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Signature Alan A Lee

Date November 18, 1970

THE RELATIONSHIP OF BACKGROUND MEDICAL KNOWLEDGE TO THE INCIDENCE OF UNTOWARD DRUG REACTIONS

by

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ABSTRACT

The problem considered in this study was whether there is a relationship between the level of medical knowledge possessed by a population and the incidence of untoward reactions within that population. Corollary problems were whether there is a relationship between socio-economic level or attitude toward hospitalization and the incidence of drug reactions.

The purposes were to measure the level of medical knowledge within the target populations and to determine whether this level is related to the incidence of untoward drug reactions. It was felt that the establishment of such a relationship would be of value in the prevention and treatment of such reactions.

A questionnaire, designed to measure both medical knowledge and attitude toward hospitalization was given to the following four groups:

Group I	Student Professional Nurses (N=65)
Group II	Non-nursing university students (lay university students) (N=21)
Group III	Practical Nurse students (N=24)
Group IV	Non-nursing Vocational-Technical school students (lay vocational-technical school students) (N=23)

The portion of the test designed to measure medical knowledge was scored on the basis of one point for each correct answer, while the attitude items were given one point for each response indicating a positive attitude toward hospitalization. Each respondent was given two scores, one for medical knowledge and one for attitude.

The group scores were statistically analyzed and the results indicated that there was no significant relationship between either medical knowledge or attitude toward hospitalization, and the incidence of untoward drug reactions.

However, if university students are considered to be of higher socio-economic status than students in vocational-technical schools, there is a significant positive relationship between socio-economic status and the incidence of untoward drug reactions.

CHAPTER I

INTRODUCTION

In the last century, medicine has moved from the use of nostrums to the prescription of increasing numbers of specific and potent medications. As a result, the incidence of untoward reactions to drugs has become a major health problem.

Several studies of iatrogenic disease undertaken in the last few years have given us a glimpse of the true dimensions of this situation. One survey of hospitalized patients showed that fifty out of a thousand had "serious" reactions to prescribed medications.[1]

A survey conducted by Dr. David Barr of New York Hospital-Cornell Medical Center indicated that five percent of all hospital admissions were for drug induced disease.[2] Dr. Schimmel of Yale-New Haven Hospital found even more impressive statistics. His survey showed that of 1014 patients studied, 198 had had a total of 240 iatrogenic episodes, and that of these episodes, 119 were drug induced.[3] These figures yield a ratio of one hospitalized patient out of eight having had an untoward drug reaction.

In 1965, the admission rate for general hospitals in the United

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[1] L. Meyler and H. M. Peck, Drug Induced Diseases (Assen, The Netherlands: Royal Vangorcun Publishers, 1962), p. 1.

[2] M. Gross, The Doctors (New York: Random House, 1966), p. 235.

[3] Ibid., p. 236.

States was fourteen per one hundred population.[4] If the findings of the above studies are projected, one arrives at an annual figure of between 1,250,000 and 3,125,000 incidents of untoward reaction to prescribed medications in hospitalized patients alone. With the realization that many Americans take prescription medications outside the hospital, and that many drug reactions do not require hospitalization--in fact, are often never recognized or reported--it becomes apparent that the actual incidence is probably much higher.

The field of medicine has recognized the scope and severity of the problem of untoward or unexpected reactions to prescribed medications. Most data on the effects of drugs result from animal experimentation, and indicate that there are marked differences between species, families, and individuals with regard to the reaction to any drug. There are even significant differences in the same individual from one time to another.[5]

While such research into the physiological effect of drugs is extremely valuable, it would seem that too little attention has been given to the sociological and psychological factors which influence the effect of drugs on the human animal. The studies which have been

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[4] L. Goerke and E. Stebbins, Mustard's Introduction to Public Health (New York: The Macmillan Company, 1968), p. 139.

[5] A. Albert, "Toxic Effects Which Occur in the Range of Normal Therapeutic Dose," Annals of the New York Academy of Science, Vol. 123, Article 1, p. 2.

conducted in this area indicate that marked physiological effects, often totally unrelated to pharmacological action, can be produced by the administration of any medication.

An outstanding example of this type of research was an experiment conducted in Budapest, which compared two groups of patients who had been diagnosed as having bleeding peptic ulcers. The experimental or placebo group was given an injection of sterile water by the doctor, who told them that it was a new and very potent therapeutic drug, while the control group received the same injection from the nurse, who said that it was an experimental drug, whose effects were uncertain. The placebo group had seventy percent "excellent" remissions, lasting over a year, while the control group had a remission rate of twenty-five percent.[6]

Another study followed 136 cases of common warts and 36 cases of flat warts for two and a half years. Forty-four percent of the common warts and eighty-eight percent of the flat warts were cured by painting them with an inert dye.[7]

Beecher's classic review of studies of symptom relief with pure

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[6] J. Frank, "The Dynamics of a Psychotherapeutic Relationship," Psychiatry, Vol. 22, pp. 35-36.

[7] Ibid.

placebos showed that 35.2 percent of patients obtained significant relief from such diverse symptoms as the pain of angina pectoris, seasickness, headache and cough from the administration of pure placebos.[8]

The above studies are concerned with pure placebos, but all drugs appear to have some placebo effect, which is defined by Shapiro as:

> any psychological, physiological, or psychophysiological effect of any medication which is given with therapeutic intent, which is independent of, or minimally related to, the pharmacological properties of the medication, and which operates through a psychological mechanism.[9]

The use of the words, "with therapeutic intent," makes an essential transition--from controlled experiment to clinical setting--for the placebo action of drugs is not limited to the laboratory setting. As Modell stated:

> I believe that placebo actions develop and are exerted against any kind of symptom, regardless of whether its basis is physical, physiologic, or psychic, and regardless of the mechanism of the symptom, the severity of the distress, or type or quality of the primary disease.[10]

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[8]H. Beecher, Measurement of Subjective Responses (New York: Oxford University Press, 1959), p. 299.

[9]W. Shapiro, "The Placebo Effect in the History of Medical Treatment," Medical Sociology, D. Mechanic (New York: Free University Press, 1968), p. 185.

[10]W. Modell, "Placebo Effects in the Therapeutic Encounter," Medical Care: Readings in the Sociology of Medical Institutions, eds. R. Scott and E. Volkhart (New York: John Wiley and Sons, 1966), p. 369.

It is widely recognized that the doctor himself exerts a potent placebo action. In fact, according to Balint:

> ...the most frequently used drug in general practice was the doctor himself, i.e., that it was not the bottle of medicine or the box of pills that mattered, but the way the doctor gave them to his patients--in fact, the whole atmosphere in which the drug was given and taken.[11]

Most research on the placebo effect of drugs has been primarily concerned with positive effects. However, it is well documented that negative effects also occur.[12] Pure placebos of lactose have produced "epigastric pain, diarrhea, urticaria, and angioneurotic edema of the lip."[13]

Thus, all drugs exert a placebo effect, and this effect can exert its force in either a therapeutic or a pathological direction. The concern of nursing must be to maximize positive placebo effects and minimize the possibility of such effects becoming a negative factor, for, as Mechanic put it:

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[11] M. Balint, "The Drug 'Doctor'," Medical Care: Readings in the Sociology of Medical Institutions, eds. R. Scott and E. Volkhart (New York: John Wiley and Sons, 1966), p. 281.

[12] S. Wolf, "The Pharmacology of Placebos," Pharmacological Review, (11, 1959), pp. 689-704.

[13] Meyler and Peck, op. cit., p. 4.

> There is little question that the context of the situation in which the patient is treated, and the attitude of those performing the treatment, play some part in the magnitude and direction of the placebo effect.[14]

Remembering that the "context of the situation" is the patient's context, and is therefore a product of his perception, clearly highlights the complexity of the problem. The nature of the patient-professional relationship can create a situation wherein, "the patient very much wants to feel that he is getting better, and he may present a picture of improvement which is motivated by a desire for rewarding the doctor..."[15]

A comparison of the traditional role expectations for the family doctor with the role behavior of today's specialist, with his technical-scientific orientation, clearly indicates the roots of a serious rift in the doctor-patient relationship. Today's doctor may view himself primarily as a technical specialist,[16] capable of curing specific maladies, but it is apparent that the patient still wishes him to function as a participant in a caring relationship.[17]

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[14] D. Mechanic, Medical Sociology (New York: The Free Press, 1968), p. 188.

[15] Ibid., p. 200.

[16] Ibid., p. 166.

[17] Ibid., pp. 158-163.

In reviewing pertinent literature, it is difficult to avoid references to the consequences of this rift. Articles in the lay press, as well as professional publications of the various healing professions, make frequent references to the appearance of increasing stress within the traditional helper-helped relationship. Examples of such comments are:

> Much criticism of medicine, in recent years, and many malpractice suits against physicians, reflect the impersonal nature of the doctor-patient relationship and patients' doubts concerning the doctor's interest in their problems.[18]

> We think it safe to conclude, however, that, although some patients are well satisfied with and appreciative of the care they have received, many are not only dissatisfied but disturbed by the way in which patient care is organized and administered.[19]

> While bacteria remain the number one factor in the creation of human illness, the doctor has reached the second place, and can be regarded as having a negative potential which is nearly equal to that of the microorganisms.[20]

It is of vital importance that those in the health professions realize that this animosity is not directed toward the physician alone, but toward the entire health care delivery system. A one hour television special on CBS News on April 21, 1970 was dedicated to the

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[18] Ibid., p. 169.

[19] E. Brown, "Meeting Patients' Psychosocial Needs in the General Hospital," Patient Care, eds. J. Skipper and R. Leonard (Philadelphia: J. B. Lippincott, 1965), p. 11.

[20] D. Spain, quoted in M. Gross, The Doctors (New York: Random House, 1966), p. 235.

inadequacies and inequities in this system, and was titled, "Don't Get Sick in America." This program gave the clear impression that medical care in America was distributed only to those who could afford to pay dearly for it, and the general message appeared to be one of hostility toward the deliverers of health services.

Thus, we see that it is quite probable that many patients in this country today could be motivated by a desire quite different from that of "rewarding the doctor." As Modell stated:

> If, because of previous experience or rumor, the patient has come to believe that the physician prescribes carelessly, or orders certain drugs routinely, the physician's positive placebo potential may well be reduced.[21]

It seems apparent that, given the proper emotional setting and the right behavioral cues, the patient's attitude toward the purveyors of health services could easily convert a positive placebo potential into a negative reaction.

Obviously, an emotional setting which involves feelings of hostility toward the therapeutic regime, or those conducting it, is a proper setting for a negative placebo reaction, while behavioral cues in this case would be a knowledge of acceptable reactions to prescribed medications.

The evolution of modern medicine is not yet complete. Vestiges

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[21] W. Modell, "Placebo Effects in the Therapeutic Encounter," Medical Care, eds. W. Scott and E. Volkhart (New York: John Wiley and Sons, 1966), p. 372.

of the witch-doctor and medicine as magic still remain an important part of the treatment process. Modell (a physician) made this apparent when he said:

> When the medical graduate is given his degree, he is, in fact, ordained. Upon him is conferred a quality, a force, which sets him aside from the layman.[22]

This quality, which certainly does exist in the eyes of many lay persons, is often not apparent to his medical colleagues, hence nurses and doctors are traditionally viewed as difficult and uncooperative patients. It is possible that this attitude results from their inability to accept the judgments and dictates of health professionals as infallible.

Friedson describes the behavior of various social classes with regard to seeking professional medical help. He feels that those of lower socio-economic status tend to use lay referral systems prior to seeking professional help, while those from higher socio-economic status move directly from self treatment to the use of medical services.[23] Thus, members of lower socio-economic groups tend to consult the doctor only when they have exhausted all available resources, and they may well be expecting miracles, whereas professional persons seek medical expertise, and feel qualified to assess performance.

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[22] Modell, op. cit., p. 266.

[23] E. Friedson, "Client Control and Medical Practice," Medical Care, eds. R. Scott and E. Volkhart (New York: John Wiley and Sons, 1966), p. 264.

Apparently, there have been no studies done attempting to quantify the relationship of socio-economic status[24] to the degree of willingness to accept the role of being "dependent on, and subject to, the healer,"[25] which is said to be inherent in the sick role. However, it would seem reasonable to postulate a negative relationship between these variables, if we assume that those of higher socio-economic standing, in general, have higher levels of educational attainment, and are therefore more knowledgeable about medicine.

One function of non-communication on the part of health professionals appears to be self-protection.[26] As the possession of medical information by the patient would minimize the power-retaining function of withholding such information, and give informed patients the ability to judge the performance of medical personnel, it seems quite likely that as medical knowledge on the part of the patient increases so does the degree of stress in the helper-helped relationship.

In view of Beecher's[27] conclusion that placebo action is

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[24]While many variables have been used in the attempt to describe socio-economic status, for purposes of this paper the assumption that there is a strong positive correlation between level of education and socio-economic level has been accepted.

[25]Scott and Volkhart, op. cit., p. 255.

[26]Skipper, op. cit., p. 75.

[27]Beecher, loc. cit.

enhanced when the patient is distressed, it seems reasonable to postulate that there might be a positive relationship between the degree of medical knowledge which a patient possesses and the likelihood that he might suffer an untoward drug reaction.

In addition to increasing stress, the patients' possession of medical information could contribute in another way to the production of placebo action. It could furnish the patient with behavioral cues through his knowledge of the existence and manifestations of untoward drug reactions.

> When a patient is relatively well informed about a medication, identification of placebo action is likely to be more difficult; in such a case the effect of the drug will tend to fall in line with expected pharmacologic actions.[28]

While it has always been assumed that there is a direct relationship between a patient's knowledge and his prognosis, it remains to be established that this is necessarily true. In view of the ideas cited above, it would seem that research in the area of the effect of sophistication with regard to the action of drugs is indicated.

The Problem

Is the incidence of untoward drug reactions in a given population influenced by the general level of medical knowledge within that population?

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[28] Modell, op. cit., p. 371.

The Purposes

1. To measure the level of medical knowledge in the target populations.
2. To determine whether there is a relationship between the level of medical knowledge in a group and the incidence of untoward drug reactions within that group.
3. To increase awareness of psycho-social factors in the production of untoward drug reactions, and thus, increase the effectiveness of prediction and prevention of such reactions.
4. To indicate the need for further research in this area.

Assumptions

Certain assumptions are basic to the logic underlying this study. These are:

1. All patients are persons, with individual social and cultural backgrounds, and these backgrounds influence their progress toward optimum health.
2. It is possible for an organic lesion to be psychogenic in origin.
3. Socio-economic status is directly related to the level of educational attainment.
4. Students enrolled in vocational-technical programs are, as a group, of lower socio-economic status than those enrolled

in universities.

5. The tool utilized gives an accurate measurement of general background medical knowledge.
6. Student nurses, both professional and practical, have higher levels of medical knowledge than those of equivalent educational background in fields unrelated to medicine.

Hypothesis I

There is a significant positive relationship between the level of medical knowledge within a population and the incidence of untoward drug reactions in that population.

Hypothesis II

There is a significant positive relationship between socio-economic levels in a given population and the incidence of drug reactions within that population.

Hypothesis III

There is a significant negative relationship between attitude toward hospitalization within a population and the incidence of drug reactions within that population.

Limitations

1. The validity and reliability of the tool utilized to measure the level of medical knowledge has not been tested.

2. The number of participants was limited, and because of the location (Montana) the group was too homogenous for really meaningful comparisons between socio-economic levels.
3. Sampling technique could be improved.

Definition of Terms

Drug: Any chemical or biological substance, other than food, intended for use in the treatment, prevention, or diagnosis of disease.[29]

Medicine: See drug.

Untoward Drug Reaction: (or drug reaction) Any undesirable effect caused by administration of a drug, except expected reactions to therapeutic levels of dosage. (Does not include reactions to overdosage.)

Allergy: For purposes of this paper, see untoward drug reaction.

Placebo Action: Any psychological, physiological, or psycho-physiological effect of any medication which is given with therapeutic intent, which is independent of, or minimally related to the pharmacological properties

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[29] S. Landau, Standard Encyclopedic Dictionary (Chicago: J. G. Ferguson Publishing Company, 1966), p. 196.

of the medication, and which operates through a psychological mechanism.[30]

Placebo: A medicine given, not for its pharmacological action, but for psychological effects.

Pure Placebo: A substance given as medicine, but which is inert, that is, contains no active ingredients.

Psychogenic: Arising primarily from the influence of psychological factors.

Significant: Used throughout this study to indicate the .05 level on a two-tailed test.

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[30] Shapiro, loc. cit.

CHAPTER II

METHODOLOGY

This chapter is devoted to a detailed description of the procedures by which this research was conducted. The survey method was utilized.

The intent of the study was to determine whether there was a relationship between the level of medical knowledge within the target populations and the incidence of untoward drug reactions within those populations. The study was designed to test the primary hypothesis, (there is a significant positive relationship between the level of medical knowledge within a population and the incidence of untoward drug reactions within that population).

Sampling: Four classes, two at a university, and two at a vocational-technical school, were chosen. Thus, the following four groups made up the target population:

Group I	Sixty-eight (68) senior students in a baccalaureate program in nursing.
Group II	Twenty-four (24) non-nursing university students enrolled in a sophomore class in sociology.
Group III	Twenty-four (24) students in a practical nurse program at a vocational-technical school.
Group IV	Twenty-five (25) students in a clerical program in a vocational-technical school.

Although no controlled sampling techniques were employed, the nature of the groups chosen gave some control over the following variables:

Age: A student population has a somewhat limited age range. The age range in the population chosen for this study was from eighteen (18) to sixty (60); the mean age was twenty-four and five tenths (24.5), and the mode was twenty-two (22). Of the total sample used [one hundred thirty-three (133)], one hundred and twelve (112), or eighty-five (85) percent, were in the eighteen to twenty-five years of age bracket.

Sex: This sample was nearly all female. Out of one hundred and thirty-three (133) respondents, only four (4) were male. Since no sex related variables were postulated in the hypothesis, and the number of males was not large enough to lend itself to statistical computation, for purposes of this study, sex differences were not measured.

Educational Level and Socio-Economic Status:

Utilizing entire classes gave a great deal of

homogeneity in the sample. All are high school graduates. Eighty-six (86) or sixty-five percent (65%) of the total sample (133) were enrolled in college, with the remaining forty-seven (47) or thirty-five percent (35%) being enrolled in a vocational-technical school.

Data Collection

Because the primary intent of the study required the measurement of the level of medical knowledge within the target population, the following multiple choice test was constructed. The intent was to utilize items which should be known to most lay persons. The multiple choice type of test was chosen because it was felt that this would offer a reminder to those who might be aware of some of the information, but have little occasion to recall it. No confusing answers were offered, and no attempt was made to make the questions difficult. Items were chosen from information which was felt to be readily available to lay persons who might have an interest in medical matters. Questions finally utilized were as follows:

Question 1. A MEDICINE COMMONLY USED IN TREATING DISORDERS OF THE HEART IS:

a. penicillin
b. librium
c. digitalis
d. don't know

Rationale: This particular medication is frequently mentioned in popular literature. It is also commonly prescribed for many elderly people, and is usually identified to the patient. It was felt that most lay persons would be familiar with the fact that it was"heart medicine."

Question 2. A COMMONLY USED "SLEEPING PILL" IS:

a. nembutal
b. pentothal
c. mannitol
d. don't know

Rationale: The barbiturates are extremely well publicized today, and are well known by size, shape and action. Many patients in the hospital can identify the type of barbiturate by sight.

Question 3. THE DRUG GIVEN IN THE TREATMENT OF "SUGAR DIABETES" IS:

a. urised
b. insulin
c. picrotoxin
d. don't know

Rationale: This was inserted as a give-away, for it was felt that no high-school graduate in the United States could fail to connect the terms diabetes and insulin.

Question 4. A DIABETIC TESTS HIS URINE FREQUENTLY. HE IS TESTING FOR THE PRESENCE OF:

a. salt
b. acid
c. sugar
d. don't know

Rationale: In recent years, the appearance and publicity of mobile diabetic check labs, which do routine urine screening, as well as the rate of diabetes in the population, would lead one to expect that nearly everyone is aware that diabetics spill sugar in their urine.

Question 5. THE OPERATION IN WHICH THE WOMB (UTERUS) IS REMOVED IS CALLED:

a. laminectory
b. hysterectomy
c. cholecystectomy
d. don't know

Rationale: It was believed that the anti-cancer crusade had made the American public keenly aware of this surgery, and familiar with the technical term.

Question 6: "MILTOWN" IS A (AN):

a. tranquilizer
b. antibiotic
c. vitamin
d. don't know

Rationale: The researcher felt that "Miltown" had become a household word.

Question 7. _____ IS OFTEN GIVEN TO PEOPLE TO IMPROVE THE QUALITY OF THEIR BLOOD.

a. milk of magnesia
b. iron
c. vitamin
d. don't know

Rationale: In view of advertisements about "iron-poor blood" and iron deficiency anemia, there seemed little doubt that the connection of iron with blood was well enough known that most lay persons could give the correct response on a multiple choice question.

Question 8. THE CONDITION IN WHICH THERE ARE TOO FEW RED CELLS IN THE BLOOD IS CALLED:

a. anemia
c. polycythemia vera
b. syncope
d. don't know

Rationale: The rationale for this question was the same as for question seven.

Question 9. THE BONES OF THE SPINAL COLUMN ARE CALLED:

a. calcaneous
c. vertebrae
b. thymus
d. don't know

Rationale: Since one is first exposed to the term vertebrae in elementary school science, and the exposure is repeated in many classes, as well as in popular literature and conversation, it seemed that this term had ceased to be technical, and had become a part of lay terminology.

Question 10. ANOTHER NAME FOR CEREBRO-VASCULAR ACCIDENT (CVA) IS:

a. heart-attack
c. angina
b. stroke
d. don't know

Rationale: This question was designed to span the gap between lay and medical terminology. There are few lay persons (it was felt) who are not conversant with the term "stroke," and any first year medical or nursing student should know the meaning of cerebro-vascular accident. This question was designed to indicate how many persons are familiar with both terms.

Question 11. ANOTHER NAME FOR THE WOMB IS:

a. uterus
b. pancreas
c. lottafuss
d. don't know

Rationale: This item, also, was designed to connect lay and medical terminology.

Question 12. FRACTURE MEANS THE SAME AS:

a. sprain
b. strain
c. broken bone
d. don't know

Rationale: This was another give-away question, for it seemed inconceivable to the researcher that there was really anyone who could not define this term.

Question 13. TO "EMPTY YOUR BLADDER" IS TO:

a. defecate
b. urinate
c. meditate
d. don't know

Rationale: Urinate seemed to be another word which had become a part of lay terminology.

Question 14. ANOTHER TERM FOR THE ABOVE (URINATE) IS:

a. void
b. null
c. eructate
d. don't know

Rationale: This term is in very common usage among nurses. However, hospital patients often appear to be confused by it. The question was chosen to test the validity of the assumption that lay persons are familiar with the term "void".

Question 15. DEMEROL IS USUALLY GIVEN TO RELIEVE:

a. dizziness
b. constipation
c. pain
d. don't know

Rationale: Demerol is one of the most commonly used pain relievers in the hospital. Most post-operative or orthopedic patients receive this narcotic, as do many obstetrical patients. In view of the modern feeling that patients should know what medications they are taking, it was felt that it would be valuable to know how many persons were familiar with the purpose of this drug.

Question 16. NAUSEA MEANS:

a. feeling sick at your stomach
b. feeling dizzy
c. vomiting
d. don't know

Rationale: It seemed that nausea was another term which could now be considered to be a lay term.

Question 17. PATIENTS ARE NOT ALLOWED TO HAVE ANYTHING TO EAT OR DRINK FOR SEVERAL HOURS PRIOR TO SURGERY, THE REASON FOR THIS IS:

a. it's a hospital rule

b. it makes surgery easier for the doctor

c. to cut down on the danger of vomiting while anesthetized

d. don't know

Rationale: One of the most frequent criticisms leveled at nurses and doctors is that they fail to explain procedures to the patients. The most likely explanation for a lay person's understanding of the "nothing by mouth" policy is that someone gave him a reason.

Question 18. THE GROUP OF MEDICATIONS WHICH ARE USUALLY PRESCRIBED WHEN YOU HAVE AN INFECTION ARE CALLED:

a. tranquilizers c. antibiotics

b. barbiturates d. don't know

Rationale: The terms infection and antibiotic have come to be very closely related in our society. The presence of the former requires the administration of the latter.

Knowledge of this particular relationship seems to have become public property.

Question 19. THE FIRST ANTIBIOTIC DISCOVERED WAS:

a. penicillin
b. streptomycin
c. terramycin
d. don't know

Question 20. THE VACCINE CALLED "D.P.T." PROTECTS AGAINST:

a. Diverticulitis, psitticosis, and typhoid fever
b. Diptheria, whooping cough (pertussis) and tetanus
c. Dengue fever, plague, and trachoma
d. Don't know

Rationale: These questions are discussed together, since the rationale for their inclusion in the test was a comparison. The D.P.T. vaccine has had a great deal of word of mouth publicity by many community health agencies for a number of years. Nearly all American parents have their children innoculated with this vaccine in the first year of life. Awareness of the diseases against which this innoculation gives protection would seem a rational expectation.

Which antibiotic was discovered first, is however, of only academic value, but has had a great airing in the news media, as well as text books in various disciplines.

Scoring: The above portion of the test was scored by giving one point for each correct answer, and it was assumed that there was a direct relationship between the score obtained and the respondent's level of medical knowledge.

Since hypothesis III (there is a direct relationship between attitude toward hospitalization and the incidence of untoward drug reactions) required an estimate of attitude toward hospitalization, a section of questions seeking to elicit such feelings was included. Items included are listed below:

Item 1. I ENJOYED MY HOSPITAL STAY.

Rationale: This item attempts to elicit an overall reaction to the hospitalization experience.

Item 2. DOCTORS CHARGE TOO MUCH.

While almost everyone would agree that doctors charge a great deal, it was felt that those with a positive attitude toward the health care system would not agree that it was "too much." (On this item a negative response was scored as a positive attitude.)

Item 3. MOST NURSES ARE VERY COLD AND UNFEELING.

Rationale: Only those with highly negative feelings would be inclined to answer this affirmatively, since the word "most" gives it a great deal of bias. (A negative

response was scored as indicating a positive attitude.)

Item 4. MOST NURSES CARE VERY MUCH ABOUT THEIR PATIENTS.

Rationale: Patients seem to feel that caring is one of the most important functions of the nurse. Therefore, a positive response was felt to indicate a generally positive response to the hospitalization experience.

Item 5. MOST DOCTORS ARE DEDICATED TO THE WELFARE OF THEIR PATIENTS.

Rationale: It was believed that a negative response to this item would indicate a negative attitude toward the medical profession and therefore, toward hospitalization.

Item 6. MOST HOSPITAL PATIENTS IN THE UNITED STATES RECEIVE EXCELLENT CARE.

Rationale: This item requires an objective assessment of hospitals in general.

Item 7. A HOSPITAL IS A FRIGHTENING PLACE TO BE IN.

Rationale: The hospital should not be frightening to one who sees it as primarily a helping institution. (A negative response was scored as indicating a positive attitude.)

Item 8. IT IS VERY COMFORTABLE TO BE IN THE HOSPITAL IF YOU'RE VERY SICK.

Rationale: Patients often express the feeling that the hospital is a good place to be when you are quite ill. However, the unfortunate use of the word "comfortable" probably rendered this question meaningless.

Item 9. MOST PERSONS EMPLOYED BY THE HOSPITAL ARE KIND AND CONSIDERATE.

Rationale: This item was designed to elicit an overall assessment of hospital personnel.

Item 10. IT WOULD BE BETTER IF YOU COULD HAVE VISITORS ANY TIME.

Rationale: In general, agreement with this statement would tend to indicate dissatisfaction with hospital rules, or at least some question as to whether they are viewed as being for the patient's good. (A negative response was scored as indicating a positive attitude.)

Item 11. I AM LUCKY THAT I WENT TO THE HOSPITAL.

Rationale: This item was also designed to draw an overall assessment of the hospitalization experience.

Scoring: In this portion of the tool, respondents were asked to answer the questions on a 1-4 scale, with 1 being strongly yes, 2 being slightly yes, 3 being slightly no, and 4 being strongly no.

In order to score this portion of the questionnaire, a response

of either slightly yes or strongly yes was given one point. Certain items were constructed in such a way that an affirmative response indicated a negative attitude. These were:

Item 2. Doctors charge too much.

Item 3. Most nurses are very cold and unfeeling.

Item 7. A hospital is a frightening place to be in.

Item 10. It would be better if you could have visitors any time. These items were scored on the basis of one point for either strongly no or slightly no.

The scores for this portion of the test were assumed to give an indication of the level of positive feelings toward hospitalization.

Those who had never been hospitalized (34) were not asked to respond to this section of the questionnaire. Ninety-nine (99) persons responded.

Background information elicited from each respondent and utilized in the study was age, sex, and the answer to the question, "Are you allergic to any medication?" An affirmative answer to the latter question was interpreted to mean that the respondent had had some type of untoward reaction to medication. No attempt was made to differentiate between degrees and types of such reactions.

In order to form groups of a size which could be statistically evaluated, the original groups were combined as follows:

1. Medically Oriented and Lay Groups: Group I (professional

student nurses) was combined with Group III (practical nurse students) to form the medically oriented group, while Groups II (non-nursing university students) and IV (non-nursing vocational-technical students) were combined and designated the lay group.

2. Allergic and Non-Allergic Groups: On the basis to the response to the question, "Are you allergic to any medication?" the group was divided into allergic and non-allergic.

3. University and Vocational-Technical Groups: Groups I (professional nurse students), and II (lay university students) were joined to form the university group, while Group III (practical nurse students) together with Group IV (lay vocational-technical students) formed the vocational-technical group.

Statistical analysis, utilizing either Pearson's Product Moment or Chi Square as applicable were applied to test for the following relationships:

1. Higher test scores on the medical knowledge portion of the test for those who designated themselves as allergic than for those who denied allergy.

2. Higher medical knowledge test scores and a higher incidence of allergy among the medically oriented group than among the lay group.

3. A higher incidence of allergy among university students than among vocational-technical students.

4. A less positive attitude score toward hospitalization in those persons who designated themselves as having an allergy to medication.

CHAPTER III

ANALYSIS OF DATA

The data collected in this study consisted of the scores obtained from the administration of an instrument designed to measure general medical knowledge and attitudes toward hospitalization. This test was administered to four groups: Group I consisted of sixty-eight (68) professional nurse students, Group II of twenty-four (24) lay university students. Group III of twenty-four (24) practical nurse students, and Group IV of twenty-five (25) students in the clerical program at a vocational-technical school.

For purposes of analysis, the original groups were further categorized as follows: 1) Groups I (professional nurse students) and Group III (practical nurse students) were combined to form the medically oriented group, 2) Group II (lay university students) was combined with Group IV (lay vocational-technical students) to form the lay group, 3) those who indicated that they had been allergic to some medication were designated the allergic group, and 4) those who denied having had allergy to medication were classified as the non-allergic group.

Before embarking on the actual statistical interpretation of the results, an overview was obtained through item analysis. The results of

this analysis are summarized as follows:[31]

Question 1. A MEDICINE COMMONLY USED IN TREATING DISORDERS OF THE HEART IS: (digitalis)

Findings: All the medically oriented students gave the correct response, but sixty-five (65) percent of the lay students were unable to do so.

Question 2. A COMMONLY USED "SLEEPING PILL" IS: (nembutal)

Findings: One (1) student professional nurse responded incorrectly to this question, as did sixty-five (65) percent of the lay students. It was noted that no person who reported an allergy missed this question.

Question 3. THE DRUG GIVEN IN THE TREATMENT OF "SUGAR DIABETES" IS: (insulin)

Findings: All the medically oriented students gave the correct response, and only three (3) of the lay university students and two (2) of the lay vocational-technical students were unable to do so.

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[31]The portion of the test which was concerned with medical knowledge was in multiple choice form. In the interests of conserving space, only the correct response will be included in this summary. The complete test may be found in Appendix A, as well as Chapter II, pp. 18-25.

Question 4. A DIABETIC TESTS HIS URINE FREQUENTLY. HE IS TESTING FOR: (sugar)

Findings: Four (4) of the lay vocational-technical students, and one (1) of the lay university students failed to respond correctly. All other respondents gave the desired response.

Question 5. THE OPERATION IN WHICH THE WOMB (UTERUS) IS REMOVED IS CALLED: (hysterectomy)

Findings: Only three (3) persons in the sample failed to respond correctly, and all three of these were male.

Question 6. "MILTOWN IS A (AN): (tranquilizer)

Findings: A total of sixty-three (63) persons failed to answer this question correctly. Thus, forty-seven (47) percent of the target population did not know what "Miltown" is. It appears that this result is probably a reflection of the researcher's age, and "Miltown" is now a term of antiquity.

Question 7. _____ IS OFTEN GIVEN TO PEOPLE TO IMPROVE THE QUALITY OF THEIR BLOOD. (iron)

Findings: As expected, most persons were able to answer this question correctly. Only two (2) gave an incorrect response. It seems odd that these were lay-university students. It is possible that university students place less credence

in advertising than do those of lesser educational background.

Question 8. THE CONDITION IN WHICH THERE ARE TOO FEW RED CELLS IN THE BLOOD IS CALLED: (anemia)

Findings: Nine (9) persons, one (1) professional nurse student, one (1) practical nurse student, three (3) lay university students, and four (4) lay vocational-technical school students failed to answer correctly.

Question 9. THE BONES OF THE SPINAL COLUMN ARE CALLED: (vertebrae)

Findings: Vertebrae can apparently now be classified as a lay term. as one hundred (100) percent of the sample responded correctly.

Question 10. ANOTHER NAME FOR CEREBRO VASCULAR ACCIDENT (CVA) IS: (stroke)

Findings: Two (2) professional nurse students and one (1) practical nurse student responded incorrectly to this question, while twenty-four (24) lay students were unable to give the desired response. While one does not expect that lay persons should be fluent in medicalese, it is difficult to justify the failure of nurses to be fluent in lay terminology for medical conditions.

Question 11. ANOTHER NAME FOR THE WOMB IS: (uterus)

Findings: Only one (1) respondent missed this item. However, this was an eighteen year old female from the lay vocational-technical group. It would be of interest to know which term (uterus or womb) was unfamiliar to her. It is possible that womb is becoming an obsolete term.

Question 12. FRACTURE MEANS THE SAME AS: (broken bone)

Findings: It hardly seemed possible, but two (2) persons, one a university student, and the other in vocational-technical school, missed this question. (Both were from non-nursing fields.)

Question 13. TO "EMPTY YOUR BLADDER" IS TO: (urinate)

Findings: Two (2) lay students, one of university standing, and the other in vocational-technical school, failed to give the correct answer.

Question 14. ANOTHER TERM FOR THE ABOVE (URINATE) IS: (void)

Findings: Nursing students all responded correctly. By contrast, however, twenty-nine (29) or sixty-five (65) percent of the lay sample gave an incorrect answer. It would seem that this term should either be used sparingly in conversations with lay persons, or these persons should be educated as to its meaning.

Question 15. DEMEROL IS USUALLY GIVEN TO RELIEVE: (pain)

Findings: All the nursing students answered this question correctly. Of the lay group, twenty (20) answered incorrectly. All of those who missed this question had had at least one previous hospitalization, while those who had never been hospitalized all answered correctly.

Question 16. NAUSEA MEANS: (feeling sick at your stomach)

Findings: One (1) professional nurse student, three (3) lay university students, and five (5) lay vocational-technical school students offered incorrect responses. It would appear that this term, which has a specific meaning in the medical mind, may be more loosely defined in the minds of lay persons.

Question 17. PATIENTS ARE NOT ALLOWED TO HAVE ANYTHING TO EAT OR DRINK FOR SEVERAL HOURS PRIOR TO SURGERY. THE REASON FOR THIS IS: (to cut down on the danger of vomiting while anesthetized)

Findings: Seven (7) lay students failed to give the correct response to this item. Of the seven (7), three (3) had never been hospitalized, while four (4) reported previous hospitalizations. Thus, of ninety-nine (99) of the total sample who had been previously hospitalized, only four (4) did

not understand the purpose of taking nothing by mouth prior to surgery. These results would seem to indicate that hospital personnel may well do a better job of explaining procedures than they are given credit for.

Question 18. THE GROUP OF MEDICATIONS WHICH ARE USUALLY PRESCRIBED WHEN YOU HAVE AN INFECTION ARE CALLED: (antibiotics)

Findings: Four (4) of the lay students, one (1) of university standing, and the other three (3) in vocational-technical school, answered incorrectly.

Question 19. THE FIRST ANTIBIOTIC DISCOVERED WAS: (penicillin)

and

Question 20. THE VACCINE CALLED "D. P. T." PROTECTS AGAINST: (diptheria, whooping cough (pertussis), and tetanus)

Findings: These questions were included for purposes of comparison between the efficacy of information received through medical professionals, and that received through other channels. Of the lay sample, fifteen (15) were unable to identify the diseases against which the "D. P. T." vaccine gives protection, whereas only six (6) did not recognize penicillin as the first of the antibiotics.

After compilation of the test scores, statistical evaluation tools were applied to test the validity of each hypothesis.

Analysis of Data:

Hypothesis I. The first analysis undertaken was concerned with testing hypothesis I (there is a significant positive relationship between the level of medical knowledge within a population and the incidence of untoward drug reactions in that population). In order for this hypothesis to be retained, it would be necessary to show that the scores on the medical knowledge portion of the test were significantly higher for those who reported allergy than for those who did not.

A total of one hundred and forty-one (141) tests were given out. Those who failed to indicate whether they had ever been allergic were not used. Eight (8) persons failed to respond to this question, leaving a total of one hundred and thirty-three (133) tests available for analysis.

Of the total number (133), twenty-four (24) or eighteen (18) percent reported that they had had untoward reactions to medication, while one hundred and nine (109) or eighty-two (82) percent denied having had such a reaction.

On the medical knowledge portion of the test, the allergic group had a mean of eighteen and three-tenths (18.3) as compared to a mean of seventeen and nine-tenths (17.9) for the non-allergic group. The difference was found to be not significant at the .05 level on a two-tailed test.

Thus, it could not be established that there was a significant

relationship between level of medical knowledge and the incidence of untoward drug reactions.

However, it seemed worthwhile to further test hypothesis I (there is a significant positive relationship between the level of medical knowledge within a given population and the incidence of untoward drug reactions in that population). Therefore, it was decided to compare nursing students with those in non-nursing programs with reference to the rate of allergies in each group.

If there is a relationship between the level of medical knowledge and the incidence of drug reactions, then it would follow that since students in medically oriented fields may be assumed to be more knowledgeable about medical matters than students in fields unrelated to medicine,[32] professional and practical nurse students would be expected to have significantly higher rates of allergy than students in non-nursing programs.

However, comparison of these groups did not show a significant relationship between enrollment in a nursing program and the incidence of allergy.

The medically oriented group consisted of eighty-nine (89)

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[32]Results on the portion of the testing tool concerned with medical knowledge also support this assumption. The mean for nursing group was nineteen point six (19.6), as compared to the non-nursing group, whose mean was fifteen point seven (15.7)

students, sixty-five (65) being enrolled in a university under-graduate nursing course, and twenty-four (24) in a practical nurse program in a vocational-technical school. Of the total medically oriented group (N=89), fifteen (15) or sixteen and nine tenths (16.9) percent reported having had an untoward drug reaction, while seventy-four (74) or eighty-three and one tenth (83.1) percent denied having had such a reaction.

The lay group, twenty-one (21) university students and twenty-three (23) vocational-technical students, had a higher percentage of allergic reactions than did the nursing students. With nine (9) persons or twenty and five tenths (20.5) percent reporting allergy. An attempt was made to establish a correlation, but the difference was not found to be significant.

On the basis of these comparisons, hypothesis I (there is a significant relationship between the level of medical knowledge and the incidence of drug reactions) was rejected.

Hypothesis II (there is a significant positive relationship between socio-economic status and the incidence of drug reactions). Students enrolled in vocational-technical programs were compared with university students. This comparison was based on the assumption that university students, as a group, come from higher socio-economic backgrounds than do vocational-technical students.

The university student group consisted of sixty-five (65) professional nurse students, and twenty-one (21) university students in

fields not related to medicine. Of the total (N=86), twenty-two (22) or twenty-five and five tenths (25.5) percent reported that they were alergic to some medication, while sixty-four (64) or seventy-four and five tenths (74.5) percent said they had never had an untoward reaction to medication.

By comparison, the vocational-technical group, consisting of twenty-four (24) practical nurse students and twenty-three (23) clerical students, reported an incidence of two (2) persons, or four and two tenths (4.2) percent of the population, who had had untoward reactions to drugs, and forty-five (45) or ninety-five and eight tenths (95.8) percent who had not. The difference in incidence of untoward reactions between the university and vocational-technical groups was found to be significant at the .05 level. Of the total number of allergies, (24), twenty-two (22) or ninety-two percent (92%) were from the university group, which comprised only sixty-five percent (65%) of the total population.

It was also of interest to note the differences in medical knowledge mean score between university and vocational-technical students. The mean for the university group was eighteen and seven tenths (18.7), while that of the vocational-technical students was sixteen and nine tenths (16.9).

The difference was found to be significant at the .05 level, although little of the material on the test could be considered to be

more available to university students than to high school students. However, the number of professional nurse students in the university student group, sixty-five (65) probably biased the findings, since nursing students made up seventy-five (75) percent of the university group, as opposed to the vocational-technical group, in which nursing students comprised only fifty-one (51) percent of the population.

Hypothesis III (there is a significant negative relationship between positive attitude toward hospitalization and the incidence of untoward drug reactions) was tested on the basis of responses to a set of questions designed to measure these feelings.

Of the total sample (N-133), thirty-four (34) had never been hospitalized, so did not respond to the questions regarding hospitalization. Thus, the total number of respondents to this portion of the questionnaire was ninety-nine (99). Results of the attitude measuring tool are summarized on Table 1, pages 43 and 44)

Table 1

Positive Attitude Responses

	Allergic Group (N=21) $\bar{X}_1 = 6.9$		Non-allergic Group (N=78) $\bar{X}_2 = 7.4$	
	Number	Percent	Number	Percent
Item 1. I enjoyed my hospital stay.	13	62.	54	75.
Item 2.* Doctors charge too much.	2	10.	26	33.
Item 3.* Most nurses are very cold and unfeeling.	13	62.	56	78.
Item 4. Most nurses care very much about their patients.	17	81.	62	79.
Item 5. Most doctors are dedicated to the welfare of their patients.	19	91.	68	87.
Item 6. Most hospital patients in the United States receive excellent care.	10	48.	47	60.
Item 7.* A hospital is a frightening place to be in.	8	38.	43	55.

*Indicates items worded in such a way that a negative reponse was scored as indicating a positive attitude.

Table 1 (continued)

	Allergic Group $\bar{X}_1 = 6.9$		Non-allergic Group (N=78 $\bar{X}_2 = 7.4$	
	Number	Percent	Number	Percent
Item 8. It is very comfortable to be in the hospital if you're very sick.	13	62.	65	83.
Item 9. Most persons employed by the hospital are kind and considerate.	19	91.	66	85.
Item 10* It would be better if you could have visitors anytime.	11	52.	49	63.
Item 11. I am lucky that I went to the hospital.	12	57.	65	83.

*Incidates items worded in such a way that a negative response was scored as indicating a positive attitude.

While the non-allergic group indicated a more positive response to most items, and the mean score on the attitude portion of the test was lower (6.9) for the allergic group than for the non-allergic group (7.4), the difference was not found to be significant. In view of the above analysis, hypothesis III (there is a significant relationship between attitude toward hospitalization within a group and the incidence of untoward drug reactions in that group), was rejected.

CHAPTER IV

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

Summary

The purpose of this study was to examine the health problem of untoward drug reactions, with the hopes of isolating some explanatory variables which might assist in combating this hazard.

Observation of patient behavior while working as a hospital staff nurse had led to the thought that it seemed possible that at least some untoward drug reactions were induced or exacerbated by psychosocial factors. Classes in the behavioral sciences and exposure to current theories tended to focus this formerly vague idea. It was postulated that the possession of increasing amounts of medical knowledge on the part of patients might have the effect of diminishing the authority of health personnel, and thus, contribute to increasing stress in the helper-helped relationship. Such stress might well act to produce negative or unexpected reactions to prescribed medications, while knowledge of drug action could furnish behavioral cues to guide such reactions.

Accordingly, the primary hypothesis was formulated as follows: There is a significant positive relationship between the level of medical knowledge within a population and the incidence of untoward drug reactions in that population. Alternate hypotheses were: hypothesis II--there is a significant positive relationship between socio-economic status of a given population and the incidence of untoward drug

reactions within that population, and hypothesis III--there is a significant negative relationship between positive attitudes toward hospitalization within a population and the incidence of untoward drug reactions in that population.

Data for this study were collected by the administration of a two part questionnaire. The first part was a multiple choice quiz covering items of medical knowledge which had been aired in the lay press, and the second section consisted of items which attempted to assess attitudes toward hospitalization as positive or negative.

The test was administered to four (4) groups: Group I consisted of sixty-five (65) senior professional nurse students in a baccalaureate program, group II was twenty-one (21) lay university students, group III referred to twenty-four (24) students in a practical nurse program at a vocational-technical school, and group IV designated twenty-five (25) lay vocational-technical school students.

Separate scores were given for each portion of the test. The medical knowledge portion was scored on the basis of one point for each correct answer, and the attitude portion was given one point for each response which indicated a positive attitude toward hospitalization. Statistical analyses were applied to test relationships between the above groups. Results were also analyzed by grouping the respondents as allergic or non-allergic and university or vocational-technical school students.

Conclusions

Analysis of the data suggested that:

1. Hypothesis I (there is a significant positive relationship between the level of medical knowledge within a population and the incidence of drug reactions within that population) must be rejected.

2. Hypothesis II (there is a significant positive relationship between socio-economic status of a population and the incidence of untoward drug reactions within that population) should be retained.

3. Hypothesis III (there is a significant negative relationship between a positive attitude toward hospitalization within a population and the incidence of untoward drug reactions in that population) must be rejected.

Recommendations

The recommendations which arise from this study fall into two broad areas; 1) the research design of the study itself, and 2) implications for further research.

The entire research design should be modified, with particular attention to sampling procedures and to the testing tool. Better sampling techniques should be applied to control the numerous extraneous variables which clouded the study as conducted. The size of the sample should be increased, and attempts should be made to acquire a sample representing more diverse socio-economic levels. Respondents should be asked for information regarding the number of prescription medications

they have taken, which medication produced the untoward reaction, and type and severity of the reaction. This information would allow for much more control of variables than was possible as the study was conducted.

An entirely new questionnaire should be developed and thoroughly tested prior to the beginning of the study. This tool should be designed to permit quantification of a much wider range of medical knowledge than was possible with the current effort.

This study produced many implications for further research in this area. All computations indicated that while most relationships were not statistically significant, a relationship did exist. In view of the methodological deficiencies in this study it seems well worthwhile to replicate it with the modifications indicated above.

It is very easy to dismiss the significance of the relationship postulated in hypothesis III* as a correlate of the established fact that those of higher socio-economic status utilize professional medical help more often than do those of lower socio-economic status, and therefore, could be presumed to take more prescription medications than those of lower socio-economic groups. However, this study did not examine the variable of numbers of medications which had been taken,

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*There is a significant negative relationship between attitude toward hospitalization within a population and the incidence of untoward drug reactions within that population.

and it seems premature to reach the conclusion that this is the sole explanatory variable in the relationship between socio-economic status and the incidence of untoward drug reactions. It would seem that a study should be conducted comparing first the relationship between socio-economic status and number of prescription drugs taken, and second, the relationship between number of prescription drugs taken and the incidence of untoward drug reactions. While the latter relationship seems at first glance to be self-evident, this researcher has seen no hard data to support the assumption of its validity.

APPENDICES

APPENDIX A

MEDICAL KNOWLEDGE QUIZ

The information gained through administration of this questionnaire will be used in a research project conducted through the Nursing Department at Montana State University.

Please fill in the following background information to aid in quantifying the results of the questionnaire.

Age _____ Sex _____ Years of school completed _____

Last year school attended _____

Are you allergic to any medication? _____

This test consists of multiple choice questions. Please circle the correct answer. When answering, please rely on quick recall and do not guess.

1. A medicine commonly used in treating disorders of the heart is:

   a. penicillin
   b. librium
   c. digitalis
   d. don't know

2. A commonly used "sleeping pill" is:

   a. nembutal
   b. pentothal
   c. mannitol
   d. don't know

3. The drug given in the treatment of "sugar diabetes" is:

   a. urised
   b. insulin
   c. picrotoxin
   d. don't know

4. A diabetic tests his urine frequently. He is testing for:

   a. salt
   b. acid
   c. sugar
   d. don't know

5. The operation in which the womb (uterus) is removed is called:

a. laminectomy
b. hysterectomy
c. cholecystectomy
d. don't know

6. "Miltown" is a (an):

a. tranquilizer
b. antibiotic
c. vitamin
d. don't know

7. _____ is often given to people to improve the quality of their blood.

a. milk of magnesia
b. iron
c. magnesium
d. don't know

8. The condition in which there are too few red cells in the blood is called:

a. anemia
b. syncope
c. polycythemia vera
d. don't know

9. The bones of the spinal column are called:

a. calcaneus
b. thymus
c. vertebrae
d. don't know

10. Another name for cerebro-vascular accident (CVA) is:

a. heart-attack
b. stroke
c. angina
d. don't know

11. Another name for the womb is:

a. uterus
b. pancreas
c. lottafuss
d. don't know

12. Fracture means the same as:

a. sprain
b. strain
c. broken bone
d. don't know

13. To "empty your bladder" is to:

a. defecate
b. urinate
c. meditate
d. don't know

14. Another term for the above is:

a. void
b. null
c. eructate
d. don't know

15. Demerol is usually given to relieve:

a. dizziness
b. constipation
c. pain
d. don't know

16. Nausea means:

a. feeling sick at your stomach
b. vomiting
c. feeling dizzy
d. don't know

17. Patients are not allowed to have anything to eat or drink for several hours prior to surgery. The reason for this is:

a. it's a hospital rule
b. it makes surgery easier for the doctor
c. to cut down on the danger of vomiting while anesthetized
d. don't know

18. The group of medications which are usually prescribed when you have an infection are called:

a. tranquilizers
b. barbiturates
c. antibiotics
d. don't know

19. The first antibiotic discovered was:

a. penicillin
b. streptomycin
c. terramycin
d. don't know

20. The vaccine called "D. P. T." protects against:

a. Diverticulitis, Psitticosis, and typhoid fever
b. diptheria, whooping cough (pertussis), and tetanus
c. Dengue fever, plague, and trachoma
d. don't know

APPENDIX B

ATTITUDE QUESTIONNAIRE

If you have ever been hospitalized, please answer the following questions.

1 = strongly yes 2 = slightly yes

3 = slightly no 4 = strongly no

	1	2	3	4
1. I enjoyed my hospital stay.				
2. Doctors charge too much.				
3. Most nurses are very cold and unfeeling				
4. Most nurses care very much about their patients				
5. Most doctors are dedicated to the welfare of their patients				
6. Most hospital patients in the United States receive excellent care				
7. A hospital is a frightening place to be in				
8. It is very comfortable to be in the hospital if you're very sick				
9. Most persons employed by the hospital are kind and considerate				

ATTITUDE QUESTIONNAIRE (continued)

	1	2	3	4
10. It would be better if you could have visitors any time				
11. I am lucky that I went to the hospital				

APPENDIX C

TABLES

TABLE 2

TEST MEANS--ALL GROUPS

	Medical Knowledge	Attitude
Group I Professional Nurse Students (n=65)	19.5	6.7
Group II Non-nursing University Students (n=21)	14.6	6.9
Group III Practical Nurse Students (n=24)	19.2	8.0
Group IV Non-nursing Vocational-Technical Students (n=23)	14.7	7.9
Nursing Group Groups II and IV (n=44)	15.7	7.2
Allergic Group (n=24)	18.3	6.9
Non-allergic Group (n=109)	17.9	7.4
University Group Groups I and II (n=86)	18.7	6.8
Vocational-Technical Group Groups III and IV (n=47)	16.9	7.9

TABLE 3

INCORRECT RESPONSES--BY GROUPS
(MEDICAL KNOWLEDGE)

Questions	Prof. Nurse Students (n=65)	Practical Nurse Students (n=24)	Med. Oriented Students (n=21)	Lay Vo-Tech Students (n=23)	Total (n=133)
1. (digitalis)			15	14	29
2. (nembutal)	1		11	18	30
3. (insulin)			3	2	5
4. (sugar)			1	4	5
5. (hysterectomy)			3	2	5
6. (miltown)	15	16	15	20	66
7. (iron)			2		2
8. (anemia)	1	1	3	4	9
9. (vertebrae)					
10. (stroke)	2	1	10	14	27
11. (uterus)				1	1
12. (fracture)			1	1	2
13. (urinate)			1	1	2
14. (void)			11	18	29
15. (demerol)			12	13	25
16. (nausea)	1		3	5	9
17. (pre-surgical preparation)			4	3	7
18. (antibiotic)			1	3	4
19. (penicillin)			2	4	6
20. (D. P. T.)			7	8	15

TABLE 4

INCORRECT RESPONSES--MEDICAL KNOWLEDGE
ALLERGIC TO NON-ALLERGIC

Question	Allergic Group (n=24)		Non-Allergic Group (n=109)	
	Number	Percent	Number	Percent
1. (digitalis)	3	12.5	26	23.8
2. (nembutal)	0	0	30	27.5
3. (insulin)	4	16.6	1	0.9
4. (sugar)	0	0	5	4.5
5. (hysterectomy)	1	4.2	4	3.6
6. (miltown)	8	33.3	58	53.2
7. (iron)	0	0	2	1.8
8. (anemia)	3	12.5	6	5.5
9. (vertebrae)	0	0	0	0
10. (stroke)	5	21.0	22	20.1
11. (uterus)	0	0	1	0.9
12. (fracture)	1	4.2	1	0.9
13. (urinate)	1	4.2	1	0.9
14. (void)	5	21.0	24	27.5
15. (pain)	5	21.0	20	18.3
16. (nausea)	2	8.3	7	6.4
17. (pre-surgical preparation)	2	8.3	5	4.5
18. (antibiotic)	3	12.5	4	3.6
19. (penicillin)	0	0	6	5.5
20. (D. P. T.)	1	4.2	14	12.8

TABLE 5

NUMBER ALLERGIC AND MEAN AGE--ALL GROUPS

	Allergic		
	Number	Percent	Mean Age
Group I Professional Nurse Students (n=65)	15	23.0	22.1
Group II Non-Nursing University Students (n=21)	7	33.3	31.0
Group III Practical Nurse Students (n=24)	0	0	27.0
Group IV Lay Vocational-Technical Students (n=23)	2	8.6	23.1
Medically Oriented Group Groups I and II (n=89)	15	16.9	23.2
Lay Group Groups II and IV (n=44)	9	20.5	28.9
Allergic Group (n=24)			27.2
Non-Allergic Group (n=109)			23.8
University Group Groups I and II (n=86)	22	25.5	24.0
Vocational-Technical Group Groups III and IV (n=47)	2	4.2	25.1

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