THE INFLUENCE OF PREDETERMINED FACTORS ON THE COMPREHENSION OF WRITTEN HEALTH INFORMATION OF SELECTED PATIENTS IN A UNIVERSITY OUTPATIENT CLINIC

by

Evon Hull Weigand

A THESIS

Presented to

the University of Oregon School of Nursing

and the Graduate Council

of the University of Oregon Medical School

in partial fulfillment of the requirement for the degree of

Master of Science

June 9, 1966

This study was supported by a federal traineeship from the United States Public Health Service Grant Number NT-35-08.

APPROVED:

[redacted]

Lucile Gregerson - Associate Professor

[redacted]

Chairman, Graduate Council

ACKNOWLEDGEMENTS

A special word of appreciation is expressed to Miss Lucile Gregerson, R.N., M.Ed., Associate Professor, on the faculty of the University of Oregon School of Nursing for her able assistance during the preparation of this study. Appreciation is also expressed to Mrs. Marian Parsell, Nursing Supervisor of the Outpatient Clinics, for permission to use the facilities for the collection of data.

Grateful appreciation is extended to the Department of Health, Education and Welfare of the United States Public Health Service for the opportunity for advanced study and financial assistance from a traineeship grant.

Immeasurable indebtedness is expressed to my husband, Mr. Donald J. Weigand and my family for their continual support and encouragement during the course of this study.

ekw

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

CHAPTER I

INTRODUCTION

Scope of the Problem

The need for adequate communication with patients about their health care has long been recognized by those concerned with this care. (12) The well informed patient generally accepts and participates in health care and treatments more effectively, safely, and comfortably than the poorly informed patient. When the amount and complexity of information to be communicated to the patient increases, printed material is often used either in conjunction with or instead of individual instruction. (12)

In 1961, the National Health Library had 57,556 different health pamphlets and every year it receives about 1600 new ones. (13) The American Medical Association has published 1200 health pamphlets in quantities ranging from 1500 copies of one publication to half a million. There are printed health materials written by individual medical personnel, hospital groups, voluntary and official health agencies, insurance companies, and pharmaceutical houses. The result of nonselective use of these materials can range from a total lack of communication, to a partial understanding which creates unnecessary fears and hazards, to a failure to capitalize on a patients' self-teaching ability. (12)

The problem is not how to use printed material but how to have the messages transmitted in forms which are accepted, comprehended and used by the various people. (6) The only current methods available to test reading ability in adults are literary tests, which are not sufficiently definitive, or standardized tests of reading comprehension which are primarily developed for school children. (12) The standardized tests have been used to test adults but these are based on conceptual material in history, geography, and literature. The validity of predicting an adult's ability to comprehend written health information is not known.

The giving of a certain logical form of description does not imply that logical argument or reasoning goes on. Information given may provide an apparent function executed by the brain, but does not imply the brain's mechanisms, or specify thoughts. Perceptive activity proceeds through the perceiver's own general framework and background.

Communication proceeds in the face of a number of uncertainties and has the character of, or may be described as consisting of, numerous inductive inferences being carried out concurrently. (3) Colin Cherry (4) outlined a number of uncertainties which affect oral communication and may also be applied to written communication.

> Uncertainties of language and syntax. Sentence construction differs; language may be bound by few rules of syntax. Vocabularies vary, words have many near-synonyms, popular usage, special usage, et cetera.
>
> Environmental uncertainties. May be disturbed by street noises, telephone and background clatter.

> Recognition uncertainties. Recognition depends upon the peculiar past experiences of the receiver, upon his familiarity with the speaker's or writer's habits, knowledge of the language, subject matter, et cetera.

Other factors which may influence perception include: social position or welfare, personality, education, intelligence, selection and sequence of time, feedback from previous utterances, religious or early belief, and cultural background. (3, 7, 14, 18) These influences may be either conscious or unconscious on the part of the receiver.

Words are arbitrary things and do not have inherent meanings. The vast majority of words in any language have multiple potential connotations. (9, 11, 18) It is the people who have and give meaning to words and not the words themselves. Some words have powerful affective connotations while other words with the same informative connotations do not.

In health education the greatest concern is with the behavior of the individual. To communicate, it is necessary to have a basic understanding of the value of people. (18) Jawaharlal Nehru in Visit to America wrote: "If we seek to understand a people we have to try to put ourselves in that particular historical and cultural background. There must be a language of the mind and some kind of emotional awareness of the other people." (14) To understand the type of audience to be reached with written information is one of the basic fundamentals in its construction. (7, 13, 18)

Statement of the Problem

In constructing health information it must be known for what type of audience the material will be used. The problem of this study is to determine what factors influence the comprehension of written material. Evaluating the achievement of a select group of patients on a health information test is basic to the personnel responsible for teaching and giving instruction in the University of Oregon Outpatient Clinic, because more awareness will be developed concerning the type of audience they are attempting to reach.

This study, therefore, aims to determine the extent to which 104 dermatology clinic patients comprehend health information incorporated into a test with known reading levels. It is further proposed to assess the influence(s) of six pre-determined variables on the comprehension of the selected health information test. (See Appendix A) The variables are:

1. Age
2. Sex
3. Race
4. Place of schooling
5. Years of schooling
6. Occupation

Limitations

This study includes only the information obtained from a selected health information test from a study reported by Mary F.B.

Mohammed in Nursing Research, Spring, 1964, on "Patients' Understanding of Written Health Material" and an interview guide outlined for the study.

The participants are limited to the patients in the Dermatology Clinic of the University of Oregon Outpatient Clinic who attended during and inclusive of the following dates, June 14, 1965 through June 22, 1965.

The criteria for the selection of the clinic at the University of Oregon Outpatient Clinic include the following:

1. The location and facilities are accessible and available to the investigator.
2. It is a small clinic and all patients could be interviewed.
3. It meets every morning, Monday through Friday.
4. The majority of the patients are adults and adolescents.
5. For the most part the patients do not have problems which would hinder reading.
6. The physical setting is adequate and the investigator would not interrupt the regular clinic procedure.

The Dermatology Clinic met the above criteria, hence was selected for this study.

Assumptions

For the purpose of this study it was assumed that:

1. The comprehension of health information could be measured by a test with items constructed on known reading levels.

2. The data collecting tool had merit in that the test could be used to determine comprehension of health information.
3. The patients would cooperate in taking the test and answering the questions during the interview.
4. The questions would be answered truthfully and authentically.
5. The data obtained could have implications for originators of printed health information.

Definitions

For the purpose of this study, the following definitions have been accepted:

1. Reading level - the ability to understand and comprehend written communication which has been presented on the basis of the difficulty of vocabulary and the average length of the sentences according to known grade levels. (5)
2. Comprehension - the act of and capacity for understanding. (Websters' New World Dictionary, 1960).

Procedures of the Study

Source of Data. The primary source of data was that obtained from the set of four multiple-choice questions following each of the five 100 word paragraphs constructed at known grade levels, and from an interview guide administered immediately after the test to obtain age, sex, race, place of schooling, last year of school completed, and occupational history. This tool was administered to 104 of the 118 patients approached in the Dermatology Clinic at the University

of Oregon Outpatient Clinic between June 14, 1965 and June 22, 1965. The secondary source of data was a review of the literature and related studies.

Methodology. This study was conducted as an ordinal survey using the dependent variable, scores from the test questions, as primary data. A comparison of the influence(s) of the independent variables, age, sex, race, place of schooling, years of schooling completed, and occupational history with the mean scores on the test and distribution tables was used to describe the findings.

The design of the study may be described in a series of steps as follows:

1. Established the purpose and scope of the study.
2. Reviewed the literature and related studies to discover what factors influence patients' comprehension of written health material and to develop a frame of reference regarding comprehension of health information.
3. Determined the assumptions and limitations.
4. Selected the tool from Mary F.B. Mohammed's study. (12)
5. Established criteria for the selection of a clinic to be used for collecting data. (Criteria described in the limitations of the study.)
6. Located a clinic that met the criteria.
7. Obtained administrative clearance for testing clinic patients.
8. Duplicated necessary number of tests for administration to patients.

9. Administered test and interviewed all patients attending Dermatology Clinic on specified days.
10. Tabulated the data, interpreted same.
11. Described the findings mathematically, summarized, drew conclusions, and made recommendations for further study.

Presentation of the Study

This study is presented in four chapters: Chapter I, INTRODUCTION, which indicates the nature of the study, defines the purpose and describes the plan for procedure; Chapter II, REVIEW OF THE LITERATURE AND RELATED STUDIES, presents a review of pertinent literature and related studies; Chapter III, PROCEDURE AND FINDINGS, explains the procedure used and a presentation of the findings; Chapter IV, SUMMARY, CONCLUSIONS AND RECOMMENDATIONS, provides a summary of the study with conclusions and recommendations for further study based on the data obtained.

CHAPTER II

REVIEW OF THE LITERATURE AND RELATED STUDIES

Review of the Literature

A review of the literature and related studies was made to discover what factors influence patients' comprehension of written health material.

Communication is the process by which the communicator transmits cues to modify the behavior of the communicatee. (6) It is the art of imparting or interchange of information, thought and opinions. (1) Communication proceeds in the face of a number of uncertainties and has the character of, or may be described as consisting of, numerous inductive inferences being carried out concurrently. (3) In addition to the linguistic relativity expressed in the culture, there are two other forms of relativity applicable to language, meaning and perception. The meaning each individual perceives is relative to his experience, and for a message to be understood, there must be some overlapping of experience between the sender and the receiver. A vast majority of words in any language have multiple potential connotations. (8, 11, 18) Some words have powerful affective connotations while other words with the same informative connotations do not.

Factors which may influence perception include: social position or welfare, personality, education, intelligence, selection and sequence of time, feedback from previous utterances, religious or early belief and cultural background. (3, 7, 14, 18) These influences may be either conscious or unconscious on the part of the receiver.

Logic and reason form only a part of the communicative process and not always a dependable part. To understand a person really, something must be known about his feelings, needs and motives. In writing, information concepts must be communicated so the reader and author can reach an extensional agreement. (3) To understand the type of audience to be reached with written information is one of the basic fundamentals in its construction. (7, 13, 18)

The recipient of any message is guided in his interpretation of that message and in his resulting action by his view of the relative roles and status between himself and the sender. (15) What is assumed to be personal and ephemeral is more subject to change than the more basic patterns. The individuals' freedom of action and self correction is presumed to be relatively great at a personal level. (15) He sees the effects of his actions, he can correct them and relate cause and effect. But difficulties arise in regard to those ideas which the individual assumes to be shared by large numbers of people. Although he may unconsciously assume these rules are shared, he may be exceedingly deviant from other people in his communicative habits.

Dr. Carl Hovland in a paper on "Mass Media", prepared for the University of Illinois Institute of Communications Research in 1948, (6) named common defects of mass communication judged in his analysis: absence of motive; wrong motive assumed; too many steps in the process; relation of steps not clear; response not specified after motive aroused; and appeal without appropriate response being possible.

Stuart Chase (3) defined the following communication failures: confusing words with things; failure to check abstract terms with concrete evidences; confusing facts with inferences with value judgments; spurious identification; wholesale application of two-valued logic; failure to assemble the main fact before passing judgment; extrapolation; gobbledegook; failure to associate the other man's background and point of view; failure to appraise motives; and failure to allow for cultural differences.

In naming blocks of effective verbal communication, Helen Hewitt (9) listed "inappropriate use of medical facts or nursing knowledge" as a major block, which is also applicable to written communication.

Written material is often constructed in order to persuade others to take some action. The consent of the audience is won by convincing them that the recommended action is in their own best interests. When someone judges a persuasive effort to be not in the best interest of the audience, the effort is identified as propagandistic. (3) When the message has reached the audience the problem is to get it reclassified as information rather than propaganda. This involves

establishing a good character and is only, in small part, in the control of the source itself. In open competition where all sources are discredited, repetition is probably the cardinal principle of persuasion. (3)

Colin Cherry (4) says that information can be received only where there is doubt and doubt implies the existance of alternatives where choice, selection or discrimination is called for. Signals have an information content by virtue of their potential for making selections.

Other factors in the comprehension of written material are reading errors. The most common reading error is mistaking one word for another. (7) The eyes do not have time to read words letter by letter. They look at the general shape of a group of letters and take them in as a whole. The classic paper on mistakes in reading was written by Professor Thorndike in 1917. (7) He analyzed children's mistakes in reading and discovered an important principle; words and word groups may have so much meaning for a reader that they blot out the meaning of other words around them. Thorndike called this the "overpotency" of words.

There is no sure-fire remedy for this sort of mistake, but the author of written material should watch for pairs of "contagious" or "allergic" words. (7) The use of the negative is many times a confusing factor.

Much work has been done on various methods of teaching reading in regard to content comprehension; this subject will not be dealt

with in this review of the literature.

The only current methods available to test reading ability are literary tests, which are not sufficiently definitive, or standardized tests of reading comprehension which are primarily developed for school children. (12) The standardized tests have been used to test adults but these are based on conceptual material in history, geography and literature. Their validity in predicting an adult's ability to comprehend written health information is not known.

Related Studies

Mary F.B. Mohammed, responsible for studies in patient teaching and implementation of the findings of these studies at the University Hospitals in Cleveland, Cleveland, Ohio, reported a study of "Patients' Understanding of Written Health Information" in Nursing Research, Spring, 1964. (12) Mrs. Mohammed devised a test to provide needed information about patients' ability to understand printed health information. This consisted of a series of five 100 word paragraphs constructed at known grade levels. Each paragraph was followed by four multiple choice questions with answers which were clearly stated in the paragraphs. The subject matter of all tests was general health information. The reading grade levels for the paragraphs and questions were determined by the use of the Dale-Chall Readability Formula. (5) Four trial runs, followed by item analysis and revisions, were completed before the final tests were made.

The final testing was done on 300 randomly selected ambulatory

patients attending a Diabetes Clinic at University Hospitals in Cleveland. A questionnaire was administered following the test to obtain age, sex, race, place and amount of schooling, length of Cleveland residence and occupations. A comparison of the mean scores on the tests and the descriptive variables was made. All differences reported as significant were at the P .05 level. The following was found:

1. The lower the age, the higher the test score, with no significant differences between sex, race or amount of schooling. The age range was from 17 to 86 years.
2. The mean score for those educated in the urban north was significantly higher than those educated in the urban and rural south.
3. There was positive association between the last school grade completed and mean scores on the test.
4. There was little variation up to the level of the skilled manual worker in the most skilled occupation reported, where the mean score was nearly four points higher than the less skilled occupational levels, which was a significant difference.
5. The life-time Cleveland residents scored significantly higher than the immigrants.

In the discussion Mrs. Mohammed pointed out that comparisons of mean scores and descriptive variables do not reveal that sex, race, birthplace, years in Cleveland or occupation have any strong predictive

value regarding ability to comprehend health information. Age had some effect on the apparent difference in mean score, but the number of school grades completed had a much greater effect. See Appendix B for the test.

William D. Leipold (10) and associates stated that words had a different meaning to various people. If the sender and receiver attribute different meaning to the same words, the situation may become non-communicative, or even result in misinterpretation and misunderstanding. To determine whether word communiques via clinical reports, lectures, and therapeutic sessions were being sent and interpreted effectively, a study was done at a Minnesota State Mental Hospital to determine how accurately staff members and patients could define psychiatric terminology.

The study involved 111 people, including staff members and patients. These were divided into four groups. To test them, three word lists were devised consisting of 25 words each. Only words that had appeared at least three times in hospital reports, lectures, or therapy sessions were used. Group I consisted of 28 physicians, chaplains and other supervisory staff members. List I was used for this group. Group II included 18 student nurses in the last six weeks of their psychiatric affiliation. List II was used for this group. Group III consisted of 51 patients from a receiving hospital ward, which was selected because of their hospital therapeutic community. List III was used for this group. Group IV consisted of 14 nurses and aides working on the receiving unit. List III, the

same used for patients, was also used for this group.

The results and conclusions follow:

Group I correctly defined 66 percent of the words on its list. The range was from 3 to 24 words. Some of the answers were surprising. "Abstract thinking" was defined as "bizarre", "day-dreaming", and "disconnected thinking". The staff group checked 45 percent of the words as usable, but in actuality only two out of every three words were defined or used adequately.

Group II defined 62 percent of the words accurately on their list. They checked 58 percent of the words as familiar enough to use. When these were analyzed for accuracy of definition, it was found that three out of four were defined correctly, which means that the 18 students tended to use more words correctly than did the 28 staff personnel. It was reported that the students had been introduced recently to the words on their list, so these results were not surprising. The study suggested that since words become unfamiliar with disuse, perhaps frequent workshops geared to better understanding between disciplines would prove beneficial.

Group III, the patients, defined 28 percent of the words accurately. Ward therapy sessions were geared towards the patients' achieving a better understanding of the dynamics and symptoms that influence their lives. If they only understood one-fourth of what was said there would be a great break down in communications. Another problem to consider was the possible increase in psychological distance between staff and patients. Frustration, anger, or

hopelessness at his own lack of understanding may have made the patient withdraw further into himself.

Group IV, the 14 nurses and aides, accurately defined 59 percent of the words. This compared favorably with the staff and student nurses and tended to substantiate the belief that frequent orientation facilitates understanding of psychiatric terminology.

The findings indicated that what the sender attempted to communicate, the receiver was not always interpreting as the sender anticipated. However, as a result of the study the author hoped the increased awareness of the personnel that communication and understanding of what is communicated is at a premium may help to reduce the problem in the future.

Although only words that had appeared at least three times in hospital reports, lectures, or therapy sessions were used to compile the lists, the investigation is in question as to the validity of presenting different lists of words to the various groups. Perhaps a more valid comparison of the groups could be made if the same lists had been used.

It was reported to the National Health Council in 1962 (13) that the Association for the Aid of Crippled Children sponsored a study to discover what channels of information were used by parents of crippled children. Reading material of any kind played a small role in the communication experience recalled by the parents. The statistics showed that the people who read the pamphlets and who retained information were those who also used other information sources much

more frequently and readily than the group as a whole.

In follow-up interviews with parents who had said the literature did not tell them what they wanted to know, it was indicated that what those parents wanted was a kind of reassurance and a type of comfort.

An article by James Skipper, (17) "What Communication Means to Patients", published in the American Journal of Nursing reported that the results of 132 interviews with patients reveal that communications with doctors and nurses were of great importance to patients. Communication had two primary meanings for hospitalized patients: (1) to secure information and (2) to provide interpersonal contact. The patients desired information about their illness, technical procedures, and the general social organization of the hospital. When the patients received this type of information their anxieties about their illnesses were decreased. It also helped the patients to learn what the nurses and doctors expected of them.

The patients desire personal contact with hospital personnel because they need attention. The patients used this type of communication not only as a means of determining if their nurses and doctors were dedicated and interested in their care and cure and would not reject them, but also to determine if these persons were technically qualified and possessed the knowledge and skills necessary to get them well.

Summary of the Literature

A review of the literature and related studies revealed that much research and study has been done in the areas of mass

communication, methods of teaching reading and testing comprehension on the grade school levels, but few studies have been done regarding comprehension levels in the adult, particularly in regard to health information.

The literature reports two main forms of relativity, meaning and perception. The meaning each individual perceives is relative to his experience, and for a message to be understood there must be some overlapping of experience between the sender and the receiver. There are many factors which may influence perception. Included are: social position or welfare, personality, education, intelligence, selection and sequence of time, feedback from previous utterances, religious or early beliefs, cultural background and reading errors. (3, 7, 14, 18)

Understanding the type of audience to be reached with written information is fundamental in its construction.

CHAPTER III

PROCEDURE AND FINDINGS

Procedure

The purpose of this study is to determine the extent to which 104 dermatology clinic patients comprehend health information incorporated into a test with known reading levels (4th, 6th and 8th grades). It is further proposed to assess the influence(s) of six predetermined variables on the comprehension of the selected health information test. (See Appendix A) The variables are:

1. Age
2. Sex
3. Race
4. Place of schooling
5. Years of schooling
6. Occupation

A review of the literature and related studies was made to discover what factors influence patients' comprehension of written health material. Much research and study has been done in the areas of mass communication, methods of teaching reading and testing comprehension of the grade school levels, but few studies have been done regarding comprehension levels in the adult, particularly in regard to health information.

The tool for the collection of data was taken from the study "Patients' Understanding of Written Health Material" by Mary F.B. Mohammed reported in Nursing Research, Spring, 1964. The test consisted of a series of five 100 word paragraphs which were constructed at known grade levels as determined by use of the Dale-Chall Readability Formula. (5) This formula measures the difficulty of the vocabulary through the use of a list of 300 words known in reading by 80 percent of 4th grade children. Any word not included in this list was termed an "unfamiliar" word. The reading level was determined on the basis of the difficulty of the vocabulary (or number of "unfamiliar" words) and the average length of the sentences in the writing. The tests were constructed on the 4th, 6th, and 8th grade levels.

Four trial runs, followed by item analysis and revisions, were completed before the final testing by Mrs. Mohammed and associates. The final testing was done on 300 ambulatory patients attending a Diabetes Clinic at University Hospitals of Cleveland, Ohio. The findings of the final testing were reported in Chapter II. See Appendix A for the test.

The variables selected for this study are similar to the Mohammed study (12) and a comparison of the two studies was made. The variables were obtained by an interview held with each patient immediately following the test to obtain age, sex, race, place of schooling, years of schooling and occupation. (See Appendix B)

Permission to use the University of Oregon Outpatient Clinic was

obtained from Mrs. Marian Parsell, nursing supervisor. The Dermatology Clinic was selected according to the criteria outlined in Chapter I of this study. The data were collected over a period of seven consecutive scheduled clinic days. All 118 patients scheduled for the Dermatology Clinic were approached, and 104 completed the test and were interviewed.

The patients were approached in the waiting area designated for the Dermatology Clinic. Each received an individual explanation of the reasons the study was being done and was asked to help by reading some short paragraphs and answering some questions. (Appendix A) Each patient was given an individual written and verbal explanation and sample questions. The patients were given a pencil and a stable writing area. Patients having difficulty with the sample test were given assistance until they could proceed alone or until it was clearly evident that there was no understanding of the material. After each patient finished the test an interview was held immediately to obtain data re the desired variables. (Appendix B)

Fourteen out of the 118 approached in the sample population did not participate in the study. Three patients (2.5 percent) were unable to read. Eight or 6.8 percent did not bring their glasses to the clinic. Two were unable to see because of eye problems and only one refused to take the tests. She stated, "It is too silly". It was discovered that she recently had had extensive brain damage.

Findings

Figure 1 shows a profile of the percent distribution of the total number of correct responses on the test of the 104 patients. The wide range of scores from 1 to 20 can be noted in this figure. The figure has a definite skew to the right with the total possible (twenty correct) being the peak with 26.9 percent of the patients achieving that score. Following in the decreasing number of correct responses is 17.3 percent of the patients achieving 19 correct; 10.6 percent of the patients achieving 18 correct responses and the same percentage achieving 17 correct responses; 7.7 percent had 16 correct responses; 4.8 percent achieving 15 correct responses; and there were 3.9 percent of the patients in each of the 11, 13, and 14 correct response categories. The percent of patients achieving the fewer number of correct responses (1 to 10) was also lower (1.0 to 1.8).

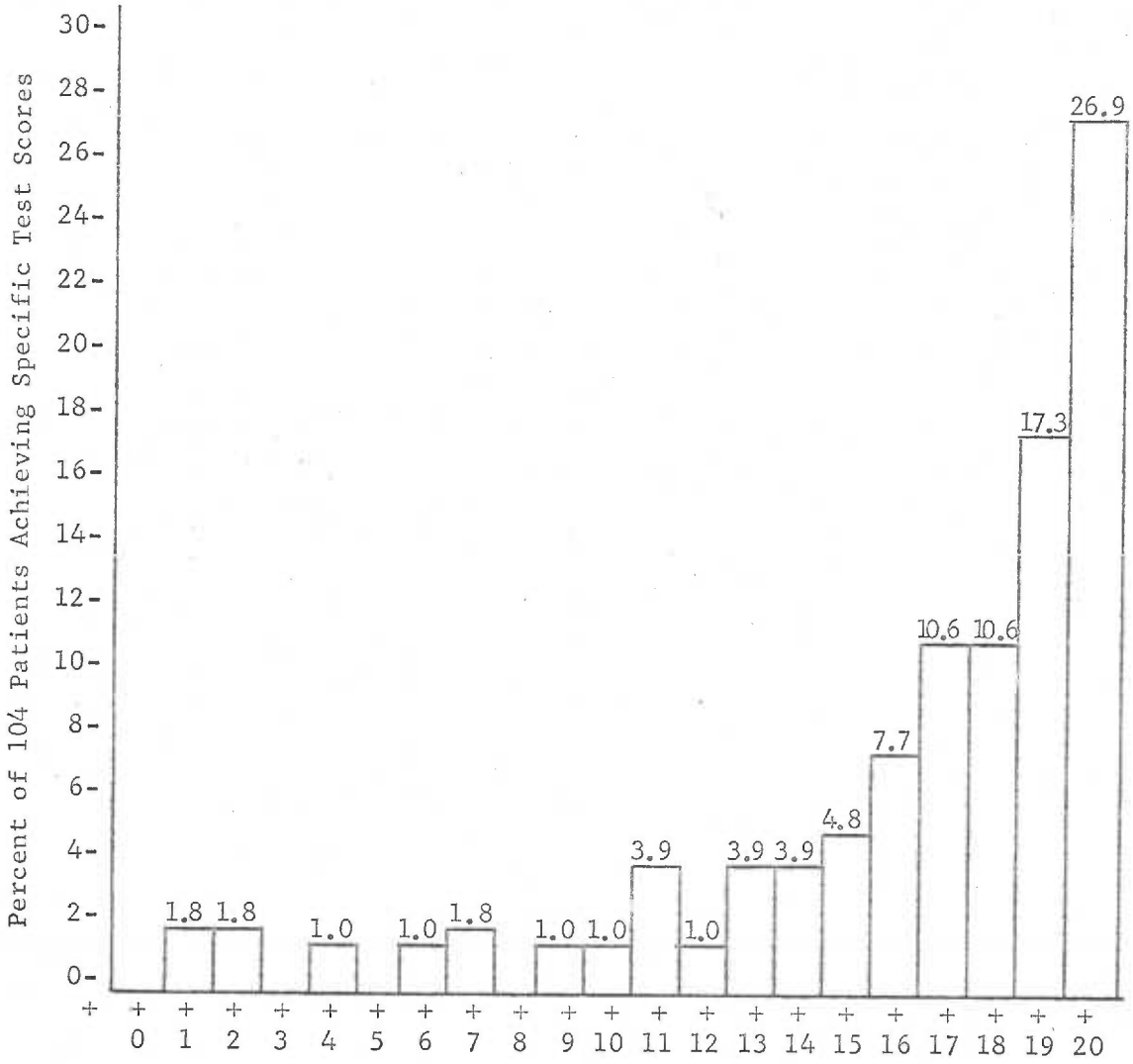


Figure 1. Percent Distribution of Total Number of Correct Responses on Test of 104 Patients From the University of Oregon Outpatient Dermatology Clinic.

The ability to profit from written health information has been established for this study as the ability to answer the questions correctly following each of the paragraphs. For descriptive purposes the discriminating ability of the patients to correctly answer each question has been categorized as follows: low ability - achievement that does not show success; medium ability - achievement that does not show failure nor success, and; high ability - achievement that shows success.

Table 1 indicates the number and percentage distribution according to the discriminating ability of 104 patients participating in this study to profit from written health material. Low discriminating ability is shown by nine participants who scored nine or less on the test, by answering 45 percent or less of the questions correctly.

Medium discriminating ability was established as those achieving scores of 10 to 16. There were twenty-seven people in the medium category who answered between 50 and 80 percent of the questions correctly.

High discriminating ability was established as those scoring 17 and over on the test, which is 85 percent and over of the questions answered correctly. There were 68 people or 65.39 percent of the participants in this category.

Table 1. Number and Percentage Distribution by Ability to Profit from Written Health Material of 104 Patients in the University of Oregon Outpatient Dermatology Clinic.

Item	Number of Patients	Percentage of Patients
1. Unable to profit from material written at a 4th grade level or above. Scored nine or less on the test.	9	8.65
2. Ability to profit not established by the study. Scored 10 to 16 on the test.	27	25.96
3. Able to profit from material through 8th grade level. These patients may comprehend material written at higher than an 8th grade level but this was not tested. Scored 17 and over on the test.	68	65.39
Totals	104	100.00

The number of correct responses for each of the four questions following each of the five paragraphs which were constructed at known grade levels is shown in Table 2. The number of correct responses out of the total 104 responses for the four questions following each of the five paragraphs ranges from 51 to 96. All but six of the questions have a range of 80 to 96 correct responses. Five out of these six are from the questions following the paragraphs which are constructed on the 4th grade level; one is from the paragraph constructed on the 8th grade level. Out of the 2080 total possible correct responses there were 414 incorrect responses.

The paragraph which had the 51 correct responses to one of the questions was constructed on the 4th grade level. It is interesting to note that this question was on the subject of diet. The question was, "What does Mrs. Brown need to use up her store of?". The answer, "fat" was clearly stated in the paragraph, (See Appendix A) but out of the fifty-three incorrect responses, thirty-four answered "protein".

The responses to the questions of the tool used for this study seem to indicate the question difficulty for each paragraph does not differ greatly.

Table 2. Number of Correct Responses for Each of the Four Questions Following Each Paragraph Constructed at Known Grade Levels by 104 Patients in the University of Oregon Outpatient Dermatology Clinic.

Subject of Paragraph	Number of Correct Responses of Each Question			
	1	2	3	4
Diet Information (4th)*	96	87	93	51
Test Instruction (4th)*	78	62	69	89
Reading a Thermometer (6th)*	91	89	95	64
Information on Cold Virus (6th)*	92	95	82	93
Eye Hygiene (8th)*	86	79	93	83

* Should be interpreted as 4th, 6th or 8th grade reading level.

Table 3 shows the average number correct responses for each paragraph and the grade level on which each were constructed. The average number correct responses for the 104 patients answering each

series of four questions ranges from 3.00 to 3.41 correct. The three paragraphs written on the 4th and 6th grade levels had an average number correct of 3.23, 3.00 and 3.39 respectively. The two other series of questions written on the 4th grade level had an average number correct of 3.29 and 3.39. The one series written on the 8th grade level had an average number correct of 3.29.

According to the tool used for this study, the grade level of written material does not appear to be a factor in patients' comprehension of written health material.

Table 3. Question Difficulty, Expressed in Terms of the Average Number of Questions Correct for Each Test Paragraph by 104 Patients in the University of Oregon Outpatient Dermatology Clinic.

Subject of Paragraph and Question	Grade Level	Average Number Correct
Diet Information	4th	3.23
Test Information	4th	3.00
Reading a Thermometer	4th	3.39
Information on Cold Virus	6th	3.41
Eye Hygiene	8th	3.29

Table 4 gives the distribution of the mean scores of the age grouping of the patients taking the test.

The mean scores for the age groupings rose to the 40 to 49 year grouping then declined with a very slight rise in the 60 to 69 year grouping, declining drastically in the 70 to 79 grouping and rising sharply in the 80 to 89 year grouping.

The adolescents had a mean score of 16.8 but the 10 to 39 year age groupings had mean scores of 19.2 and 19.3. The 40 to 69 year groupings were very close with a mean score of 15.6, 15.2 and 15.4 respectively. The 70 to 79 year grouping had a mean score of 11.1 and the 80 to 89 year old group had a mean score of 17.0. There were only two patients in the 80 to 89 year old group. The small number might account for the higher mean score.

Table 4. Distribution of Mean Scores on the Test According to Age Groupings of 104 Patients in the University of Oregon Outpatient Dermatology Clinic.

Age	10-19	20-29	30-39	40-49	50-59	60-69	70-79	80-89
Mean Score on Test	16.8	19.2	19.3	15.6	15.2	15.4	11.1	17.0

Table 5 gives the average age of patients in each race and sex group. The average age of fifty-three white female patients was 40.23 with a standard deviation of 21.74. The white males had a standard deviation of 19.52 for the 41 patients with an average age of 48.63. The average age of the six female Negroes was 49.83 with a standard deviation of 10.77. The standard deviation was 27.00 for the four Negro males with an average age of 38.75. The age range for the Negro males was 12 to 76 which accounts for the larger standard deviation. The age range for the Negro females was from 34 to 64 which accounts for the smaller standard deviation. The fact that the number in each of these groups was small compared with the other two

groups could account for the high and low standard deviation.

The age range of the population sampled at the University of Oregon Outpatient Dermatology Clinic for this study was from 12 to 76 years with an average age of 44.4 years. The age range in the Mohammed study (12) was 17 to 86 years with an average age of 57.5 years.

Table 5. Average Age of 104 Patients in the University of Oregon Outpatient Dermatology Clinic According to Sex and Race.

	Female White	Male White	Female Negro	Male Negro
Number of Patients	53	41	6	4
Average Age	40.23	48.63	49.83	38.75
Standard Deviation*	21.74	19.52	10.77	27.00

*mean age rounded to nearest whole number for computation of standard deviations.

The mean score of the tests for the females was 16.45 and 16.46 for the males. According to the data collected during this study there is no significant difference between the sexes in the comprehension of written health material.

The mean score for the white patients taking the test was 16.8 and for the Negro patients was 10.5. The sample included only 10 Negro patients in comparison with 94 white patients. The number of Negro patients is too small to establish a relationship between the groups.

Table 6 shows the distribution by place of schooling and the mean score on the tests. The geographical division of north and south is a common horizontal division of the United States; no attempt was made in this study to obtain data according to any vertical division such as east, midwest, mountain states or west coast. Eighty-four from the sample obtained their schooling in the north, either urban or rural. The mean scores from these areas were higher than from the south. The participants from the urban north had a mean score of 17.46 and those from the rural north had a mean score of 16.44.

The urban south was the place of schooling for 10 of the study population; they had a mean score of 15.25. The ten who were schooled in the rural south obtained a mean score of 12.20.

Two people were educated in foreign countries with a mean score of 10.00. One person received a score of 19 out of 20 on the test whereas the other received a score of one correct. The number of this sample is too small to have any significance. There was no apparent language handicap. Both had been in the United States over twenty years.

Table 6. Distribution of 104 Patients in the University of Oregon Outpatient Dermatology Clinic According to Place of Schooling, Number of Patients and Mean Score on Test.

Place of Schooling	Number of Patients	Mean Score on Test
Urban North	57	17.46
Rural North	27	16.44
Urban South	8	15.25
Rural South	10	12.20
Foreign Country	2	10.00
Total	104	

Figure 2 illustrates the percentage distribution by the last school grade completed. One-fifth or 21.2 percent of the total sample population reported the 8th grade was the last school grade completed. The high school years composed the next four highest positions with the 12th grade having 19.2 percent, the 10th grade consisting of 12.5 percent, the 9th grade having 8.7 percent, and the 11th grade showing 6.7 percent. There is approximately the same percentage on either side of the 8th through 12th grades. The 13th grade up to the 19th grade show percentages of 4.8, 3.9, 2.9, 1.0, 1.8 and 1.0 respectively. The 7th grade down to the 2nd grade show percentages of 3.9, 3.9, 1.0, 3.9, 1.8 and 1.8 respectively. The majority or 66 percent of the patients have completed between the 8th and 12th grades in the sample population of this study.

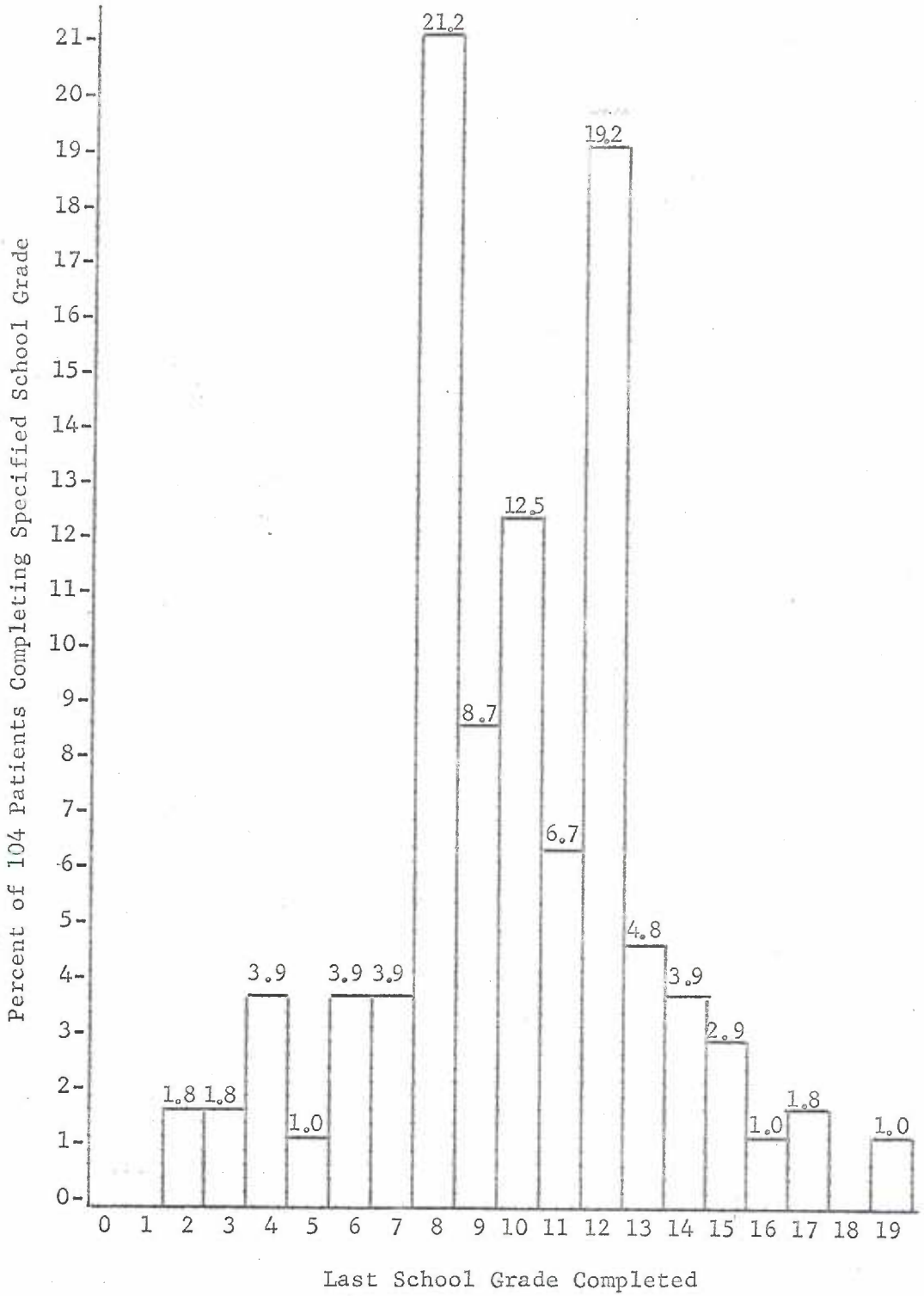


Figure 2. Distribution of Last School Grade Completed and Percentage of Patients Completing Specific School Grade Reported by 104 Patients From the University of Oregon Outpatient Dermatology Clinic.

Those educated in the north had an average length of schooling of 10.2 years, in comparison with 8.3 years of those educated in the south. The average amount of schooling for the sample population was 9.8 years.

Figure 3 is a scatter-gram giving the distribution by last school grade completed and the total score on the test. Most of the higher scores are concentrated around the 8th to 12th school grades completed. There is positive evidence in the literature that these two factors are associated. (2, 12, 18)

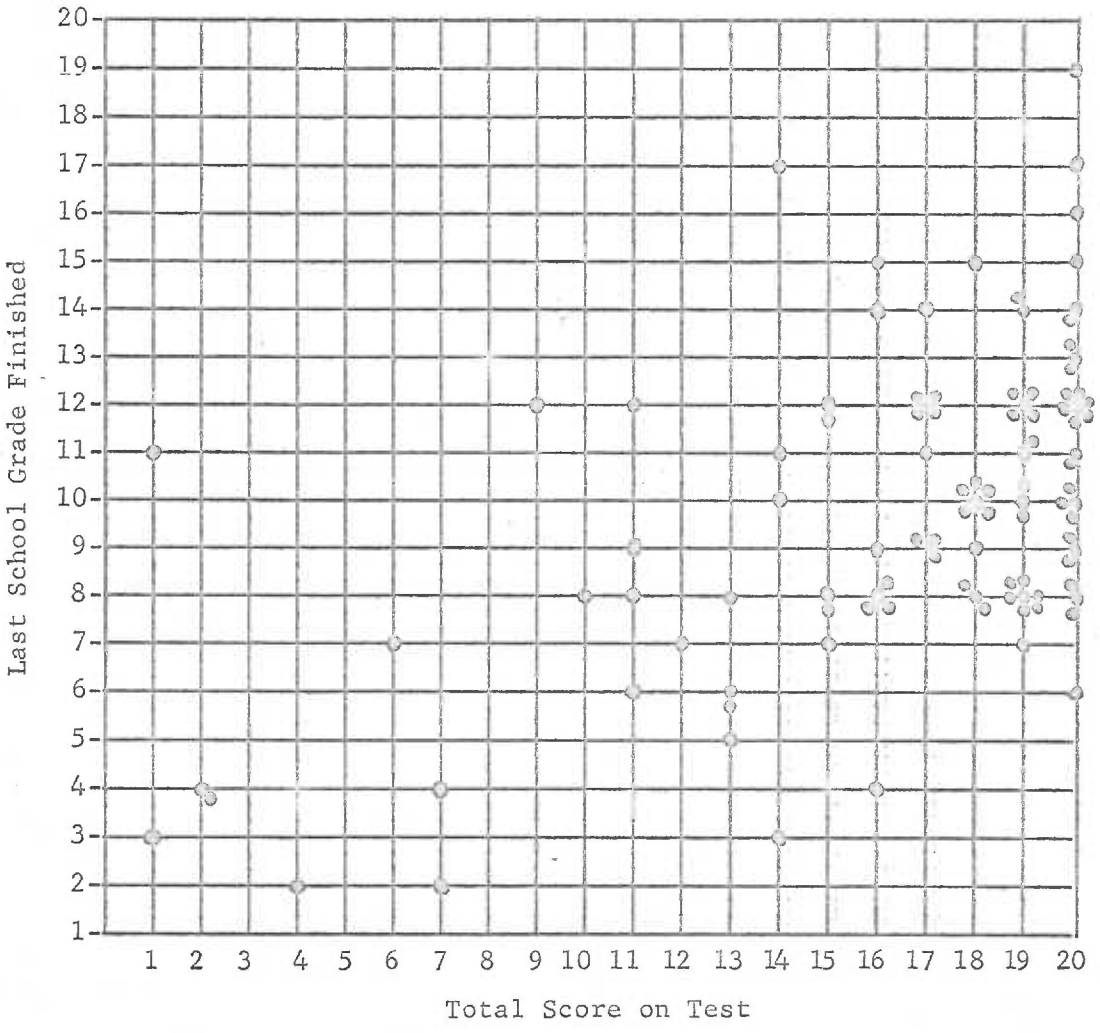


Figure 3. Distribution By Last School Grade Completed and Total Score on Test by 104 Patients From the University of Oregon Outpatient Dermatology Clinic.

Table 7 indicates the percentage distribution of the 104 patients by highest occupation reported. One-fourth or 25.00 percent of the population sampled were unskilled workers. The groupings of housewife and clerical, sales, technicians and small business proprietors each contained 12.5 percent of the total population, while the domestic or service workers contained 13.5 percent. The percentage in the semi-skilled or machine operators and skilled manual classifications were 6.7 and 7.7 percent respectively. About fifty-one percent of the total population were in the unskilled classification or below.

In obtaining the occupation of each patient the investigator posed such questions as, "What kind of work have you done?", in order to ascertain their general life-work pattern. The 12.5 percent who reported their occupation as housewife had always been housewives as adults and reported never having worked outside the home.

The professional classification made up 6.7 percent of the total and the student category concluded the last 15.4 percent. The fact that certain dermatological problems are prevalent during the adolescent age (16) no doubt influenced the high percentage of students in this sample population, although no attempt was made in this study to determine the diagnosis of the patients in the sample population.

For ease in tabulation the occupational classifications have been alphabetized in Tables 7 and 8.

Table 7. Percentage Distribution of 104 Patients in the University of Oregon Outpatient Dermatology Clinic by Highest Occupation Classification* Reported.

Occupation	Percentage
Clerical, Sales, Technicians, Small Business Proprietors	12.5
Domestic or Service Workers	13.5
Housewife	12.5
Professional	6.7
Semi-skilled or Machine Operator	6.7
Skilled Manual	7.7
Students	15.4
Unskilled Workers	25.0
Total Percent	100.0

*Classification based on Index of Social Position by A.H. Hollingshead of Yale University.

The distribution of the highest occupation classification reported and the mean score on the test with the number of patients in each classification is given in Table 8. It is interesting to note that the mean scores for the occupation classifications were all above 15.7 with the exception of the unskilled workers which had a mean score of 13.8. The semi-skilled or machine workers had the highest mean score of 19.1, which was followed by a mean score of 18.5 by both the housewife and professional groups. The students had a mean score of 17.9 and the domestic or service workers had a score of 15.9. It is closely followed by the clerical, sales, technician and small business proprietors grouping with a 15.7 mean score.

There appeared to be no relationship between patient

comprehension of the written material presented in this study and the highest occupation reported.

Table 8. Distribution by Number of Patients and Mean Score on Test for Each Highest Occupation Classification Reported of 104 Patients in the University of Oregon Outpatient Dermatology Clinic.

Occupation Reported	Number of Patients	Mean Score on Test
Clerical, Sales, Technicians, Small Business Proprietors	13	15.7
Domestic or Service Workers	14	15.9
Housewife	13	18.5
Professional	7	18.5
Semi-skilled or Machine Operators	7	19.1
Skilled Manual	8	16.2
Students	16	17.9
Unskilled Workers	26	13.8
Total	104	

The study conducted by Mrs. Mary F.B. Mohammed (12) at the University Hospitals of Cleveland, Ohio, used 300 ambulatory adult patients, randomly selected from a Diabetic Clinic. The patients' average age was 57.5 years and their average amount of education was 6.8 school grades completed. In comparison, this study included 104 patients selected from a Dermatology Outpatient Clinic. The average age was 44.4 years and the average amount of school grades completed was 9.8 years. Forty-three percent of the patients in Mrs. Mohammeds study were unable to profit from any written health material while only nine patients or 8.65 percent were unable to profit from written

health material in this study. In the Mohammed study 22.3 percent were classified as being able to profit from written material by scoring 17 or over on the test. In contrast, 65.39 percent were able to profit from written material by scoring 17 or over on the test.

CHAPTER IV

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

Summary

The problem presented in this study was to determine if age, sex, race, place of schooling, years of schooling, occupation, or the construction of written material at various known grade levels affected the patients' comprehension of written health material.

Permission was obtained from the nursing supervisor of the University of Oregon Outpatient Clinic to use the Dermatology Clinic to collect the data. The data collecting tool was administered to 104 of the 118 patients approached in the Dermatology Clinic. The information was obtained from a set of four multiple-choice questions following each of the five 100 word paragraphs constructed at known grade levels of 4th, 6th and 8th grades respectively. An interview was held with each patient immediately following the test to obtain information re the variables of age, sex, race, place of schooling, years of schooling and occupation.

Description of Sample Population

The test was given to 104 of the 118 patients approached in the University of Oregon Outpatient Dermatology Clinic between June 14, 1965 and June 22, 1965. The age range was from 12 to 82 years. This wide range occurred in the white female category with a standard

deviation of 21.74. There was also a wide range in the Negro male grouping of 12 to 76 years, with a standard deviation of 27.00. The standard deviation of age for the white males was 19.52 and 10.77 for the Negro females. There were 53 white females with an average age of 40.23 and 41 white males with an average age of 48.63. There were ten Negroes, six females and four males, with average ages of 49.83 and 38.75 respectively.

One-fourth or 25.00 percent of the population sampled were unskilled workers. The groupings of housewife and clerical, sales, technicians and small business proprietors each made up 12.5 percent of the total population; the domestic or service workers consisted of 13.5 percent. The percentage of the semi-skilled or machine operators and skilled manual classifications were 6.7 and 7.7 respectively. The professional and student categories made up about 36 percent. None of the participants of the study was in acute physical distress and accordingly all were able to participate in the study.

Findings

The data were processed manually with the aid of an adding machine for the mathematical computations. The information obtained from the interviews, the tests, a review of the literature and related studies, provide the basis for the findings summarized as follows:

1. The number of correct responses on the test ranged from 1 to 20. Approximately one-fourth or 26.9 percent responded

correctly to all questions on the test. Sixty-eight answered 17 or more questions correctly and twenty-seven made between 10 and 16 correct responses. Nine achieved nine or less correct responses on the test.

2. The mean scores or comprehension steadily rises with increase in the age until the 40 year age level, where there is a decline. The 80 to 89 year grouping mean scores rose sharply. This might be caused by a small number in that group. The highest mean scores were in the 20 to 39 year age groupings. Mrs. Mohammed (12) found that the lower the age, the higher the score, with no significant difference between sex or race.
3. According to the data collected during this study there is no significant relationship between the sexes and the comprehension of written health material.
4. The sample included only ten Negro patients in comparison with ninty-four white patients. The number of Negro patients was too small to establish a relationship between the achievement of these racial groups.
5. The mean scores of those educated in the urban and rural north were significantly higher than those educated in the urban and rural south. This was also found to be true in the study Patients' Understanding of Written Health Material by Mary F.B. Mohammed conducted in the Diabetes Clinic at

University Hospitals of Cleveland in Ohio. (12)

6. The average length of schooling for those from the south was 8.3 years, compared to the average length of schooling of 10.2 years for those from the north.
7. Sixty-six percent of the 104 patients completed between the 8th and 12th grades. Most of the higher scores were concentrated in this range of school grade completed. However, in some instances the reader did not comprehend what was read despite advanced schooling and some who were lacking in formal schooling comprehended what was read. There is evidence in the literature that these two factors are associated. (8, 12, 18)
8. There appeared to be no relationship between the patients' comprehension of the written material presented in this study and the highest occupation reported. Mrs. Mohammed (12) in the study mentioned above found there was little variation up to the level of the skilled manual worker in the most skilled occupation reported, where the mean score was nearly four points higher than the less skilled occupational levels, which was a significant difference.
9. The tool used for this study of the reading level of written material does not appear to be a factor of patients' comprehension of written health material. The responses to the questions on the tool used for this study seemed to

indicate the question difficulty for each paragraph does not differ greatly.

10. Low discriminating ability was shown by nine participants who scored nine or less on the test, by answering 45 percent or less of the questions correctly. The medium discriminating ability category included twenty-seven people who answered between 50 and 80 percent of the questions correctly. Sixty-eight people or 65.39 percent of the participants were in the high discriminating ability category by correctly answering 85 percent and over of the questions.

Conclusions

From the findings of this study the following conclusions may be drawn:

1. The comprehension of written material does not appear to be affected by the predetermined factors selected for this study as much as by other possible factors not included in this study.
2. In constructing written material, the characteristics of the population to whom the material is intended must be carefully evaluated. Findings of this study indicate that about 36 percent of the sample population were able to profit little or none from the written material.
3. The reading level of the written material does not seem to be a factor in the patients' comprehension. The number of

correct responses on the tests constructed at various grade levels did not vary greatly. The test used for the study may not be sensitive enough to determine at what particular reading level score the ability to comprehend written health material is located.

4. Since it is thoroughly documented in the literature that motivation for learning is derived from a personal need to learn, it could be concluded that the health information test did not contain items related to the personal needs of participants in a dermatology clinic.

Recommendations for Further Study

The following recommendations are made, based upon the findings of this study:

1. The study be repeated, administering the tool to a select group of private patients and compare the findings with this and other studies.
2. The study be repeated, administering the tool to a group of hospitalized patients and compare the findings with this and other studies.
3. A study be conducted that would test and compare comprehension of the three following groups: Group I - given written health information or instructions: Group II - given oral health information or instructions, and; Group III - given both oral and written health information or instructions.

4. Develop a study that would test and compare patients' comprehension of written health material with their reading habits and predetermined personality traits.
5. Analyze printed health information originating from commercial or governmental sources for the purpose of devising test items worded in such a manner that they can be equated with known reading levels. Utilize such tests sufficiently to assess the value of the health information publications intended for lay consumption.

APPENDIX A

DATA COLLECTION TOOL

These are stories about Mrs. Brown, a make-believe patient. We have written them so you can help us. We need to learn how to write medical things for our patients. Then our teaching and directions will be clear.

Please read the stories. Then underline the one best answer for each question. The answer is in the story. If you can't find it, don't worry. It shows us we need to write more clearly.

Here is a sample:

Mrs. Brown has a sore finger. She went to the doctor to have it treated.

1. What part of Mrs. Brown is sore?

   (leg) (head) (hand) (finger)

2. Where did Mrs. Brown go?

   (hospital) (doctor) (home) (store)

Mrs. Brown's doctor has told her that she weighs too much. This is not due to her glands. She weighs too much because she eats too much.

Mrs. Brown should eat the foods we all need to keep us healthy. These foods are: meat, fish, cheese, eggs, milk, fruit and vegetables. These are the foods which have lots of proteins, vitamins, and minerals.

Mrs. Brown needs to eat less of the foods that can be taken away safely. These foods are the starches, the sweets, and the extra fats. Then she will begin to use up the extra fat her body has stored.

19. What is wrong with Mrs. Brown?

(she's healthy) (she needs fat) (she has gland trouble)

(she's overweight)

20. What does Mrs. Brown do?

(eat meat & eggs) (eat too much) (eat too little)

(eat vegetables)

21. What should Mrs. Brown eat?

(more sweets) (extra fat) (healthy foods) (more starches)

22. What does Mrs. Brown need to use up her store of?

(extra fat) (sweets) (extra fruit) (protein)

Mrs. Brown's doctor has ordered a Glucose Tolerance Test. She must follow a diet for three days before the test. The dietitian has told her what to eat. Mrs. Brown knows what to eat for each breakfast, lunch and dinner.

This is Mrs. Brown's diet:

Fruit	1 serving
Toast	2 slices
Jelly	1 tablespoon
Egg	1
Coffee or Tea	as desired
Sugar	2 teaspoons

Mrs. Brown may have the test done at the laboratory any day except Wednesday or Saturday. The night before the test she should eat nothing after 9 P.M. The morning of the test she should have no breakfast, just water.

24. What is Mrs. Brown going to have done?

(a dietitian) (a test) (the laboratory) (a test on Wednesday)

25. What has the dietitian told Mrs. Brown to eat?

(Glucose Tolerance) (three days) (certain food)

(nothing on Saturday)

26. What can Mrs. Brown have all she wants of, for three days?

(eggs) (tablespoons of jelly) (lunch and dinner)

(coffee or tea)

27. What can Mrs. Brown have on the morning of the test?

(coffee) (not Wednesday or Saturday) (fruit) (water)

Mrs. Brown's cold is not from the bad weather. It is an infection caused by a virus. A virus is the smallest of all germs. It can be seen only under a powerful microscope.

Cold viruses float in the air. They are sprayed in droplets from the mouths of sick people. The virus floats in the air for some time and it may be carried a long way.

Mrs. Brown's cold is most catching during the first few hours of her infection. This is sometimes even before she is sure she has a cold. She remains infectious for three or four days.

29. What is Mrs. Brown's cold caused by?

(the weather) (infectious) (a virus) (a large germ)

30. Where is the only place a virus can be seen?

(under a microscope) (a long way away) (in droplets)

(for a few hours)

31. When is Mrs. Brown's cold most catching?

(when carried) (in the first few hours) (in winter)

(for 3 or 4 days)

32. What is the smallest of all germs?

(a droplet) (an infection) (a virus) (a cold)

The eyes are a frequent site of infection. Any hint of disease either inside or outside the eyeball should have the attention of an eye doctor. He is called an ophthalmologist.

The most familiar eyelid trouble is a stye, an infection of the root of the eyelash. An inflammation of the inner lining of the eye is called conjunctivitis.

Mrs. Brown helps to prevent these troubles. She uses good hygiene to keep germs from getting in her eyes. She keeps her face clean. She does not use other peoples wash cloths or towels. She keeps soiled fingers away from the eyes.

34. What do infections often attack?

(the ophthalmologist) (the stye) (the conjunctivitis) (the eyes)

35. What is an infection of the root of the eyelash called?

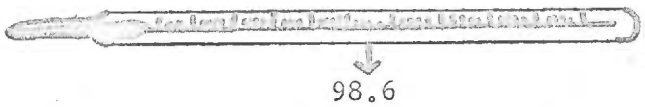
(an inflammation) (a germ) (conjunctivitis) (a stye)

36. What is an ophthalmologist?

(an eye doctor) (an infection) (a stye) (good hygiene)

37. What does good hygiene help to prevent?

(ophthalmologists) (eye infections) (frequent styes) (clean face)



98.6

normal temperature

Mrs. Brown has learned to take a temperature. This is how she does it.

First she shakes the thermometer so the silver line is below the 98.6 mark. (This is shown in the picture above.) Then Mrs. Brown puts it under her tongue. She holds it there for three minutes. She keeps her lips closed. Then she takes it out and reads it.

On the picture the 98.6 shows a normal temperature. Each line counts .2 so that the next line is 98.8. Two lines above normal is 99.0. When Mrs. Brown looked at the thermometer it was three lines above, or 99.2.

40. What has Mrs. Brown learned how to take?

(a normal) (a 98.6) (a thermometer) (a temperature)

41. How much does each line on the thermometer count?

(.2) (three) (.6) (98.6)

42. What is a normal temperature?

(98.6) (98.8) (99.0) (99.2)

43. What is the temperature if the silver line is 2 lines above normal?

(98.6) (99.0) (99.2) (100.2)

APPENDIX B

INTERVIEW GUIDE

Sex_____

Age_____

Race_____

Last School Grade Completed _____

Place of Schooling _____

Occupational History

_____

Occ. Classification _____

Total Score _____

Items Correct:

Diet _____

Test _____

Themo _____

Info _____

Eye _____

APPENDIX C

Master Tabulation

Number approached in the Dermatology Clinic of the University of Oregon Outpatient Clinic = 118.

Number participating in the study by taking test and answering questions during the interview = 104.

Reasons Given by the 14 Not Participating in the Study:

Reasons	Number of Patients	Percentage of Total
Unable to Read	3	2.5
Did not Bring Glasses	8	6.8
Unable to See	2	1.7
Refused to Take Test	1	.8
Total	14	11.8

Number of Patients Obtaining Each Score on Test:

Correct Responses	Number of Patients	Percentage of Patients
1	2	1.8
2	2	1.8
3		
4	1	1.0
5		
6	1	1.0
7	2	1.8
8		
9	1	1.0
10	1	1.0
11	4	3.9
12	1	1.0
13	4	3.9
14	4	3.9
15	5	4.8
16	8	7.7
17	11	10.6
18	11	10.6
19	18	17.3
20	28	26.9

Age: Range 12 to 82 Years.

	White Female	White Male	Negro Female	Negro Male
Number	53	41	6	4
Sum of Ages	2132	1194	299	155
Mean Age	40.23	48.63	49.83	38.75
Standard Deviation	21.74	19.52	10.77	27.00

Age	10-19	20-29	30-39	40-49	50-59	60-69	70-79	80-89
Number	16	14	13	17	14	18	10	2
Sum of Scores	269	269	251	265	213	277	111	34
Mean on Test	16.8	19.2	19.3	15.6	15.2	15.4	11.1	17.0

Sex:

	Male	Female
Number	46	58
Sum of Scores on Test	755	952
Mean Score on Test	16.46	16.45

Race:

	White	Negro
Number	94	10
Sum of Scores on Test	1602	105
Mean Score on Test	16.8	10.5

Place of Schooling:

	Urban North	Rural North	Urban South	Rural South	Foreign Country
Number	57	27	8	10	2
Sum of Scores on Test	997	444	122	122	20
Mean Scores on Test	17.46	16.44	15.25	12.20	10.00

Years of Schooling:

Year of Schooling Completed	Number of Patients	Percent of Total Patients
2nd grade	2	1.8
3rd grade	2	1.8
4th grade	4	3.9
5th grade	1	1.0
6th grade	4	3.9
7th grade	4	3.9
8th grade	22	21.2
9th grade	9	8.7
10th grade	13	12.5

(concluded on next page)

Years of Schooling: (concluded)

Year of Schooling Completed	Number of Patients	Percent of Total Patients
11th grade	7	6.7
12th grade	20	19.2
13th grade	5	4.8
14th grade	4	3.9
15th grade	3	2.9
16th grade	1	1.0
17th grade	2	1.8
19th grade	1	1.0

	North	South
Number	83	21
Sum of Scores on Test	844	175
Mean Scores on Test	10.2	8.3

Occupation:

	Number	Percentage	Sum of Scores	Mean Score
Housewife	13	12.5	204	18.5
Domestic or Service Worker	14	13.5	213	15.9
Unskilled Worker	26	25.0	358	13.8
Semi-skilled or Machine Operator	7	6.7	134	19.1
Skilled Manual	8	7.7	130	16.2
Clerical, Sales, Tch. Sm. Business Prop.	13	12.5	204	15.7
Professional	7	6.7	103	18.5
Student	16	15.4	286	17.9
Total	104		1632	15.7

Number of Correct Responses for Each Question: Out of Possible 104:

	Question Number			
	1	2	3	4
Diet Information	96	87	93	51
Test Information	78	62	69	89
Reading a Thermometer	91	89	95	64
Information on Cold Virus	92	95	82	93
Eye Hygiene	86	79	93	83

Number Correct in Each Test Question Series:

Number Correct in Series	Diet	Test	Thermometer	Virus	Eye
0	4	4	6	4	6
1	3	9	3	2	6
2	10	19	5	6	
3	39	23	20	17	15
4	48	49	70	75	69
Total Number	104	104	104	104	104
Sum of Responses Corrected	332	312	352	365	343
Average Number Correct	3.23	3.00	3.39	3.41	3.29

BIBLIOGRAPHY

1. Bingham, Gloria, "To Communicate with Negro Patients," American Journal of Nursing (September, 1964), 64:113-115.

2. Brown, Rodger, Words and Things. The Free Press, Glencoe, Illinois, 1958.

3. Chase, Stuart, Power of Words. Harcourt, Brace and Co., New York, 1954.

4. Cherry, Colin, On Human Communication. A Review, A Survey and A Criticism. The Technology Press of Massachusetts Institute of Technology, 1957.

5. Dahl, Edgar, and Chall, Jeanne, "A Formula for Predicting Readability," Educational Research Bulletin (January and February, 1958), 27:11-20, 37-54.

6. Fifteen Studies of the Mass Media prepared for the University of Illinois Institute of Communications Research. Communications In Modern Society. University of Illinois Press, Urbana, Illinois, 1948.

7. Flesch, Rudolf. The Art of Readable Writing. Harper and Brothers Publishers, New York, 1949.

8. Hayakawa, S.I., Language In Action. Harcourt, Brace and Co., New York, 1941.

9. Hewitt, Helen, "Major Blocks to Communication with Patients," American Journal of Nursing (July, 1964), 64:101-103.

10. Leipold, William, "Are We Communicating?", Mental Hospitals (August, 1963), 14:448+.

11. Malmbery, Bertil, Structural Linguistics and Human Communication. Academic Press, Inc., New York, 1963.

12. Mohammed, Mary F.B., "Patients' Understanding of Written Health Information," Nursing Research (Spring, 1964), 13:2:100-108.

13. National Health Forum, Better Communication for Better Health. The National Health Council, New York, 1962.

14. Oliver, Robert T., Cultures and Communication. Charles C. Thomas, Publisher, Illinois, 1962.

15. Ruesch, Jurgen, and Bateson, Gregory, Communication - The Social Matrix of Psychiatry. W.W. Norton and Co., Inc., New York, 1951.

16. Shafer, Kathleen, et al., Medical-Surgical Nursing. The C.V. Mosby Company, St. Louis, 1964.

17. Skipper, James, "What Communication Means to Patients," American Journal of Nursing (April, 1964), 64:101-103.

18. Wagner, Sara P., "ABC's to Communication," American Association of Industrial Nurses (August, 1963), 11:8+.

Typed by Lorraine C. Snook

AN ABSTRACT OF THE THESIS OF

Evon Hull Weigand

for the Master of Science in Nursing Education

Date of receiving this degree: June 9, 1966

Title: The Influence of Predetermined Factors on the Comprehension of Written Health Information of Selected Patients in a University Outpatient Clinic

Approved: [redacted]

(Professor in Charge of Thesis)

THE PROBLEM

In constructing health information it must be known for what type of audience the material will be used. The problem of this study was to determine what factors influence the comprehension of written material. The aims of this study were to determine the extent to which 104 dermatology clinic patients comprehend health information incorporated into a test with known reading levels. It was further proposed to assess the influence(s) of six predetermined variables on the comprehension of the selected health information test. The variables are:

1. Age
2. Sex
3. Race
4. Place of Schooling
5. Years of Schooling
6. Occupation

DESCRIPTION OF PROCEDURES

The primary source of data was that obtained from the set of four multiple-choice questions following each of the five 100 word paragraphs constructed at known grade levels, and from an interview guide administered immediately after the test to obtain age, sex, race, place of schooling, last year of school completed, and occupational history. This tool was administered to 104 of the 118 patients approached in the Dermatology Clinic at the University

of Oregon Outpatient Clinic between June 14, 1965 and June 22, 1965. The secondary source of data was a review of the literature and related studies.

This study was conducted as an ordinal survey using the dependent variable, scores from the test question, as primary data. A comparison of the influence(s) of the independent variables, age, sex, race, place of schooling, years of schooling completed, and occupational history with the mean scores on the test and distribution tables were used to describe the findings.

FINDINGS

The information obtained from the interviews, the tests, a review of the literature and related studies, provide the basis for the findings summarized as follows:

1. The number of correct responses on the test ranged from 1 to 20. Approximately one-fourth or 26.9 percent responded correctly to all questions on the test. Sixty-eight answered 17 or more questions correctly and twenty-seven made between 10 and 16 correct responses. Nine achieved nine or less correct responses on the test.

2. The mean scores or comprehension steadily rose with the increase of age until the 40 year age level, where there was a decline. The 80 to 89 year grouping mean scores rose sharply. This might be caused by a small number in that group. The highest mean scores were in the 20 to 39 year age groupings.

3. According to the data collected during this study there is no significant relationship between the sexes and the comprehension of written health material.

4. The sample included only ten Negro patients in comparison with ninty-four white patients. The number of Negro patients was too small to establish a relationship between the achievement of these racial groups.

5. The mean scores of those educated in the urban and rural north were significantly higher than those educated in the urban and rural south.

6. The average length of schooling for those from the south was 8.3 years, compared to the average length of schooling of 10.2 years for those from the north.

7. Sixty-six percent of the 104 patients completed between the 8th and 12th grades. Most of the higher scores were concentrated in this range of school grade completed.

8. There appeared to be no relationship between the patients' comprehension of the written material presented in this study and the highest occupation reported.

9. The tool used for this study of the reading level of written material does not appear to be a factor of patients' comprehension of written material.

10. Low discriminating ability was shown by nine participants who scored nine or less on the tests, by answering 45 percent or less of the questions correctly. The medium discriminating ability

category included twenty-seven people who answered between 50 and 80 percent of the questions correctly. Sixty-eight people or 65.39 percent of the participants were in the high discriminating ability category by correctly answering 85 percent and over of the questions.

CONCLUSIONS

The conclusions of this study could not be generalized to other groups because of the small population sample. The conclusions drawn from the findings of this study include:

1. The comprehension of written material does not appear to be affected by the predetermined factors selected for this study as much as by other possible factors not included in this study.

2. In constructing written material, the characteristics of the population to whom the material is intended must be carefully evaluated. Findings of this study indicate that about 36 percent of the sample population were able to profit little or none from the written material.

3. The reading level of the written material does not seem to be a factor in the patients' comprehension. The number of correct responses on the tests constructed at various grade levels did not vary greatly. The test used for the study may not be sensitive enough to determine at what particular reading level score the ability to comprehend written health material is located.

4. Since it is thoroughly documented in the literature that motivation for learning is derived from a personal need to learn,

it could be concluded that the health information test did not contain items related to the personal needs of participants in a dermatology clinic.

RECOMMENDATIONS

1. The study be repeated administering the tool to a select group of private patients and compare the findings with this and other studies.

2. The study be repeated, administering the tool to a group of hospitalized patients and compare the findings with this and other studies.

3. A study be conducted that would test and compare comprehension of the three following groups: Group I - given written health information or instruction; Group II - given oral health information or instruction, and; Group III - given both oral and written health information or instruction.

4. Develop a study that would test and compare patients' comprehension of written health material with their reading habits and predetermined personality traits.

5. Analyze printed health information originating from commercial or governmental sources for the purpose of devising test items worded in such manner that they can be equated with known reading levels. Utilize such tests sufficiently to assess the value of the health information publications intended for lay consumption.