NURSING

DESCRIPTIVE STUDY METHODS IN NURSING

by

Phyllis J. Verhonick

PAN AMERICAN HEALTH ORGANIZATION
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NOTE

This manual was prepared by Phyllis J. Verhonick, R.N., Ed.D., Professor of Nursing Research and Teaching at the School of Nursing of the University of Virginia, at the request of the Pan American Health Organization.

CONTENTS

FOREWORD

The provision of nursing care in the quantity and of the quality required for the attainment of health program objectives, and within the limitations imposed by social, cultural, and economic factors, is one of the major challenges confronting nursing leaders of developing countries. As nursing itself develops, these leaders are becoming increasingly aware that the most logical approach to solving the problems is through nursing participation in the health planning process and through programming to meet the nursing needs on a comprehensive basis. Reliable information on current nursing resources and their utilization is therefore required, to serve not only as an element in the health planning process but also as the basis for assessing the current situation and for determining future needs and the course of possible change.

Nurse administrators have become more and more aware of the need for fact-finding studies, but they hesitate to have them conducted because of the lack of knowledge and experience in this type of activity. This guide is designed to provide nurses with information on the various facets of and steps involved in fact-finding studies. It is hoped that its use will make more reliable data on nursing resources available and thus lead to better programming, with a view to furnishing the nursing care required for the delivery of health services to the people.

Margaret Cammaert
Chief Nurse
Pan American Health Organization

INTRODUCTION

This is a guide for conducting studies in nursing. It is not a manual of research in nursing, although selected research methods are used. The steps in the process of carrying out a particular type of study parallel those of the broader scientific method of research. The material is presented in as realistic and practical a manner as possible. Practitioners of nursing can refer to this handbook in collecting data in their respective settings. The terminology is intentionally simple and direct, as an aid to beginning investigators.

The purpose of descriptive studies in nursing is to assess the current situation. Systematic studies provide the necessary documentation for planning and future programming in the field of nursing. Circumscribed studies on various aspects of nursing and health care serve as the foundation for a continuing program. Although this manual is intended as a guide for beginning investigators, it can also serve as an administrative tool in nursing.

The processes in systematic investigation are presented in such a way that nurse practitioners, administrators, and educators can become involved as investigators. The specific steps in problem identification and definition, data collection, analysis and interpretation, report writing, and implementation of findings are discussed.

The importance of the systematic collection of reliable information on what nursing is and on the work of nursing personnel cannot be emphasized enough. It is essential to know, on the basis of factual evidence, what nurses actually do, before plans can be advanced for future nursing practice, education, and administration.

One of the initial steps in planning for nursing and health care needs is a nursing diagnosis. Yet even before such a diagnosis can be made, reliable data must be obtained. Facts in and of themselves are of little value. Not only must these data be related to specific problems and purposes, but they must be systematically collected and analyzed in the search for an answer to a specific nursing problem.

Chapter I

STATEMENT OF THE PROBLEM

The initial step in the research process is to formulate the problem, such a statement being not only the first but also the most important step in conducting a study. All the subsequent steps in a study, whatever the field, proceed from a sound statement of the problem. A clear, concisely worded problem statement serves as the guide for outlining objectives, selecting design, choosing methods of data collection, and analyzing the findings of the study.

A problem must be stated so specifically that it can be researched or studied. All the words and terms in the problem statement should therefore be clear and understandable. The reader should know exactly what is intended.

SOURCES OF PROBLEMS IN NURSING

Problems for study usually arise in areas where information is lacking, where doubt and uncertainty must be eliminated through documentation with factual evidence, or where unidentifiable and confusing circumstances persist. For example, patients waiting to see a nurse or doctor in a clinic may have to spend an unreasonable length of time before they are examined. The type of activities that various levels of nursing personnel perform may not be clearly defined. Specific information may be needed on the amount of time the public health nurse devotes to traveling from one patient to another. These are but examples of situations in which a problem could be identified and stated for purposes of conducting a study.

There is no shortage of problems in nursing practice, education, or administration, either in the hospital or in public health. Problems represent situations that require a solution, improvement, alteration, or modification. Problem statements must be related to practical solutions or to changes in the situations that prevail in nursing.

A broad problem that persistently confronts nursing is the shortage of personnel. The shortage of nurses is in fact a general problem area. An attempt to investigate all the reasons for such a shortage would be almost certain to fail, because the situation is too widespread and nonspecific for study. However, within the broad problem area several specific problems related to the shortage of nursing personnel can be singled out for study. Insoluable situations may very well encompass numerous researchable problems for which realistic solutions are

possible. The individual problems and solutions, taken as a whole, furnish information that is basic to the reasons for the shortage of nursing personnel. Specific examples of circumscribed researchable problems include the following:

1. What do patients require of nursing personnel?
2. What are the ratios of specific categories of patients to each type of nursing personnel in the hospital? in public health?
3. Is shortage related to numbers of personnel in the hospital? in public health?
4. What types of activities does each level of nursing personnel perform in the hospital? in public health?

These examples take the form of questions. The problem statement can be written either as a question or as a declarative statement, depending on the investigator's preference. A problem is defined as a question requiring an answer. Therefore, beginning investigators may have less difficulty in identifying and stating problems in a researchable form if they use the question format.

A critical examination of individual nursing situations yields numerous problems for study. For instance, does the manner in which nursing procedures are carried out produce proper results? Are nursing personnel performing non-nursing functions? Is the staffing of hospital units appropriate for a 24-hour period? What are the content and use of nursing records and reports? What type of educational preparation are nurses receiving? What types of errors are being made in the administration of medicines? How much do prenatal patients know about their diet? These are but a few of the questions suggested by nursing and patient care situations. Thoughtful reflection on specific health care settings would lead to many more problems for study.

GUIDELINES FOR SELECTING AND STATING A PROBLEM

It is necessary, first, to select a problem to which research methods can be applied. It should be remembered that these are guidelines for conducting nursing studies, not for doing research. However, the systematic study of nursing requires selected research methods. One nursing problem for which research methods do not exist is the assessment of the quality of nursing care. And because no measure of quality of care now exists, problems concerning this subject are not researchable.

Aside from the need for having appropriate study methods available, a problem must be within the investigators' scope of achievement. Solving a problem may require skills the investigators simply do not possess, for example, capabilities in statistics, biochemistry, or psychology. They may not have the necessary educational preparation or experience to conduct the study. Time is also a factor in the scope of achievement. If a study will require longer than two

years to complete, it may be unrealistic to undertake it. Competence in nursing is of course essential to studies in nursing.

Other questions regarding a potential problem for study might include the following:

1. Is the problem of interest to the investigator?
2. Will the study open new and promising areas for further studies in nursing practice?
3. How significant is the problem?
4. Is the study of value to nursing?
5. Is the problem related to a general field of nursing theory or practice?
6. Is the study financially feasible?

When answers to the preceding questions are supplied, the investigator will have an idea on how to move to the next step, that is, stating the problem in such a way that it can be studied systematically.

WRITING THE PROBLEM STATEMENT

The problem must be so stated that it can be solved systematically. The problem statement must therefore be clear, precise, concrete, and easily communicated to others. Vague, nonspecific terminology should be avoided. Certain terms in the problem statement will need an "operational definition," which differs from a standard dictionary definition. In an operational definition a term such as "levels of nursing personnel" may include graduate nurses, practical nurses, nurse aides, and orderlies. Each word in the term is not defined with an isolated meaning. Operational definitions include specific, measurable behavior or phenomena.

Examples

1. **Problem.** Patient's lack of understanding of prenatal diet and weight gain during pregnancy.

   Problem Statement. To assess, by interview, the stated amount of knowledge of selected prenatal clinic patients concerning their diet during pregnancy.

   Operational Definitions

   a) "Selected prenatal clinic patients": primipara and multipara patients from [city] visiting the [name] Health Center during their pregnancy.

   b) "Stated amount of knowledge": the response patients give the interviewer regarding specific questions about their diet.

2. **Problem.** Utilization of nursing personnel.

   Problem Statement. To observe and describe the number and types of activities performed by each level of nursing personnel during a 24-hour period in selected hospital units.

   Operational Definitions

   a) "Each level of nursing personnel": includes the supervisor, head nurse, staff nurse, nursing student, practical nurse, nurse aide, and orderly.

   b) "Selected hospital units": include medical, surgical, obstetrical, and pediatric wards; do not include the emergency room, the operating room, or clinics.

3. **Problem.** Availability of nursing supervisor to assist with nursing problems in hospital units.

   Problem Statement. To observe and describe the nursing supervisor's nursing and non-nursing activities on each shift during a one-week period.

   Operational Definitions

   a) "Nursing supervisor": includes the day supervisor for general hospital wards and the evening and night supervisor; does not include the operating room or clinic supervisor.

   b) "Nursing and non-nursing activities": nursing activities are directly related to giving, planning, preparing, or consulting about nursing care to patients; non-nursing activities are all other tasks, including administration, messenger service, and clerical and personnel work.

4. **Problem.** Infrequency of home visits by the public health nurse in a community.

   Problem Statement. To measure the amount of time the public health nurse devotes to home visits, health teaching, nursing care, and travel.

   No operational definitions are required for the foregoing problem statement, because the terms are clear. Operational definitions are not always needed for clarification of the problem statement.

SUMMARY

The statement of the problem is the most important, and often the most difficult, step in research or a study. It dictates the objectives, design, and methods of data collection and the analysis and interpretation of findings. The following questions should be asked about the problem to be studied:

1. Is it researchable?
2. Does the investigator have the competence to complete the study?

3. Is the problem interesting?
4. Will this study open additional areas for study?
5. Is the problem significant for nursing?
6. Is the problem related to a general field of nursing theory or practice?
7. Is the study financially possible?
8. Is there enough time to complete the study?

Chapter II

STATEMENT OF PURPOSE AND OBJECTIVES

The second step in conducting a study is to state the purpose and to specify the objectives. As was indicated previously, the statement of the problem designates *what* is to be studied. The statement of purpose outlines *why* the study is being undertaken. The purpose is, simply put, the reason why the study is being carried out—its justification.

The stated purpose of a study is usually broad, outlining long-range goals or an over-all contribution to the field. In the nursing profession it may deal with a general contribution to nursing practice, the utilization of nursing personnel, or the content of a nursing education program. From this over-all statement of purpose, subpurposes and objectives are derived. Objectives relate to realistic short-term goals. Both the purpose and the objectives evolve from the statement of the problem.

WRITING THE STATEMENT OF PURPOSE

The purpose may be expressed as a question or as a declarative statement, whichever is easier for the investigator to write. Also, the purpose and the problem may be covered together in a single clear and concise statement. The investigator can, in one statement or question, provided it is not too complex, set forth what is to be done and why it is being done. The statement of purpose must meet some of the same criteria as the statement of the problem. These include clarity, precision, concreteness, and ease of communication.

The purpose, though broad in nature, establishes the limits of the study; it may, for example, set restrictions on time, geographic area, or the number of persons to be included. The investigator needs specific guidelines to follow in order to obtain relevant information on which to base answers to the question or solutions to the problem under study.

The written statement of purpose usually contains an active verb preceded by the preposition "to." For example, a study may be conducted "*to provide* information on utilization." The purpose of another may be stated as "an investigation *to assess* the amount of knowledge diabetic patients have concerning their home care." A study on nursing education may be undertaken "in order *to gain* insight into the content of basic nursing education programs in

a specific country." From these examples, the close relationship between the over-all purpose and the problem statement can readily be seen.

There are many reasons for conducting research. Investigations may be designed to extend the limits of knowledge, to describe an existing situation, to explain circumstances, or to verify existing knowledge by experimentation. This manual will be concerned primarily with the discovery and description of information in existing situations.

WRITING STUDY OBJECTIVES

The analysis of the results from the collection of data is in accordance with the specific objectives formulated. The statement of objectives must denote measurable attributes or observable phenomena. Otherwise, it would be impossible to know whether the objectives have been met. Without clearly defined goals, research could not be intelligently evaluated and analyzed. There would be no sound basis for making recommendations or for knowing whether the stated problem has been solved.

With clearly written objectives the investigator knows the specific activities and the sequence of steps in the study process. The objectives describe the desired outcome of the study. Therefore, objectives and subpurposes should be stated in such a way as to make achievement as likely as possible. A written objective is meaningful to the extent that it succeeds in communicating the intent.

Like the statement of purpose, the statement of objectives includes an active verb preceded by the word "to." Examples of objectives might include: (1) *to identify* the frequency of activities of the head nurse; (2) *to compare* differences or similarities between activities in medical and surgical wards; (3) *to measure* the amount of time the public health nurse spends traveling from one home to another; and (4) *to write* job descriptions on the basis of activity analysis findings.

In a well-designed study these short-term objectives could be realized. The data collected should furnish the information needed for achieving each of the objectives.

Example

Statement of the Problem. To observe and describe the activities performed by various levels of nursing personnel during each shift, in selected units in a general hospital.

Purpose. There is a need to systematically examine and analyze activities performed by various categories of personnel in order to gain insight into appropriate utilization. Because this information has not yet been made

available, a second over-all purpose is to gather data on the distribution of activities performed by nursing personnel.

Objectives

1. To identify the types of activities now being carried out by various categories of nursing personnel.
2. To measure the frequency of performance of various activities within each category of nursing personnel.
3. To classify activities by area of nursing and by skill level.
4. To delineate activities according to categories of nursing personnel.
5. To furnish factual information on which to base guidelines for reformulating written job descriptions for each category of nursing personnel in the hospital.

SUMMARY

The statement of purpose and subpurposes and of objectives evolves from the problem statement. It furnishes the investigator direction in completing sequential steps in the study. The purpose is usually a broad statement outlining the over-all contribution the study is expected to make to nursing. Objectives are discrete, specific short-term goals that can be met realistically through the collection and analysis of data.

The statement of the problem specifies *what* is being studied; the statement of purpose indicates *why* the study is being undertaken.

Chapter III

SELECTED DESIGNS FOR THE STUDY

The design is the plan for the study, providing the over-all framework for collecting data. Once the problem has been concretely formulated, a design is developed in order to provide a format for the detailed study. The design is relatively specific, consisting of a series of guidelines for systematic data gathering. The type of design depends on the statement of the problem.

There are as many classifications of research design as there are researchers. The designs presented here are those used for descriptive studies. The primary aim of this type of research is to furnish a factual description of a situation—in other words, to describe what exists. Within broad descriptive studies other areas of investigation are usually identified. Three types of descriptive designs will be presented. Each design shows how data can be collected, but it does not single out specific methods, such as a questionnaire or interview, or designate type of observations.

In addition to the statement of the problem, the following considerations may also influence the investigator's choice of design:

1. The extent to which the problem is researchable.
2. The types of observations and data available.
3. The ability to translate observation into operational definitions.
4. The types of controls needed to minimize known biases.

Although there are many other types of descriptive designs, the three presented in this chapter are ones that are most frequently used by nursing to study its particular situations. The designs include activity analysis, survey, and record review.

DEFINITION OF TERMS

Before design is discussed, some of the terms used in research must be defined, for many words and phrases in everyday usage have a different connotation in research and studies.

Variables are any observations or measurements possessing the characteristic of change. A variable may be a person, an activity, a unit of time, a trait, a way of behaving, or a response to a question.

Facts are events or phenomena that have actually happened. They are any occurrences that are known and observed and have been verified by planned observation.

Generalizations are inferences drawn from circumstances that have been observed, described, and analyzed, and are thus formulated. The details of the data collected are rendered into broader categories.

Controls are the operation designed to minimize sources of error or distortion of knowledge. In good design, controls are planned to eliminate known biases.

Research is a systematic study in which data are purposefully gathered, analyzed, and interpreted to seek the solution to a problem. The key words in this definition are "systematic" and "problem."

ACTIVITY ANALYSIS

The activity analysis is a descriptive study in which specific activities of persons are observed, classified, and analyzed. The subquestions answered by activity analysis are *who? what? where?* and *when?* Descriptive research does not answer the question *why?* Once information on activities or tasks is presented, the investigator seeks patterns of similarities and differences.

Activities of nursing personnel are frequently examined in terms of those tasks related or not related to nursing. Clues to appropriate utilization of various types of personnel can readily be identified. Activities that persons perform can easily be observed and classified. The investigator may wish not to limit observations to type of activities but also to consider the length of time devoted to specific activities.

The design for activity analysis uses specific methods of direct observation and classification to describe existing phenomena. The study of nursing activities has been widely used as an administrative tool as well as a research method.

The basis for the study of activities of nursing personnel is the time study developed by industrial engineers. Analyses of activities provide insight into the level of skill and extent to which nursing personnel perform various tasks. The specific methods selected depend on the answers individual investigators seek. The solutions may relate to all categories of personnel, a specific group of nurses, time devoted to tasks, skill level required for activities, functional areas of nursing, or distribution of workload over a 24-hour period.

Generally the activity analysis employs a sampling of observations rather than continuous observation. Persons in the situation itself participate in the collection of data. Not only is this more interesting for the participants but implementation of findings can more readily be accomplished by those involved. This type of study describes activities, personnel, and time, but not the quality

of care being given. Activity analysis results may open other avenues of study. The examination of data points out gaps in knowledge and therefore may be but part of the first of a series of studies.

SURVEY

The descriptive survey is a process for gaining pertinent and precise information about an existing situation. It is one of the most widely used and oldest research designs. Most surveys involve counting, with the data being characteristically quantitative. The survey typically constitutes a means of obtaining precise facts and figures. It attempts to describe a condition or learn the status of something.

The specific research technique for a survey usually includes the questionnaire, opinionnaire (public opinion polls), interview, or census taking. Historically it dates back to Biblical times, when Augustus Caesar took a census of all subjects in the Roman Empire. In nursing, the formal approach to research in the United States began with a series of function studies in 1950. Most of those early studies were descriptive surveys. Although the survey design has been widely used, it has not been as extensively employed in nursing as it might be.

The survey is the most appropriate method for gaining information from a large sample. Like other descriptive research, it is designed to learn *what is*. It is a flexible means of gathering facts and then seeking relationships among them to identify patterns of similarities or differences.

In addition to being able to assess a large sample of subjects, the descriptive survey has other advantages. It is usually less costly than other designs. Besides, the data collection and analysis require less time. The survey subjects are ordinarily very cooperative and, if approached correctly, are often willing to participate. If the sample of subjects is appropriately selected, the survey is broadly representative of the population. Sample choice and population will be discussed in the following chapter, which deals with specific research techniques.

To the advantages of the survey must be added a few disadvantages. Because this design is widely used, it is subject to misuse resulting from lack of a clear-cut definition of the problem and objective. It is not possible to identify cause-and-effect relationships with the survey design. Moreover, the descriptive survey has little value when applied to new situations. When the questionnaire and interview techniques are used to obtain a self-report from respondents, it is necessary to assume the honesty of their answers, particularly in sensitive areas of inquiry.

In general, it is easiest to obtain factual data through the survey method as a means of providing the basis for generalizations. Valid general recommendations can be drawn from the facts discovered through a well-designed survey. The

critical importance of the survey approach lies in developing the foundation for additional studies. There are many types of surveys that can be used for this purpose.

RECORD REVIEW

The record review, the third descriptive design treated here, is not widely recognized by researchers as a specific method. Though related to historical research, it is not historical methodology per se. Records serving as sources of data help to fill gaps in knowledge. This design often complements and supplements other methods that nurses may employ. It is used extensively in clinical research.

Examples of records that may be of value to nurse investigators include hospital or public health records, patients' charts, personnel records, and school records. If they are to serve their purpose, records must be accurate and objective, clear and concise, easily referred to, uniform, and up to date. Very often none of these standards apply to records, which thus pose a problem to investigators. Uniformity of records within a hospital, within a health agency, or within a country facilitates research and reference.

Use of the record review design in any investigation requires the active process of attention and discriminating selection from a considerable mass of materials. It is a temptation for the investigator to include information that may be of interest but that bears no relation to the specific problem under study. It is desirable to strive for a balance between the completeness necessary to objectivity and the brevity essential to clarity.

Many records are not kept for the primary purpose of research and therefore do not meet the standards for accuracy. One of the shortcomings of this type of design is informational gaps. Not only must the investigator assume that the records reviewed are accurate, but data that may be important for a study are frequently missing.

Factual data from records are easy to classify and tabulate, whereas narrative data pose a problem. Narrative types of records may be examined and analyzed chronologically, topically, or both. All methods fall short because of the extraneous information included in narrative reports.

Although the record review has several disadvantages, it is a valuable design for gathering cumulative information. Records provide a relatively easy method for identifying problems for future study. Record reviews are retrospective in nature. It is necessary to examine past or recorded events and relate them to a current problem. But precisely because past events are being examined in the light of present-day problems, there is danger of bias. The impressions recorded some time ago in documents may no longer be valid.

SUMMARY

The various designs for descriptive studies provide specific plans for data collection. The choice of design is determined by the statement of the problem. There are many descriptive designs, but three—activity analysis, survey, and record review—are selected as appropriate for studying nursing. Each design is discussed in general terms.

Chapter IV

SPECIFIC METHODS AND TECHNIQUES FOR THE COLLECTION OF DATA

Once the decision on design has been made, the next step is selecting the appropriate method for collecting data. At this stage in the study it is advisable to obtain specialized assistance. A knowledgeable statistician can be of invaluable help in advising the investigator on the best method, techniques of sample selection, and number of subjects, and in outlining the basis for the analysis of data. Early consultant services of a statistician are particularly beneficial to beginning investigators and to those conducting a study of this type for the first time. Errors can be avoided if the statistician is called in during these preliminary stages of the investigation.

The methods employed for the study must meet specific criteria to ensure success. Regardless of the method selected, there are four criteria or standards for evaluating the data-collection tools:

1. Validity
2. Reliability
3. Freedom from bias
4. Practicability.

Validity is the most important of the four criteria. Unless the tools or methods are valid, the other criteria are not likely to be met. Besides, an instrument or method that is not valid is itself an unsatisfactory measure for the study. Validity means: Does the measure actually measure what it is supposed to measure? For instance, if an interview schedule is used to obtain information from patients concerning care of their infants, the assessment of validity would entail a careful examination of each question asked of the patients, so as to gain specific knowledge about the care of their babies. Are the questions in the interview relevant to the information sought from the patients? Validity may be influenced by the subjects selected for the sample. Before a technique for the actual collection of data is used, a trial run, or pilot test, should be conducted, since it provides information that is helpful in assessing validity. If responses elicited by the particular method or instrument do not give information related specifically to the question, then there may be no validity. The importance of validity or truthfulness of instruments cannot be emphasized too strongly.

The next most important criterion is *reliability*. Reliability refers to the precision, or accuracy, of the tool. Can the method of measurement be reproduced and consistently yield the same results? For example, if the questions put to patients concerning infant care were asked over and over again, would the same type of responses be obtained? Undoubtedly the answers would vary in specific details, but they should be related in nature. If mechanical instruments—such as the sphygmomanometer for measuring blood pressure—are used, the same instrument should be used for each subject in a study. Before an instrument such as the sphygmomanometer is used for collecting research data, it should be calibrated against a standard for accuracy. A statistician can help determine reliability, there being specific statistical tests for this criterion.

The next consideration is *freedom from bias.* No study should be started with known bias. For example, an investigation designed to determine what is wrong with the evaluation of clinical experience for students is improper, for stating "what is wrong" is introducing a bias. Bias can be reduced also by minimizing the use of quality terms, such as "best" and "good." External controls may be exercised by the investigator to decrease bias. These might include using the same environment for data collection whenever possible; collecting information during the same season if climate has an influence; employing the same instrument for measurement; and having the same individual or individuals make the observations.

The last criterion, *practicability*, deals with the realistic situations the investigator faces. These may include such factors as time, money, equipment, experience, and availability of data. Even though the methods for collecting data may meet all the criteria, such apparently simple considerations as time and expense may preclude their use.

DEFINITION OF TERMS

Before data-collecting tools are discussed specifically, other concepts and definitions must be introduced for greater understanding.

Population includes all the subjects belonging to a defined universe or group. The population limits may be set by the investigator regardless of how large or small the group may be. It might include all the patients in a parish (county), all nursing personnel in one hospital, or all graduate nurses in the country.

Sample is a smaller group representing the population selected for study. Frequently the population as previously defined is too large and unwieldy for study, so through special techniques a sample that represents the total population is carefully selected.

Random relates to a technique used to select subjects or to plan observations. Randomness assures the probability that the sample is of the same composition as the population. Subjects or observations may be allocated to different groups

by the laws of chance. Random sample permits generalization regarding the total population.

Criterion is a yardstick or standard against which the accuracy of observations is measured. It is sometimes referred to as *criterion-measure.* If the performance of nursing students is being observed, the criterion-measure may be the number of correct answers to a valid examination in nursing. A criterion-measure for the rate of healing of a decubitus ulcer may include lesion size, color, amount of drainage, and presence or absence of infection.

ACTIVITY ANALYSES

There are several specific instruments that may be used to collect data for activity analyses. Most of these tools require direct observation. Through educational preparation and experience, nurses are skilled observers; however, the type of observation required in research and studies is of a different kind.

Direct Observation

Research observations are conducted for a specific purpose and therefore require rigorous thought and strict discipline. The observations are, of course, based on the problem statement and the objectives. Before such observations are made, what is to be observed has been painstakingly defined in precise, detailed terms. Accuracy and consistency are essential in study observations. The guidelines for observation must be outlined prior to the actual collection of data.

The investigator or members of the study team can observe only behavior or outward signs of patient response. What may be intended by such behavior cannot be observed, interpreted, or recorded. It is a temptation not to limit observation to those points set forth in the problem statement, but once the definition is stated it is not appropriate to digress and collect other information, no matter how interesting it may appear.

When nursing personnel become members of the research team to assist in making observations, they may find it difficult to be objective, particularly if they observe in units where they work. There is always a danger of introducing personal reactions. Prejudice in observed situations is difficult to control.

Prior planning and decisions about what, whom, and when to observe should be made before actual observation begins. For example, if supervisors are to be included in unit observation, this must be previously planned. The decision to observe for either 24 or 12 hours should also be made beforehand, since it will serve as a guide to the length of time and the number of observers required for the study. It is advisable to have an observation practice, to teach the specific technique and to see whether observation recording sheets are accurate.

Recording of observations should be accurate, complete, and consistent. Because it is difficult to write complete descriptions of everything observed, certain items may be coded. Since what are observed and recorded are activities and behavior, verbs should be used. For instance, if a nurse is observed taking a patient's temperature, the observation should be recorded as "taking temperature," not as "temperature." Instructions to observers are given in Appendix A, and a sample Observation Recording Sheet appears as Appendix B.

Work Sampling Technique

It being impossible to observe all activities that occur within a given period of time, a sampling of the total period is designated. The work sampling method is used to determine how nursing service personnel divide their time among various activities. The method may be used within hospital units or public health departments, with the necessary adaptations.

The specific steps in a study that employs the work sampling method are as follows:

Step 1. A study team and a principal investigator or project director must be selected. The project director should be free from all other duties in order to devote full time to the study. The scope of the study depends on the time available and on the number of areas and personnel to be observed.

Step 2. The statement of the problem must be set forth, to include the who, what, when, and where of the observations that will take place.

Step 3. Individuals who will serve as observers must be chosen. They may or may not be members of the study team. Inexperienced observers should be offered brief instruction and a practice period.

Step 4. If an entire hospital or health unit is not being observed, representative units must be designated for observation. For example, one medical, one surgical, one pediatric, and one obstetrical unit might be selected. The selection should be done at random, with slips of paper containing the numbers of each type of ward placed in a box and one of the slips then drawn. If the service to be studied has only two units, the choice of one may be made by the flip of a coin. Randomization based on the laws of chance decreases the possibility of introducing unconscious bias.

Step 5. The decision on time of observation must be made. This could include one shift or the entire 24-hour day. Unless there is a large number of observers, randomly selected time periods should be planned. It is well documented that persons can observe accurately for only a period of two hours; consequently, 12 observers would be required for a 24-hour period. Often observers work a split shift, in which they observe for two hours, are off four or six hours, and then are assigned another two-hour

observation. Time planning is based not only on the problem statement but also on the number of persons available to assist in data collection. Some observers may work on a part-time basis, performing a two-hour observation in addition to their assigned duty shift.

Step 6. The study director or investigator must decide how long a period is necessary to carry out the study. A five-day (Monday through Friday) period is recommended, for it provides a comprehensive picture of the work week. However, a shorter period is satisfactory, with a minimum number of three days. Again, the choice is the study director's, or it may be made by the members of the study team as a whole.

Step 7. The decision on who will be observed must be made. Observations can cover each category of personnel, including head nurse, staff nurse, nursing students, practical nurses, and nurse aides. If supervisors, nursing administrators, and clinical instructors are to be observed when they enter the unit, the decision should be made at this stage of planning.

Step 8. Once the units, times, and personnel have been determined, it is necessary to provide orientation not only for the observers but also for the personnel in all the units to be observed. Because the personnel under observation may feel threatened by the presence of the observers in the unit, a series of meetings or individual conferences should be held to acquaint them with the purpose, objectives, and procedures of the study. Implementation of findings is easier if appropriate relationships are established early and maintained throughout the study.

Step 9. The data-collecting forms must be designed and tested. In the Observation Recording Sheet (Appendix B) there should be at least five columns of entries, with space for time, personnel observed, activity, and activity level and area. The heading on the Observation Recording Sheet appears below (Form 1).

Form 1. Observation Recording Sheet.

OBSERVATION RECORDING SHEET

Date _____ Observer _____ Unit _____

Shift _____ Page _____ of _____ pages.

Time	Personnel observed	Activity	Level	Area

Codes for recording information may be printed on the reverse of the sheet or attached to it. The code information might include:

Personnel observed

HN	----------	Head nurse
SN	----------	Staff nurse
NST	----------	Nursing student
PN	----------	Practical nurse
NA	----------	Nurse aide
O	----------	Orderly
SU	----------	Supervisor
CI	----------	Clinical instructor

The level and area of each activity may be recorded at the time of observation or at a later period, whichever is more convenient for the study team.

Step 10. The codes for classifying skill level and area of nursing must be developed. Specific classifications depend on the situation under study. A detailed sample of types of activities for coding is found in Appendix C. General code classifications might include the following:

Skill Level of Activities

A	----------	Administrative activities
N	----------	Nursing activities
C	----------	Clerical activities
D	----------	Dietary activities
H	----------	Housekeeping activities
M	----------	Messenger activities
U	----------	Unclassified activities

Area of Nursing (numerical code)

1	----------	Patient-centered activities
1.1	----------	Direct care
1.2	----------	Other patient activities relating to direct care
1.3	----------	Exchange of information concerning patients
1.4	----------	Indirect care
2	----------	Personnel-centered activities
2.1	----------	Professional development of staff
2.2	----------	Personnel: Other
2.3	----------	Nursing student education (may be subdivided into professional and practical nursing students)

3 ---------- Unit-centered activities
- 3.1 ---------- Environment
- 3.2 ---------- Supplies and equipment
- 3.3 ---------- Other unit activities

0 ---------- Other-centered activities
- 0.1 ---------- Personal time
- 0.2 ---------- Standby, or waiting, time

It should be noted that each classification has a category for unclassified or other information. There are usually some activities that do not lend themselves to coding or classification.

Step 11. Before actual data collection is started, a trial run, or pilot test, should be conducted. All persons who will serve as observers should collect data for a period of two hours. The observers as a group should then code the collected data according to level of activity and area of nursing. This permits identification of incorrectly recorded observations and lack of clarity. Moreover, it allows the observers to gain skill in observing and recording activities.

The frequency of observations depends on the number of persons being observed, the physical layout of the unit, and the amount of information sought. Observations can be made every five, 10, or 15 minutes. The pilot test will reflect the frequency most appropriate for each individual setting. With five-minute periods, there will be 12 observations per hour; with 10-minute periods, six observations; and with 15-minute periods, four observations. Experience has shown that 10-minute observations can be made with relative ease in a large hospital unit. The time interval varies with the number of persons to be observed. An observer cannot ordinarily observe more than 10 persons during a 10-minute period.

Step 12. The last step in a study based on the work sampling method is the construction of tables for tabulating data. These are referred to as "dummy tables." The dummy tables are based on subquestions asked by the investigator. For example: (1) What activities are performed by each category of personnel according to skill level? (2) Are there differences between hospital units with regard to activities performed by each type of personnel? (3) What types of activities are performed during each shift? The foregoing questions give the dimensions for the dummy table, with one factor presented horizontally and the other vertically. An example illustrating the two factors, or dimensions, presented in the first question appears in the accompanying dummy table (Form 2).

Form 2. Activities of Each Category of Personnel, by Skill Level.

Category of personnel	Activities by skill level							Total
	A	N	C	D	H	M	U	
HN	𝍸 𝍸 III	𝍸 II	𝍸 IIII	III		I	III	36
SN	𝍸 I	𝍸 𝍸 𝍸 𝍸 II	𝍸 𝍸 II	𝍸 II	III	I	𝍸	56
NST	II	𝍸 𝍸 𝍸 𝍸 𝍸 𝍸 𝍸 𝍸 III	IIII	𝍸 𝍸 II	𝍸 IIII	𝍸 III	𝍸 IIII	82
PN		𝍸 𝍸 𝍸 𝍸 𝍸 𝍸	𝍸 II	𝍸 𝍸 𝍸 𝍸 II	𝍸 𝍸	𝍸 𝍸 III	𝍸 II	79
NA		𝍸 III	𝍸 𝍸	𝍸 𝍸 𝍸 𝍸 III	𝍸 𝍸 𝍸 𝍸 IIII	𝍸 𝍸 𝍸 𝍸	IIII	79
O	II	𝍸 𝍸 𝍸 I	I	II	𝍸 IIII	𝍸 𝍸 I	𝍸 I	42
SU	𝍸	I	III					9
CI	𝍸 𝍸 II	𝍸 III	II				III	25
Total	40	115	48	69	50	49	37	408

A = Administrative
N = Nursing
C = Clerical
D = Dietary
H = Housekeeping
M = Messenger
U = Unclassified

If possible, the data should be coded and tabulated periodically while they are being collected. If large numbers of observation sheets are allowed to accumulate, the task of tabulation can become overwhelming.

Work Diary Method

Closely related to the work sampling technique is the work diary method. The personnel studied are requested to record their activities at designated intervals during their shift of duty. Individuals may record a summary of activities every 15 or 30 minutes. Specific forms, similar to the Observation Recording Sheet, may be designed for the collection of data. An illustration of the work diary record is shown in Form 3.

Form 3. Work Diary Record.

WORK DIARY RECORD

Date _____ Unit _____ Position _____

Name _____ Page _____ of _____ pages
(optional)

Time	Summary of activities	Do not write in this space	
		Level	Area

Because positions rather than individuals are being investigated, it is not necessary to identify the work description with a person's name. Obviously, this type of data collection is not as accurate as the methods that employ observers. There is a greater opportunity for introducing personal bias. Individuals may have an unconscious tendency to exaggerate in recording specific activities. The investigator or study team will be required to code the recorded summary of activities after the records are collected. Because data are recorded by numerous types of personnel, the coding and analysis of activities may be more difficult.

If time and money preclude the use of observers for an activity analysis, the work diary method is less expensive and takes less time. However, as was noted, the self-report used in recording activities is less accurate than the observation sheet used in the work sampling method. The decision as to which of the methods should be employed rests with the project director or members of the study team.

Time Study

If the statement of the problem is related to the amount of time a group or one type of personnel spends on specific activities, a time study would be appropriate. When this method of data collection is employed, one observer is designated to follow one worker during a shift or portion of a shift. Each activity and the exact amount of time devoted to the activity are recorded by the observer. This may be an ideal method to assess the amount of time public health nurses spend visiting patients, working in health centers, and traveling from one area to another. It may also be used to examine the work of the nursing supervisor during a shift.

The precision of timed observations must be planned in advance of data collection. If timed activities are to be recorded in minutes and seconds, a stopwatch will probably be necessary. If such precision is not required, an ordinary watch with a second hand—the kind that nurses regularly use—will suffice. The observer must record the time the activity begins and ends, the activity itself, and perhaps a code for the activity. Codes for area and level may be used, or activities may be classified as nursing or non-nursing. This, of course, depends on the statement of the problem and the objectives. A sample of the form used to record time study data is shown in Form 4.

If the particular method and form are being used to study the public health nurse, an additional column for "place of activity" may be included. The amount of detail desired can be planned for by the study group. For example, an observed procedure may be written as "giving hypodermic medication—2 minutes and 15 seconds." Or the procedure may be observed and recorded as "cleansed patient's skin—7 seconds; forced air from syringe—5 seconds; injected needle—1 second; gave drug—3 seconds; removed needle—1 second; massaged injection site—5 seconds." The time study can be used with as much precision and detail as the investigator wishes to include.

Form 4. Time Study Observer Record.

TIME STUDY OBSERVER RECORD

Observer _____ Date _____ Shift _____

Observed _____ Position _____ Page ___ of ___ pages

Description of activity	Time		Total time	Code
	Began	Ended		

As was indicated previously, survey methods may be employed to conduct a descriptive study or they may be used to supplement other descriptive investigations. Three specific tools to be discussed are the questionnaire, the interview, and the opinionnaire. Different techniques may be used for different situations. The purpose of all three of these methods is basically the same. Questions or opinions are asked in either written or oral form.

The questions asked in all surveys must be asked correctly, and each should have a purpose for being included. Vaguely worded questions will produce ambiguous and vague responses. Consequently, each question should be stated clearly and precisely. The levels of understanding and literacy of the respondent must be taken into consideration. This is particularly true when patients are answering questionnaires or being interviewed.

Questionnaire

The questionnaire may include multiple-choice, checklist, open-ended, or free-response questions, or a combination of these tools. The investigator should take nothing for granted; everything that is asked should be clarified or defined if necessary.

The questionnaire format should have a heading to identify the source. A brief title should state what the questionnaire is about. The instructions to the respondent should be clear and complete, including the following:

1. Desired completion date for the questionnaire.
2. Whether or not the questionnaire should be signed.
3. Directions for answering questions, with examples if the questions are complex.
4. How the questionnaire is to be returned.
5. Assurance that the answers will be handled in a confidential manner and that individuals will not be identified.
6. Expression of appreciation for the respondent's cooperation.

Instructions usually appear on the top half of the first page of the questionnaire. The information on the questionnaire should be attractively typed or printed and easy to read. Space should be provided at the right-hand margin of the page for coding and analysis. Wide margins and double-spacing permit easier reading. If free-response questions are asked, the respondent should be given ample space to answer. A sample questionnaire is found in Appendix F.

Certain methods are used to induce respondents to answer the questionnaire. Because this is one of the most frequently used tools, some of the respondents may be accustomed to receiving questionnaires. Some, in fact, may be tempted to discard the query without answering. If the questionnaire is lengthy, a

motivating letter, briefly explaining the purpose and value of the questionnaire and indicating why the respondent was chosen to participate, is helpful. The respondent should not be told that he was randomly selected, because this may make him feel that his contribution is not very important. He should be told approximately how long it will take to complete the questionnaire. He should also be asked whether he would be interested in receiving a summary of the findings. If the questionnaire is to be returned by mail, a self-addressed, stamped return envelope should be enclosed. Even if it is not to be mailed, providing an envelope for its return is a courtesy to the respondent.

Frequently the question is raised concerning the percentage of returns expected before the initial question is answered. The returns depend on the questions asked. If the questions are of the kind to which the respondent is likely to be sensitive, such as those relating to age or income, he may not wish to give the information. Response can be blocked by inappropriately asked questions. One method of testing the appropriateness of individual questions is to write up a rationale for each question in terms of the statement of the problem.

Regardless of which types of questions are asked, there should be no doubt in the respondent's mind. If a checklist is used to obtain answers about a person's age, the categories for checking should be "mutually exclusive." The following example demonstrates mutually exclusive categories:

Please place a check in the space designating your age.

	Code
a. Less than 20 years	a. ____
b. 21-25 years	b. ____
c. 26-30 years	c. ____
d. 31-35 years	d. ____
e. 36-40 years	e. ____
f. More than 40 years	f. ____

If the respondent is 25 years old, there will be no doubt which space should be checked.

Writing questions requires a great deal of tact and care, to avoid irritating the respondent. Global, sweeping statements should be avoided, as should statements that, whether negative or positive, are so worded as to attempt to catch the respondent off guard. Questions with "either-or" choices--for example: "Do you prefer working either a day shift or a night shift? "--should not be included, because they force the individual to make a choice between unclear alternatives. The question just given would be more effective in this form: "Which shift of duty do you prefer to work? _____" In other instances, when "yes" or "no" responses are requested, care should be taken to avoid double, or compound, objects of the principal verb. The respondent would have difficulty answering a

question like this: "Do you like to care for medical and surgical patients? yes _____ no _____." Perhaps the person enjoys caring for medical but not surgical patients and therefore could not answer the question with a simple "yes" or "no." This is also a good example of a question that lacks validity.

Specific examples of how questions may be asked are included at the end of this chapter. The manner in which questions are presented applies not only to the questionnaire but also to the interview and the opinionnaire.

Interview

An interview is a conversation with a purpose. It is a device for collecting data concerning knowledge, opinions, expressed feelings, and reactions. It is basically the same as the questionnaire, except that its questions are oral instead of written. Because of the one-to-one nature of the interview, it cannot be used with as large a sample as the questionnaire or opinionnaire.

When the interview begins, the interviewer should explain its purpose and ask for the respondent's cooperation. In addition, the respondent should be told the length of time required and the approximate number of questions. Giving this information can help set the interviewee at ease and establish rapport. The interviewer should avoid the use of professional jargon.

During the interview the investigator may take verbatim notes or use a checklist form for recording answers. If notes are not taken at the time of interview, the investigator may forget what answers were given and be forced to rely on recall, which is usually unreliable. Sometimes the subjects are asked to take notes also, and after the interview the two sets of notes can be compared and doubtful points clarified. If a checklist is used, space should be allowed for inserting "other" or additional comments. A sample Interview Schedule is found in Appendix G.

There are two types of interview: structured or unstructured. The formats of both coincide with those of the checklist or open-ended questionnaire. The unstructured interview poses questions to which the respondent may give free response. Questions should be asked of each respondent in the same way and in the same order. This of course is difficult, because the investigator may relate to different individuals differently.

The structured interview format should be designed for easy analysis later. If the right-hand side of the page is reserved for answers, the interviewer can more readily record the information. The disadvantage of this method is that data other than those specifically listed for checking may be overlooked. An example of the checklist format is given in Form 5.

In using the unstructured interview method, the interviewer ordinarily has a great deal of information to write. At the conclusion of the interview it may be advisable to summarize what has been said and ask for additional responses. If

Form 5. Checklist.

Question: For what reasons did you enter nursing?	a. To care for the sick a. ____ b. To make money b. ____ c. Always had an interest c. ____ d. Desire to help others d. ____ e. Other; specify: e. ____ _____ _____
Question:	

simple factual information is being sought, the data may be better collected by the questionnaire method. When the interview method is chosen over the questionnaire, it is usually because in-depth information is desired from the subject.

Rapport between the interviewer and interviewee should be established before specific questions are asked. The respondent should be made comfortable and confident. The investigator should not include close friends as subjects in an interview survey. In their desire to see that the interviewer gets successful results, personal friends may give answers that are not completely honest. Ruling out friends as subjects is therefore one way of reducing bias. Yet, if a good relationship is not established for the interview, the respondent may withhold information.

Opinionnaire

The opinionnaire is basically the same as the questionnaire except for the type of information sought. The opinionnaire collects data concerning the feelings, attitudes, and reactions of respondents. Because the questions are

sensitive in nature, their wording requires tact and care. In the United States the opinionnaire, or public opinion poll, is used extensively to ascertain the people's political views.

Frequently a Likert-type scale is used for getting at an individual's opinions. In this scale the respondent is given a choice of indicating a degree of favorableness or unfavorableness toward a statement. Some of the statements are positive and some negative. to enable the respondent to express his reactions of agreement or disagreement with each statement. The investigator should plan to include an equal number of positive and negative statements in the scale.

With the problem statement relating to the way nursing personnel feel toward caring for the alcoholic patient, an example of the Likert-type scale is given in Form 6.

This type of scale ordinarily presents five choices, but as few as three may be given. For example, the range of preferences may go from "agree" to "neither agree nor disagree" to "disagree." With a Likert-type scale, the feelings of respondents can perhaps be ascertained more accurately than if the direct question "How do you feel about caring for alcoholic patients? " were asked.

Form 6. Likert-Type Scale for Opinionnaire.

Instructions: Please place a check (√) in the space which best represents how you feel toward the alcoholic patient.

Statements	Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
1. Alcoholic patients can be helped to rehabilitation by the nurse.					
2. Alcoholic patients are always uncooperative.					
3. Care of the alcoholic patient is a challenge.					
4. Alcoholic patients should not be permitted to take up hospital beds.					

Form 7. Record Review Tabulation Sheet.

Code number	Name	Birth date	Birth weight	Present weight	Birth length	Present length	Diet	Date of clinic visit	Frequency of clinic visits	Sex

RECORD REVIEW

The record review is a type of retrospective methodology. Observations are not noted and recorded as they occur but rather relate to past events. Records as sources of data pose certain problems. They have not usually been kept for a specific purpose, particularly the purpose relating to the statement of the problem. Therefore, from previously recorded information the investigator must select the information relevant to his specific problem. Records may have informational gaps that make data collection inconsistent.

After the problem to be studied has been defined, the specific variables to be elicited from records must be outlined. For expediency in recording, a system of organization is helpful. If, for example, a patient's records are being used for data, the record review form should be set up in such a way as to record data in the order of appearance in the patient's chart. This saves time by eliminating the need for flipping chart pages back and forth to find information. The same applies to school records or public health records. Once specific variables, which yield information called for in the problem statement, have been designated, they should be listed as headings on a tabulation sheet. The design of the tabulation sheet depends on the extent of the information sought. If the number of variables is very large, the collection and analysis of data will be difficult. The format of the tabulation sheet should provide easy identification of patterns showing a relationship, similarities, or differences. A sample brief record review tabulation sheet that outlines variables related to infant malnutrition is shown in Form 7.

The foregoing type of data may be collected from public health and hospital records. The tabulation sheet should be wide enough to fit the variables on one page. At the bottom of each column, space should be provided for a total. With this type of format it is relatively easy to see patterns of relationship. For instance, there may be a specific age group or sex in which a variable is predominant.

If an activity analysis is being done, the investigator may wish to use a record review as a supplemental data-collecting device. For example, personnel records may be examined for the type and number of persons working each shift in a specific unit during the preceding three months. The number of absences from duty according to shift, time of year, and type of personnel could provide important supplementary information.

When studies are planned to examine an area of patient care, the record review may be a preliminary step or it may be used for a pilot study. For example, the investigator may be interested in juvenile diabetic patients. Assuming that information on the incidence of diabetes is not known, the investigator may examine hospital, clinic, and public health records for a period of one or two previous years. If the record review shows an incidence of six patients per year, there may not be enough data available for conducting a study.

The major drawback of the record review is the lack of uniformity of recorded information. If such records as nurses' notes are being used, the quality of data varies widely. Expressions such as "ate well" or "slept well" may have different meanings for different people. As a result, the investigator must assume quality. Straightforward factual information such as age, race, marital status, or sex is more reliable than quality terms obtained from records.

EXAMPLES OF HOW TO ASK QUESTIONS

Open-ended, or free, response:

1. What is your perception of continuity of care in public health agencies?

_____

_____

[*leave several lines for response*]

2. Approximately at what age did you become interested in nursing? _____ years.

Multiple choice:

1. Please indicate the following reasons why you decided to visit [name] clinic. (Check (✓) all answers that apply.)

a. I suddenly became sick.	a. ____
b. I have been sick for six months or longer.	b. ____
c. This clinic is near my home.	c. ____
d. Someone suggested that I visit this clinic.	d. ____
e. My doctor ordered me to visit this clinic.	e. ____
f. I can afford treatment at this clinic.	f. ____
g. Other; specify: _____	g. ____

_____

2. Please indicate the types of food you usually eat for breakfast. (Check (✓) all answers that apply.)

a. fresh fruit	a. ____
b. fruit juice	b. ____
c. egg	c. ____
d. meat	d. ____
e. bread or toast	e. ____

f. cereal — f. ____
g. milk — g. ____
h. coffee — h. ____
i tea — i. ____
j. butter — j. ____
k. Other; specify: _____ — k. ____

_____

Checklist:

Please check (✓) the one answer that applies.

1. How long have you been working as a graduate nurse?

a. Less than one year — a. ____
b. 1-5 years — b. ____
c. 6-10 years — c. ____
d. 11-15 years — d. ____
e. 16-20 years — e. ____
f. More than 20 years — f. ____

2. What percentage of your duty time is devoted to patient teaching?

Less than 25 % ☐ 25-50 % ☐ About 50 % ☐ 50-75 % ☐ More than 75 % ☐

3. What symptoms did you feel before you came to the clinic?

	Check (✓)
Headache	
Chills	
Fever	
Nausea	
Pain	
Other; specify:	

SUMMARY

In order to gain the best results from data-collection instruments, they must meet the following criteria:

Validity
Reliability
Freedom from bias
Practicability

Terms relating to sample selection and data gathering are defined. The specific methods for conducting an activity analysis are the work sampling method, the work diary method, and the time study. Instructions for making observations and coding are outlined. Examples of data-collection forms are given in the text.

Three survey methods discussed are the questionnaire, the interview, and the opinionnaire. Suggestions on question format are offered, as well as examples of three types of questions which lend themselves to the questionnaire, the interview, or the opinionnaire.

The record review technique is briefly discussed, and the method of tabulating data from records is illustrated.

Chapter V

ANALYSIS OF DATA

The analysis of data depends on the questions asked in the statement of the problem and on the tools and techniques used in the collection of those data. In the analysis the investigator may ask: "Does the analysis really furnish an answer to my problem?" If not, the original question may have been vague or unanswerable, the design may not have been correct, or the specific tools may not have elicited the required information.

Before setting up tables for analysis, the investigator must design analytical categories based on specific subquestions related to the data. For example, questions asked may include the following: (1) Is there a relationship between length of time the patient has a disease and the severity of symptoms? (2) What is the relationship between the patient's age and the onset of specific symptoms? (3) How are marital status and knowledge of health care related? (4) Are there identifiable patterns among age, race, and occurrence of the symptoms of malnutrition? As was described in the previous chapter, dummy tables are in reality the first step in the analysis of data. From the dummy tables, additional analytical tables can be made.

The data may be analyzed by two methods—statistical or nonstatistical. Simple statistical methods may be applied in the analysis of both qualitative and quantitative data. Regardless of the type of analysis, some basic guidelines can help the investigator plan it in such a way that it will be sound.

The data should be examined beforehand, so that the analysis selected will emphasize the relevant differences and similarities. Previous examination of data will suggest to the investigator or study team the appropriate approach to adopt. For example: Should the variables be examined individually or grouped together? If the decision is made to group the data, what should be the type and size of the groups selected?

Another guideline to be considered is the elimination or minimizing of personal bias, since the manner in which data are grouped and analyzed could reinforce the viewpoint of the investigator. The greatest possible objectivity should be the goal of the data analysis.

The statistical methods of analysis include four fundamental procedural steps:

1. Collection of data
2. Classification and condensation of data
3. Presentation of data
4. Analysis and interpretation of data.

The collection of data has been discussed in the previous chapter, but the classification and condensation of data introduce new concepts and definitions.

TERMINOLOGY AND PROCEDURAL STEPS

Frequency distribution is the grouping of data according to the frequency of occurrence of observations, responses, or measurements of variables. The numerical listing of the frequencies ranges from the highest to the lowest number of times a variable occurs. A table of frequency distribution can be made.

Array is similar to frequency distribution in that it lists the number of variables, responses, or observations in a range either from the highest to the lowest or from the lowest to the highest number of occurrences.

Examples of a frequency distribution and of an array are shown in Tables I and II.

Table I. Frequency Distribution of Weights.

Weight of patient (lbs.)	*No. of persons*
*Class interval**	*f*†
137.6–147.5	12
147.6–157.5	8
157.6–167.5	7
167.6–177.5	1
177.6–187.5	1
	29

Table II. Array of Weights.

Rank	*Weight of patient (lbs.)*
1	180.5
2	177.0
3	165.2
4	165.0
5	164.9
6	164.5
7	163.0 . . . .

*Class interval = Arbitrary category of weight for grouping.
†*f* = Frequency of occurrence.

The choice of an array or a frequency distribution depends, of course, on the questions asked in the analysis. If weight differences between individuals were sought, the array would show this effectively. A frequency distribution, on the other hand, reflects the weight range of a group of persons–e.g., 29 subjects, in Table I. Some information may be lost when data are grouped; however, if the sample is large, individual figures do not count heavily.

Mean is the sum of all the values in a group divided by the number of subjects in the group. It is the same as the average. The mean weight of the group of 29 subjects would be obtained as follows:

Total of all weights = 4,408 pounds
Total subjects = 29

$\bar{X}^* = \frac{4{,}408}{29}$ or $\bar{X} = 4{,}408 \div 29 = 152$ pounds

*Mean symbol: (cap X with macron over it).

On the basis of the actual data in Table II, the following steps reveal how the mean may be obtained when data are grouped into 10-pound categories. The interval for grouped data is designated as *class interval.* The middle value of the class interval is called the *midpoint.* The midpoint value of the interval of grouped data is multiplied by the frequency, then divided by the total number of subjects.

(1)	(2)		(3)		(2) x (3)
Class interval	*Frequency*		*Midpoint*		
137.6–147.5	12	x	142	=	1704
147.6–157.5	8	x	152	=	1216
157.6–167.5	7	x	162	=	1134
167.6–177.5	1	x	172	=	172
177.6–187.5	1	x	182	=	182
	29				4408

$29\overline{)4408}$ (152)

$\bar{X} = 152$ pounds

Mode, the value that occurs most often, is the value of the variable at which the concentration of observations is the greatest.

Median is often called the "middle" observation or measure. One-half of the observations are above the median and the other half lie below the median.

The mode for the above frequency distribution is 142, or the midpoint of the value which occurs most frequently. The median is 152, or the middle value.

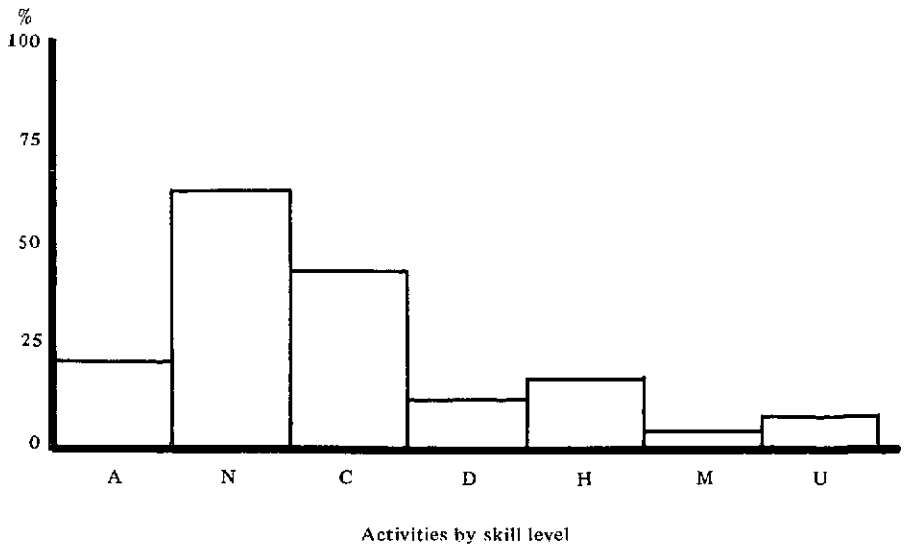
The mean, the median, and the mode are referred to as measures of central tendency or averages. They are descriptive statistics. It is valuable to seek statistical advice when the mathematical analysis is planned, for statisticians can determine which measure is most appropriate for the analysis and interpretation of the data.

Regardless of which method and design the investigator has used, there are generally applicable points concerning analysis. Depending on the type and amount of data, the presentation may take the form of narrative text, tables, or graphs. The mass data require organization, which begins with dummy tables and tallies of observations. The goal of tabular and graphic presentation of data is to present a comprehensive and clear picture. Only the most important data should be included. The decision on the inclusion of data in this form is based on whether or not the tabular or graphic arrangement answers the question set forth.

Graphic presentation may take any of three forms: the histogram, or bar graph; the frequency polygon, or line graph; and the pictogram, or pie chart. Every table or graph developed for analysis must have a number and a precise title. Graphic illustrations are referred to as figures in the text. The graphs and tables are derived from information appearing in dummy tables. These tables furnish the investigator clues concerning which data should be used in tables or graphs.

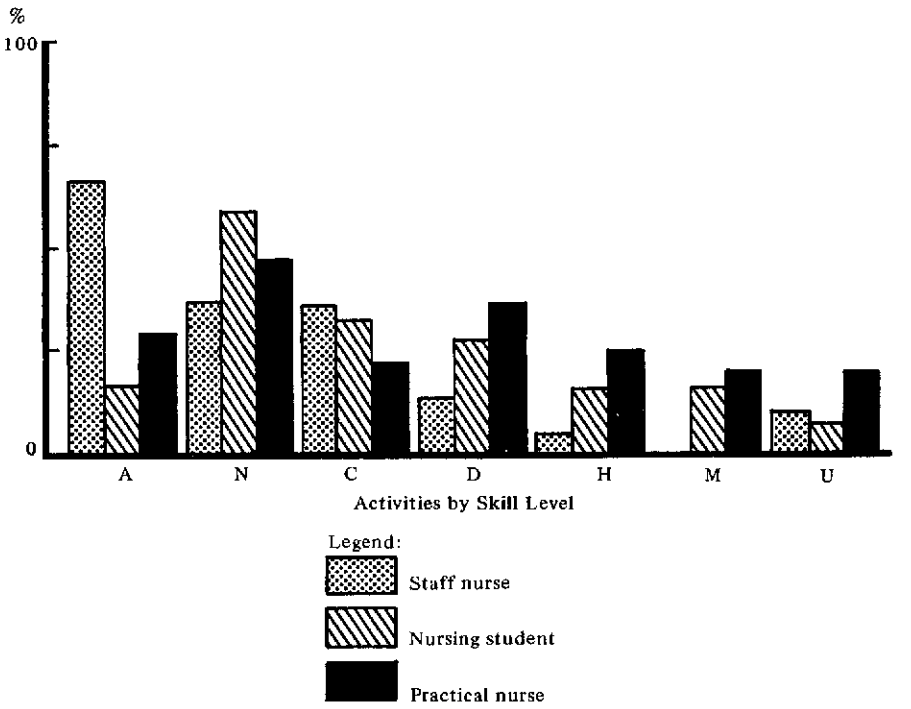
The following figures demonstrate three types of analytical graphs.

Figure 1. Percentage of Activities Performed by Staff Nurses in All Units, by Skill Level.



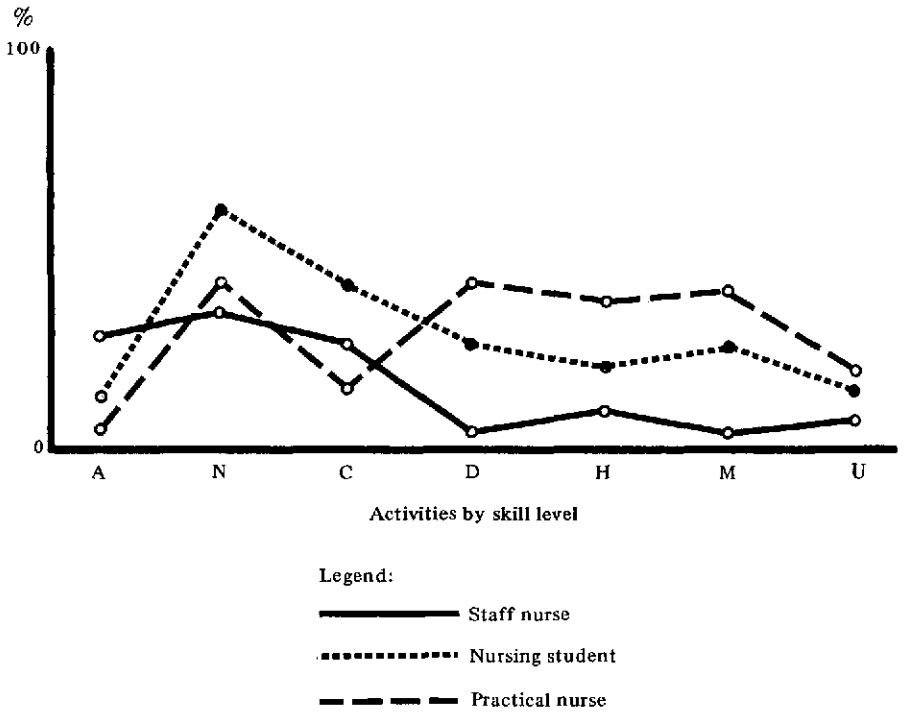
When frequency of observations is expressed in percentages, there must be a zero point. The intervals at the base line should be equal. Through the use of various colors or markings, two or three dimensions may be shown on this type of graph, as Figure 2 illustrates.

Figure 2. Percentage of Activities Performed by Staff Nurses, Nursing Students, and Practical Nurses, by Skill Level.



A legend, or key, is required to explain each category. Also, if the code categories have not been defined previously, they should be clarified for the reader. The foregoing data could be expressed in a line graph such as the one in Figure 3.

Figure 3. Percentage of Activities Performed by Three Categories of Nursing Personnel, by Skill Level.



It is obvious that the three categories of personnel shown on the foregoing graph are difficult to distinguish. The graph therefore does not meet the requirement of presenting a clear and comprehensive picture. Data which are first organized in an array ranging from the highest to the lowest value may be more appropriately presented in linear format. Figure 4 demonstrates this point.

The Figure 4 line graph gives a very clear comparison of the weight loss of the two groups of patients. With data calculated in arrays, linear presentation is more vivid. It is advisable to discuss with a statistician the best way to present the data.

The graph that takes the form of a circle to show analysis of data is useful because the components of the whole are indicated as slices of a pie. The slices or sectors can be judged by the area of circumference or the central angles. If percentages are used, they must be converted to angle values before being plotted on the pie chart, in which 360 degrees equal 100 per cent. Figure 5 shows the activities of the staff nurse by skill level.

Figure 4. Comparison of Mean Weights of Men and Women on Reducing Diets during a Ten-Week Period.

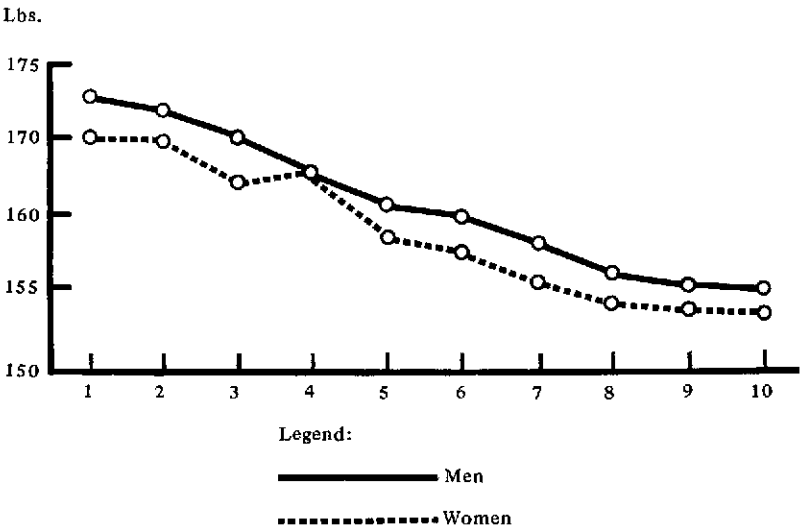
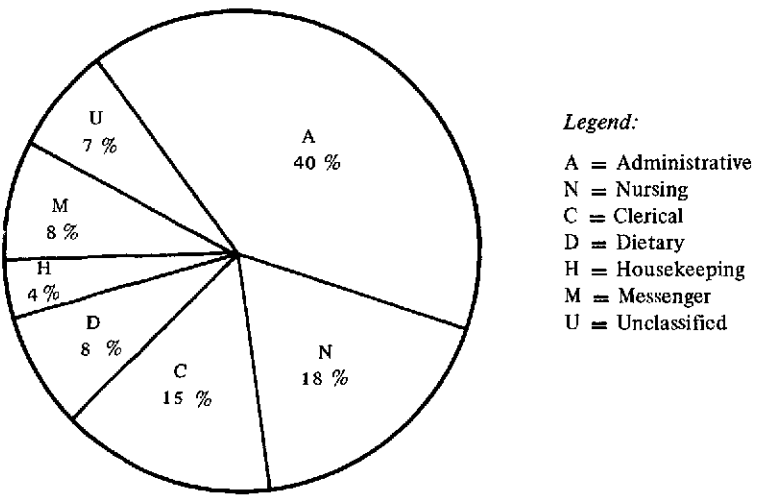


Figure 5. Percentage of Activities Performed by the Staff Nurse, by Skill Level.



Each of the figures used as an example has both a number and a title. Table and graph titles should state the precise information being presented. They are shown in the inverted pyramid format; that is, the second line is indented both left and right more than the first line. If there are three lines or more, the indentation continues for each additional line. Examples of the inverted pyramid format are given below.

Two-line table title:

Table I. Relationship between Opinions of
Staff Nurses and Student Nurses.

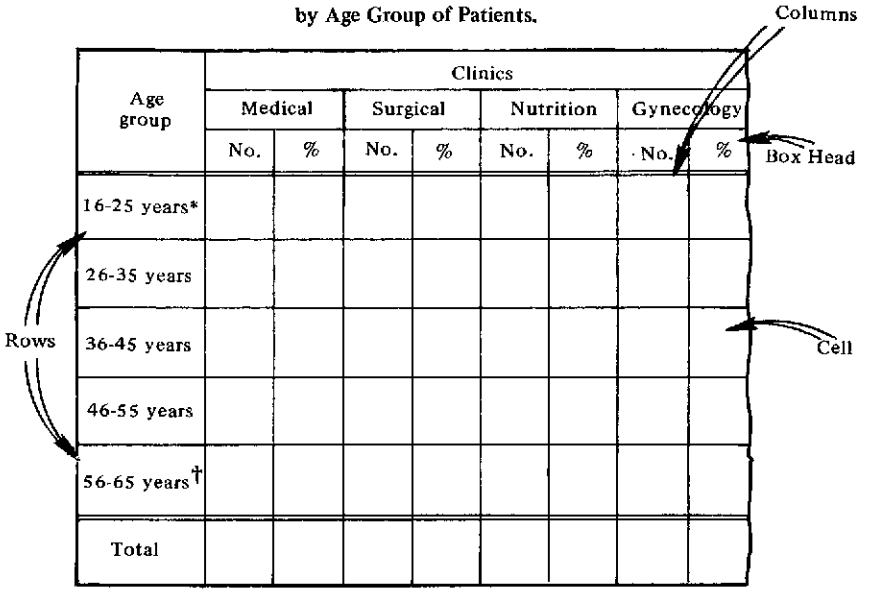
Three-line table title:

Table II. Number and Percentage of Clinic Visits
by Prenatal Patients during the First
Trimester of Pregnancy.

TABLE FORMAT

In a table the horizontal arrays are referred to as rows, or lines, and the vertical arrays are called columns. The space that is common to both the rows and columns is designated as a cell; that is, the cell contains data relating to the two dimensions in rows and columns. Each column has a box heading, or box head. There may also be side headings. If necessary for explanation, footnotes may be used for table entries. They are usually preceded by asterisks and other symbols or by lowercase letters, to prevent confusion with numerals in the body of the table itself. Rules and lines in tables should be clear and distinct. Depending on their nature, the data in the rows and columns may or may not be totaled. Table III gives an example of table format.

Table III. Number and Percentage of Clinic Visits by Age Group of Patients.



Age group	Clinics							
	Medical		Surgical		Nutrition		Gynecology	
	No.	%	No.	%	No.	%	No.	%
16-25 years*								
26-35 years								
36-45 years								
46-55 years								
56-65 years†								
Total								

* Patients younger than 16 years attend pediatric clinics.

†Patients over 65 years report to the geriatric clinics.

ANALYSIS OF ACTIVITY STUDIES

After the data have been tallied and totaled from the observation records, additional analytical tables can be designed. Tabulating data consists of counting the tallies and totaling the number of times various activities are performed. Totals can be calculated by area of nursing, level of skill, or type of personnel. Tabulation of data can be done by either hand tally or by machine. Automatic data processing may be available at a medical center or university. It is suggested that specific statistical guidance be sought for machine analysis.

In hand tabulation, data for each unit observed should be totaled on separate tables for clarity. The information can be consolidated later. Separately analyzed data are easier to handle. Observer records arranged in chronological sequence by shift and by date are more convenient for tallying. Dummy tables or basic work tables can be developed for each type of data collected. Tables IV and V illustrate analytical approaches.

The information is tabulated for each unit individually and then summarized for all units. Table V shows this.

Table IV. Frequency of Activities Performed by Personnel in Three Units, by Type, Shift, and Skill Level.

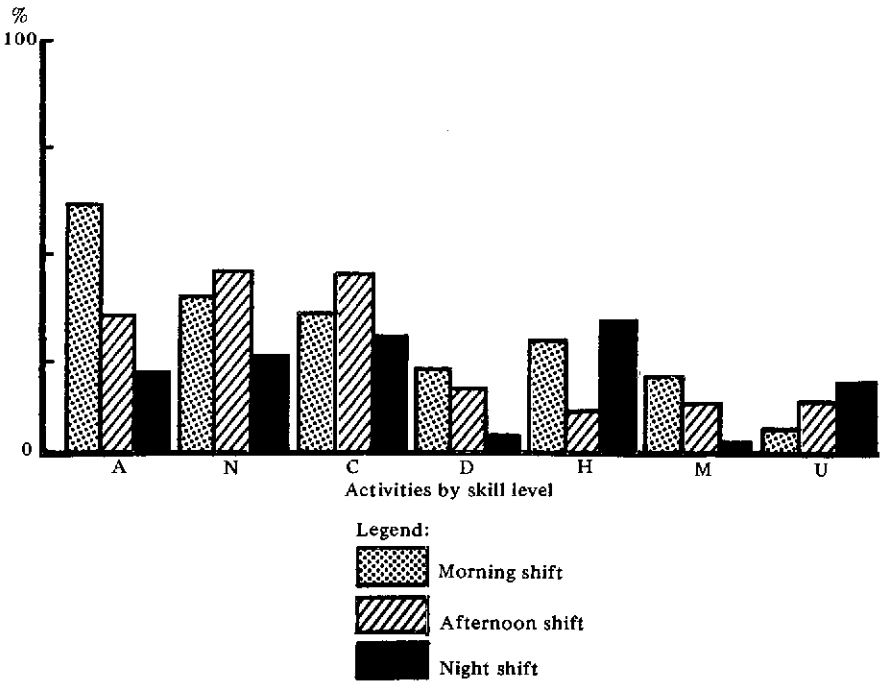
Personnel	Shift	Skill level							Total
		A	N	C	D	H	M	U	
HN	1								
SN	1								
	2								
	3								
PN	1								
	2								

Table V. Frequency of Activities Performed by Personnel in Three Medical Units, by Skill Level.

Type of personnel	Unit	Skill level							Total
		A	N	C	D	H	M	U	
Head nurse	1								
	2								
	3								
	Total								
Staff nurse	1								
	2								
	3								

Comparisons can be made between shifts and personnel. The frequencies or percentages of these data once totaled could be presented by means of a bar graph for one type of personnel, by shift, as shown in Figure 6.

Figure 6. Percentage of Activities Performed by Staff Nurses, by Shift and Skill Level.



In making a choice between tabular or graphic presentation, the investigator should decide which presents the data most realistically.

Tables VI and VII illustrate the table format for examining data by area of nursing and by respective units.

All of these tables illustrate how various dimensions of data can be organized for analysis. Comparisons for differences and similarities can be made between the multiple categories. If there are no marked differences shown, the tables need not be included in the report of the study.

Table VI. Frequency and Percentage of Activities Performed by Staff Nurses in a Medical Ward during a One-Week Observation Period, by Area of Nursing and Skill Level.

Area of nursing	Skill level														Total
	A		N		C		D		H		M		U		
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	
1 1.1															
1.2															
1.3															
1.4															
2 2.1															

Table VII. Frequency and Percentage of Activities Performed by Nursing Assistants, by Unit and Skill Level.

Unit	Skill level														Total
	A		N		C		D		H		M		U		
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	
Medical															
Surgical															
Pediatric															
Obstetrical															
Orthopedic															

Thus far the discussion has centered on measuring the frequency and percentage of selected activities performed. The frequency of observation in a one-hour period in the work sample method can be converted to an estimation of time devoted to activities (see Appendix D). The random selection of observation periods permits generalization up to the total 24-hour time period. Two-hour observation periods covering the 24-hour day may be written on slips of paper and placed in a container. Then eight or nine of the slips may be drawn randomly, representing those time periods designated for observation. It is not necessary to observe every two hours during the 24-hour period. When observations are planned for a three-day or a five-day period, it is highly probable that each hour of the day will be covered. The Observer's Schedule in Appendix D illustrates this point.

The following steps explain how frequency of observations may be converted to time spent on various categories of activities, whether by area of nursing or skill level.

Step 1. From the separate dummy table for each type of personnel observed the frequencies (tallies) of activities in the area of nursing or skill level are obtained.

Step 2. The total number of observations for each level or for each area is then divided by six, because with observations every 10 minutes there is a total of six observations during one hour. For instance, this reflects the number of hours the head nurse devotes to administrative, nursing, clerical, and other activities.

Step 3. The number of hours may be converted to a percentage to provide a realistic picture. Percentage of time devoted to an activity may be calculated in two ways. First, the total number of hours a specific category of personnel devoted to areas or levels is obtained. Then the total is divided into each separate number cited for areas or levels and multiplied by 100, as follows:

Head Nurse Category

Level	*Hours*							*Percentage*
A	12	÷	26	= .462	x	100	=	46.2
N	8	÷	26	= .308	x	100	=	30.8
C	2	÷	26	= .077	x	100	=	7.7
D	0.5	÷	26	= .019	x	100	=	1.9
H	1	÷	26	= .038	x	100	=	3.8
M	0.5	÷	26	= .019	x	100	=	1.9
U	2	÷	26	= .077	x	100	=	7.7
Total	26.0							100.0

Question: What percentage of time does each category of personnel devote to areas of nursing?

Table VIII. Percentage of Time Spent by Nursing Service Personnel in Each Unit, by Area of Activity.

Areas of activities	Category of personnel observed						Total
	Head nurse	Staff nurse	Student	Practical nurse	Aide	Orderly	
1.1 Giving Care							
1.2 Other Direct Activities							
1.3 Exchange of Information							

Question: What is the relationship between areas of nursing and levels for the staff nurse?

Table IX. Percentage of Activities Performed by Staff Nurses in All Hospital Units, by Area and Skill Level.

Area of activities	Skill level of activities							Total
	A	N	C	D	H	M	U	
1.1 Giving care								
1.2 Other direct activities								
1.3 Exchange of information								
1.4 Indirect care								

The foregoing shows the percentage of time the head nurse spends on various activities. This information is calculated for each type of personnel and entered into a summary table. If there is an extensive list of figures to divide by the total, the percentage may be obtained by another method using multiplication. First, the reciprocal of the total number is calculated by dividing it into the number one. The result is then multiplied by the respective number of hours, as follows:

Head Nurse Category

Total hours = 26

Reciprocal = 1 ÷ 26 or 1/26 = .038

Level	*Hours*	*Reciprocal*	*Percentage*
A	12	x .03846 = .462 x 100 =	46.2
N	8	x .03846 = .308 x 100 =	30.8
C	2	x .03846 = .077 x 100 =	7.7
D	0.5	x .03846 = .019 x 100 =	1.9
H	1	x .03846 = .038 x 100 =	3.8
M	0.5	x .03846 = .019 x 100 =	1.9
U	2	x .03846 = .077 x 100 =	7.7
Total	26.0		100.0

The investigator may choose either of these approaches for calculating the percentage of time various types of personnel devote to each level. A percentage presents a more comprehensive picture because of the unequal numbers of personnel in each category.

Step 4. Tables for each question asked are then designed. The percentage or number of hours is then entered into each cell in the table. Examples of table headings relating to specific questions are shown below (Tables VIII and IX).

ANALYSIS FOR WORK DIARY METHOD

The analysis for the work diary method is fundamentally the same as for the activity studies. The same patterns of relationship are sought between position, skill level, and area of nursing. In relation to the questions asked, the dimensions on the tables or graphs are outlined.

The primary difference is that the summary of activities may not be consistent. Persons analyzing the data may have to make a series of decisions about categorizing recorded data. Even though individual members of the

nursing staff are instructed on putting their activities in writing, differences occur. Key words in the written summaries of activities may have to be identified and reclassified. Some of the classifications and subclassification codes shown in Appendix C may have to be modified. Otherwise, the steps are basically the same, except for estimating the amount of time spent. If, for example, the activities are recorded at 15-minute intervals, the total number of activities is divided by four instead of six. Or as was noted in Chapter IV, activities may be recorded every 30 minutes. If so, the total number of activities would be divided by two. The larger the time period chosen for recording activities, the less accurate the analysis of data.

Time estimation may be less accurate because the person may record a number of activities in a 15-minute summary. For instance, a nurse may record in the summary of activities column, "Review patient's charts, record temperature, and total intake and output." These are three separate though related activities. For this reason, an approximate calculation of time spent, as well as inconsistency of recording, lessen the precision required for analysis. And inasmuch as recommendations for changes in practice and administration evolve from the analysis, if the analysis is not accurate the basis for the future planning of nursing may not be sound.

ANALYSIS OF TIME STUDY DATA

The time study analysis lends itself to a greater degree of precision. Not only are detailed activities recorded but specific time phases are also included. When the question is asked, "How much time does the head nurse spend on administration?" an exact answer can be given. Of course, the recorded observations must be assigned an appropriate code number reflecting skill level, area of activity, or the distinction between nursing and non-nursing activities. Time may be recorded in minutes, fractions of hours, or in minutes and seconds—again depending on the degree of detail desired by the investigators.

Time studies may also be analyzed to examine the steps in a procedure in order to reduce wasted time and motion. Here precision in detail is highly important. Decisions made from this type of analysis may furnish guidelines for rearranging treatment trays, outlining preparatory steps of a procedure in a different order, or repositioning equipment and furniture in a patient's unit. Moreover, the order in which a public health nurse makes home visits might be altered on the basis of time spent in travel.

Figure 7 and Table X illustrate how time data may be analyzed.

Figure 7. Percentage of Time Spent on Nursing and Non-Nursing Activities by Nursing Personnel in a Medical Ward.

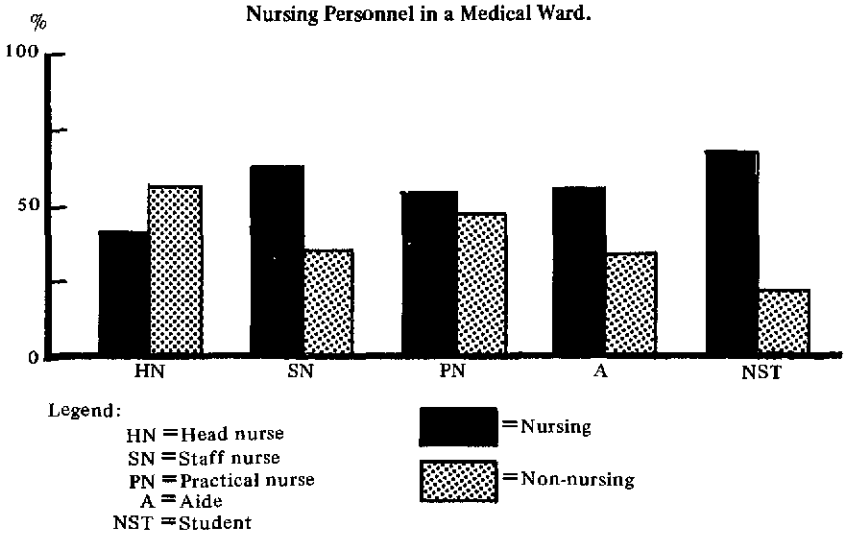


Table X. Amount and Percentage of Time Spent on Nursing and Non-Nursing Activities by Nursing Personnel in a Medical Ward.

Activities	Nursing personnel										Total
	HN		SN		PN		A		NST		
	Min.	%	Min.	%	Min.	%	Min.	%	Min.	%	
Nursing											
Non-nursing											

The percentage of time is calculated in the same manner as described previously. The number of minutes for each category is divided by the total number of minutes, or the number of minutes for each category is multiplied by the reciprocal of the total number of minutes. This information might be placed in a table, but a graph shows differences more clearly.

Another example of this study analysis may relate to the activities of administering medications to patients. All the steps in preparation, administration, and cleanup are analyzed in Table XI.

Table XI. Amount and Percentage of Time Required to Administer Medications for All Shifts in a Surgical Ward.

Type of activity	Procedural steps	Time	
		Min.	%
Preparatory	Checking doctor's order	29	38.6
	Pouring tablets into cups	16	21.3
	Filling syringes	18	24.0
	Setting up tray	12	16.0
Total		75	99.9
Administering medicine	Explaining medicine to patient	32	46.4
	Giving tablets	14	20.3
	Giving injections	23	33.3
Total		69	100.0
Cleanup			

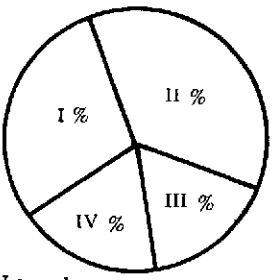
A summary of the same data may be presented in the two ways shown in Table XII and Figure 8.

In this instance, the table is more informative than the figure. It is left to the discretion of the investigator to determine which form best shows the patterns of similarities and differences in the data.

Table XII. Percentage of Time Required for Procedural Steps in Giving Medications.

Procedural steps	Percentage
Preparatory	29
Administering medicines	36
Cleanup	17
Travel to and from patient's bedside	18
Total	100

Figure 8. Percentage of Time Required for Procedural Steps in Giving Medications.



Legend:
I. Preparatory
II. Administering medicines
III. Cleanup
IV. Travel to and from patient's bedside

Time study data can also be analyzed to reflect the work of a specific category of personnel, such as supervisors. An observer following a supervisor on her rounds could time and record the types of activities performed. A code could be developed for classifying the observed activities. This is done simply by first listing similar activities and then designating a code category for them. For the supervisor this might include such categories as planning, coordinating, developing personnel, and counseling. The code for the supervisor's work should include allowances for walking from unit to unit throughout the hospital and for unclassified activities. The specific steps in the analysis are the same. First the hours and minutes are totaled; then percentages are calculated.

In all the activity analysis studies, additional data may be examined to supplement the analytical tables and figures. Such data may include the patient census of the various units studied. The number of patients on complete bed rest, the number of types of special therapy, and the number of diagnostic examinations may provide more insight into the analysis of activities. The supplemental information can be written up in the text or presented in tables or graphs. Here the average number of occurrences, such as treatment or admissions and dispositions, may be meaningful. Because these figures vary from day to day, a weekly average may give a more complete picture of total occurrences.

The averages for supplemental data are calculated as follows:

	Diagnostic Tests	*Admissions*	*Dispositions*
	f	*f*	*f*
Mon.	3	0	2
Tues.	7	4	1
Wed.	4	3	0
Thurs.	10	2	2
Fri.	2	1	2
Total	26	10	7
5 days	$\bar{X}$ = 5.2	$\bar{X}$ = 2.0	$\bar{X}$ = 1.4

f = frequency of occurrence.
$\bar{X}$ = average or the frequency of occurrence divided by the number of days.

All these supplemental data may be presented in a table, to show differences between the units that have been studied.

Table XIII. Supplemental Information for Each Unit.

Supplemental data weekly mean (Average)	Medical	Surgical	Pediatric	Obstetrical	Orthopedic
$\bar{X}$ Patient census					
$\bar{X}$ Number of bed patients					
$\bar{X}$ Admissions					
$\bar{X}$ Dispositions					
$\bar{X}$ Operations					
$\bar{X}$ Diagnostic tests					
$\bar{X}$ Special treatments					

If the staffing of a ward included the following numbers and types of personnel, ratios could be established.

	Morning Shift	*Afternoon Shift*	*Night Shift*
Head nurse	1	0	0
Staff nurse	2	2	1
Practical nurse	3	2	1
Nurse aide	1	2	1
Nursing student	4	3	1

If the actual census for the ward is 42 patients, for a 24-hour period the following ratios can be calculated:

Head nurse – 1:42, or 1 head nurse to 42 patients
Staff nurse – 5:42, or 1 staff nurse to 8.4 patients
Practical nurse – 6:42, or 1:7 patients
Nurse aide – 4:42, or 1:10.5 patients
Nursing student – 8:42, or 1:5.3 patients

The foregoing reflects only the ratio, without taking into consideration the number of patients on complete bed rest or those requiring extensive nursing care. It may be helpful to serve as a staffing guide, but it is unrealistic in terms of actual nursing activities.

In the analysis, the data collected must be thoroughly examined for every possible relationship or pattern. The statistician will be helpful in suggesting ideas for further analysis. These types of analyses should show gaps in information, which may provide clues for future studies. Moreover, specific areas for which more data are needed should also be revealed.

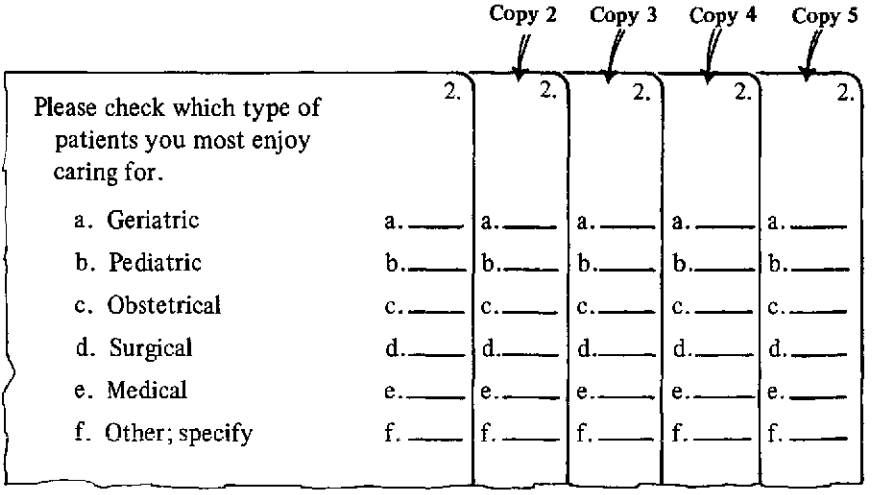
ANALYSIS OF SURVEY DATA

If questionnaire or interview schedules consist of checklist or multiple-choice responses, the analysis of data is relatively simple. The investigator has merely to count the occurrence of responses and place them in a frequency distribution or a table reflecting the percentage of specific answers. The relationships sought will guide in the format of the tables or graphs. For example, the analysis may be concerned with patient preferences of nurses according to years of experience. Table XIV depicts this relationship.

Table XIV. Patient Preferences of Nurses, by Years of Nursing Experience.

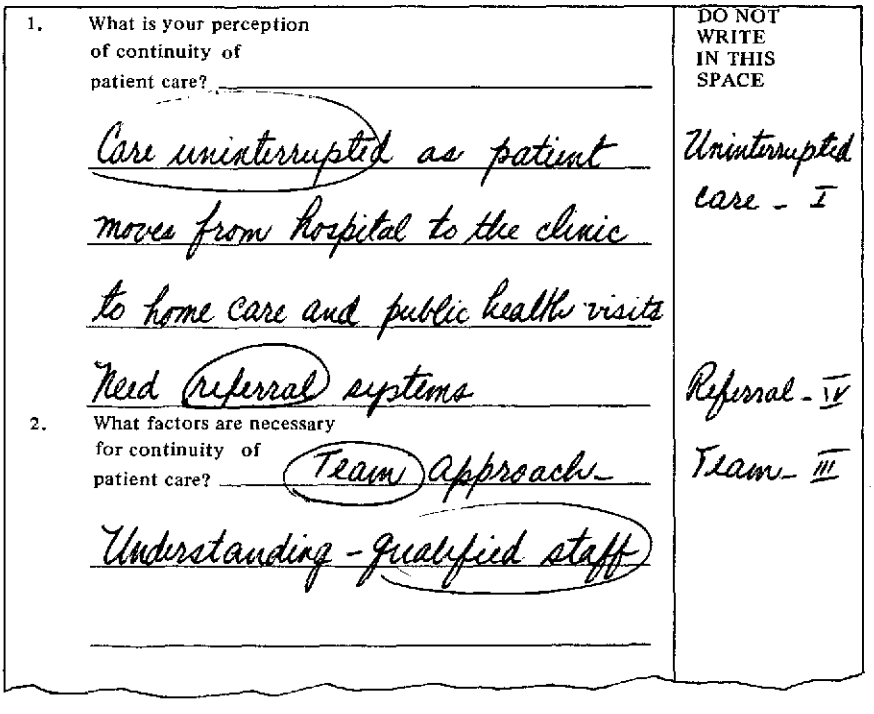
Years of experience	Type of patient			
	Geriatric	Pediatric	Obstetrical	Surgical
Less than 1 year				
1-3 years				
4-6 years				
7-9 years				

Subquestions posed form the categories used for tables or frequency distributions. As was noted previously, if checklist and multiple-choice answers are requested, they are counted and totaled before being entered in the table. The design of the questionnaire or interview schedule will help in the analysis. In Chapter IV it was suggested that the right-hand margin of the page be designated for responses. If this is done, several pages can be lined up and analyzed simultaneously. The following illustration shows how this may be accomplished.



A ruler may be used to guide the investigator in counting the frequency of specific responses to a question or statement. If the format is designed as shown above, as many as 10 pages can be checked at one time. This shortcut in analysis saves time, particularly if there is a large number of questionnaires to be analyzed.

Open-ended, or free-response, questions are more difficult to analyze, because each respondent has an individual way of answering a question. It is necessary to identify key words or phrases before counting for frequency distribution. The words or phrases may be categorized into major response divisions with related material grouped together. The questionnaire or interview schedule again should allow marginal space for analysis. The first step in analysis is to read the responses and then encircle key words, as demonstrated below.



The key words should then be examined and categorized under meaningful headings. The responses to the question in the foregoing example may be categorized as follows:

Continuity of Care

	Category	*Key words*
I.	Cyclical rotation from hospital to clinic to home to hospital	uninterrupted care continuous referrals hospital clinic home etc.
II.	Comprehensive care	total care comprehensive meeting all patient needs etc.
III.	Team concept	medical team nursing team cooperative concern including all workers
IV.	Referral	referral by doctor or nurse

The categories established, of course, are dependent on the general content of the answers. It is possible for one free response to contain more than one answer, with the answers falling into two or three different categories. A frequency and percentage table may be designed to reflect the answers of various respondents. Table XV reflects such an analysis.

Table XV. Frequency and Percentage of Perceptions of Continuity of Patient Care, by Type of Personnel

Perceptions of continuity of patient care	Type of personnel					
	Nurse administrator		Hospital care nurse		Public health nurse	
	No.	%	No.	%	No.	%
I. Cyclical concept						
II. Comprehensive care						
III. Team concept						

For any type of analysis it is necessary to group data into categories. However, grouping data means sacrificing a certain amount of information. One caution to be considered is the number of responses that may fall into a "miscellaneous" or "unclassified" category. If the frequency counts exceed those of other arbitrary categories, then the instrument may lack validity. It is also possible that the categories may be inappropriate.

ANALYSIS OF RECORD REVIEW DATA

The initial step for analysis of record review data is to total the information listed on the tabulation sheets (see Appendix H). Next, similar categories are identified and frequency distributions designed for compilation of the data. For example, age groups or diagnostic categories may be established. As was stated previously, the record review may be undertaken to supplement other data or it may serve as the sole method for collecting data. The information that has been totaled can be examined by developing two-dimensional tables. For example, information concerning diagnostic categories of patients according to age might be presented as follows:

Diagnostic category	Age group					
	20–30	31–40	41–50	51–60	61 +	Total
Cardiovascular						
Metabolic						
Gastrointestinal						
Orthopedic						

The totals for each category on the tabulation sheet should be examined initially for patterns of similarities and differences. It is conceivable that the investigator will decide that the patterns are not significant enough to present in tabular form. Such information can instead be incorporated into the text of the report. Frequently, large numbers of records must be tabulated before meaningful patterns emerge. The time period for examining records, of course, depends on the incidence of occurrence.

SUMMARY

The basis for analysis depends on the questions asked, the design, and the specific tools used to collect data. Examples and terms for analysis of data are presented throughout the chapter. General steps in organizing data prior to analysis are outlined. Examples of how data may be presented in tables, graphs, and charts are given.

Specific points for analysis of activity studies, surveys, and record review are discussed, with examples.

Chapter VI

THE WRITTEN REPORT

The study is not considered finished until a written report of the results has been completed. The report of the study serves as a guide for implementation and also furnishes a model for planning future or additional investigations. The report may be prepared for subsequent publication in a professional journal or it may serve as a source of information within a hospital, a public health agency, or a country. The style of the report is determined by its purpose and the readership.

The main purpose of the written report is to disseminate information on the findings of the study. Sharing both the methods and findings of an investigation increases the value of the study. If a series of studies is planned, the written reports of all the studies will serve as a source of future reference. This type of investigation-reporting is an economical way of keeping other agencies informed because if information is shared studies will not be duplicated.

ORGANIZING MATERIALS FOR WRITING

Initially, it is helpful to write down the major points of the study in chronological order. This may be done as each step is carried out or it may be done following the analysis of data. The chronology serves as a blueprint, or guide, for preparing a detailed outline. It also furnishes the divisions and subdivisions for the written report format. This preliminary step gives the author the opportunity to see relationships of content and subject matter. It can be annoying to find the discussion of a single topic scattered throughout a paper.

Following the chronological listing, the next step in organizing the material for the report is preparing a detailed outline. Although this outline is the basis for the organization of the report, it should not place undue restrictions on the author's style of writing. Outline subdivisions may later be used as divisions of the paper. In this manner, all related material may be included under the appropriate heading. It is a matter of author's preference, but an outline so detailed as to specify individual paragraphs is usually beneficial, particularly for beginning writers. With an outline this precise, the author needs little more than transitional sentences, which relate one subject to another. Each section of the outline deals with a topic or one of its natural subdivisions.

The investigators are ordinarily faced with a mass of notes which, without organization guides, could mean chaos. The basic steps in organizing the material give the author not only a firm grasp of the content but also an indication of the approximate length of each section.

SUGGESTED REPORT FORMAT

The following format is merely a guide, not intended to be strictly adhered to, because individual approaches to report writing vary. The specific approach taken depends not only on the study but on the results obtained. Certain studies are likely to call for the selection of portions of the following format outline, at the discretion of the investigator.

Format Guide for Sections of the Written Report

SECTION I. Title. The title should be concise, stating precisely what the study is about.

SECTION II. Author's name.

SECTION III. Introduction. Information relating to the following:

- A. Statement of the problem
- B. Purpose and objectives of the study
- C. Operational definitions of terms used in the statement of the problem and throughout the study
- D. Significance or importance of the problem to nursing or to patient care
- E. Reference to what has previously been done in the area—literature review
- F. Historical background.

SECTION IV. Methodology. Description of the specific methods and tools used in the study:

- A. Specific approach
- B. Tools and technique
  1. Observation forms
  2. Checklists
  3. Questionnaire or interview format
- C. Sample (population)
  1. Selection
  2. Size
  3. Description
- D. Place where data were collected
- E. Design.

SECTION V. Findings

A. Presentation of facts (and only facts; interpretations of findings not to be included)
   1. Tables
   2. Figures
   3. Graphs

   } Illustrations may be used

B. Presentation of similarities and differences.

SECTION VI. Discussion

A. Interpretation of the data
B. Speculation regarding the facts, if appropriate.

SECTION VII. Summary and/or recommendations

A. Recommendations for:
   1. Practice
   2. Education
   3. Future studies

   (Conclusions are usually not possible with descriptive studies)
B. Implications for nursing generally
C. Statement as to whether data have really answered the question.

SECTION VIII. References. Specific references used throughout the paper (not necessarily in alphabetical order).

SECTION IX. Bibliography (optional). General references in the area of the study (in alphabetical order).

Using the preceding headings as subdivisions for the paper not only helps in organizing the information but results in easier reading. Unbroken or continuous narrative is more difficult to read. Once a first draft of the paper has been completed, the author has an idea of the shape the report will take as a whole. A second, third, or even more drafts should be written, to polish the report and to give it the best possible scholarly style. In this way, ideas take a more definitive form and the author has the opportunity to improve on the initial text.

USE OF REFERENCE MATERIALS

The extensiveness of the literature review depends on the particular study. Before taking the first steps the investigator may wish to review published reports in the general subject area. These materials may be used for specific references or as part of the general bibliography. Study reports should be reviewed in reverse chronological order—that is, from those most recently

published to those issued earlier—because the most recent findings may nullify the results of previous ones. This approach to the literature in the field may save the investigator time and effort.

The best sources for undertaking the literature review in a library are cumulative indices of nursing articles or *The International Nursing Index.* Reports are listed by title and subject as well as by author. *The International Nursing Index* includes articles from all countries in the world, with their titles in five languages.

When a reference to be used for the study is decided upon, the investigator should prepare a complete bibliographic citation. This includes the author, the exact title of the article, the book or journal in which the article appears, the precise page numbers, and the date of publication. These citations may be written on three-by-five or five-by-eight cards or slips of paper. The following illustration shows the correct format for bibliographic citations:

Author's last name, first name. "Title of the Article," Journal Name, Vol.: page numbers, date.

General ideas presented in the article

The bibliography cards should be typewritten, if possible, with a hanging indentation, the second and subsequent lines indented five spaces to the right of the first line. The title of an article is enclosed in quotation marks, and the journal title and volume number are underlined. The correct and complete preparation of bibliography cards initially will save the author time and effort later.

Notes from specific articles can be written on separate cards and referred to later as they are needed in the written report. Keeping the cards together in a file helps the author maintain a proper organization of the materials during the writing. The orderly completion of all steps required in the report facilitates the actual writing, which is difficult for many persons, especially those with limited experience.

Articles used as specific references may be identified by numbers in the text of the report. Then the same numbers are listed with the appropriate bibliographic citation in the section of the report entitled "References." These are shown in the order of their appearance in the report, not in alphabetical order. Specific page numbers should be used to document materials from other authors and reports. Reference to other work from the literature review may be included in any part of the paper. For example, if the need for doing the study is being discussed, previous work in the area may appear in the introduction under "Importance of the Problem." Or, if specific guides on method are drawn from other works, the review of such articles may appear in the "Methodology" section. Usually there is not a separate portion of the study devoted to literature review. This information is sometimes included in Master's theses, but not necessarily in reports of investigations.

SUMMARY

The steps in the organization of materials for writing a report are discussed. The study is not considered complete until the written report of its findings has been prepared. An outline presenting a format for report writing is included to serve as a guide for the investigator or study team. Review of the literature and preparation of reference citations are briefly discussed.

Chapter VII

IMPLEMENTATION OF FINDINGS

The value of the study increases greatly when efforts are directed toward implementing the findings and recommendations. The purpose for doing the study and its objectives must first be evaluated. Has the purpose been achieved? Have each of the objectives been attained? The purpose and objectives make up the over-all blueprint for the steps to be taken in implementation. If the purpose has not been totally achieved, it is conceivable that another study or a restudy may be indicated.

The implications for possible change in nursing administration, practice, and education should evolve from the findings if the systematic steps in investigation have been followed. In the area of nursing administration, patterns of staffing patients' units may be studied for possible reorganization. The need for changes in the distribution of personnel in various units may be readily identified. In the area of practice, the time for delivery of specific types of direct care may be indicated. The amount of time for direct care to the patient may be reviewed. In the area of education, the amount or type of clinical supervision may be recognized. Numerous questions should be posed concerning the findings.

DEVELOPING GOALS AND OBJECTIVES

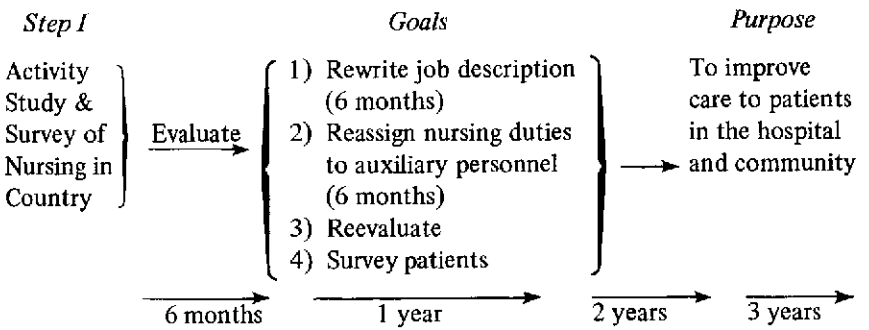
From the facts, which have been organized for analysis, the investigators and nursing leaders should formulate goals for future changes, as appropriate. Goals are specific targets that can be achieved within a specific period, such as six months or one year. The content of the goals is based on the factual evidence extrapolated from the study. The goals usually, but not necessarily, evolve from the objectives. For example, the job descriptions of nursing service personnel may need to be rewritten on the basis of factual data. It is obvious that a goal directed toward this can be reached within a realistic period.

The over-all objective or purpose related to the foregoing goal may be cited in broader terms, such as "better utilization of personnel to provide optimum care to patients." Models for improved care can be drawn from the evaluation of the entire study. The models for nursing should parallel the objectives outlined for over-all national health planning for the country. It is possible that one study cannot yield sufficient information; therefore, additional studies may be

included in future goals. For instance, because information relating to public health care may not be sufficient, a follow-up study may be needed.

When the over-all purposes for nursing have been outlined so as to form a model, the time phasing of specific goals can be planned. The model identifies what is needed for nursing and what nursing *should do*. The systematic investigation provides information on what currently exists. On this basis, plans for what should exist can be considered. For example, observations reflect what the head nurse is doing. The question to be considered then is: Is this what the head nurse should be doing? It may be apparent that she devotes 14 per cent of her time to clerical activities. Should she do so, or might she devote more time to evaluation of patient care?

This type of evaluation should be applied to all the findings. The process may seem slow, but it is a prerequisite to implementation. It is from this thinking process that a model for future planning can be developed. An example of one type of model formulation follows:



The models for nursing planning and action may be revised as changes are made and evaluated. This type of planning should be a continuing process. Reassessment of what exists should be undertaken periodically. Any of the study designs may be used to reassess or reevaluate nursing after changes have been made or after recommendations have been implemented. Without periodic reassessments, it is impossible to determine whether implemented recommendations are leading to the actions that are appropriate for attaining the over-all purposes in nursing planning. Reassessment in some instances may be done by surveying personnel or patients or both.

If an activity analysis has been carried out to identify what currently exists, the investigator may wish to repeat the study after one year. Information from a repeated study should supply clues concerning better utilization of personnel. A comparison of the findings of an initial and a repeated study should show patterns of differences and similarities. A repeated study may be carried out on a

limited basis, using smaller numbers of units or randomly selected time periods. The sample should be adequate for making comparisons.

Unless the findings of studies are used to alter and plan for the improvement of nursing, their value decreases. Not only are findings beneficial for improving health services, but documentation based on facts is an excellent administrative tool. Plans for nursing are of course sounder when based on factual evidence than when based on intuitive experience. Patients' needs and demands for care are never fixed. To meet these ever-changing needs, nursing must constantly study, evaluate, and reassess what is being done. Changes in nursing that are based on systematic investigation are realistic and practical. Indeed, systematic study is essential to appropriate nursing planning as an adjunct to over-all national health planning.

Appendix A

INSTRUCTIONS TO OBSERVERS

1. Check the Observer's Schedule daily to confirm hours of work.
2. Observations should cover two-hour periods (except for the night shift, which has fewer activities).
3. Every 10 (or 15) minutes walk through the entire unit and record what each person (nursing personnel) in the unit is doing.
4. Observations of activities should, whenever possible, be recorded in verb form. Example:
   a. Giving bath; not "bath"
   b. Taking TPR; not "TPR"
   c. Talking on telephone
   d. Is "off unit"
   e. Sitting; doing nothing
5. Activities of personnel need not be recorded in the order first observed. (The first person encountered may be a nursing student, and the second the head nurse; at the next observation the first person encountered may be staff nurse No. 1.)
6. A code for persons observed is suggested to include:

SU	– Supervisor	CI	– Clinical instructor
HN	– Head nurse	PN-I	– Practical-nurse instructor
SN	– Staff nurse	NA	– Nurse aide
NST	– Nursing student	O	– Orderly
PN	– Practical nurse		

7. If a person is away from the unit at observation time, ask her later where she was and record the response.
8. Record the time of observation, personnel, and the activity for each time period (10 or 15 minutes).

Appendix B

OBSERVATION RECORDING SHEET

Nursing Activity Study

Observer ____________ Date ____________ Unit __________ Page ______ of _______ pages

Time	Personnel observed	Activity	Level	Area

Appendix C

STUDY CODE

Classification of Activities by Level of Skill

Code

A = ADMINISTRATIVE ACTIVITIES (all coded as A in "Level Column")

Administration includes activities requiring nursing judgment. These involve responsibility for planning and providing effective patient care, for developing unit personnel, and for managing and operating the nursing unit.

Patient care activities include:

Assigning personnel to meet the individual needs of patients.

Planning and participating in unit education programs to ensure safe and effective nursing care.

Assisting the physician in his plan for patient care by directing the execution of his orders and reporting to him the patients' symptoms, reactions, and progress.

Supervising and evaluating the effectiveness of patient care.

Giving nursing care for the purpose of observing a patient, establishing rapport with a patient, or teaching a member or members of the nursing staff.

Promoting, supervising, and evaluating the education and rehabilitation program for the patient and his family.

Making nursing rounds to assess the patient's condition, progress, and immediate environment.

Development of unit personnel includes:

Planning for and participating in continuous learning experiences for nursing personnel.

Promoting personal growth and development of unit personnel.

Conducting written and oral evaluations of the performance of staff members.

Unit management activities include:

Planning for and maintaining an environment conducive to the well-being of patients and personnel.

Promoting good interpersonal relationships.

Assisting in the development and implementation of objectives and policies of the nursing service.

N = NURSING ACTIVITIES (all coded as N in "Level Column")

Nursing activities include those involved directly and indirectly in giving nursing care to patients:

Preparation of a nursing care plan for direct patient care.

Carrying out orders prescribed by the physician for his individual patients.

Observing and reporting on a patient's symptoms, reactions, and progress.

Making out Rx sheet for direct patient care.

Recording intake and output.

C = CLERICAL ACTIVITIES (all coded as C in "Level Column")

Clerical activities are those concerned with counting, copying, ordering, recording:

Assembling chart forms for new patients.

Checking charts after discharge of patients.

Copying records, such as time sheets.

Transcribing orders, counting supplies or drugs. (Checking drugs from pharmacy.)

Charting TPR on graph sheet.

D = DIETARY ACTIVITIES (all coded as D in "Level Column")

Dietary activities are those concerned with the routine serving of fluids, food, and nourishment:

Caring for unit diet kitchen.

Carrying or picking up trays.

Cleaning water glasses and pitchers and distributing fresh water and chipped ice.

Preparing and serving nourishment between meals.

Setting up trays.

H = HOUSEKEEPING ACTIVITIES (all coded as H in "Level Column")

Housekeeping activities are those concerned with the appearance of the unit environment and the care of supplies and equipment:

Making unoccupied beds.

Cleaning floors, windows, bathrooms, and service rooms.

Cleaning room after discharge of patient, including cleaning and making up the bed.

Routine checking of the unit to maintain furnishings in good order.

Dusting furniture, emptying wastebaskets, general cleaning of the nursing station.

Distributing and collecting linens.

M = MESSENGER ACTIVITIES (all coded as M in "Level Column")

Messenger activities are those requiring absence from the unit for transport services, escort service, and errands, such as:

Accompanying patients to other parts of the hospital.
Delivering requisitioned orders, both routine and emergency.
Picking up drug and supply orders, both routine and emergency.

U = UNCLASSIFIED ACTIVITIES (all coded as U in "Level Column")

Unclassified activities are those which, by definition, are eliminated from any of the preceding codes. Code U is used to identify those activities which refer to the person as an individual. For example:

Time	Personnel observed	Area	Level	Activity
A. M. 10:00	RN_1	2.1	U	Reading new pamphlet on diabetes.
10:30	RN_2	0.1	U	Drinking chocolate milk.
11:00	RN_3	0.2	U	Waiting to assist physician with a dressing.
11:30	RN_4	0.1	U	Checking hour book for days off.

The activity, not the person observed, is coded. The activity is classified or coded in two dimensions—area and level—simultaneously. This means that each activity as entered on the Observation Recording Sheet will be coded in the same manner, regardless of who performs it, whether a nurse, clerk, or nurse aide, for example.

HN	1.4 C	Copying medical order from order sheet to medicine tickets.
SN	1.4 C	
NA	1.4 C	
CI	1.4 C	
HN	1.4 A	Checking on orders as copied (by clerk).
SN	1.4 A	
HN	2.1 A	Showing nurse aide how to give a sitz bath.
SN	2.1 A	
PN	2.1 A	
SN	1.2 A	Explaining intercom system to a new patient.
NA	1.2 A	
HN	1.1 N	Giving medicine to patient.
SN	1.1 N	
PN	1.1 N	
NST	1.1 N	

Classification of Activities by Area of Nursing

Code	Subcode	
1		PATIENT-CENTERED ACTIVITIES
		These activities may occur in the patient's presence or away from him.
	1.1	Direct Care
		Activities occurring in the presence of the patient which involve the giving of care, including:
		Carrying out nursing procedures.
		Assisting doctors with treatments or procedures.
		Giving or assisting patients with personal hygiene.
	1.2	Other Patient Activities Relating to Direct Care
		Conversing or exchanging pleasantries with the patient (talking with patient).
		Evaluating the patient's need for care.
		Escorting patients.
		Listening to requests, wishes, and complaints of patients.
		Interpreting procedures and practices to patients.
		Observing the physical condition and behavior of patients.
		Teaching patients.
		Making unoccupied bed with patient at bedside.
	1.3	Exchange of Information Concerning Patients (mainly oral communication). These activities include:
		Discussing an assignment of patient care.
		Reading Kardex (nursing care plan).
		Examining reports on the patient with other members of the unit or hospital staff, physicians, the patient's family and friends, or other interested persons or agencies.
		Listening to or giving the morning, afternoon, or evening report.
		Ordering specific drugs, diet, supplies, or equipment by telephone for a particular patient or for a few patients, but not unit supplies.
		Participating in doctor's rounds.
		Receiving or giving an assignment related to patient care.
	1.4	Indirect Care
		All patient-centered activities not classified under Code Numbers 1.1, 1.2, 1.3, including:
		Maintaining patient's records.
		Charting care given.
		Checking physician's orders.
		Completing form on patient's condition.

Making out written requisition for specific drugs, diet, supplies, or equipment for a particular patient.
Preparing medication and treatment trays.
Setting up and performing immediate aftercare of equipment.
Obtaining information from Kardex.

2 PERSONNEL-CENTERED ACTIVITIES

These activities are primarily concerned with the professional growth and development of nursing service personnel and with personnel management.

2.1 Professional Development of Staff

Participation in all activities conducive to improved nursing service, as well as planned and unplanned events which increase the knowledge and skill of the staff, including:

Holding or attending demonstrations for teaching staff members individually or collectively.
Giving or receiving planned or impromptu instruction.
Observing and evaluating the quality of work performed.
Orienting new unit staff members.
Reading or questioning to gain more information about a drug, treatment, etc.

2.2 Personnel: Other

Activities having to do with personnel management (personnel-centered activities), including:

Attending staff meetings.
Participating in individual conferences on personal matters which relate to work.
Maintaining personnel records and conferring on personnel matters.
Obtaining physical examination on self by physician.

2.3 Professional Nursing Student Program*

These activities include:

Discussing the nursing students' program with unit personnel, physicians, clinical instructors, and others.
Observing and evaluating the quality of work performed by nursing students.
Planning and selecting experiences for nursing students.
Giving nursing students impromptu or planned instruction.

*Activities in which nursing students are involved must be weighed carefully in terms of whether they are patient-centered or personnel-centered. If an activity is personnel-centered, a determination must be made as to whether it is for the student or for the unit staff of which the student is considered a part.

2.4 Practical Nursing Student Program

Activities concerned with the educational program or with experience for practical nursing students.

3 UNIT-CENTERED ACTIVITIES

These activities are concerned primarily with the patient's environment and with equipment and supplies for the unit.

3.1 Environment

Cleaning and maintenance activities for the order and safety of the unit, including:

Cleaning patient's unit (*patient not at bedside*).
Making unoccupied bed (*patient not at bedside*).
Caring for unit after patient's discharge.
Cleaning of nurses' station, utility room, etc.

3.2 Supplies and Equipment

Activities concerned with obtaining, dispensing, or maintaining material for the unit, including:

Obtaining drug and linen supplies.
Checking drugs delivered by pharmacy.
Obtaining required supplies and equipment and conducting all discussions on this matter.
Obtaining and serving all foods and fluids.
Caring for supplies and equipment.
Maintaining the Kardex.

3.3 Other Unit Activities

These include:

Performing work related to the activity analysis study.
Holding conversations to maintain rapport and good interpersonal relationships with unit and hospital staff, visitors, etc.
Delivering mail to patients.
Holding discussions, compiling data, etc., in connection with any other studies.
Running errands on behalf of unit personnel.
Giving or receiving an interpretation of hospital policy as it affects the unit staff.
Maintaining unit records such as time sheets, leave records, daily reports.
Reporting on or off duty.
Serving on committees for the purpose of discussing, revising, or formulating hospital and nursing policy and procedure.

0 OTHER-CENTERED ACTIVITIES

O.1 Personal

These activities include:

All activities of a personal nature, e.g., coffee breaks, conversations about personal affairs.

O.2 Standby Time

Time spent waiting for the arrival of a person or thing prior to the start of an activity, including:

Waiting for a doctor to arrive in order to assist him with a spinal puncture.

Waiting for a sterile dressing tray to arrive in order to change a patient's dressing.

Appendix D

OBSERVER'S SCHEDULE

Dates _____ Unit _____

Hours of observation	Monday *	Tuesday	Wednesday	Thursday	Friday
7:00-9:00 A.M.					
9:00-11:00 A.M.	Observer's name				
11:00 A.M.-1:00 P.M.					
1:00-3:00 P.M.	name				
3:00-5:00 P.M.	name				
5:00-7:00 P.M.					
7:00-9:00 P.M.	name				
9:00-11:00 P.M.	name				
11:00 P.M.-1:00 A.M.					
1:00-3:00 A.M.					
3:00-5:00 A.M.					
5:00-7:00 A.M.					

*Areas blocked out have been eliminated by means of random selection of periods for observation.

Appendix E

DUMMY TABLE: INITIAL ANALYSIS FOR IDENTIFYING PATTERNS OF SIMILARITY OR DIFFERENCE

Basic question: What is the relationship between the nurses' length of experience and their preference for specific types of patients?

Length of nursing experience	Type of patient preference								Total
	Medical		Surgical		Pediatric		Geriatric		
	Acute	Chronic	Acute	Chronic	Acute	Chronic	Acute	Chronic	
Less than 6 months									
7 months to 5 years									
6-10 years									
11-15 years									
16-20 years									
21-25 years									
More than 25 years									
Total									

Appendix F

QUESTIONNAIRE FORMAT

Directions

1. Please answer every question with a check mark (✓) or short response.
2. It should take approximately 45 minutes to complete the questionnaire.
3. Your signature is optional. You will not be identified individually and your responses will be treated in confidence.
4. Please return the completed questionnaire to _____.
5. Thank you for your cooperation.

* * * * *

I. Background Information

Code

1. Please check your age in the appropriate space.

a. 20 years or less	a. _____
b. 21-25 years	b. _____
c. 26-30 years	c. _____
d. 31-35 years	d. _____
e. 36-40 years	e. _____
f. 41-45 years	f. _____
g. 46-50 years	g. _____
h. 51-55 years	h. _____
i. More than 55 years	i. _____

2. From what type of basic educational program did you graduate? (Please check appropriate answer.)

a. General nursing	a. _____
b. Mental nursing	b. _____
c. Other; specify	c. _____

_____

_____

3. What is your present position? (Please check appropriate answer.)

Code

a. Matron	a. _____
b. Assistant matron	b. _____
c. Departmental sister	c. _____
d. Ward sister (Head nurse)	d. _____
e. Staff nurse	e. _____
f. Tutor (Instructor)	f. _____
g. Other; specify	g. _____

_____

_____

4. How long have you worked in your present position? (Please check appropriate answer.)

a. Less than 1 year	a. _____
b. 1-3 years	b. _____
c. 4-6 years	c. _____
d. 7-9 years	d. _____
e. 10-12 years	e. _____
f. More than 12 years	f. _____

II. Patient Preference

1. What type of patients do you prefer to care for? _____

_____

_____

2. Please give the reason for your answer. _____

_____

_____

_____

_____

_____

Appendix G

INTERVIEW SCHEDULE

1. a. Is this your first visit to the clinic? b. If the answer is "no," when was the last time you visited the clinic? c. Approximately how many times have you visited the clinic?	Yes _____ No _____ _____ _____
2. For what reason did you come to the clinic today?	a. Complaint of pain _____ b. Complaint of other symptoms _____ c. Wanted to see doctor _____ d. Wanted laboratory test _____ e. Wanted an examination _____ f. Other reason; specify _____ _____ _____ _____ _____
3. How are you feeling now?	a. Sick (ill) _____ b. Not sick but uncomfortable _____ c. Healthy _____ d. Other; specify _____ _____ _____

Appendix H

TABULATION SHEET FOR RECORD REVIEW

Clinic register number	Clinic visit number	Sex	Race	Age	Marital status	Height	Weight	Diet	Medical diagnosis	Signs and symptoms	Remarks

SUGGESTED ADDITIONAL READING*

Books

Abdellah, Faye G., and Levine, Eugene. *Better Patient Care Through Nursing Research.* New York: The Macmillan Co., 1965. 736 pp. (general)

American Nurses Association. *Facts About Nursing.* New York: ANA, published yearly. (factual data)

Barzun, Jacques, and Graff, Henry J. *The Modern Researcher.* New York: Harcourt Brace Jovanovich, Inc., 1957. pp. 229-249. (The written report)

Beveridge, W. I. B. *The Art of Scientific Investigation.* New York: W. W. Norton and Co., Inc., 1957. 178 pp. (observation)

Doby, John T. (editor). *An Introduction to Social Research.* New York: Appleton-Century-Crofts, 1967. 381 pp. (design)

Fox, David J. *Fundamentals of Research in Nursing.* New York: Appleton-Century-Crofts, 1966. 285 pp. (general)

Good, Carter V. *Introduction to Educational Research.* New York: Appleton-Century-Crofts, 1963. 542 pp. (record review)

Goode, William J., and Hatt, Paul V. *Methods in Social Research.* New York: McGraw-Hill Book Co., 1952. pp. 132-208, Chs. 11, 12, 13. (questionnaire and interview)

Hagen, Elizabeth, and Wolff, Luverne. *Nursing Leadership Behavior in General Hospitals.* New York: Teachers College, Institute of Research and Service in Nursing Education, 1961. pp. 1-37, 146-156. (supervision studies)

Hillway, Tyrus. *Introduction to Research.* Boston: Houghton-Mifflin Co., 1956. (survey)

Hodnett, Edward. *The Art of Problem Solving.* New York: Harper & Row, Publishers, 1955. 202 pp. (problem solving)

International Conference on the Planning of Nursing Studies. London: Geo. Gibbons Ltd., Sponsored by the Florence Nightingale International Foundation, 1956. 117 pp. (general)

Meyer, Burton, and Heidgerken, Loretta E. *Introduction to Research in Nursing.* Philadelphia: J. B. Lippincott Co., 1962. 431 pp. (general)

Pan American Health Organization. *Methodology of Nursing Studies: Course Report.* Washington, D.C.: PAHO/WHO, Reports on Nursing No. 10, 1968. 115 pp. (activity analysis)

Seltiz, Claire; Jahoda, Marie; Deutsch, Morton; and Cook, Stewart W. *Research Methods in Social Relations.* New York: Holt, Rhinehart and Winston, Inc., 1962. 622 pp. (purpose)

*Each entry is followed by a parenthetical reference to the specific area to which it is applicable.

Turabian, Kate L. *A Manual for Writers of Term Papers, Theses, and Dissertations.* (third edition) Chicago: University of Chicago Press, 1969. 164 pp. (the written report)

U.S. Department of Health, Education and Welfare, PHS. *How to Study Nursing Activities in a Patient Unit.* Washington, D.C.: U.S. HEW, PHS. Division of Nursing, 1964. (nursing activity studies)

Wandelt, Mabel A. *Guide for the Beginning Researcher.* New York: Appleton-Century-Crofts, 1970. 322 pp. (general)

Articles

Abdellah, Faye G. "Criterion Measures in Nursing," *Nursing Research, 10:*21-26, Winter 1961. (observation)

Abdellah, Faye G., and Levine, Eugene. "The Aims of Nursing Research," *Nursing Research, 14:*27-32, Winter 1965. (general)

Austin, Anne L. "The Historical Method in Nursing," *Nursing Research, 7:*4-10, February 1958. (historical)

Dwyer, Joyce M. "The Nurse and Medical Research," *Nursing Outlook, 13:*51-53, May 1965. (general)

Levine, Eugene. "Experimental Design in Nursing Research," *Nursing Research, 9:*203-212, Fall 1960. (analysis)

Malone, Mary F. "Research as Viewed by Researcher and Practitioner," *Nursing Forum, 1:*39-55, Spring 1962. (general)

McManus, R. Louise. "Nursing Research—Its Evolution," *The American Journal of Nursing, 61:*76-79, April 1961. (future planning)

———. "Today and Tomorrow in Nursing Research," *The American Journal of Nursing, 61:*68-71, May 1961. (future planning)

Means, Richard K. "Interpreting Statistics: An Art," *Nursing Outlook, 13:*34-37, May 1965. (analysis)

Newton, Mildred E. "As Nursing Research Comes of Age," *The American Journal of Nursing, 62:*46-50, August 1962. (general)

———. "The Case for Historical Research," *Nursing Research, 14:*20-26, Winter 1965. (historical)

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