadth of the skills taught (National League for Nursing, 1979). Can these differences in education affect the graduate's ability to make nursing judgments in the clinical area? If the type of education program is related to differing judgment abilities, this information would have implications in the work setting. Educational preparation could be used to determine job assignment. Roles identified as requiring independent nursing judgments could be filled by those educated to use the skills.

Conceptual Framework

The nursing process is used in order to make an objective decision regarding patient data. Decision making is a major component of nursing and is the process by which patient needs are determined (Grier, 1976). The conclusion of this inferential reasoning process is the clinical judgment (Hammond, 1966). This judgment is central to clinical

nursing practice. Professional nurses are responsible for making clinical judgments regarding the clients they care for (Hammond, 1966; Mundinger & Jauron, 1975). It is through the judgment process, a cognitive skill, that information about the client is analyzed. Ideally, this process is a merger of conceptual information with assessment data (Doona, 1976).

Patient assessment data are available from a variety of sources, including their verbal and nonverbal behavior. Analysis of these responses may be performed empirically or theoretically (Hammond, 1966). Conceptual and theoretical processes will aid the professional practitioner in systematic assessment of variables, explanation of causal dynamics, strategies for practice, and prediction of outcomes (National League for Nursing, 1975). Empirically, nurses may associate cues (signs or symptoms) and patient response with various causes based on their past experiences. In empirical analysis the nurse evaluates the client cues based on past validated causes.

Hammond (1966) stated that nursing education in the past emphasized empirical associations between patient cues (symptoms) and states-of-patient. With the empirical focus in education, recognition of certain cues is taught. The nurse learns to observe the client for these cues and

to note their presence or absence. Presence of these cues is associated with certain nursing activities. This method of education teaches the nurse to observe cues, comprehend the observed cues, and act on that knowledge.

Associate degree nursing programs use the empirical method of education to teach direct nursing care of clients. The associate degree program teaches the nursing student to comprehend and analyze changes in the client's basic health status and then to apply appropriate treatment modalities (Ashkenas, 1973; National League for Nursing, 1979).

Analysis of patient responses may also be performed theoretically. By this method, the nurse associates the response with various characteristic textbook etiologies. The client cues (symptoms) are related to a clinical judgment. The act of judgment includes an ordering of the concepts leading to formulation and consideration of a prospective judgment (Doona, 1976). It is by relating these concepts with the client cues that clinical judgments are determined.

Baccalaureate nursing education programs teach related concepts and theories; baccalaureate programs teach the professional nurse to obtain and analyze client data. Thus, the graduate of a baccalaureate nursing program has been prepared to make theoretical analyses and incorporate them

into the judgment process. This can be contrasted with associate degree nursing programs which teach theories associated with nursing principles (Ashkenas, 1973).

Critical thinking is a key element in making clinical judgments. During the judgment process, data pertinent to the patient are organized in order to make them more meaningful to the nurse, and this requires critical thinking ability. Associate degree nursing education teaches observation, comprehension, and action; baccalaureate nursing students are taught the skill of critical thinking as a guide for their professional practice. The baccalaureate nursing curriculum is designed to facilitate development of organizing concepts in order to assist the graduate in analysis and synthesis of client data. Baccalaureate nursing education includes the critical thinking skills necessary for making clinical judgments (NLN, 1979).

The majority of professional nursing education in Texas occurs on two levels: associate degree and baccalaureate degree. Is the type of basic nursing educational preparation related to the ability to make clinical judgments, and is it related to the ability to engage in critical thinking? This study investigated these areas.

Assumptions

The assumptions of this study follow:

1. Both a simulated patient situation and an actual patient situation require similar critical thinking skills.
2. Critical thinking is a behavior which can be learned with or without formal instruction (Oleson, 1979).

Research Questions

The following research questions were addressed:

1. Is there a difference between senior nursing students in baccalaureate and associate degree programs in terms of ability to engage in critical thinking as determined by the Watson-Glaser Critical Thinking Appraisal(1980)?
2. Is there a difference between senior nursing students in baccalaureate and associate degree programs in terms of ability to make correct clinical judgments as determined by the adapted Narrative Case Study (Fatzer, 1978)?

Definition of Terms

The following terms were defined as they were used in this study:

1. Clinical judgment--the process of observing, grouping, and assigning value to a client's symptoms in order to

state the unhealthy response. Clinical judgment was measured by the adapted Narrative Case Study (Fatzer, 1978).

2. Critical thinking--(a) attitudes of inquiry that involve an ability to recognize the existence of problems and an acceptance of the general need for evidence in support of what is asserted to be true; and (b) knowledge of the nature of valid inferences, abstractions, and generalizations in which the weight of accuracy of different kinds of evidence is logically determined (Matthews, 1978). Critical thinking was measured by the Watson-Glaser (1980) Critical Thinking Appraisal.
3. Cues--symptoms, signs, and other information pertaining to the client which are available to the nurse.
4. Senior associate degree nursing student--a student currently enrolled in a State Board accredited associate degree nursing program who is within six months of completion of the program.
5. Senior baccalaureate nursing student--a student currently enrolled in a state board accredited baccalaureate nursing program who is within six months of completion of the program.

Limitations

The following limitations were identified:

1. A convenience sample of voluntary participants was used thus limiting the generalizability of the findings to the sample studied.
2. Variables such as subjects' attitudes, opinions, and biases were not controlled in this study.

Summary

Clinical judgment is both a process and a product. As a process it is the assessment phase of the nursing process, and as a product it is the summary statement of this assessment. Professional nurses are expected to carry out this process and make clinical judgments daily.

This study investigated students' ability to make clinical judgments and to engage in critical thinking. Volunteer nursing students from an associate degree nursing program and a baccalaureate degree nursing program participated in the study.

A review of the literature is presented in Chapter 2. Chapter 3 relates the procedures used in collecting and treating the data. Chapter 4 gives an analysis of the data and Chapter 5 presents the summary, including conclusions, implications, and recommendations for further study.

CHAPTER 2

REVIEW OF LITERATURE

Judgment is the process of making a decision and is a concept central to nursing practice. In the clinical setting, nurses are responsible for making judgments regarding a patient's care. Obtaining the skills necessary to make clinical judgments should occur during the basic nursing education program. One of the skills necessary for making clinical judgments is critical thinking; therefore, the ability to engage in critical thinking should be taught in the basic nursing education program. Nursing education primarily occurs at three levels--diploma, associate degree, and baccalaureate degree--and each type of nursing program has different characteristics. These characteristics include differing course emphases, skill development, and orientation toward leadership (Grier, 1976).

This chapter presents a review of literature covering the areas of judgment, clinical judgment, critical thinking, and characteristics of nursing education. Judgment is defined and theories are presented; the processes involved in judgment are then discussed. Sequential processes associated with clinical judgment are presented, followed by a discussion of critical thinking and its relation to clinical

judgment. The educational preparation of the nurse is also discussed with special emphasis on differences between associate degree and baccalaureate degree nursing programs.

Judgment

Nursing practice revolves around the concept of judgment, or the act of making a decision. But what is a judgment and what thought processes are involved in making a judgment? Empirical definitions of judgment are presented, as well as an overview of the processes involved in making or reaching a judgement, in this section.

Definitions and Theories of Judgment

According to Freud (1933/1965), judgment is concerned with two types of decisions: one type asserts or denies the presence of a particular property and the other affirms or disputes the existence of an image in reality. Freud described judging as the process of deciding whether something, or someone, possesses a particular property. He believed this process, developing out of early instinctual experience, is present prior to testing wether an image exists in reality.

Reality testing was also discussed by Freud (1933/1965). He proposed that initially no difference is noted between subjective and objective reality. Gradually the realization

develops that not all thoughts exist in reality. As reality testing progresses, images of earlier perceptions are reproduced, and the presence or absence of the object is evaluated. The reproduction of an earlier perception may be distorted as elements of the image may be omitted or combined. Freud also described judgment as intellectual action; that is, judgment is the intermediary phase between merely thinking and acting in which the choices of action are decided.

Unlike Freud (1933/1965), Dewey (1933) proposed that thinking consists of a series of judgments and that these judgments occur with problem solution. He pointed out that:

> Judging is the act of selecting and weighing the bearing of facts and suggestions as they present themselves, as well as deciding whether the alleged facts are really facts and whether the idea used is a sound idea. (p. 120)

Dewey discussed three aspects of a judgment: (1) a controversy, (2) a process of defining and determining supportive data, and (3) a final decision which may also assist in deciding future examples. He described judgments as proceeding from a situation of controversy or doubt. This uncertain situation may suggest several possible meanings. Dewey noted that the interpretation of these meanings is accomplished by determination of which data are important

as well as elaboration of the definitions suggested by the data. Two questions which he proposed to assist in this process are: (1) What aspects are significant for interpretation? (2) What is the meaning and influence of the idea used as a method of interpretation? Not all the data in every situation are equally valuable as supportive signs or evidence; cues are selected which provide insight into meanings and possible meanings are considered in relation to the data. When a final decision is reached, the judgment has been made. Dewey further proposed that similar cases being interpreted by the same process form principles of judgment. These principles of judgment become useful in deciding future cases.

In contrast to Dewey, Schilder (1951), who considered judgment the basic form of thinking, suggested that the process of judgment involves striving to achieve knowledge regarding a state of affairs. Affirmation or denial of the judgment is implied. He, as Freud (1933/1965), described judgment as a type of reality testing in which the judgment process is initiated mentally with a schematic representation in thought of the judgment. When the schematic representation matches actuality the judgment has occurred. Schilder further proposed that judgment preceeds action and is more than just knowing.

Judgment, according to Kaplan (1975), consists of three factors: the person making the judgment, information pertinent to the judgment situation, and any specifics of the judgment situation. The first factor in any judgment concerns the individual making the judgment. Four ways were proposed by Kaplan by which the person making the judgment may express his individuality.

In Kaplan's (1975) first method, information valuation, a cue may have values dependent on the judgment situation. Also, individuals may attribute different values to the same cue. The value or worth an individual places on a cue is seen as dependent on the pooled past experiences of the individual with that cue. In addition, these past experiences are thought to determine overall value which sets up expectations relevant to that cue.

The second way individuality may be expressed when making a judgment, according to Kaplan (1975), is by attributing importance to certain cues. Kaplan discussed the idea that cues may vary in significance due to an individual's own personality. For instance, if two people differ in judgments inferred from a set of cues, they also differ on the values attributed to those cues.

The third way of expressing individuality, as suggested by Kaplan (1975), involves integration of information. Each

person differs in the number of constructs used in making the judgment. According to Kaplan, in situations which involve contradictory information certain personality types demonstrate resistance to changing judgments after a judgment has been made. Personalities mentioned as resistant to change include high authoritarians, high dogmatics, and wide categorizers. These personality types have difficulty in later judgments incorporating information which conflicts with their initial judgment formulation. Two common individual strategies for integrating information identified by Kaplan were linear and configural. Linear processing involves the addition or subtraction of stimulus cue values, whereas in a configural strategy the value of a cue is affected by the relationship of all the cues in the pattern (Kaplan, 1975).

The fourth, and Kaplan's (1975) last, way of expressing individuality when making a judgment is the response disposition of the judge. These dispositions, existing prior to the judgment situation, may be temporary, such as mood, while others are more permanent and involve judging those of a given class alike or labeling. Basically Kaplan suggested that response dispositions are perceptions existing prior to the judgment situation and are independent of any specific cue observed.

The second of Kaplan's (1976) three factors involved in any judgment is information pertinent to the situation. He mentioned two attributes, value and weight, as influencing the judgment decision. Values were described as being assigned to the information of the judgment situation whereby these individual values are grouped to form an overall judgment. The second informational attribute, weight, refers to the significance of a cue in the judgment situation. Each cue is assigned an arbitrary weight proportional to its significance in the situation. The individual cue weights are added to form an overall value.

The third factor pertinent to any judgment, according to Kaplan (1975), involves specifics to a judgment situation. Information attributed to this particular judgment situation is collected, processed and becomes part of the overall judgment. Value assigned to informational components is based on the particular judgment situation. Information could have differing values contingent on the situation. For instance, shortness of breath may be credited with high or low value, depending on whether it occurs while resting or after exercise.

Dincher and Stigner (1976) defined nursing judgment as follows:

> Response to multiple simultaneous cues, often taking place within a short time span. The nurse is frequently presented with incomplete data and judgment

> adds information to the output. The response results in selection of an appropriate nursing intervention. (p. 280)

An act of judgment has been operationally defined by Doona (1976) as the disturbance of an individual's preheld judgment position leading to the collection of related evidence which suggests a revised tentative judgment. If the tentative judgment is accepted, the knowledge acquired during the process becomes an explanation. Doona presented the operational definition of a judgment as a paradigm consisting of a series of 13 steps divided into three phases (see Table 1).

According to Doona (1976), the first phase in an act of judgment is the antecedent phase. This phase is the person's individual perception prior to the new judgment situation. The second phase is the interactive phase which is comprised of 10 separate steps. As the judgment situation arises the previous equilibrium is disturbed and a problem is perceived. Data pertaining to the current problem are collected with earlier judgments being recalled. Previous ideas and current data, clarified by an ordering of pertinent concepts, lead to formulation of a prospective judgment. The prospective judgment is considered and either confirmed or denied. The third and last phase of an act of judgment consists of two steps. First, any consequences of

Table 1

Doona's Phases of Judgment--A Paradigm of a Complete Act of Judgment

Phases	Steps
1. Antecedent Phase	a. Signatory position of the individual
2. Interactive Phase	a. Inception (1) Disequilibrium (2) Collection of raw facts (3) Recall of concepts (4) Refinement of percepts and concepts b. Development (1) Ordering and arrangement of concepts (2) Formulation of prospective judgment (3) Reflective consideration of the prospective judgment c. Fulfillment (1) Affirmations or denial of prospective judgment (2) Increment of knowledge (3) Establishment of new equilibrium
3. Consequent Phase	a. Scrupulous discriminative observation of the consequences b. Use of new knowledge as a working hypothesis

(Doona, 1976, p. 28)

the recently formulated judgments are noted, and secondly, the knowledge acquired during the process becomes a working judgment (Doona, 1976).

Processes Involved in Judgment

The cognitive processes involved in judgment include perception, learning, and thinking. One model of the cognitive processes of judgment is Brunswik's lens model (cited by Hammond, Stewart, Brehemer, & Steinmann, 1975). Brunswik was concerned with both the organism, or person, and cues as separate systems and visualized a symmetrical relationship between them. In his model, both systems are parallel (see Figure 1). On one side environmental cues vary in validity, while on the other side utilization of cues by the organism varies. In other words, cues have relationships with environmental variables as well as judgments.

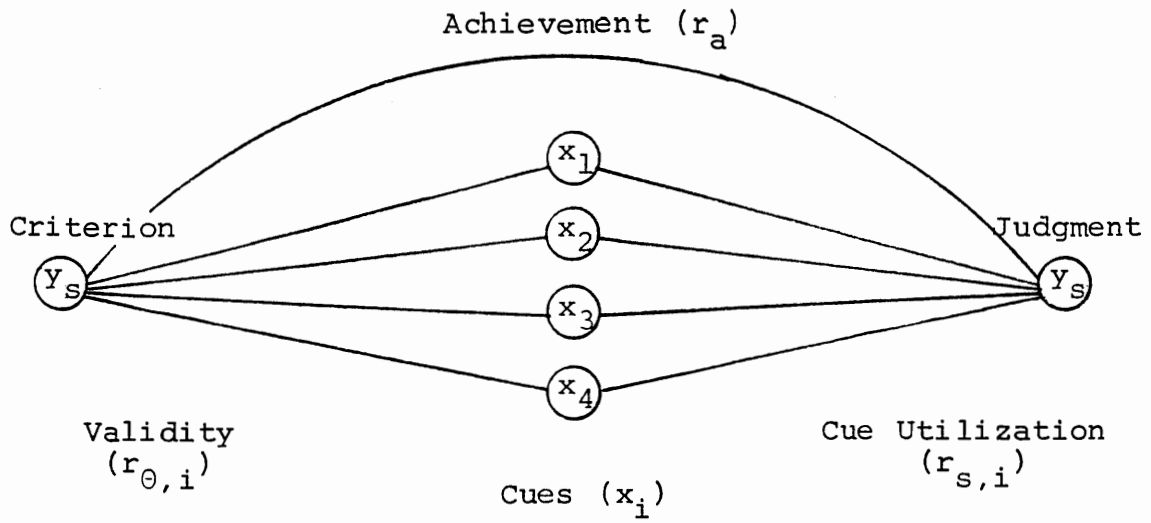

Figure 1. Brunswik's Lens Model (cited by Hammond et al., 1975, p. 274)

According to Hammond et al. (1975) each person has individual policies which guide judgment formulation. Four steps are used to analyze the cognitive components of an individual's policies. Initially the person identifies the judgment problem. Hammond et al. saw this step as consisting of the formal properties of problem definition, identification of significant cues on which to base the judgment, and identification of the properties of cue variables. In step number two they included the process of judging a number of cases of the problem. The third and fourth steps consist of an analysis of the individual's judgments and a display of the analysis, respectively. By using the above four steps of analysis, Hammond et al. demonstrated that individuals are often inconsistent in applying their judgment policies, and a small number of cues are often used.

In addition, Brunner, Goodnow, and Austin (1956) noted that cognitive processing of information relevant to the overall judgment involves categorization. Categorization is described as using cue attributes in order to discriminate examples of a class. The categorization of a cue as a class example was viewed as dependent on the conditions under which it was learned, the number of variations, the time since learning, and cultural factors.

Brunner et al. (1956) pointed out that once a cue is categorized, the person may resort to one of the following

four methods of class validation. The first method discussed was recourse to an ultimate criterion in which defining properties are used to discriminate between classes. Should misclassification have serious consequences, as in similarities between medication and poison bottles, early distinguishing labels are invented. The second method of class validation involves noting the context in which the cue is present. Determining if the cue fits the context is testing by consistency. The third method, consensus, is used for ambiguous classification. A reference group composed of the class is used to resolve the ambiguity. The fourth and last method presented was testing by affective congruence. This method is described as categorization of a cue based on a feeling of subjective certainty. Later evaluation of the categorization may be difficult as the strength of the certainty is dependent on how fulfilling the categorization is to the individual. In other words, if the individual's goal system is confirmed by this categorization, then the categorization will have increased strength (Brunner et al., 1956).

Judgments vary in their complexity. Doona (1976) discussed four types of judgment in ascending order of complexity. The first type of judgment, common sense, concerns specific solutions to defined problems. This type

focuses on the current problem and is related to experience. Doona described nurses who rely on this type of judgment as technicians. The second type of judgment, speculative judgment, is reached by combining concepts. Pertinent concepts are given emphases in formulation of the judgments. The third type of judgment, pragmatic judgment, focuses on the specific situation. The facts of the patient situation are considered more important than concepts. The fourth type of judgment, ideal, involves merging patient data with nursing concepts. Doona pointed out that common sense, speculative, and pragmatic judgments have directional foci which determine whether conceptual or factual judgments occur. She proposed that use of her paradigm (see Table 1) may prevent emphasis on either conceptual or factual data by combining both into the judgment.

Another paradigm of an act of judgment was presented by Elstein (1979). His four stage model of a diagnostic judgment includes the following steps:

(1) Data collection
(2) Hypothesis generation
(3) Cue interpretation
(4) Hypothesis generation or judgment (p. 20)

In Elstein's (1979) first stage, data are gathered through a sequential and selective process; that is, data are gathered in a progressive manner by selecting which information is meaningful in order to generate a hypothesis.

In the second stage, hypothesis generation, more than one hypothesis is usually considered with seven being the maximum number which can be effectively remembered at any one time. In the third stage the data are discussed as cues and are explained relative to the generated hypothesis. In the fourth stage, hypotheses are evaluated and a diagnostic judgment is reached. Elstein pointed out that it is during this last stage that the information gathered in the first three steps is combined and interpreted. This interpretation may lead to one of three conclusions in relation to the diagnostic judgment: confirm, disconfirm, or non-contributory.

Clinical Judgment

Information pertinent to the judgment situation may be obtained either subjectively or objectively. According to Feinstein (1967), information used in clinical judgment is obtained by both methods. Clinical information largely consists of signs and symptoms. A symptom is the subjective information reported by the patient, whereas a sign is objectively observed by the nurse. Feinstein discussed three roles of clinical information. One role is diagnosis and is suggestive of causative factors; the second involves predicting outcomes of general therapy; and the third role, therapeutic intervention, was described as an indicator of

specific treatment goals. Feinstein proposed that each role may suggest a different method of reasoning and a different type of classification. The significance of clinical information, he asserted, is determined by identifying symptoms and signs, assigning value to each abnormal finding, and classifying and listing significant findings. The list of significant findings may suggest s disease, be a clue to a judgment deduction, or guide collection of additional information.

Selection Strategies and Quality of Clinical Judgments

Obtaining information regarding judgment alternatives involves investigation of generated hypotheses in some sequence. If the investigator can control the sequence of alternatives, the amount of information obtained from each alternative can be maximized (Brunner et al., 1956).

One way to control the order of alternatives is through using a selection strategy. Brunner et al. (1956) presented four separate strategies for sequencing information. One of the strategies, simultaneous-scanning, consists of remembering which hypotheses are possible, as well as which have been rejected. Obviously, as the authors mention, this increases the memory load.

Another strategy discussed by Brunner et al. (1956) was successive-scanning which is the testing of each

hypothesis in turn. Choices are limited to direct tests of each hypothesis. However, as the authors pointed out, obtaining maximum information with each choice may not occur with this method. This strategy is advantageous, as stated by Brunner et al. (1956), because of the limited inferences necessary and the decreased amount to remember.

A third strategy was termed conservative-focusing which consists of using an example of the concept as a focus. Brunner et al. (1956) described this strategy as sequentially listing choices which change individual attributes of the concept. Each attribute change is then tested to determine positive or negative association with the concept. The authors pointed out that if attribute change results in a negative association with the concept example, then the original attribute is an essential part of that concept. This strategy was believed to yield maximum information since most attributes are tested directly and determined to be either relevant or not relevant to the concept example. Also mentioned was the possibility of decreasing task complexity and abstractness with this method. However, as Brunner et al. further pointed out, task complexity may increase if the attribute list is not complete and sequential.

Focus-gambling, Brunner et al.'s (1956) fourth strategy, was viewed as being similar to conservative-focusing in

that a concept example is used as a focus, but more than one attribute is changed. Because more attributes are changed, fewer trials may be necessary to determine concept attributes. Brunner et al. (1956) did stress the possibility that more trials could be necessary, such as when a negative trial is encountered. When a negative trial occurs in order to obtain information from the situation, possible hypotheses must be tested in turn. This process is called simultaneous-scanning. The authors proposed that by using any of the above four strategies to control the information sequence, judgment alternatives may be evaluated and the best one chosen.

Komorita (1963) posited that judgment is based upon both knowledge of the patient and underlying scientific knowledge. She suggested that a systematic strategy is used by a nurse to arrive at a judgment. This strategy involves observing the patient, remembering past experiences with similar situations, and identifying relevant scientific knowledge. Prior to the determination of a clinical judgment, Komorita proposed that patient observations are listed, and those observations that require action are noted. She also stated that clinical and scientific knowledge is used as a foundation to label the observations noted as problems. Problem alternatives and their

consequences are evaluated, and a decision or judgment is made after deliberation of the alternatives.

Measurement of Clinical Judgments

Williamson (1966) considered the quality of a clinical judgment to be the most important determinant of the quality of care provided by the physician. Thus, he attempted to assess the level of clinical competence by establishing measurable performance criteria in order to evaluate judgment. Assessment of clinical competence was noted to involve two areas: (1) efficiency--measurement of a clinician's performance, and (2) proficiency--measurement of results in a patient. In order to evaluate these components, Williamson (1966) designed a simulated problem in which a clinical patient description was followed by a list of choices of diagnostic therapeutic interventions. He then compared the clinician's written performance with accepted interventions developed by experts.

Clinical judgment was seen by Feinstein (1967) as involving clinical classification. Clinical classification, a system of noting the information used as the basis for the judgment, is an inferential reasoning process. Information pertinent to clinical judgment involves the areas of patient environment, description of the findings, and the interaction between these two. Classification of subjective

and objective information means that discrete attributes may be lost when the information is grouped into findings and sequencing. Thus, data regarding patient environment, description of findings, and interaction between the two develops information to consider in order to determine past etiology, current judgment, and future clinical programs.

Schaefer (1974) pointed out that decision making is the act of choice after deliberation and judgment. She distinguished between the two processes by noting that deliberation involves listing situations needing action, whereas judgment involves analysis of alternatives and their consequences. The decision is the choice of one judgment alternative. Koehne-Kaplan and Tilden (1976) also asserted that clinical judgment is a process of decision making. The authors indicated the components of clinical judgment form a rationale for nursing behavior and that the process of making a clinical judgment is reflected in the steps of the nursing process of observation, assessment, planning, intervention, and evaluation.

Measurement of clinical judgment was also undertaken by Dinchner and Stigner (1976). They developed an instrument to test the ability to make clinical nursing judgments. Their instrument begins with a written clinical description of a patient followed by a list of inquiries or

actions. The examinee is instructed to select responses which are pertinent to this patient. These responses provide additional data or information to assist in making the clinical judgment. This instrument design and scoring are similar to the simulated patient-problem format by Williamson (1966).

Gordon (1976) also discussed the grouping of patient cues in order to infer a state-of-the-patient. This process was described as involving data collection and the grouping of weighted data in order to make a diagnostic judgment. Patient cues were found to vary in reliability as predictors of a diagnostic judgment. Aspinall (1979) discussed evaluation of cues in order to infer patient problems. She considered nursing judgment to be the process of alternatives being ruled out and a diagnostic decision being made. This process was stated as involving theoretical knowledge regarding illness as well as the combination of analytical and intuitive methods of critical thinking.

Critical Thinking

Critical thinking has been defined by many authors and sequential processes have been identified. Being able to think critically is needed in order to make diagnostic decisions or clinical judgments. A definition of critical

thinking and literature dealing with critical thinking processes and skills development is presented.

Definition of Critical Thinking

Critical thinking is a cognitive skill involving drawing inferences, deduction, interpretation, assumption, and evaluation. Watson-Glaser (1980) defined critical thinking as a composite of abilities which includes not only problem recognition, but the need for supporting information or evidence as well. The value of this supporting information is determined through use of processes of inference, abstractions, and generalizations.

Critical Thinking Processes and Skills Development

Oleson (1979) noted that the concepts of critical thinking, scientific method, and reflective thinking have approximately the same meaning. Due to this similarlity among concept meanings, discussions concerning reflective thinking may be relevant to the concept of critical thinking.

Dewey (1933) defined reflective thinking as the process of something being accepted based on past evidence; that is, something stands as evidence of the event. Reflection involves both doubt and an act of searching to resolve the doubt. Dewey discussed five aspects of reflective thinking.

The first of these aspects is suggestions. This aspect takes place when possible solutions occur mentally. Suggestions involve more than one idea concerning what to do. These suggestions thereby provide a spontaneous hesitation in which further inquiry is initiated. The second phase of critical thinking involves definition of the problem or question and was described as arising out of a recognition of a disturbing situation. This feeling of disequilibrium gradually decreases as the problem is defined. During the third phase, a hypothesis which serves to focus data collection is derived. Dewey also mentioned that a solution becomes possible as the alternatives narrow and a working hypothesis develops. Clarification of the hypothesis occurs in the fourth phase. In the last phase, hypothesis testing occurs. The working hypothesis is tested both theoretically, by imagination, and/or actually. Dewey further pointed out that these five phases do not necessarily occur sequentially; phases may occur in any order and all are somewhat intertwined.

Kelly (1964, 1966) and Hammond (1964, 1966) conducted a three-part, two and one-half year study of the inference aspect of critical thinking; they assumed that inference is central to all nursing practice. This longitudinal study concerned the process by which clinical judgments are made

by the nurse. Six nurse participants were asked to respond to 100 narrative patient descriptions. The responses were analyzed for cue identification and utilization, the order in which information was obtained to arrive at the clinical judgment, and any revisions of the clinical judgment. The results indicated that single patient cues transmitted little information and various cue groupings did not relate to inferences made. The results further indicated that each nurse had a specific inference system which was used consistently. Cues were not discriminated based on usefulness, but inference choices were made based on the presence or absence of certain cues (Hammond, 1966; Hammond, Kelly, Schneider, & Vacini, 1966; Kelly, 1964, 1966).

Inference drawing is one of several thought processes associated with critical thinking. Being able to think critically is a skill which may be learned and is one of the reasoning skills expected to be taught in college.

Arons (1978) listed assumptions regarding thought processes of college students. Some of these processes include the following: (1) recognition, identification, and control of variables; (2) forming and comprehending propositional statements; (3) discriminating between observation and inference; (4) analyzing a line of reasoning in terms of underlying assumptions; (5) drawing inferences

from data and evidence; (6) ability to discriminate between inductive and deductive reasoning, and (7) checking inferences, conclusions, or results. The assumption concerning the ability to recognize, identify, and control variables was described as the ability to determine cause and effect relationships regarding variables as well as the validity of inferences. Arons noted that courses in economics, political science, and experimental psychology tend to enhance this ability. In the assumption of discrimination between inductive and deductive reasoning, he noted the college student learns to discriminate between a concept or model and a construct. This discriminatory process is common in physics, chemistry, biology, economics, or sociology courses. All seven preceeding assumptions included reasoning abilities assumed to exist as goals or objectives of higher education. These processes involve aspects of critical thinking and are presumed to be part of the collegiate curriculum (Arons, 1978).

One of the skills of critical thinking, drawing inferences, is also a part of the diagnostic process. Matthews (1978) designed a study to determine if a relationship existed between the ability to think critically and the ability to make a nursing diagnosis. The sample included 22 undergraduate and 26 graduate nursing students.

Results indicated a significant difference between the undergraduates' and graduates' ability to arrive at a nursing diagnosis. The undergraduates correctly identified 50% of the nursing diagnoses, while the graduates' correctly identified 62%. However, no relationship was demonstrated between the ability to think critically and the ability to make a nursing diagnosis. The following three conclusions were presented by Matthews. Cue selection and value placed on the selection were unique to each nurse. This conclusion supported an early study by Kelly (1964, 1966) and Hammond (1964, 1966) in which results indicated each nurse had a specific inference system. The second conclusion stated that cues with assigned high values were the basis for the nursing diagnosis. The conclusion also supported Kelly's (1964, 1966) and Hammond's (1964, 1966) findings that inference choices were made on the presence or absence of certain cues. The third conclusion stated that a small portion of cues were used to derive a nursing diagnosis (Matthews, 1978).

Oleson (1979) studied critical thinking and problem identification to explore the relationship between critical thinking ability and effectiveness of nurses' decisions. Thirty-one graduate nursing students participated. The results of the Kruskal-Wallis one-way analysis of variance

indicated that the number of years of nursing experience did affect decision making. Nurses with more years of experience scored higher on the author-developed Nursing Decisions Experiences in Clinical Problem Solving tool. A Spearman correlation coefficient was calculated and no relationship was found between the ability to think critically and effectiveness in decision making. This finding is similar to Matthews' (1978) study in which no relationship was found between the ability to think critically and the ability to make a nursing diagnosis.

Oleson's (1979) study result is contrasted with a study by Ketefian (1981) in which the relationship between critical thinking, educational preparation, and moral judgment was explored. Seventy-nine professional and technical nurses participated. The purpose of the study was to determine if a relationship existed between critical thinking and moral decision making. Results of the Pearson product-moment correlation indicated that critical thinking ability was related to moral decision making or judgment and is inconsistent with the findings of the two previous studies. The results of a one-way analysis of variance indicated a significant difference between professional and technical nurses' moral decisions with the professional nurses' demonstrating more advanced levels of moral reasoning (Ketefian, 1981).

Educational Preparation of the Nurse

Critical thinking has been determined to be a learnable skill, therefore educational preparation for nurses can contribute to their expertise in critical thinking. The minimal educational preparation for registered nurses is reviewed and studies delineating differences between associate degree and baccalaureate degree nursing programs are presented.

Minimal Educational Preparation

Education for the registered nurse occurs at an associate degree, diploma, and baccalaureate degree level. Each of these types of programs is designed to provide a different knowledge base. In comparing the associate and baccalaureate knowledge bases, the National League for Nursing (NLN)(1979) reported:

> all nurses are responsible and accountable for their nursing judgments and actions in a manner consistent with the knowledge base, practice role, focus of care, and minimal expectations delineated for the new graduate. (p. 5)

Therefore, educational preparation should affect the manner in which graduates of the program practice nursing.

The Board of Nurse Examiners for the State of Texas (1980) is responsible for prescribing standards for the practice of nursing within Texas. These basic standards are maintained through requiring the nursing graduate to

achieve a passing score on a written licensing examination as well as graduation from an accredited school. The Board further maintains minimal competency in nursing through the accreditation of educational programs which prepare the student to practice nursing.

Differences Between Associate and Baccalaureate Degree Nursing Programs

Educational preparation affects the role for which the graduate nurse is prepared. Ashkenas (1973) determined what graduates of associate degree nursing programs considered as aids or deterrents to nursing performance in the first six months after graduation. Findings indicated that the majority of associate degree graduates were employed for direct patient care; however, they were asked to perform activities and assume responsibilities for which they had had not been prepared. The assumption of new responsibilities for which they were not prepared was a factor which graduates listed as a deterrent to performance. Ashkenas recommended that the educational preparation of the associate degree nurse be considered by the employing agency in job assignments. She stated that the graduate is prepared to be a technical nurse and should be used in that capacity. The author further recommended orientation and

continuing education programs be designed for the associate degree graduate.

Baccalaureate curricula were identified in 1975 by the NLN as following trends of focusing on process, teaching by concepts, as well as integrating theoretical and laboratory learning with an emphasis on the whole person. These trends were noted to involve learning how to learn, think, and decide rather than learn specific facts and tasks. This NLN report suggested that baccalaureate nursing students need to learn concepts, not a collection of facts, so more knowledge may be assimilated by the students.

DiMarco and Hilliard (1978) compared baccalaureate, diploma, and associate degree nursing graduates on five performance-related dimensions in the team leader role. The study, conducted in a 300 bed hospital for a three-year period, compared nurses on state board test scores, nursing audit, competency, supervisor ratings, and the Job Descriptive Index Scale developed by these authors. The Job Descriptive Index was used to measure satisfaction with supervision and satisfaction in five job related areas. Competency was measured with the Competency Rating Scale, also developed by these authors. This instrument is composed of six categories of nurse activity in the team leader role. Based on the Kruskal-Wallis one-way analysis of variance, no

significant difference was found between the three groups, baccalaureate, diploma, and associate graduates, for the above measures. According to the authors, to fill the team leader position without considering the type of nursing preparation appears appropriate based on their results (DiMarco & Hilliard, 1978).

An awareness of the educational preparation of the associate degree nursing student led one hospital to set up a transition program for the new graduates (McSherry & O'Neill, 1978). In 1978 one community hospital coped with local schools' alleged weaknesses of associate degree nursing graduates by implementation of a specialized internship program. The program was designed to attempt to correct the following deficits:

1. A theory-practice gap brought about by having too few patients to care for during the training experience
2. A pharmacological deficit
3. Difficulties on the evening and night shift; assignments which may be out of the graduate's ability, shortage of available guidance
4. Difficulties in organization, setting priorities, and in making nursing care decisions.
(McSherry & O'Neill, 1978, pp. 11-12)

The authors proposed that this orientation program will assist associate degree graduates adjust to their employment role by allowing time for skill acquisition and decision making (McSherry & O'Neill, 1978).

Baccalaureate education, by contrast, focuses on developing skill in problem solving and decision making (Tanner, 1979). Tanner noted that the steps in clinical problem solving include: (1) attending to relevant cues, (2) hypothesis generation, (3) informal rank ordering of hypotheses, (4) information collection to differentiate hypothesis alternatives, and (5) utilizing information to choose the best clinical judgment. These steps of clinical problem solving were described as involving several cognitive processes. In problem solving, the cues in the patient situation must be identified with important cues being noted, but not irrelevant ones. Based on the important cues, the author proposed that possible working hypotheses are generated. These hypotheses then guide further information search. The problem is defined when the information gathered is evaluated against the hypothesis. Tanner noted that next interventions are generated, ranked, and the best are chosen. Evaluation of the intervention occurs last. If results are unsatisfactory then the process is again initiated.

Tanner (1979) pointed out that problem solving skills can be tested using simulation tests. Simulation tests attempt to duplicate a real situation in the clinical setting. The premise of the simulated test is that the student

will respond as if the situation occurred in the clinical setting. Simulation testing of the judgment process involves concepts similar to clinical problem solving. An act of judgment includes: (1) noting relevant cues, (2) generating and rank ordering of plausible judgments, (3) interpretation of collected data, and (4) a final judgment decision (Dewey, 1933; Doona, 1976; Elstein, 1979). Williamson (1966) discussed use of simulation testing in assessment of clinical judgment skills whereby cues relevant to several judgments are presented so as to cause the student to interpret the data in order to determine a final judgment.

Tanner (1979) and Williamson (1966) noted differences in educational preparation between associate degree and baccalaureate degree preparation. In a 1979 NLN study, associate degree and baccalaureate degree nursing knowledge bases were found to differ in cognate, nursing, and integrated courses. Associate degree programs devoted 50% of the curriculum to cognate courses and 50% to nursing courses. In contrast, 35-40% of the baccalaureate curriculum is devoted to cognate courses, 30-35% to nursing courses. Additionally, the baccalaureate program includes social science courses, leadership, management and research. According to NLN (1979), the graduate of an associate degree

nursing program is expected to identify, comprehend, apply scientific knowledge, and evaluate. The graduate of a baccalaureate degree nursing program is expected to assess, analyze, synthesize, and evaluate nursing observation with theoretical and scientific knowledge.

Goldstein (1980) compared associate degree and baccalaureate degree nursing students on factors associated with leadership which included time competence, nature of man, synergy, and acceptance of aggression. The professional (baccalaureate degree) nurse's education includes leadership and decision making. The technical (associate degree) nurse's education prepares the graduate to function under the supervision of others. Therefore, as noted by Goldstein (1980), these two types of programs differ in their orientation toward leadership. Factors which have been associated with leadership include aspects of self-actualization. Goldstein assessed these aspects by two overall scales of time competence and inner directed support as measured by the Personal Orientation Inventory. Goldstein reported that this study's findings:

> indicated that the two programs are fulfilling their defined functions--preparation of practitioners of nursing for specifically recommended roles. . . . Identifying factors that promote leadership and incorporating them in the baccalaureate curriculum is important so that the baccalaureate student upon graduation is prepared to assume the responsibilities inherent in the leadership role. The AD student needs to be

> trained for the technician role, with the option for acquiring leadership skills through additional education. (p. 48)

Summary

Determination of a clinical judgment is a skill central to nursing practice. Making a clinical judgment involves the ability to think critically. Both making a judgment and the ability of critical thinking are skills which should be taught in the basic nursing educational program. Associate degree and baccalaureate degree nursing programs contain curriculum differences which may impact on development of the skill of judgment.

This chapter presented discussions of theories of judgment and factors associated with the judgment process. Strategies associated with the formulation of a clinical judgment were reviewed. Clinical judgment was related to aspects of critical thinking. The differing knowledge bases between associate degree and baccalaureate degree nursing programs were identified and discussed.

CHAPTER 3

PROCEDURE FOR COLLECTION AND TREATMENT OF DATA

A nonexperimental, explanatory study was designed to investigate the relationship between educational level of student nurses and problem solving ability (Polit & Hungler, 1978). Educational level was evaluated in relation to critical thinking ability and the ability to make clinical judgments.

Setting

The study was conducted in two schools of nursing located in a metropolitan area of approximately three million people in the southwestern portion of the United States. The schools included one associate degree nursing program of 47 senior rural commuter students, and one baccalaureate nursing program of 60 senior students who were primarily dormitory residents in a large medical center. Data were collected in the classrooms in each of the selected schools.

Population and Sample

The population for this study included 107 senior nursing students currently enrolled in the selected associate degree and baccalaureate degree schools of nursing.

These senior nursing students were all within six months of graduation.

The sample was conveniently chosen from the selected programs. Senior students from each program were contacted, and the first volunteers, 31 from the associate degree program and 26 from the baccalaureate program, comprised the sample. Responses from 9 associate degree and 1 baccalaureate degree students were discarded due to failure to complete both instruments; 23 associate degree and 25 baccalaureate students were study participants.

Protection of Human Subjects

Prior to initiation of this study, approval was obtained from Texas Woman's University and from the selected agencies. Individual subjects were provided an oral explanation regarding the purpose and methodology of the study. Subjects' return of completed questionnaires indicated agreement to participate in the study. Anonymity was maintained since no names or codes were used to identify individuals (Appendix A).

Instruments

Demographic data on the subject's age, sex, and work experience were obtained for descriptive purposes. Two instruments were used in this study, the Narrative Case

Study (Fatzer, 1978) designed to determine clinical judgment, and the Watson-Glaser Critical Thinking Appraisal (1980) used to evaluate critical thinking ability (Appendix B).

The Narrative Case Study was originally developed by Fatzer (1978). Face validity was initially established through agreement between two of three medical or nursing textbooks. A pilot study was also conducted with seven master's prepared nurses to determine clarity of directions.

The Narrative Case Study originally consisted of a case study followed by statements of clinical inference. The response portion of the instrument was adapted for this study. After reading the narrative case study subjects responded by listing the patient's cues and stating the clinical judgments. A value of two was assigned for each correctly listed cue and judgment depicting an emergency; other correct cues and judgments were assigned a value of one. The total possible score is composed of the sum of the four values. The total score possible is 37, the minimum score possible is 0. Content validity of the adapted response portion of the questionnaire was determined by consensus of a panel of three experts. Two medical-surgical faculty members of a local state university and one faculty member of a local college were consulted regarding correct cue listing and clinical judgment(s).

Validity of an instrument is a function of both the representativeness of the traits being measured as well as the sample (Polit & Hungler, 1978). The Critical Thinking Appraisal has been found to have criterion related validity. High correlations have been reported with standardized academic achievement tests such as the College Entrance Examination (r=.65) and the Miller Analogies test (r=.55) (Watson-Glaser, 1980).

Reliability of the Critical Thinking Appraisal has been assessed by three methods: split-half coefficients, parallel forms, and test-retest. Split-half reliability was computed separately for each subtest with the minimum score possible being 0 and the maximum 10. The five subtests include inference, recognition of assumptions, deduction, interpretation, and evaluation of arguments. The scores from each subtest were then summed, and the Spearman-Brown formula was used to compute the correlation coefficients for 10 norming groups. The correlation coefficients ranged from r = .69 to r = .85. Parallel forms reliability was determined by correlating responses to Forms A and B. A group of 228 12th grade students took both forms, yielding a r = .75 correlation. Test-retest reliability was determined by administering the instrument twice, three months apart, to a group of 96 college students. The mean and

standard deviations were essentially the same for both administrations. The correlation between the two testing periods was r = .73 (Watson & Glaser, 1980).

Data Collection

Permission to conduct the study was granted by one associate degree nursing and one baccalaureate degree nursing program from a large metropolitan area in the southwestern United States. Data collection was conducted in a classroom setting on three separate occasions in the summer and fall of 1982.

At the beginning of a class period, the investigator requested volunteers for participation in the study. Each group was informed that the purpose of the study was to assess the ability of senior nursing students to make clinical judgments and engage in critical thinking. The completion and return of the questionnaire constituted individual consent. Directions for the completion of each instrument were presented preceding distribution of the instruments. Subjects were asked to complete the Narrative Case Study first and then the Watson-Glaser Critical Thinking Appraisal. The demographic data and both instruments were completed in the classroom and returned to the investigator immediately. Twenty-three senior students from the

associate degree and 25 senior students from the baccalaureate degree nursing program received the Watson-Glaser Critical Thinking Appraisal (1980) and the Narrative Case Study (Fatzer, 1978).

Treatment of Data

Frequencies and percentages as well as measures of central tendency when appropriate were computed for each of the demographic variables of age, sex, and work experience.

For the Narrative Case Study (Fatzer, 1978), the total possible score was composed of the sum of each correctly identified cue and each correct clinical judgment. A one-way analysis of variance (ANOVA) was performed on the total possible score. A one-way ANOVA was used to determine if differences existed between associate degree and baccalaureate degree students in terms of clinical judgment.

For the Watson-Glaser Critical Thinking Appraisal (1980), subtotal scores for each of the five sections were separately computed. The group mean and standard deviation were determined for each of the five sections. The groups were compared by using the total number correct to compute a one-way analysis of variance (ANOVA) to determine if there were any differences between associate degree and

baccalaureate degree students in terms of ability to engage in critical thinking.

The scores on the Narrative Case Study (Fatzer, 1978) were correlated with the total score on the Watson-Glaser Critical Thinking Appraisal (1980) as well as the demographic variable of age. Scores on both instruments were correlated with participants' ages to determine if critical thinking ability, the ability to make a clinical judgment, and age were related.

Summary

Forty-eight student volunteers participated in the study by completing a demographic data sheet, the Narrative Case Study (Fatzer, 1978) and the Watson-Glaser Critical Thinking Appraisal (1980). Frequencies, percentages, and measures of central tendency were computed for the demographic variables. Each group's mean and standard deviation as well as a one-way ANOVA were determined for the dependent variables. Scores from the instruments were correlated with the demographic variable of age.

CHAPTER 4

ANALYSIS OF DATA

A nonexperimental, explanatory study was conducted to investigate the differences in ability to engage in critical thinking and make clinical nursing judgments between senior baccalaureate and associate degree nursing students. Written tests provided measurement of the dependent variables of critical thinking ability and clinical nursing judgment. Forty-eight senior nursing students participated in this study; 25 students were from one baccalaureate program, while 23 were from an associate degree program. This chapter describes the characteristics of the sample and the findings of the study.

Description of the Sample

The sample consisted of 48 senior associate degree and baccalaureate nursing students who were within six months of graduation. Forty-six females (95.8%) and one male (2.1%) participated in the study; one subject (2.1%) did not identify gender. Subjects were from 20 to 46 years of age with a standard deviation of 6.5 and a mean age of 28.3 years. The work experience of the sample included seven job categories with 41.7% (n=20) working as students

(see Table 2). The number of days employed per week varied from zero to six days with a mean of 2.21 days; two subjects failed to respond to the item (see Table 2).

Table 2

Work Experience and Number of Days Employed per Week for 48 Senior Associate Degree and Baccalaureate Nursing Students

Variable	n	%
Job Category		
Nurse Aide/Orderly	6	12.5
Nursing Student	20	41.7
Licensed Vocational Nurse	11	22.9
Physician's Office	2	4.2
Ward Clerk	2	4.2
Medical Technician	2	4.2
Medically Related	5	10.4
Total	48	100.0
Days Employed per Week		
6	1	2.1
4-5	15	31.3
2-3	19	39.6
1	4	8.3
Less than 1	4	8.3
Not Employed	3	6.3
Missing Data	2	4.1
Total	48	100.0

Findings

The findings of this study will be discussed by organizing the data around the two research questions. The first research question asked:

> Is there a difference between senior nursing students in baccalaureate and associate degree programs in terms of ability to engage in critical thinking as determined by the Watson-Glaser Critical Thinking Appraisal?

The Watson-Glaser Critical Thinking Appraisal (1980), used to measure critical thinking ability, is composed of a total composite score as well as separate scores from each of five subtests. The subtests measure inference, recognition of assumptions, deduction, interpretation, and evaluation of arguments. Table 3 displays mean group scores on each subtest as well as the total composite score. Mean scores for both groups were similar on subtests two through five and on the total composite score. However, on subtest one, inference, a difference between group means was noted with a baccalaureate mean of 8.6 and an associate degree mean of 6.5.

A one-way analysis of variance demonstrated that subtest one, inference, was significantly related to differences in educational preparation. An F value of 5.11 was significant at $p \leq .05$ as seen in Table 4. Therefore, the

Table 3

Mean Group Scores on the Watson-Glaser Critical Thinking Appraisal for 48 Associate Degree and Baccalaureate Nursing Students

Group	T_1 Inference	T_2 Recognition of Assumptions	T_3 Deduction	T_4 Interpretation	T_5 Evaluation of Arguments	Total Composite Score
Associate Degree	6.5	10.4	10.08	9.7	9.5	46.3
Baccalaureate Degree	8.6	10.8	10.04	10.9	9.4	50.3

baccalaureate mean of 8.6 on the subtest of inference was significantly higher than the associate degree mean of 6.5. An analysis of variance showed that the subtests of recognition of assumptions, deduction, interpretation, and evaluation of arguments were not significantly related to differences in educational preparation (see Tables 5 through 8).

Table 4

One-Way ANOVA of Subtest 1, Inference, of the Critical Thinking Appraisal for 48 Senior Associate Degree and Baccalaureate Nursing Students

Source	Sum of Squares	df	Mean Square	F	p
Between Groups	51.740	1	51.740	5.110	.0286*
Within Groups	465.739	46	10.125		

*$p < .05$.

In order to evaluate the differences between the associate degree and baccalaureate groups, an analysis of variance was performed on the total composite scores of the Watson-Glaser Critical Thinking Appraisal (1980). The total composite scores were not significantly related to differences in educational preparation (see Table 9).

Table 5

One-Way ANOVA of Subtest 2, Recognition of Assumptions, of the Critical Thinking Appraisal for 48 Senior Associate Degree and Baccalaureate Nursing Students

Source	Sum of Squares	df	Mean Square	F	p
Between Groups	1.598	1	1.598	0.119	.7313
Within Groups	615.652	46	13.384		

Table 6

One-Way ANOVA of Subtest 3, Deduction, of the Critical Thinking Appraisal for 48 Senior Associate Degree and Baccalaureate Nursing Students

Source	Sum of Squares	df	Mean Square	F	p
Between Groups	0.026	1	0.026	0.003	.9572
Within Groups	416.786	46	9.061		

Table 7

One-Way ANOVA of Subtest 4, Interpretations, of the Critical Thinking Appraisal for 48 Senior Associate Degree and Baccalaureate Nursing Students

Source	Sum of Squares	df	Mean Square	F	p
Between Groups	14.426	1	14.426	1.180	.2831
Within Groups	562.553	46	12.229		

Table 8

One-Way ANOVA of Subtest 5, Evaluation of Arguments, of the Critical Thinking Appraisal for 48 Senior Associate Degree and Baccalaureate Nursing Students

Source	Sum of Squares	df	Mean Square	F	p
Between Groups	0.018	1	0.018	0.001	.9740
Within Groups	751.899	46	16.346		

Table 9

One-Way ANOVA of Total Composite Scores of the Watson-Glaser Critical Thinking Appraisal for 48 Senior Associate Degree and Baccalaureate Nursing Students

Source	Sum of Squares	df	Mean Square	F	p
Between Groups	193.170	1	193.170	1.212	.2768
Within Groups	7334.310	46	159.442		

Basically no difference was found between senior associate degree and baccalaureate nursing students' ability to engage in critical thinking. One of the subtests of the Critical Thinking Appraisal, inference, was noted to be significantly related to educational preparation.

The second research question asked:

> Is there a difference between senior nursing students in baccalaureate and associate degree programs in terms of ability to make correct clinical judgments as determined by the adapted Narrative Case Study?

Each total possible score on the Narrative Case Study (Fatzer, 1978), used to assess nursing judgment, represented the sum total of the values of correctly identified patient cues as well as correct nursing judgments. Each total

possible score is composed of four subscores indicating identification of emergency and non-emergency patient cues as well as emergency and non-emergency nursing judgments. The total cue scores of the sample ranged from 5 to 32 with a mean of 18.7 and a standard deviation of 7.7. The mean total cue score for the associate degree group was 14.1 with a standard deviation of 6.5, whereas the baccalaureate group mean was 22.4 with a standard deviation of 8.7.

The total nursing judgment subscore on the Narrative Case Study (Fatzer, 1978) was also composed of correctly identified emergency and non-emergency judgments. Scores varied from zero to six with a mean of 2.2 and a standard deviation of 1.6. The associate degree group mean was 2.5 with a standard deviation of 1.6, while the baccalaureate mean was 1.9 with a standard deviation of 1.7.

The sum of the cue and the nursing judgment subscores formed a total possible nursing judgment score on the Narrative Case Study (Fatzer, 1978). The sample's scores on this variable ranged from 6 to 35 with a mean of 20.8 and a standard deviation of 9.0. The associate degree group mean was 17.1 with a standard deviation of 9.38.

A one-way analysis of variance was performed to assess the differences between the associate degree and baccalaureate groups in cue scores. An F value of 12.5 was

significant at $p \leq .001$ (see Table 10). The baccalaureate mean of 22.4 was significantly higher than the associate degree mean of 14.06 regarding correct cue identification.

Table 10

One-Way ANOVA of Total Cue Identification Scores of the Narrative Case Study for 48 Senior Associate Degree and Baccalaureate Nursing Students

Source	Sum of Squares	df	Mean Square	F	p
Between Groups	727.188	1	727.188	12.149	.0011*.
Within Groups	2753.478	46	59.858		

*$p < .001$.

Differences between the associate degree and baccalaureate groups' means on the nursing judgment subscore were not found to be significant after performing an analysis of variance (see Table 11). Therefore, the participating associate degree and baccalaureate degree nursing students must be viewed as having similar skill levels when formulating clinical nursing judgments.

An analysis of variance computed to determine differences between the associate degree and baccalaureate groups on the total possible nursing judgment score on the Narrative Case Study (Fatzer, 1978) revealed an F value of

Table 11

One-Way ANOVA of Total Nursing Judgment Scores of the Narrative Case Study for 48 Senior Associate Degree and Baccalaureate Nursing Students

Source	Sum of Squares	df	Mean Square	F	p
Between Groups	4.288	1	4.288	1.612	.2107
Within Groups	122.379	46	2.660		

8.9 which was significant at $p \leq .05$ (see Table 12). The baccalaureate mean of 24.28 was therefore significantly higher than the associate degree mean of 17.08 regarding total nursing judgment.

Table 12

One-Way ANOVA of Total Possible Nursing Judgment Scores of the Narrative Case Study for 48 Senior Associate Degree and Baccalaureate Nursing Students

Source	Sum of Squares	df	Mean Square	F	p
Between Groups	619.801	1	619.801	8.879	.0046
Within Groups	3210.866	46	69.801		

A significant difference was found between senior associate degree and baccalaureate nursing students' ability to make correct clinical judgments. The clinical judgment score was composed of both cue identification and formulation of nursing judgments. Of these components, only cue identification was found to be significantly related to educational preparation.

Other Findings

Pearson product-moment correlation coefficients were computed for both cue and nursing judgment subscores as well as the total possible score of the Narrative Case Study (Fatzer, 1978), the total composite score of the Critical Thinking Appraisal, and age of subjects (see Table 13). A significant positive relationship ($p \leq .05$) was found between identification of emergency and non-emergency cues with an $r = .387$. The correlation between emergency cues and formulation of emergency judgments was $r = .297$ which was significant at $p \leq .05$. Age was positively correlated with non-emergency nursing judgments with an $r = .319$ which was significant at $p \leq .05$. No significant relationships were noted between nursing judgment scores and non-emergency cues or total composite critical thinking scores.

Table 13

Pearson Product-Moment Correlation Coefficients for 28 Associate Degree and Baccalaureate Nursing Students

Variable	Non-Emergency Cues	Emergency Cues	Total Cue Scores	Non-Emergency Nursing Judgments	Emergency Nursing Judgments	Total Nursing Judgments	Total Composite on Watson-Glaser
Age	0.1226 p=.208	-0.0605 p=.345	0.0256 p=.433	0.3193 p=.015*	0.1300 p=.195	0.2086 p=.082	-0.1204 p=.213
Non-Emergency Cues		0.3869 p=.003*	0.7854 p=.000	-0.0448 p=.381	-0.0097 p=.474	-0.0215 p=.442	-0.0365 p=.403
Emergency Cues			0.8747 p=.000	-0.0264 p=.429	0.2974 p=.020*	0.2674 p=.033	0.1346 p=.181
Total Cue Scores				-0.0413 p=.390	0.1947 p=.092	0.1682 p=.127	0.0712 p=.315
Non-Emergency Nursing Judgments					0.1350 p=.180	0.4044 p=.002	-0.1682 p=.127
Emergency Nursing Judgments						0.9608 p=.000	-0.0368 p=.402
Total Nursing Judgments							-0.0811 p=.292

*p<.05

Summary of Findings

The sample consisted of 23 senior associate degree and 25 baccalaureate degree nursing students between the ages of 20 to 46 years. Most of the sample were working as students for a period of from two to three days per week.

Based on the analysis of data, educational preparation was not found to be related to the ability to engage in critical thinking. This finding negatively answers the first research question presented in this study. Also, educational preparation was not related to nursing judgment formulation.

However, differences in educational preparation were found to be related to cue identification, the total possible nursing judgment score, and the inference subscore with the baccalaureate students scoring higher on these three items. Therefore educational preparation was related to ability to make correct clinical nursing judgments. This finding positively answers the second research question.

Identification of emergency cues was positively related to identification of non-emergency cues and emergency nursing judgments. Age was positively related to formulation of non-emergency judgments. Age was not noted to be related to cue identification, emergency judgment formulation, the total nursing judgment score, or the composite score of the

Critical Thinking Appraisal. Subscores of cue identification were not related to formulation of non-emergency judgments. Non-emergency cue identification was not found to be related to the formulation of emergency nursing judgments, or to the total nursing judgment score. The total cue identification score was not noted to be related to nursing judgment scores. Non-emergency nursing judgment formulation was not related to emergency judgment formulation. The composite score on the Watson-Glaser Critical Thinking Appraisal (1980) was not related to cue identification nor nursing judgment formulation.

CHAPTER 5

SUMMARY OF THE STUDY

The purpose of this study was to investigate the differences in associate degree and baccalaureate degree nursing programs related to critical thinking skills and formulation of clinical nursing judgments. The conceptual framework based on the review of the literature identified basic course differences in the two types of nursing programs. These differences in education prepared the associate degree graduate to identify and apply scientific knowledge to direct patient care, whereas the baccalaureate graduate was prepared to assess and analyze scientific knowledge in order to formulate nursing judgments. The process of judgment was noted to involve some method of grouping multiple patient cues in order to infer a clinical nursing judgment. This inferential reasoning process included critical thinking skills and is presumed to be part of the baccalaureate curriculum.

This nonexperimental, explanatory study was conducted with senior students within six months of graduation from one associate degree and one baccalaureate degree nursing program. Twenty-three associate degree and 25 baccalaureate degree student volunteers completed a demographic data

sheet, the Narrative Case Study (Fatzer, 1978) which measures correct clinical judgments, and the Watson-Glaser Critical Thinking Appraisal (1980) which measures critical thinking ability.

Demographic information was obtained on the following variables: age, sex, work experience, number of days employed per week, and educational preparation. Scores on the Narrative Case Study (Fatzer, 1978) included cue identification as well as formulation of nursing judgments with both scores being divided into emergency and non-emergency subscores. The Watson-Glaser Critical Thinking Appraisal (1980) was composed of separate scores from each of the five subtests and a total composite score.

Discussion of Findings

A review of the literature revealed differences in the educational preparation of associate degree and baccalaureate degree nursing students. These program differences suggested differing skill levels relating to the formulation of clinical nursing judgments and critical thinking ability (National League for Nursing, 1979). If a relationship can be established between the type of educational preparation and skill in formulating nursing judgments, then graduates from each type of program can be placed in work roles which recognize their educational uniqueness.

Senior baccalaureate degree nursing students correctly identified more cues than senior associate degree students. This finding is understandable as the baccalaureate degree program teaches judgment formulation which begins with noting relevant cues (Tanner, 1978). Dinchner and Stigner (1976) and Gordon (1976) referred to the initial phase of judgment as response to multiple patient cues. This result is further supported by Tanner's (1978) premise that baccalaureate education focuses on problem solving. She noted the initial step of the problem solving process involves focusing on relevant cues.

Formulation of correct clinical nursing judgments was not found to be related to type of educational preparation. Nursing judgment was noted to be positively correlated with age. Since the associate degree group had more students beyond 26 years of age, this variable may have influenced the result by contributing to higher scores in this group. However, this finding differs from Oleson's (1978) study involving critical thinking ability and nurses' decisions which concluded that years of age were not related to decision making.

Nursing judgment was not found to be related to critical thinking ability. The Narrative Case Study (Fatzer, 1978) measured nursing judgment with a simulation format, whereas the Watson-Glaser Critical Thinking

Appraisal (1980) measured separately five aspects of critical thinking by providing separate Likert-type scales on each subtest to indicate degree of agreement. The differences in instrument format may have contributed to the lack of relationship. However, other studies had similar results. Studies by Oleson (1978) and Matthews (1978) also reported no relationship between decision making or making a nursing diagnosis and critical thinking ability.

Critical thinking ability was not found to be related to type of educational preparation in this study. Oleson (1978) noted that critical thinking skills may improve without instruction which may account for the lack of differences based on type of educational preparation. However, baccalaureate students had higher scores on inference, one of the subtests of the Critical Thinking Appraisal, than did associate degree students. This finding supports Aron's (1978) assumption that inference skills are taught during college.

Conclusions

Based on the analysis of the data for this study, the following conclusions were drawn:

1. Senior baccalaureate degree nursing students correctly identified more cues than senior associate degree nursing students. The cues were patient symptoms and

assessment data which were contained in a written case study. The student was asked to identify cues because the noting of pertinent information is part of the judgment process. Therefore, cue identification is more developed in the baccalaureate educational process.

2. No significant difference existed between senior associate degree and senior baccalaureate degree nursing students' formulation of clinical nursing judgments. The judgment process includes the noting and classification of pertinent information in order to determine an overall judgment product. Based on this study, the classification or grouping process appears similarly developed in the associate degree and the baccalaureate nursing students.
3. The senior baccalaureate students' total nursing judgment scores were significantly higher as found in this study than associate degree nursing students' scores. These scores included both cue identification and the formulation of clinical nursing judgments. Data analyses suggest cue identification, or the noting of pertinent information, is more developed in the baccalaureate group; however, the process of determining the judgment does not appear more developed in either group.

4. Ability to formulate nursing judgments is not related to critical thinking ability.
5. Critical thinking ability is not related to type of educational preparation.

Implications

The following implications for nursing can be drawn from this study:

1. Baccalaureate nursing education should place more emphasis on the student's ability to formulate clinical nursing judgments. This skill could be developed by having classes in judgment formulation in which the phases of the judgment process would be separated and instruction given for each phase. The student would, therefore, receive instruction in how to formulate a judgment.
2. Effort should be made to develop critical thinking skills of nurses. Being able to think critically is an important skill because this type of thinking involves the examination of evidence for value. This skill could be taught during basic nursing education.

Recommendations

The following recommendations for further research are based on the results of this study:

1. The present study should be replicated with a larger sample including several associate degree and baccalaureate degree nursing programs in different geographic settings to test the representativeness of the findings.
2. This study should be replicated except the subjects' ages in the groups should be matched to decrease the effect of age as a variable.
3. More studies should be designed to explore the differences between associate degree and baccalaureate degree nursing programs.

APPENDIX A

APPROVAL

TEXAS WOMAN'S UNIVERSITY
COLLEGE OF NURSING
DENTON, TEXAS 76204

DALLAS CENTER
1810 INWOOD ROAD
DALLAS, TEXAS 75235

HOUSTON CENTER
1130 M. D. ANDERSON BLVD.
HOUSTON, TEXAS 77030

AGENCY PERMISSION FOR CONDUCTING STUDY*

THE North Harris County College Associate Degree Nursing Program

GRANTS TO Frances G. Fillion
a student enrolled in a program of nursing leading to a Master's Degree at Texas Woman's University, the privilege of its facilities in order to study the following problem:

Is educational preparation related to critical thinking ability and the ability to make clinical judgments?

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 _____

Date: May 7, 1982

Carol Ingw
Signature of Agency Personnel

Frances G. Fillion
Signature of Student

Signature of Faculty Advisor

* Fill out and sign three copies to be distributed as follows: Original-Student; First copy - agency; Second copy - TWU College of Nursing.

/bc

APPENDIX B

QUESTIONNAIRE PACKET

DEMOGRAPHIC DATA

1. Age: _____

2. Sex: _____

3. Level of Nursing Education (please check one):

   a. Senior associate degree student _____

   b. Senior baccalaureate degree student _____

4. Work Experience in the Field of Nursing:

   a. Have been or are currently employed (please check one):

      1) Nurse aide or orderly _____

      2) Nursing student _____

      3) Other (please specify) _____

   b. Have been or are currently employed (please check one):

      1) 4-5 days per week _____

      2) 2-3 days per week _____

      3) 1 day per week _____

      4) Less than 1 day per week _____

      5) Other (please specify) _____

DIRECTIONS

The following case study describes a medical patient admitted for left lower lobe pneumonia. The patient's behavior indicates a problem for which (a) clinical nursing judgment(s) would be made. Read the narrative case study and on the basis of this study, please do the following:

1. List ALL of the patient's cues which helped you to identify (a) clinical nursing judgment(s) to be made. (Cues = symptoms, signs and other available patient data.)
2. State the clinical nursing judgment(s). (Clinical judgment = observing, grouping, and assigning value to a client's symptoms in order to state the unhealthy response.)

Case Study

Mr. Williams, a 59 year old sales clerk, is admitted to a general medical ward of your hospital with complaints of cough, fever, and increasing dyspnea. He has had a severe cold for the past week, and although he has not missed work, he has been unable to lie down at night. He has progressed from one pillow to two and finally had to remain in an upright position the night prior to admission. Today, following examination by his physician and evaluation of a chest X ray, he was admitted with a medical diagnosis of

left lower lobe pneumonia. Mr. Williams has a history of hypertension and repeated episodes of bronchitis. Previous radiological exams have revealed cardiomegaly and changes compatible with chronic obstructive pulmonary disease. Five years ago, Mr. Williams sustained a myocardial infarction. He has been a heavy smoker, but over the last year has cut down to less than one pack per day.

On admission, Mr. Williams is a moderately obese, polite, white male appearing his stated age. During the initial conversation, he remarks that although he does not know why, he has always been afraid of hospitals. He is mildly dyspneic and becomes more so on slight exertion (changes into pajamas). Once settled into bed, in an upright position, initial vital signs are: BP 178/94, pulse 96 and regular, and temperature 101.6.

As you come on night duty at 11:00 pm, the evening nurse makes the above information available to you. She also reports that although Mr. Williams is still dyspneic, he appears somewhat relieved following continuous oxygen therapy.

At 3:30 am, his call light summons you to the room. You find him cyanotic, diaphoretic, and repeatedly mumbling "Help me." His skin feels clammy, he is thrashing about in the bed and one leg is hanging off the bed as if he has

attempted to get out of bed. Respirations are rapid, labored and shallow, 34/minute. His pulse rate is 112/minute and irregular, his blood pressure is 170/88. Loud respiratory rales are present and the jugular veins are distended.

Clinical Nursing Judgment(s)

1. All cues:

2. Clinical judgments:

WATSON-GLASER CRITICAL THINKING APPRAISAL

This test booklet has five subtests which measure separately five aspects of critical thinking. They provide separate Likert-type scales on each subtest to indicate degree of agreement. This test was originally copyrighted in 1977 by Harcourt Brace Jovanovich, Inc. Form A was copyrighted in 1980 by Harcourt Brace Jovanovich, Inc. This test is available from The Psychological Corporation, a subsidiary of Harcourt Brace Jovanovich, Inc.

There are five subtests. There is an overall total of 80 questions distributed equally among the subtests.

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