

EVALUATION OF THE PUBLIC HEALTH NURSE'S  
PRESENT KNOWLEDGE AND APPLICATION OF MEDICAL GENETICS

by

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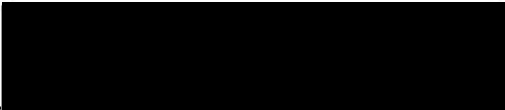
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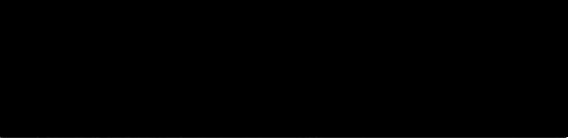
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## CHAPTER I

### INTRODUCTION

#### Statement of the Problem

The delivery of health care, particularly in the area of preventive medicine has become an issue of national concern. Proper utilization of trained medical and para-medical personnel is becoming increasingly more vital.

In the past few years, the field of molecular biology has opened a broad spectrum of scientific advancement, particularly in the field of medical genetics of which preventive medicine is a major component. Medical genetics is multifaceted and encompasses all age groups from the gamete to the elderly person, and should be of increasing importance to all members of the health team. The advances in this field will further add a burden to those involved with delivery of health care. As Motulsky states regarding the future of genetic counseling and diagnosis, "I believe that the public expects more than we can deliver in the foreseeable future." (15)

The nurse as an integral part of the health team will be expected to participate and function in the field of medical genetics as it pertains to preventive medicine, casefinding, referring, counseling



and supportive care. The literature supports the importance of the nurse's involvement in genetics and generally describes the scope and role. Several authors have implied that the traditional functions of the public health nurse in casefinding, preventive nursing measures, referring and health counseling is a good role model for implementation of genetics into nursing. (3,5,10,11,14,16,19)

The literature has mentioned the need for educational preparation, although the degree of course work is not too well defined. Prior to introducing genetics course work into nursing education, it seems necessary to define more clearly the degree of implementation and the resulting role to evolve. Gathering baseline information from nurses presently functioning in a capacity compatible with the several role models described would aid in defining proposed coursework.

#### Purpose of the Study

The purpose of this study was to assess the educational background and evaluate the knowledge and application of genetics by public health nurses practicing in Oregon

#### Assumptions

For the purpose of this study the following assumptions were made:

- 1) That the public health nurses surveyed did in fact function in the role that was described in the literature as the traditional role of the public health nurse.

2) That the public health nurses surveyed would give indication of having a higher level of knowledge of human genetics and a greater application of genetics in their practice as public health nurses than other nurses in counties throughout the state. This assumption is based on the fact that the county represented had the largest number of practicing public health nurses, the largest number of public health nurses with a baccalaureate degree in nursing, and were geographically located in the same county as the largest Genetic Clinic in the state.

3) That those nurses graduated from schools of nursing after 1965 would have had more exposure to genetics in their educational preparation than those nurses graduated before 1965.

#### Definitions

Eugenics: Eugenics concerns the improvement of the genetic material.

(13)

Euphenics: Euphenics is concerned with alteration in the chain of information from DNA to RNA to the production of protein which would be done to attain a better phenotype or physical copy. (13)

Genetic Counseling: Stevenson, Davison and Oakes give the following definition:

In particular 'counselling' suggests that advice is given to patients as to what they should do, whereas the primary purpose is to answer the question that the patient asks in terms of the risk that the event which they fear will occur. (17)

PHN: The abbreviation for Public Health Nurse(s) that will be used throughout the text.

### Methodology

To gather the information as stated in the purpose of this study, the survey research design was used. An open ended questionnaire was designed by the researcher with recommendations by the Genetics Department of the University of Oregon Medical School.

The questionnaire was divided into four parts. Part I was designed to gather the following information: educational background of the subjects, both formal and informal; the length of experience the subjects had in practicing nursing; and the length of experience the subjects had in practicing public health nursing.

Part II and Part III were designed to test the subjects' general knowledge of human genetics. Specifically Part II was designed to meet one of the criteria stated in the literature. This criterion was that public health nurses should be aware of state services available for genetic diagnosis, counseling and treatment. Part III was designed to ask questions specific to human genetics to test the subjects' knowledge of:

- 1) Mode of transmission of genetic disease with related

recurrence risks or percentages.

- 2) Well publicized facts related to two commonly mentioned genetic diseases in this country.
- 3) Percentage of children born with birth defects, including mental retardation, in this country.
- 4) The number of chromosomes in a human cell.

Part IV was designed to test the subjects' application of genetics as it related to their work as public health nurses. The three main categories covered were related to: casefinding; referring; and counseling. The subjects studied were a selected group of public health nurses that met the following criteria: were practicing in the State of Oregon; had a minimum of a Baccalaureate degree in Nursing; and were available as a group in order to be surveyed at one time and in one place and still offer a representative sample.

Information concerning the staffing patterns of various county public health departments was obtained from the Public Health Nurse Section of the State Health Department. Permission was also obtained from this source to survey public health nurses concerning their present knowledge and application of human genetics. See Appendix B. One particular county was chosen as the public health nurses met all of the pre-mentioned criteria and the size of the sample was larger than any of the other counties. Permission was granted to administer the questionnaire to these public health nurses by the Director of

this county's Public Health Nursing Department. See Appendix B.

The questionnaire was administered to all staff present at one of the regular monthly staff meetings. The subjects had no previous knowledge that this study was being done. The subjects were given the following information:

- 1) The questionnaire responses would remain anonymous.
- 2) The information being gathered was to serve as baseline information in a new area in nursing.
- 3) This information could be used to serve as a guide in developing pertinent course work in genetics relevant to public health nurses.
- 4) They as public health nurses were chosen as the subjects because of their traditional role of casefinding, counseling and referring.

The Director asked the subjects to designate on the upper right hand corner of the paper each person's status:

- 1) PHN--RN with a Baccalaureate degree in Nursing.
- 2) RN--RN with a diploma in Nursing.
- 3) LPN--Licensed Practical Nurse.
- 4) CHW--Community health worker or home health aide.

After all of the questionnaires were completed and turned in, the group was allowed to ask specific questions related to the



questionnaire and the study. They were informed that the results of the study would be shared with them if they so desired. The sample used for this study totaled 83 public health nurses with a Baccalaureate degree in Nursing.

The purposes for setting up certain criteria were as follows:

- 1) Baccalaureate degree nurses were used since the long range purpose of the study was to aid in development of pertinent course work in genetics for a Baccalaureate School of Nursing Program.
- 2) Public Health Nurses currently practicing were selected so the information would be up to date as to what was occurring at the time of the study.
- 3) Personal administration of the questionnaire by the researcher to control the variables of multiple people administering the questionnaire and insure 100 per cent return of the questionnaires that were administered.

## CHAPTER II

### REVIEW OF THE LITERATURE

#### Introduction

Genetic concepts permeate many areas of basic biologic sciences and of clinical medicine. In addition genetic ideas are being applied to sociology and other behavioral sciences. Since the field is relatively new there is no uniformity in background and training among its practitioners. (15)

This statement suggests the impact and diversification of genetics. It also implies the newness of the field in regard to roles and training. Therefore, the literature reviewed, as it pertains to nursing in genetics, was generally broad in scope but served as a guide to the development of the research purpose and questionnaire.

#### Implications for Medicine

Friedman's article on pre-natal diagnosis mentions several factors relevant to medical interest. To date, approximately 1,600 human diseases have been identified that result from error in cellular genetic metabolism. Due to recent laboratory advances in biochemistry, cellular mechanisms have been identified that if altered lead to

clinical manifestations of disease. In addition scientific discoveries have resulted in techniques useful in diagnosing genetic disease pre-natally. Through studies done on amniotic fluid obtained around the sixteenth week of gestation approximately forty pre-natal genetic diseases can be diagnosed. (4)

Muir lists the following facts: It is presently estimated that fifty to ninety percent of the pediatric admissions for diagnosis and treatment are related to birth defects. The second cause of death in children, in this country is related to birth defects, and about one-third of the fetal loss in this country is related to birth defects. (16)

In 1968, the National Foundation-March of Dimes indicated that seven percent of all infants born in the United States have birth defects that are either identifiable at birth or within the first year of life. This means approximately 250,000 babies are born annually with defects. (14) Of this number approximately 4,000 of these children have Down's syndrome and the cost for lifetime institutionalization is \$250,000. (4)

Hall and Hecht in their article on syndromes caused by nondysjunction of autosomes during meiosis, state that the main method of treatment is prevention. This must be done through education of the public concerning maternal age prior to conception and genetic counseling for families who have an affected child. (8)

#### Implications for Nursing

Gladys Hillsman who was state nursing consultant for the Maternal



and Child Health Division of the Ohio Department of Health in 1966, described her role as it related to genetics in nursing. It evolved from an awareness of the advances in genetic counseling and treatment programs and the lack of trained professional workers needed to meet the needs of the community. She developed inservice programs for nurses and inter-disciplinary groups on genetics and the services available. Following is the evaluative statement regarding these programs.

The values of such heterogenous groupings are many. The public health nurses gain a broader understanding of community and area facilities and of various means of making referrals. Hospital nurses suddenly see that diagnosis and discharge are only the beginning of care. (10)

She made home visits with public health nurses to families with many problems and established a procedure for maintaining communication between the family, local public health department, family physician and other appropriate agencies. She stated that this endeavor increased the family physician's interest in hereditary disease and his awareness of preventive medicine. Techniques were developed that the nurse could use as guidelines in counseling. She listed the following as responsibilities of the nurse in regard to hereditary disease: knowledge of counseling resources in her state for referral purposes; provision of support to parents with affected children; avoiding non-factual statements; avoiding judgmental advice; and working closely with the genetic clinic and genetic counselor. (10)

Juberg's suggestions on the requirements of genetic counselors includes a description of the role of the public health nurse. He stated that the public health nurse could be of importance to the genetic counselor through her contact with the family in the home. Because she comes to know the family more intimately than other members of the team she can recognize anxieties of parents and she may be the first one to know about the wish or existence of future pregnancies. In addition she can help to identify areas where counseling is pertinent, and help to correct misinformation. (11)

Winick suggests a team approach in the management of families with hereditary disease. He describes the roles for various members of the team. Following is his description for the public health nurse.

The public health nurse member of the team provides continuity of care - a bridge from clinic to home. She is the link between the sheltered environment of the hospital and the realities of the outside world, serving both as medical observer and practical counselor. She must be alert to the danger signs and at the same time reassure the family when things are under control. The public health nurse serves the family not only by carrying out the decisions of the panel, but by instructing the parents in methods of caring for their child. She serves the rest of the medical team by providing valuable data and suggesting practical means of implementing a program that has been proposed. She serves the community in helping to rehabilitate a child so that he may take his place as a useful member of society. (19)

Forbes also recommends the team approach to families with genetic disease. Her experience with genetic counseling has included presentation of probabilities along with concern of the families' knowledge and

their feelings. Health team members utilized were a pediatrician, cytogeneticist, public health nurse, plus a biochemist and social service personnel as consultants. In common with other authors she advocated definite diagnosis, detailed and accurate history taking, review of the literature, giving accurate information that is understood and warned against over reporting or under reporting while gathering history information. She listed the following as possible functions for the nurse in genetics: scheduling appointments for families to correspond with the team's schedule; collecting of specimens for analysis; compiling diagnostic results; collecting histories; providing for follow-up contact with the family; acting as liaison between parents and clinic team; knowing what genetic information has been given to the parents; clarifying misunderstandings or referring back to the clinic if problems are big; assisting in research by publishing data on information collected and publishing the results; and finally, providing in-service education. (3)

In 1968 the Massachusetts Nurses Association presented a clinical conference on the implications for genetics to the nursing profession. Keliher outlined the role of the nurse as described by Forbes. In addition she emphasized the responsibility of the nurse to the public in her awareness of the social implications that can result from advances in eugenics and euphenics. These two areas deal with improvement of human genes and improvement of existing human organisms. She suggested that just as nurses are involved with certain types of human engineering today they must become prepared to deal with the

possible human modifications that can result from altering gene expression and repairing genetic defects. (12)

Milliken outlined the nurse's responsibility in genetics much like Forbes and Keliher. She stated that at the present time the greatest service the nurse can offer is in casefinding and early referrals. She summarized by stating that the basic role of the nurse is that of a middleman between the family and other professional workers. (14)

An understanding of genetics, that brand of biology which holds a key to the mysteries of life, represents for the nurse a resource upon which she will have increasing occasion to draw as she responds to her involvement with individuals under a variety of circumstances. An understanding of genetics is necessary for the nurse.....the nature of whose activities is in many ways, intimately bound up with the activities of medicine. (18)

This quote by Wiedenbach suggests knowledge of genetics for all nurses. She further related that since the nurse is not a doctor or a geneticist she should not be expected to learn all the intricacies of genetics.

Following are four attributes she feels the nurse should develop.

- 1) Clarity about her central purpose in nursing.
- 2) Understanding of resources within her special area of interest.
- 3) Sensitivity to needs for help implicit in the realities of the situation in which the nurse is participating.
- 4) Skill in responding with competence to the demands the realities that the situation imposes. (18)

In addition to the roles that have been described by other authors, she includes that of incorporating genetics into classes for young people on human reproduction. She stated that this would enable them to make more responsible decisions.



Dr. Gratz takes a futuristic approach to the nurse's role in genetics. She cited the areas where nurses are involved with human engineering today.

It is not unreasonable to predict that the nurse in the year 2000 will be intimately associated and involved in a new term in genetics called 'euphenics', a form of genetic engineering which involves modification of heredity via development. Euphenics differs from eugenics by controlling gene expression without changing the genes themselves. (7)

Sharon Golub summarized quite specifically the role the nurse could assume.

The well informed nurse, regardless of her specialty, can play an indispensable role in this new medical science. First, she can help through case-finding and making referrals. By knowing what is involved in counseling, she can explain the procedure to her patients and others who need counseling, thus preventing or alleviating anxiety. After counseling she can help the families to understand what the counselors have told them if further explanation is needed. (6)

Carter suggested in 1969 that preventive measures in genetics could be utilized in the school systems. The school nurse could be utilized in screening carriers or recessive conditions so these children would know if they were carriers for a genetic disease prior to marriage. (1)

Carter discussed the environmental factors that can influence genetic diseases in his article on multifactorial diseases. He suggested that one way to help identify environmental factors that turn risk into disease would be to do long term studies of individuals presumed to be high risk for specific diseases. The nurse could

implement this research by compiling information gathered from the families she sees. (2)

Gaynor states that much is already known about the environmental effects contributing to diseases and that nurses are aware of this. When the nurse is further aware of the hereditary implication of these diseases, Gaynor feels that the nurse will be more effective in her work with patients. (5)

Hecht and Lovrien outlined the principles of genetic counseling and diagnosis. They stated that health workers from disciplines other than medicine may be needed to help in diagnosis, treatment and counseling of the patient. From their experience in genetic counseling, any member of the health team can provide genetic counseling if qualified. (9)

In 1971, Muir made the following comment.

Genetic research and its counterpart, genetic counseling, are of comparatively recent origin, and their significance in the whole field of birth defects is only beginning to evolve. Horizons for the future seem to be unlimited and an exciting and challenging area is evolving where nurses will be expected to function. (16)

She listed the following roles for nurses in genetics: 1) Team member in a genetics clinic; 2) Public health nursing; 3) Office position with a pediatrician; and 4) To be informed about genetics regardless of the nursing specialty. Further clarification of the genetic team role included: scheduling, explaining diagnostic procedures, gathering information for pedigrees, providing home follow-up care, clarification of information given and emotional support. For the public health nurse, she referred to the traditional functions of the public health

nurse as: "...casefinding, referral, and liaison activities between families and community services." (16) She stated that if the public health nurse had adequate knowledge she could determine the presence of birth defects and then refer for diagnosis. In addition she could provide emotional support, provide home management support, work with the counselor for follow-up care and bring further significant facts to the attention of the genetic counselor. The description of the pediatric office nurse was a combination of the genetic team nurse and the public health nurse. (16)

#### Educational Preparation

As the demand for heredity clinics increases and health departments and medical centers respond to the need, the nurse's role in genetics will expand. With trained genetic counselors in short supply, the nurse will be called on to participate on the heredity clinic team. Her knowledge of disease, skill in observation, experience in working with other disciplines and her ability to establish empathy with family members of all ages should make her an excellent candidate for this role. To fill it properly, she will need additional education in genetics, medical genetics, statistics, and interviewing and counseling methods. (5)

Forbes stated that greater attention should be paid to the basic features of genetics and genetic disease, both on the undergraduate and graduate levels of nursing education. (3)

Wiedenbach suggested that the nurse's knowledge of genetics must go beyond Mendelian laws and must encompass understanding of the following: human reproduction (structure and physiology); cell growth--

duplication and division; fertilization process--cellular physiology included; fertility and infertility; community facilities for counseling, diagnosis, support and therapeutic services; and being able to listen purposefully. (18)

Gratz's recommendations for education are aimed at futuristic goals.

In spite of the opposition on the part of some groups to keep the education of nurses 'status quo', nursing education is moving inexorably into the framework of America's educational system. By the year 2000, Nursing as a learned profession, will have assumed its responsibilities within the broad fabric of new dimensions in social, economic, scientific and educational events. (7)

She predicted that the nurse in the year 2000 will be working in varied environments, promoting preventive medicine, working as a colleague with the physician and will be liberally educated. She defined liberal education as development of free, capable and responsible thinking that would allow the person to be unfettered from ignorance and superstition.

...we expect our future leaders to acquire the perspective, the insight, and the ability to communicate that will enable them to become the innovators and the refiners of a free society. The nurse must therefore be more than a specified scholar. (7)

After she suggested that nursing education separate itself from requirements set by institutions of higher education tied in with hospitals, she recommended the following, for nurses.

Rather she will have been educated in the sciences with the emphasis upon the impact of scientific advancement on society as well as the basic knowledge that underlies the practice of nursing. In order



for the nurse to communicate to the public the breakthroughs in science she needs to understand some of what the scientist does and what he thinks. (7)

Muir recommended that schools of nursing include material on genetics and genetic disorders in their curricula, and that means should be provided to educate hospital personnel and public health agency staff members through inservice education. (16)

#### Summary

As indicated previously the literature supports the need for the nurse to take an active part in genetics and several roles are described. The need for educational preparation is also supported but the guidelines for implementation are unclear. The most definite ideas to unfold from the literature are related to community oriented responsibilities for the nurse in genetics. This position is supported indirectly in the following statement by Motulsky:

Most physicians with the usual training expect the patient to come to the office or laboratory. It is common experience that important specimens will be missed in this manner and that the medical geneticist must actively pursue his patients and study subjects in the home. (15)

He refers to the geneticist going out to the home but as already supported by the literature this role can and will be filled by the nurse and presently it is being done by some public health nurses. Therefore, it seems expedient to begin by aiming genetic education at this group of nurses.

## CHAPTER III

### REPORT OF STUDY

The analysis of the data will be presented in the sequence of the questionnaire, and will be discussed under three main headings; Educational Background, Part I of the Questionnaire; Knowledge of Genetics, Parts II and III of the Questionnaire; and Application of Genetics, Part IV of the Questionnaire.

#### Educational Background

The subjects in this study were 83 public health nurses currently practicing in the State of Oregon. They all had a baccalaureate degree in nursing.

Question A. asked for the year of graduation from the subject's School of Nursing. Those subjects who had graduated from a diploma school of nursing and a baccalaureate program of nursing were asked to indicate the year of graduation from the most recent program.

See Table I.

Table 1. Distribution of PHN According to Year of Graduation.

Year of Graduation	Number	Percentage
Before 1955	29	35.0
1955 to 1960	4	4.8
1960 to 1965	9	10.8
1965 to 1970	32	38.6
After 1970	9	10.8
Total	83	100.0

For further interpretation of data the total group of subjects were divided into two groups based on the assumption that subjects graduated from school of nursing after 1965 would have had more exposure to genetics in their educational preparation than those subjects graduated before 1965. The subjects graduated before 1965 will be referred to as Group A and those subjects graduated after 1965 will be referred to as Group B. See Table 2.

Table 2. PHN Graduated Before 1965 and After 1965 with their Group Mark.

Year of Graduation	Number	Percentage	Group Mark
Before 1965	42	50.6	A
After 1965	41	49.4	B
Total	83	100.0	Total Group

Question B. asked for the location, by state or country, of

the subject's school of nursing. The majority of subjects graduated from schools of nursing in Oregon. See Table 3.

Table 3. Distribution of PHN by Location of School of Nursing.

Oregon	Number	Total Group	
		Percentage	
Oregon	45	54.4	
Other States	36	43.4	
Outside the U.S.	2	2.2	
Total	83	100.0	

See Appendix C

Question C. asked for the length of time practicing nursing according to a time frame. All of the subjects in Group A had practiced nursing more than three years, while the majority of subjects in Group B had practiced nursing three years or less. See Table 4.

Table 4. Distribution of PHN as to Length of Time Practicing Nursing.

Time Practicing Nursing	Group A		Group B		Total Group	
	N	%	N	%	N	%
Less than one year	0	0	6	14.6	6	7.2
One year to three years	0	0	16	39.0	16	19.3
Three years to five years	1	2.4	13	31.8	14	16.9
More than five years	41	97.6	6	14.6	47	56.6
Total	42 83	100.0	41	100.0	83	100.0

Question D. asked for the length of time practicing public health nursing according to a time frame. The majority of Group A had practiced public health nursing more than five years while the majority of Group B had practiced public health nursing three years or less. See Table 5.

Table 5. Distribution of PHN as to Length of Time Practicing Public Health Nursing.

Time Practicing PHN	Group A		Group B		Total Group	
	N	%	N	%	N	%
Less than one year	2	4.8	19	46.3	21	25.3
One year to three years	6	14.3	14	34.1	20	24.1
Three years to five years	3	7.1	6	14.6	9	10.8
More than five years	31	73.8	2	5.0	33	39.8
Total	42	100.0	41	100.0	83	100.0

Question E. asked the length of time practicing public health nursing in Oregon. This question was asked to see if the time spent practicing public health nursing was spent mostly in Oregon or in another state. The responses to this question were distributed according to the time frame used in Question D. See Table 6.

Table 6. Distribution of PHN as to Length of Time Practicing Public Health Nursing in Oregon.

Time	Group A		Group B	
	N	%	N	%
Less than one year	2	4.7	22	53.7
One year to three years	10	23.8	14	34.1
Three years to five years	4	9.5	3	7.3
More than five years	24	57.3	2	4.9
No response	2	4.7	0	0
Total	42	100.0	41	100.0

Question F. asked the subjects to list any college degrees they may have held other than a Baccalaureate degree in Nursing. There were only two other types of degrees held. See Table 7.

Table 7. Distribution of PHN as to College Degrees Held other than a Baccalaureate Degree in Nursing.

Degree	Group A		Group B		Total Group	
	N	%	N	%	N	%
Baccalaureate Degree in Pre-Med	1	2.3	0	0	1	1.2
Master Degree in Nursing	2	4.7	1	2.4	3	3.6
Total	3	7.0	1	2.4	4	4.8

Question G. asked the subjects to list the Course Title and the Credit hours received for any college classes they had completed in



Genetics. The total number of subjects having completed a college course in Genetics was small. Group A had a slightly larger response than Group B. See Table 8.

Table 8. Distribution of PHN as to Number of College Courses Completed in Genetics.

Courses Completed	Group A		Group B		Total Group	
	N	%	N	%	N	%
One course	4	9.5	1	2.4	5	6.0
Two courses	0	0	1	2.4	1	1.2
Total*	4	9.5	2	4.8	6	7.2

\*Total number of courses for Group A equals four  
Total number of courses for Group B equals three.

Question H. asked for the number of lectures, seminars, or workshops attended on Genetics, or genetically related diseases. The number of subjects in the total group that attended lectures was small and again Group A had a slightly larger response than Group B. See Table 9.

Table 9. Distribution of PHN as to Number of Lectures Attended on Genetics or Genetically Related Diseases.

Lectures Attended	Group A		Group B		Total Group	
	N	%	N	%	N	%
One to two lectures	13	31.0	10	24.4	23	27.7
Two or more lectures	0	0	1	2.4	1	1.2
Total	13	31.0	11	26.8	24	28.9

Knowledge of Human Genetics

The evaluation of a subject's knowledge was based on a score obtained for the number of correct answers given to the questions in Parts II and III of the Questionnaire. One point was given for each correct response. There were 11 correct answers, therefore, the highest score possible was 11.

Part II asked for the locations of Genetic Clinics throughout the State of Oregon that provide genetic counseling, diagnosis and treatment. There are three such locations in the State of Oregon: Portland, Oregon; Eugene, Oregon; and Medford, Oregon.

Sixty-nine subjects answered this question, 68 of whom listed only one location, and one subject listed two locations. Sixty-nine subjects listed Portland, Oregon. The only other location mentioned was Eugene, Oregon and it was mentioned only once. See Table 10.

Table 10. Distribution of PHN that Listed Genetic Clinic Locations in the State of Oregon.

Locations Listed	Group A		Group B		Total Group	
	N	%	N	%	N	%
One location	31	73.8	37	90.3	68	82.0
Two locations	1	2.4	0	0	1	1.2
Three locations	0	0	0	0	0	0
No response	10	23.8	4	9.7	14	16.8
Total	42	100.0	41	100.0	83	100.0



The questions in Part III concerned the subject's knowledge of human genetics. Question A. concerned mode of transmission and related recurrence risks in autosomal recessive genetic disease. This question was divided into three subquestions and the correct response for each part was 25 percent. Question B. concerned mode of transmission and related recurrence risks in sex-linked recessive genetic disease and the correct response was zero percent chance. Question C. concerned the maternal age at which the risk of bearing a child with Down's syndrome greatly increased and the answer was 35 to 40 years of age or over 40 years of age. Question D. concerned the genetic disease that most states test for in all newborn babies and the answer was PKU (Phenylketonuria). Question E. concerned the percentage of children born in the United States each year, with birth defects - mental retardation included, and the answer was five to eight percent. Question F. concerned the number of chromosomes present in a human cell and the answer was 46. See Tables 11 and 12 for distribution of responses per question by the subjects.

Table 11. Distribution of Responses by PHN on Knowledge of Recurrence Risks in Genetic Disease.

Question	Response	Group A		Group B		Total Group	
		N	%	N	%	N	%
Autosomal recessive recurrence risks:							
No. 1							
second child	Right	9	21.4	22	53.7	31	37.3
	Wrong	12	28.6	4	9.7	16	19.3
	NR*	21	50.0	15	36.6	36	43.4
No. 2							
third child	Right	11	26.2	22	53.7	33	39.8
	Wrong	10	23.8	4	9.7	14	16.8
	NR	21	50.0	15	36.6	36	43.4
No. 3							
fourth child	Right	9	21.4	20	48.8	29	34.9
	Wrong	12	28.6	6	14.6	18	21.7
	NR	21	50.0	15	36.6	36	43.4
Sex-linked recessive recurrence risks	Right	19	45.3	15	36.6	34	41.0
	Wrong	9	21.4	20	48.8	29	34.9
	NR	14	33.3	6	14.6	20	24.1

\*NR means no response.

Table 12. Distribution of Responses by PHN on Knowledge of Specific Genetic Information

Question	Response	Group A		Group B		Total Group	
		N	%	N	%	N	%
Maternal Age Risk with Down's Syndrome	Right	29	69.0	33	80.5	62	74.7
	Wrong	6	14.3	3	7.3	9	10.8
	NR*	7	16.7	5	12.2	12	14.5
Detection by Screening	Right	37	88.1	38	92.7	75	90.4
	Wrong	1	2.4	1	2.4	2	2.4
	NR	4	9.5	2	4.9	6	7.2
Prevalence of Birth Risks	Right	1	2.4	3	7.3	4	4.8
	Wrong	14	33.3	10	24.4	24	28.9
	NR	27	64.3	28	68.3	55	66.3
Chromosome Complement of a Human Cell	Right	3	7.1	9	21.9	12	14.5
	Wrong	27	64.3	30	73.2	57	68.7
	NR	12	28.6	2	4.9	14	16.8

\*NR means no response.

On the basis of points obtained by each subject on Parts II and III, the scores possible for Groups A and B were tabulated and the points obtained by each group were tabulated. Group B obtained more total points and had higher scores than Group A. See Table 13.

Table 13. Tabulation of Scores by Groups Based on Knowledge of Human Genetics.

Scores*	Group A N=42	Group B N=41	Total Group N=83
Total possible scores	462	451	913
Total score obtained	150	200	350
Average score per PHN	3.57	4.88	4.23
Median score per PHN	3.25	5.38	3.81

\*Score is based on one point per one correct answer with the total correct answers being 11 therefore, a perfect score would be eleven.

Group B also had more subjects with higher scores than did Group A.

See Table 14.

Table 14. Point Distribution by PHN Based on Knowledge of Human Genetics.

Points	Group A N	Group B N
0	1	0
1	5	1
2	6	4
3	12	10
4	6	2
5	4	4
6	3	10
7	5	7
8	0	3
9 to 11	0	0

Application of Human Genetics

Part IV of the Questionnaire concerned the subjects' application of human genetics in their clinical experience as public health nurses. Question A. asked the subjects to indicate if they had taken family pedigrees or family histories during their experience as public health nurses. Of the total group only 22 subjects had taken a pedigree or family history during their public health experience. See Table 15.

Table 15. Distribution of PHN Who have Taken Pedigrees.

Responses	Group A		Group B		Total Group	
	N	%	N	%	N	%
Have taken pedigrees	10	23.8	12	29.3	22	26.5
Have not taken pedigrees	31	73.8	29	70.7	60	72.3
No response	1	2.4	0	0	1	1.2
Total	42	100.0	41	100.0	83	100.0

Those subjects who had taken pedigrees were asked to answer five additional questions related to their knowledge of pedigrees. Group B had twice as many correct answers for these questions as did Group A. See Table 16.

Table 16. Distribution of Correct Responses by PHN, Who Have Taken Pedigrees.

Questions	Group A N=10 Number Correct	Group B N=12 Number Correct
How many generations do you usually include	6	6
What symbols do you use for female and male	2	9
How do you indicate the proband or index case	1	4
What specific non-medical information do you obtain about the parents of the proband	2	2
How often do you include your pedigree in the formal chart	1	4
Total of Correct Responses	12	25

Question B. asked the subjects if they had ever quoted recurrence risks, or percentages, to patients or parents seeking this advice. Of the total group only 25 subjects had quoted recurrence risks. See Table 17.

Table 17. Distribution of PHN, Who Have Quoted Recurrence Risks.

Recurrence Risks	Group A		Group B		Total Group	
	N	%	N	%	N	%
Have quoted	14	33.3	11	26.8	25	30.1
Have not quoted	23	54.8	26	63.4	49	59.0
No response	5	11.9	4	9.8	9	10.9
Total	42	100.0	41	100.0	83	100.0

Those subjects who had quoted recurrence risks were asked to answer four additional questions related to their knowledge of information needed before quoting recurrence risks. The first of these four questions asked if the patient was seeking risk advice for themselves or someone else. The next three questions were directly related to risk information for the patient themselves. Since the first question did not relate directly to risk information specific to the patient, the responses for this particular question were not tabulated. For tabulation of responses to the last three questions see Table 18.

Table 18. Distribution of Correct Responses by PHN, Who Have Quoted Recurrence Risks.

Question	Group A N=14 Number Correct	Group B N=11 Number Correct
If they wanted the information for themselves, had they been formally diagnosed	10	7
If they were diagnosed, by whom was it done	11	9
Where did you obtain your information on recurrence risks	11	9
Total of Correct Responses	32	25

Question C. was a question concerned with the counseling ability of the subjects. Four choices were offered and the subjects were asked to indicate what they would do first if they were presented with the situation. The correct response was for the subject to assess the level of understanding that the parents had received from the Genetics Clinic. See Appendix A for the entire question and all of the possible answers. Of the total group 59 subjects answered this question correctly and Group B had more correct responses than Group A. See Table 19.



Table 19. Distribution of Responses by PHN on Application of Genetic Counseling.

Responses	Group A		Group B		Total Group	
	N	%	N	%	N	%
Correct response	24	57.1	35	85.4	59	71.1
Wrong response	12	28.6	6	14.6	18	21.7
No response	2	4.8	0	0	2	2.4
Invalid*	4	9.5	0	0	4	4.8
Total	42	100.0	41	100.0	83	100.0

\*Invalid means the questionnaire was improperly marked, not allowing for proper identification of which answer the subject had chosen.

Questions D., E., and F. were asked to obtain some idea of the subjects' awareness of patients in their case loads with genetic disease and of these cases how many were identified by the subject herself. The total number and average number for these three questions are listed per Groups A and B in Table 20.

Table 20. Distribution by PHN on Caseload Information.

Questions	Group A N=42			Group B N=41		
	TN*	AN*	SR*	TN	AN	SR
Approximate number of families per caseload	1220	29.0	26	1432	34.9	35
Approximate number of genetic cases per caseload	90	2.1	26	75	1.8	31
Approximate number of genetic cases identified by the PHN	16	.4	22	6	.2	22

\*TN means Total Number

AN means Average Number

SR means Subjects Responding to the Question

Question G. asked the subjects to give examples of the types of genetic disease in their caseloads. More subjects in Group B gave responses than did subjects in Group A. See Table 21.

Table 21. Distribution of Genetic Disease Examples Given by PHN.

Response	Group A		Group B	
	N	%	N	%
Nurses who gave examples of genetic disease	23	54.8	25	61.0
No response	19	45.2	16	39.0
Total	42	100.0	41	100.0

For the total number of examples given by both groups, Group A gave more total examples than did Group B.. For the distribution of the most

frequently given examples by Groups A and B and Total Group, see Table 22.

Table 22. Distribution of Genetic Disease Examples Most Frequently Given by PHN.

Examples	Group A	Group B	Total Group
	N	N	N
Mental Retardation	10	8	18
Cystic Fibrosis	6	6	12
PKU	4	8	12
Down's Syndrome	6	5	11
Congenital Defects	5	3	8
Diabetes	6	2	8
Sickle Cell Anemia	2	4	6
Hemophilia	3	2	5
Others*	13	7	20
Total Examples Given	55	45	100

## CHAPTER IV

### SUMMARY, FINDINGS, CONCLUSIONS, AND RECOMMENDATIONS

#### Summary

The advances in the field of medical genetics will affect all members of the health team. The nurse as an important member of the health team will be expected to participate in this new area. The literature is beginning to show evidence of this statement by supporting the importance of the nurse's involvement in genetics, and describing various roles which the nurse may assume. Since medical genetics is closely related to the area of preventive medicine, the public health nurse with her traditional role of casefinding, preventive nursing measures, referring and health counseling is a good role model for implementing genetics into nursing.

The purpose of this study was to assess the educational background, and evaluate the knowledge and application of genetics by public health nurses currently practicing in the State of Oregon. This information is to be considered as baseline information that could serve as a guide in developing pertinent coursework in genetics for baccalaureate nursing curricula.

### Findings

The findings in this study were as follows:

1. Those nurses graduating before 1965 had more experience both in practicing nursing in general and in practicing public health nursing than did those nurses graduating after 1965.
2. Only 4.4 percent more of the participating nurses graduated from schools of nursing within the State of Oregon than those who graduated from schools of nursing in other locations.
3. Group A had the larger number of subjects with advanced formal education than did Group B, although the numbers were too small to indicate meaningful findings.
4. Group A had the larger number of subjects with formal and informal education in human genetics than did Group B, although the numbers were too small to indicate meaningful findings.
5. None of the nurses were aware of all the state locations for genetic counseling, diagnosis and treatment, whereas, the majority was aware of the services available within their own county.
6. Group B had higher scores relating to knowledge of human genetics than did Group A.
7. Group B showed slightly more knowledge in application of taking family pedigrees than did Group A.
8. Group A showed comparable knowledge in application of quoting recurrence risks with the subjects in Group B.
9. Group B showed definitely more knowledge in the application of genetic counseling than did Group A.

10. Although Group B had a larger number of families per caseload than did Group A, Group A was able to identify more cases with genetic disease than Group B. Group A also was able to identify more of these cases themselves than were the subjects in Group B.
11. Even though the number of nurses in Group B who gave examples of genetic disease was larger than the number of nurses in Group A, Group A gave a larger total number of examples of genetic disease than Group B.
12. The group as a whole had less than half of the questions asked concerning knowledge of genetics, correct. Each group individually also had less than half of the total responses correct.
13. Less than one-third of the total group had ever taken a family history or pedigree and less than one-third of the total group had ever quoted recurrence risks to families, whereas, over half of the total group had been practicing public health nursing more than three years.
14. Ninety seven and sixtenths percent of the nurses in Group A had been practicing nursing more than five years, whereas only 14.6 percent of Group B had practiced nursing more than five years, yet Group B showed a higher degree of application than did Group A.



### Conclusions

Conclusions that may be drawn from this study are:

1. Those nurses graduating after 1965 seem to show a higher level of knowledge and application of human genetics than those nurses graduating before 1965.
2. The ability to identify genetic cases seems to be more associated with the length of time practicing public health nursing, since Group A which had more clinical experience than Group B showed a higher level of identification.
3. Public health nurses in this study have very little knowledge of human genetics and therefore, are unable to apply knowledge in this area to the extent expected by the role models described in the literature.
4. Public health nurses in this study indicated by the size of their caseloads show that they have contact with a large number of patients in the community and they could be very useful in the described role of casefinding, referring and counseling in regards to genetic disease.
5. Without implementation of pertinent genetic course work into nursing education, it would be difficult to expect the public health nurse to fulfill the role as described in the literature.

### Recommendations

Due to the findings of this study the following recommendations were made:

1. A further study of schools of nursing, which have a genetics program in their curriculum, and assessment of their products' knowledge and application of genetics would further delineate the degree of genetic education necessary to produce a nurse well informed in this field.
2. A further study of public health nurses practicing in other states to evaluate their knowledge and application of human genetics, in order to assess information held by other populations of public health nurses.
3. A further study of knowledge and application of human genetics by nurse practitioners in other areas of nursing to assess their knowledge and application of human genetics in relation to their clinical work. This could serve as a guide for developing genetics coursework in nursing specialties other than public health nursing.

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APPENDIX A

RESEARCH TOOL

Questionnaire



## INSTRUCTIONS:

Please withhold name.

With multiple choice questions circle the most correct answer.

With open ended questions, please answer as concisely as possible.

Thank-you for your cooperation.

## I Part one:

## A. Year of graduation from School of Nursing?

1. Before 1955.
2. 1955 to 1960.
3. 1960 to 1965.
4. 1965 to 1970.
5. After 1970.

B. Nursing School located in \_\_\_\_\_ state, or \_\_\_\_\_  
\_\_\_\_\_ country?

## C. Length of time practicing nursing?

1. Less than one year.
2. One year to three years.
3. Three years to five years.
4. More than five years.

## D. Length of time practicing public health nursing?

1. Less than one year.
2. One year to three years.
3. Three years to five years.
4. More than five years.

## E. Length of time practicing public health nursing in Oregon?

\_\_\_\_\_ months, \_\_\_\_\_ years.

F. Please list any college degrees you may hold other than a  
Baccalaureate degree in Nursing \_\_\_\_\_?

- G. If you have completed any college classes in Genetics (usually listed as a biology course), please list:

<u>Course Title</u>	<u>Credit Hours Received</u>
_____	_____
_____	_____

- H. If you have attended any lectures, seminars or workshops in Genetics, or on genetically related diseases please list the title and the sponsor or lecturer:

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

## II Part Two

List the locations of Genetic Clinics throughout the State of Oregon that provide Genetic counseling, diagnosis and treatment:

\_\_\_\_\_.

## III Part Three:

- A. Two carriers for an autosomal recessive disease such as cystic fibrosis marry. They have a 25% chance of having affected offspring. They have four children—the first child (a boy) has the disease. What is the percentage chance of the following children having the disease:
1. The second child (a boy) \_\_\_\_\_ ?
  2. The third child (a girl) \_\_\_\_\_ ?
  3. The fourth child (a boy) \_\_\_\_\_ ?
- B. In a sex-linked (carried on the X chromosome) recessive disease such as hemophilia, what are the chances of an affected father married to a normal mother, bearing an affected offspring \_\_\_\_\_ ?
- C. At what maternal age does the chance of bearing a child with Down's Syndrome (mongolism) greatly increase \_\_\_\_\_ ?
- D. Which genetic disease are all newborn babies routinely checked for in most states \_\_\_\_\_ ?

- E. What percentage of live born children, in the U.S., have birth defects—include mental retardation \_\_\_\_\_ ?
- F. How many chromosomes are present in a human cell \_\_\_\_\_ ?

IV Part four:

- A. During your public health experience, have you ever had the opportunity to take a family pedigree, or family history?  
No \_\_\_\_\_ Yes \_\_\_\_\_.

If you marked yes, please answer the following questions:

- 1. How many generations do you usually include \_\_\_\_\_ ?
- 2. What symbol do you use for female \_\_\_\_\_, male \_\_\_\_\_ ?
- 3. How do you indicate the proband or index case \_\_\_\_\_ ?
- 4. What specific non-medical information do you obtain about the parents of the proband?  
\_\_\_\_\_  
\_\_\_\_\_.

- 5. How often do you include your pedigree in the formal chart?  
\_\_\_\_\_.

- B. Have you ever quoted recurrence risks, or percentages, to patients or parents seeking this advice?  
No \_\_\_\_\_ Yes \_\_\_\_\_.

If you marked yes, please answer the following questions:

- 1. Was the person seeking the advice in regard to themselves or someone else \_\_\_\_\_ ?
- 2. If they wanted the information for themselves, had they been formally diagnosed? No \_\_\_\_\_ Yes \_\_\_\_\_ Uncertain \_\_\_\_\_.
- 3. If they were diagnosed, by whom was it done \_\_\_\_\_ ?
- 4. Where did you obtain your information on recurrence risks?  
\_\_\_\_\_.

- C. You have been asked to see a family involving home management of their child who has problems resulting from a genetic disease. The diagnosis was made at a Genetics Clinic. The physician has communicated the following information to you:

1. The diagnosis.
2. The recurrence risk to future offspring is 25%.
3. Pre-natal diagnosis is possible.
4. The family was informed of the above.

On one of your visits the couple expresses their desire to have another child. They ask you what they should do.

Please indicate what you would do first by circling one of the following:

1. Refer them back to the Genetics Clinic.
2. Tell them that this is their decision but should they decide to have another child, pre-natal diagnosis would be available.
3. Assess their understanding of the information they have already received from the Genetics Clinic.
4. Advise them to try adopting a child rather than having one of their own.

D. Approximately how many families do you have in your usual caseload?

\_\_\_\_\_.

E. Of these, approximately how many families have genetically related diseases? \_\_\_\_\_.

F. In terms of casefinding, how many of these families with genetic disease were, 1) identified by you first, or 2) in fact, referred to you by some other source?

1. \_\_\_\_\_ (number of cases).

2. \_\_\_\_\_ (number of cases).

G. Of these cases could you give examples of the type of genetic disease present?

APPENDIX B

CORRESPONDENCE

9060 S.W. Monterey Place  
Portland, Oregon 97225  
February 7, 1972

Mrs. Ellen Strand  
State Health Department  
Public Health Nurse Section  
1400 S.W. Fifth Avenue  
Portland, Oregon 97201

Dear Mrs. Strand:

In partial fulfillment of requirements for a Master of Science degree at the University of Oregon School of Nursing, I am undertaking a study to assess public health nurses' present knowledge and application of human genetics.

The importance of this study is to gather baseline information that could be used in the development of genetic course work in a Baccalaureate School of Nursing curriculum. In addition this information could serve as a guide in developing an inservice program in human genetics for practicing public health nurses. I have chosen the public health nurse because her present role is advantageous in case-finding, counseling and referral; three important aspects of community health in respect to genetics.

Miss Gay Snowhook was helpful in giving me the names of directors of county public health nurse departments, that I could contact. I have contacted Miss Billie Odegard, Director of Multnomah County Public Health Nurses' Department. With Miss Odegard's cooperation I have decided to survey the public health nurses in Multnomah County.

Should you wish further information please contact me by phone or mail. I will be more than happy to share the results of the study with you. Thank-you for your time and consideration.

Yours sincerely,

Caroline A. Seeley, R.N.

Mrs. Seeley is a regularly enrolled graduate student at the University of Oregon School of Nursing. I would appreciate any considerations you may give her concerning cooperation with her study.

May Rawlinson Ph.D  
Thesis Advisor



9060 S.W. Monterey Place  
Portland, Oregon 97225  
February 7, 1972

Miss Billie Odegarde  
Director of Public Health Nursing  
Multnomah County Health Department  
12240 N.E. Glison  
Portland, Oregon

Dear Miss Odegarde:

In partial fulfillment of requirements for a Master of Science degree at the University of Oregon School of Nursing, I am undertaking a study to assess public health nurses' present knowledge and application of human genetics.

The importance of this study is to gather baseline information that could be used in the development of genetic course work in a Baccalaureate School of Nursing curriculum. In addition this information could serve as a guide in developing an inservice program in human genetics for practicing public health nurses. I have chosen the public health nurse because her present role is advantageous in case-finding, counseling and referral; three important aspects of community health in respect to genetics.

According to our plans, made by phone, I will be prepared to administer the questionnaire on March 10th. to the Multnomah County Public Health Nurses. After analyzing the data I will be more than happy to share the information with you and any interested nurses. Thank-you for your time and consideration.

Yours sincerely,

Caroline A. Seeley, R.N.

Mrs. Seeley is a regularly enrolled graduate student at the University of Oregon School of Nursing. I would appreciate any considerations you may give her concerning cooperation with her study.

May Rawlinson Ph.D.  
Thesis Advisor

APPENDIX C

SUMMARY OF DATA

ONLY POSITIVE OR CORRECT  
RESPONSES ARE TABULATED

N=83

## INSTRUCTIONS:

Please withhold name.

With multiple choice questions circle the most correct answer.

With open ended questions, please answer as concisely as possible.

Thank-you for your cooperation.

## I Part one:

## A. Year of graduation from School of Nursing?

1. Before 1955. 29 PHN
2. 1955 to 1960. 4 PHN
3. 1960 to 1965. 9 PHN
4. 1965 to 1970. 32 PHN
5. After 1970. 9 PHN

B. Nursing School located in Oregon (45) state, or other states  
Canada (2) country? (36)

## C. Length of time practicing nursing?

1. Less than one year. 6 PHN
2. One year to three years. 16 PHN
3. Three years to five years. 14 PHN
4. More than five years. 47 PHN

## D. Length of time practicing public health nursing?

1. Less than one year. 21 PHN
2. One year to three years. 20 PHN
3. Three years to five years. 9 PHN
4. More than five years. 33 PHN

## E. Length of time practicing public health nursing in Oregon?

\_\_\_\_\_ months, \_\_\_\_\_ years.

## F. Please list any college degrees you may hold other than a

Baccalaureate degree in Nursing \_\_\_\_\_ ?

Baccalaureate Degree in Pre-Med -- 1 PHN

Masters Degree in Nursing -- 3 PHN

- G. If you have completed any college classes in Genetics (usually listed as a biology course), please list:

<u>Course Title</u>	<u>Credit Hours Received</u>
one course -- 5 PHN	
two courses -- 1 PHN	

- H. If you have attended any lectures, seminars or workshops in Genetics, or on genetically related diseases please list the title and the sponsor or lecturer:

one to two lectures -- 23 PHN
two or more lectures -- 1 PHN

## II Part Two

List the locations of Genetic Clinics throughout the State of Oregon that provide Genetic counseling, diagnosis and treatment:

Portland, Oregon -- 69 PHN; Eugene, Oregon -- 1 PHN
Medford, Oregon -- 0 PHN

## III Part Three:

- A. Two carriers for an autosomal recessive disease such as cystic fibrosis marry. They have a 25% chance of having affected offspring. They have four children—the first child (a boy) has the disease. What is the percentage chance of the following children having the disease:
- The second child (a boy) 31 correct ?
  - The third child (a girl) 33 correct ?
  - The fourth child (a boy) 29 correct ?
- B. In a sex-linked (carried on the X chromosome) recessive disease such as hemophilia, what are the chances of an affected father married to a normal mother, bearing an affected offspring 34 ?
- C. At what maternal age does the chance of bearing a child with Down's Syndrome (mongolism) greatly increase 62 ?
- D. Which genetic disease are all newborn babies routinely checked for in most states 75 ?

- E. What percentage of live born children, in the U.S., have birth defects—include mental retardation 4 ?
- F. How many chromosomes are present in a human cell 12 ?

IV Part four:

- A. During your public health experience, have you ever had the opportunity to take a family pedigree, or family history?  
No \_\_\_\_\_ Yes 22 .

If you marked yes, please answer the following questions:

1. How many generations do you usually include 12 ?
2. What symbol do you use for female 11 , male 11 ?
3. How do you indicate the proband or index case 5 ?
4. What specific non-medical information do you obtain about the parents of the proband?

4

5. How often do you include your pedigree in the formal chart?

5

- B. Have you ever quoted recurrence risks, or percentages, to patients or parents seeking this advice?  
No \_\_\_\_\_ Yes 25 .

If you marked yes, please answer the following questions:

1. Was the person seeking the advice in regard to themselves or someone else \_\_\_\_\_ ?
2. If they wanted the information for themselves, had they been formally diagnosed? No \_\_\_\_\_ Yes 17 Uncertain \_\_\_\_\_ .
3. If they were diagnosed, by whom was it done 20 ?
4. Where did you obtain your information on recurrence risks?

20

- C. You have been asked to see a family involving home management of their child who has problems resulting from a genetic disease. The diagnosis was made at a Genetics Clinic. The physician has communicated the following information to you:



- 1. The diagnosis.
- 2. The recurrence risk to future offspring is 25%.
- 3. Pre-natal diagnosis is possible.
- 4. The family was informed of the above.

On one of your visits the couple expresses their desire to have another child. They ask you what they should do.

Please indicate what you would do first by circling one of the following:

- 1. Refer them back to the Genetics Clinic.
- 2. Tell them that this is their decision but should they decide to have another child, pre-natal diagnosis would be available.
- 3. Assess their understanding of the information they have
- (59) already received from the Genetics Clinic.
- 4. Advise them to try adopting a child rather than having one of their own.

D. Approximately how many families do you have in your usual caseload?  
31.95 mean per PHN.

E. Of these, approximately how many families have genetically related diseases? 1.95 mean per PHN.

F. In terms of casefinding, how many of these families with genetic disease were, 1) identified by you first, or 2) in fact, referred to you by some other source?

- 1. \_\_\_\_\_ (number of cases).
- 2. .3 mean per PHN \_\_\_\_\_ (number of cases).

G. Of these cases could you give examples of the type of genetic disease present?

48 PHN gave examples  
 100 total examples were given



DISTRIBUTION BY STATE  
AS TO LOCATION OF GRADUATION  
FROM A BACCALAUREATE NURSING PROGRAM

Location	Total Group	
	N	%
Oregon	45	54.4
Washington	14	16.9
California	4	4.8
Colorado	3	3.6
Minnesota	3	3.6
Montana	2	2.2
Rhode Island	2	2.2
Eight other states	8	10.1
Canada	2	2.2
Total	83	100.0

AN ABSTRACT OF THE THESIS OF:

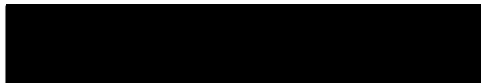
CAROLINE A. SEELEY

For the MASTERS OF SCIENCE DEGREE IN NURSING EDUCATION.

Date of receiving this degree: June 9, 1972

Title: EVALUATION OF THE PUBLIC HEALTH NURSE'S PRESENT KNOWLEDGE  
AND APPLICATION OF MEDICAL GENETICS.

Approved:

  
\_\_\_\_\_  
May Rawlinson, Ph.D., Assistant Professor, Thesis Advisor

The purpose of this study was to assess the educational background and evaluate the knowledge and application of genetics by public health nurses practicing in Oregon.

To gather the information as stated in the purpose of this study the survey research design was used with an open ended questionnaire. The questionnaire was designed to obtain information of the subjects' educational background, knowledge of human genetics and their application of human genetics in their clinical work.

The questionnaires used in this study were completed by 83 public health nurses practicing in one specific county in the State of Oregon.

They met the following criteria:

- 1) Public health nurses with a minimum education of a Baccalaureate degree in Nursing.

2) Public health nurses currently practicing in the State of Oregon.

3) Public health nurses all practicing within the specific county and all present at the same time the questionnaire was administered.

The public health nurses used in this study were assumed to have been functioning in the role that was described in the literature as the traditional role of the public health nurse in casefinding, preventive nursing measures, referring and health counseling. The subjects were divided into two categories for analysis of the data: Group A was composed of those subjects graduating from schools of nursing before 1965 and Group B was composed of those subjects graduating from schools of nursing after 1965.

The findings of this study were:

1. Those nurses graduating before 1965 had more experience both in practicing nursing in general and in practicing public health nursing than did those nurses graduating after 1965.
2. Only 4.4 percent more of the participating nurses graduated from schools of nursing within the State of Oregon than those who graduated from schools of nursing in other locations.
3. Group A had the larger number of subjects with advanced formal education than did Group B, although the numbers were too small to indicate meaningful findings.

4. Group A had the larger number of subjects with formal and informal education in human genetics than did Group B, although the numbers were too small to indicate meaningful findings.
5. None of the nurses were aware of all the state locations for genetic counseling, diagnosis and treatment, whereas, the majority was aware of the services available within their own county.
6. Group B had higher scores relating to knowledge of human genetics than did Group A.
7. Group B showed slightly more knowledge in application of taking family pedigrees than did Group A.
8. Group A showed comparable knowledge in application of quoting recurrence risks with the subjects in Group B.
9. Group B showed definitely more knowledge in the application of genetic counseling than did Group A.
10. Although Group B had a larger number of families per caseload than did Group A, Group A was able to identify more cases with genetic disease than Group B. Group A also was able to identify more of these cases themselves than were the subjects in Group B.
11. Even though the number of nurses in Group B who gave examples of genetic disease was larger than the number of nurses in Group A, Group A gave a larger total number of examples of genetic disease than Group B.
12. The group as a whole had less than half of the questions asked concerning knowledge of genetics, correct. Each group individually also had less than half of the total responses correct.

13. Less than one-third of the total group had ever taken a family history or pedigree and less than one-third of the total group had ever quoted recurrence risks to families, whereas, over half of the total group had been practicing public health nursing more than three years.
14. Ninety seven and sixtenths percent of the nurses in Group A had been practicing nursing more than five years, whereas only 14.6 percent of Group B had practiced nursing more than five years, yet Group B showed a higher degree of application than did Group A.

The conclusions of this study were:

1. Those nurses graduating after 1965 seem to show a higher level of knowledge and application of human genetics than those nurses graduating before 1965.
2. The ability to identify genetic cases seems to be more associated with the length of time practicing public health nursing, since Group A which had more clinical experience than Group B showed a higher level of identification.
3. Public health nurses in this study have very little knowledge of human genetics and therefore, are unable to apply knowledge in this area to the extent expected by the role models described in the literature.
4. Public health nurses in this study indicated by the size of their caseloads show that they have contact with a large number of patients in the community and they could be very useful in the described



role of casefinding, referring and counseling in regards to genetic disease.

5. Without implementation of pertinent genetic course work into nursing education, it would be difficult to expect the public health nurse to fulfill the role as described in the literature.

The recommendations of this study were:

1. A further study of schools of nursing, which have a genetics program in their curriculum, and assessment of their products' knowledge and application of genetics would further delineate the degree of genetic education necessary to produce a nurse well informed in this field.
2. A further study of public health nurses practicing in other states to evaluate their knowledge and application of human genetics, in order to assess information held by other populations of public health nurses.
3. A further study of knowledge and application of human genetics by nurse practitioners in other areas of nursing to assess their knowledge and application of human genetics in relation to their clinical work. This could serve as a guide for developing genetics coursework in nursing specialties other than public health nursing.