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This study explores marketing approaches to the area of preventive health care through extensive data review. It also reveals specific determinants for the utilization of health care and clearly supports the author's perception and intending results.

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PREVENTIVE HEALTH CARE UTILIZATION: A STUDY OF FACTORS INFLUENCING MILITARY PERSONNEL IN THEIR USE OF THREE PREVENTIVE HEALTH CARE FACTORS

A Problem Solving Project

Submitted to the Faculty of

Baylor University

In Partial Fulfillment of the

Requirements for the Degree

of

Master of Health Administration

by

Major Sandra Hamper, ANC

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I. INTRODUCTION

Development of the Problem

> We behave as if health is secured through the cure of disease rather than through its prevention...the practice of medicine has revealed an unbroken preference for the spear above the shield. And so the members of the tribe are encouraged to feel that health is the absence of disease and therefore as long as one is healthy one need do nothing about the possibility of disease except that when it comes, one must call upon the magic of the physician...[1]

It is the above observation which seems to characterize this nation's preference for the use of preventive health services. Regardless, the constantly rising costs of the health care arena are causing more and more providers, consumers, and legislators to become interested in the provision of "vertical" rather than "horizontal" health care. The thesis that prevention of disease will lower the overall outlay of dollars for the health care of the nation is sound. And yet there remains a real problem of determining why some people respond in utilization of preventive health services and others do not. The answers to this question might provide fertile ground for exploration of marketing approaches in the area of preventive health care.

There have been many studies performed which address demographic variables (namely, age, sex, marital status, educational level,

social structure, perception of need, cost, income, and the medical care system itself) and how these variables influence preventive care utilization. Through a review of these studies (refer to the literature review, pages 3-22) and comparison of their results to the structure of the patient populations of different institutions, it was determined that the military medical system provides the fewest barriers in these demographic variables to utilization of preventive health services.[2] Because of the apparent elimination within the military setting of many of the economic and availability barriers, it was determined that the military might be an ideal environment in which to study two more definitive aspects and their possible affect on preventive health care utilization, i.e., familiarity with the health care system and health care education. Therefore, the problem of this study is to determine the effect of health care education and familiarity with the health care system as factors influencing the use of preventive health services by military personnel at Fort Sam Houston, Texas and Fort Carson, Colorado.

One limitation inherent in collecting data on a subject so tied to social norms is that the respondents, having heard through the mass media that preventive health care is an accepted social norm, may respond from this influence. False positive answers regarding utilization may skew results. Another limitation is the interrelated aspects of some of the independent variables. Because age generally increases

with the amount of familiarity with the health care system, delineation of affect may be difficult. The results of this study must, therefore, be viewed with the understanding that no one factor can be clearly defined without interference by others somewhat interrelated. This is a limitation inherent in almost every study within the social sciences.

To study the specific variables of interest within the setting heretofore explained, only active duty Army personnel were queried. Approximately half of the questionnaires were to have been completed by personnel who fulfilled two additional requirements: (1) they must have completed at least two weeks of post high school education in some aspect of health care and/or (2) they must have worked in a health care system. These required criteria allow an adequate sample to examine the variables to be studied and their possible influences.

Review of the Literature

Although there is not a paucity of literature discussing the utility of a consumer for preventive health services, some obvious limitations in the depth of the research performed do exist. Some of the explanations for this lack of profundity may be: the patient has a vague understanding of the services he needs or seeks or why he seeks them;[3] the difficulty inherent in obtaining objective measures of awareness of motivation;[4] conflicting results regarding utility influences; the interrelatedness of variable studied; and patient's limited memory stores for this area of study. These limitations

have been reflected throughout the literature and will be expected to influence the outcome of this project as well.

In discussion of consumer utility for health care, Stratmann simplifies the consumer's determination of whether to pursue care into five categories:

1. Whether needs warrant care.

2. Kind of care required.

3. Potential benefit of care is greater than the cost of time or money that may be involved in obtaining care.

4. The benefits of such medical care are likely to be greater than the benefits derived from fulfilling other needs.

5. If the decision is made to spend scarce resources on care, which facility is likely to provide the greatest satisfaction.[5]

Two additional categories which Stratmann did not address are the pursuit of preventive health services versus the continued pursuit of an adopted life style and the secondary gains experienced through illness. Preventive health care in terms of alteration of life style has been more often addressed in the relatively recent past. It has been shown that some of our greatest causes of disability and mortality are coronary heart disease, stroke, and cancer. Hypertension, smoking, and high serum cholesterol levels have been shown to be predisposing to these three disease entities. Each of those predisposing factors could be modified or eliminated through voluntary changes in lifestyle. The sixth category which should be added to Stratmann's list is, therefore:

whether the health benefits derived are perceived as a greater gain than the loss associated with the required life style changes (i.e. no cancer vis a vis cigarette smoking).[6]

The seventh category is whether maintenance of health would counterbalance the possible secondary gains of illness. Illness often provides the individual with needed attention or necessary excuses which maintain that individual's mental health or need to escape from responsibilities.

These categories are indeed a simplification because the factors influencing the consumer's decisions are far more complex. Schweitzer addressed these determinants through the use of a model (see Figure 1). Schweitzer describes the factors which determine the risk of an individual as demographic, occupational, psychic characteristics, personal habits, and life-style. Other influences include the individual's medical history and assessment of risk. Schweitzer believes that the perception of need for preventive health care varies greatly from individual to individual depending on level of education, especially as related to hygiene, health status, and medical history. Some life-styles are so limited to poverty level that the only exposure to health is exposure to negative health or sickness. This modified perception of illness causes a higher severity of illness to be necessary to raise the utility enough to seek medical help. The obvious relation to preventive health care would be a total lack of the perception of its importance as a need, therefore lowering its utility well beyond the dollars available.

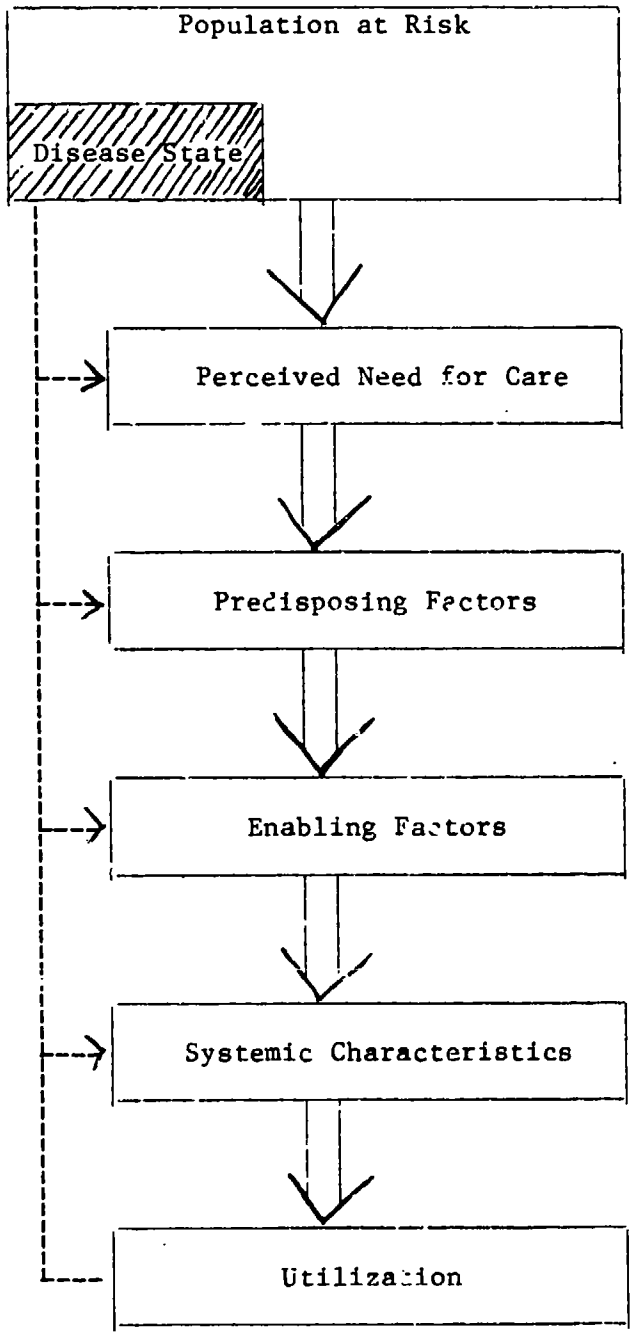

Fig. 1. Determinants for use of health care

Even if there is a perception of need for health care, the level of utility remains low unless there is an accompanying predisposition to seek those services. According to Schweitzer, predisposition is influenced by education, social class, anomie, ethnic group, taste, culture, need to reinforce social status, family role, social contact, past institutional involvement, and past experience with the medical system. Predisposition to seek preventive health services is even more confused by the professionals who themselves are arguing the utility of having physical examinations yearly versus other time intervals. In fact, those people with more education often find it less rational to pursue preventive care than do those who have been influenced by mass media. But predisposition is also affected by social class, ethnic background, and culture. These influences also often increase the utility for use of the lay referral system. Prevention is often viewed by some of the strong subcultures as honey, herb tea, or massive doses of Vitamin C. Here, the established utility of the perception of need to use some forms of preventive health measures has a low margin because of the lack of predisposition to seek such service. Other cultures are likely to seek preventive health services to a great degree; their utility being heightened by their background.

Some incongruities exist in the evaluation of predisposition which can be explained by the need for peer group social status which may be

bolstered by contact with a physician. Many socio-economically deprived individuals will seek preventive care precisely for the social status boost it gives them. Of course, this need for recognition may be nullified by the consumer's previous contacts with the health system. Crowded, impersonal waiting rooms, hurried physicians, and brusque nurses may all be influences which can lower the client's utility for seeking the care. Those persons comfortable in other institutional settings will find this type of situation less threatening and probably have a greater predisposition to seek the care perceived as needed.

Individuals who in the past have experienced spontaneous remissions of disease, or who have not contracted any obvious illness, will tend to have a much lower propensity to seek care and especially preventive care in the future. Those persons who in the past found that delaying care or ignoring preventive measures brought on serious illness will have a higher utility for care.

Consumers who perceive a need and are predisposed to seek care have a further variable to add to their utility for actually attaining the care. The ability to pursue the care may be blocked by barriers. Price, income, and insurance coverage are certainly influential in enabling or blocking an individual in the pursuit of preventive health care. Time, fear, alienation, inconvenience, distance, and family role may all be factors blocking the consumption of preventive health services. And, finally, characteristics of the health care system itself

may either increase or decrease the perceived utility of pursuing preventive health care.[7]

Several of the more important utility decisive factors of Schweitzer's model will be examined in greater detail. One of these factors is demography of a consumer population and their average utility for pursuit of preventive health services. Variations have been found in utilization of services based on age, sex, and marital status among others. Just briefly reviewing some of the results, it has been shown that generally older people do not pursue as much preventive care as middle aged and young people. This has been attributed to the aged not adopting new innovations as rapidly and the lowered perception of need for preventive care in the face of death which is becoming inevitable.[8] The opposite viewpoint is also to be considered, that there is the "illusion of immortality." Montague states:

> The new model of immortality is not at all a belief in the survival of the soul after death, but rather personal survival into a greatly extended future at some distant time far removed from consciousness, at least the consciousness of anyone who has not yet succumbed into senility. Death is understood to be a condition from which other people suffer, but for contemporary man it is not a contingency which he is quite willing to grant as a possibility for himself.[9]

If man, even the elderly, cannot believe that they will die, their interest in preventing conditions which may bring death to them sooner is lower or nonexistent. So an event which is not feared because it is

perceived as a nonexistent threat, cannot occur sooner through personal health negligence. This dilemma can be likened to multiplying any number times zero: your result is always zero, i.e. no threat.

Decreasing marginal utility for the older group may also be due to their perception of the risks of discovering their possible illness and its implications for perception of future disability. The feelings of worth or worthlessness of a previously productive and now totally leisure status also affect the marginal utility of this aging individual to seek preventive health care. If the individual perceives their life as having little worth, then they may respond with no action to try to lengthen it.

Much controversy over utilization of care and the gender of the consumer has been evoked. An interesting note is that, although almost all studies have concluded that females obtain more preventive care than males, there is great variability due to family and occupational role.[10] Women who were the head of the household and provided the family income had a greater marginal utility for preventive health care than did men who were employed. This fact is becoming increasingly important as the roles of the genders are shifting and the incidence of divorce is rising. More women are heads of households and as this trend continues, there may be a slow shift in the use of preventive health care. Unemployed persons in the household are more reluctant to pursue preventive care.

Sex linked perception of risk for various conditions and risk avoidance through use of preventive services has had little study. It has been proven that early detection of cervical cancer and resultant care can be effected through Papanicalou smears, a preventive health procedure. This is not a preventive health measure which can benefit a man. Further correlation of the preventive health measures which can benefit each sex independently and the marginal utility for pursual of preventive health care is needed to arrive at a greater understanding of this variable.

Marital status and its effect on utilization of preventive health services are linked to gender and the role played in the family. It has been found that married heads of household will pursue preventive care to a greater degree than their single counterparts. The responsibility for maintaining health to be able to provide for other members of the family may be an important factor in raising the marginal utility for pursuit of preventive health services.

The perception of need is greatly influenced by the educational level of the consumers and the consumer's head of household. The literature in this area abounds with conflicting conclusions as to how education increases the perception of individuals' utility for preventive health services. Zborowski states that ". . . more highly educated persons appear to be more conscious of their health. . . ."[11] Berki and Kobaschicawa also found that educational background directly

influences utilization of preventive care.[12] And yet, Rosenstock determined that both individuals of high and low educational attainment obtain most health and science information from mass media. The poor receive it via television and radio while the print media is often the vehicle for the better educated and higher economic status consumers.[13] These influences can cause the less educated to seek preventive care more often. The individuals made more rational by the higher educational levels and the less glamorous, more skeptical material in print used preventive services less often. Ellenbogen, Lowe, and Danley showed that acceptance of preventive health measures increases with the use of mass media (regardless of prior educational level) to educate the individual regarding preventive health care programs.[14]

The educational level of the head of household correlates with the utility for preventive health services for the children in the household, especially in regard to preventive measures such as immunizations. Sorkin found that there was a definite relationship between the number of physician and dental visits per year for children under fifteen in households where the head of the household had a higher educational background.[15]

Schweitzer indicates that education can serve as a determinant of respect for medical intervention. Use of preventive health services was shown in a survey by the United States Comptroller General in 1972 to be

significantly higher for consumers with education beyond high school than for those with less, formal education. Schweitzer attributes this difference to the utility raised by the educated individual who is less likely to feel a sense of powerlessness when confronting the system offering the preventive health care services.[16]

Basic education is not the only educational determinant of utility for preventive health services. The actual health education, however acquired, influences the perception of need. Therefore, it would be assumed that marginal utility for preventive health services can be raised by providing positive forms of health and hygiene specific education. This aspect will be addressed later in the discussion of the data interpretation of this study.

Social structure is another variable which, combined with the other factors being discussed, affects the marginal utility of preventive health services. This variable has many subvariables which are so interrelated that they are difficult to separate out to find the impact each has individually on utility. The social structure of the middle class is clearly advantaged in its determination of utility to pursue care in the health care system, since the health care system is based on middle-class rationale, knowledge, sophistication, staff, and hours. It remains no wonder that the lower class feels frustrated with the formal, impersonal, bureaucratic setting. The system, built on middle-class values, therefore is not as alienating to the middle and higher economic

groups and adds to the utility to pursue those services.

The scale of values for the lower socioeconomic group may adversely affect utility for these services. Rosenstock found that persons of lower status assign greater priority to immediate rewards and gains than to the achievement of long-range goals on which preventive health is built.[17] Due to this, the marginal utility for preventive health services is often not great enough when compared to the marginal utility for clothing, shelter, and food to compete favorably for the lower socioeconomic class dollar and is considered a luxury.

Some interesting results of studies which examined ethnic backgrounds and race concluded that the effect of race (Negro and Caucasian) was specific to utilization of preventive health services. Bullough concludes that the ethnic background of consumers can influence their knowledge of and willingness to pursue better forms of service, even when the services are free or subsidized.[18] In addition, beliefs and values established within specific social structures affect utility for goods and services. Although individual personal characteristics are highly important in the utility function, beliefs instilled by the social structure in which the indivdual lives added to the individual's personal characteristics becomes a much stronger determinant in the valuation of utility for preventive care than either alone.[19]

Very closely related to social structure and somewhat inter-dependent is actual perception of need and its influence on marginal utility

for preventive health services. If perception of need for the service is lacking, consumption will be severely curtailed regardless of economic and social variables.[20] Perception of need is a multitude of perception variables, all of which are influenced by the factors mentioned throughout this study. Five of these perceptions are: (1) perceived susceptibility, (2) perceived seriousness, (3) perceived benefits of taking action, (4) perceived barriers to taking action, and (5) cues to action.[21] Montagu additionally adds that, "The ignorance of most people concerning the construction and functioning of their own bodies is appalling."[22]

The case of perceived susceptibility and perceived seriousness can be aptly demonstrated by the case of immunizations. The present perception of need for the smallpox immunization is greatly impaired by the lack of presence of the disease in our society. Few people as well as few doctors have ever seen a case of smallpox.[23] Its perceived seriousness is, therefore, skewed by lack of contact. These same people forget to ask "why do we not see smallpox today?" The answer is that the immunizations have effectively provided such protection, but without them the disease could again flourish. Memories are so short that even the more recent eradication of polio is forgotten and the willingness, even anxiousness, to voluntarily immunize against polio has died.

Because it is difficult to perceive benefits of preventive services, this type of care has lower utility than most other goods and

services. Consumers from upper socioeconomic classes were presented with a list of recognized danger signals for disease. Of these individuals 75 percent checked all but two as requiring the attention of a physician. To demonstrate the difference in perception effected by other classes, respondents from the lowest socioeconomic class were given the same list. They identified a maximum of three danger signals as requiring the attention of a physician. Only 50 percent of the respondents of this class identified as many as the three.[24] If class differences create such diverse perceptions of the need for health care intervention with recognized danger signals or illness, then the perception divergence for preventive health care would be at least, and probably more, obvious.

Cost of health care involves a great deal more than out-of-pocket expense and complicates the dissection of this as a factor of utility. Cost can be defined in terms of time and distance as well as dollar amounts. Looking first at the absolute dollar cost of health care, it can be seen that even the absolute dollar is relative in its importance when measured against total income. The relative amount of hospital use for preventive care has been shown to correspond in reverse order to that of the relative amount of out-of-pocket expenses which are incurred by the patient.[25] There are some slight positive effects of prepayment, such as an HMO concept, on the utilization of preventive health care.[26]

Therefore, although reducing cost has some correlation with increased utility, it is not the major factor in its measurement.

Actual health dollar costs have become less relevant measures of utility with the advent of free clinics, welfare, Medicaid, and other third-party payment concepts. Impact has not been as great in the preventive health field as it has been in such areas as inpatient care, but progress is being made to include preventive care benefits in insurance policies and governmental cost reimbursement.

Other costs to be considered in the consumption of health care are time and distance. Time to a busy executive is often more valuable than the dollar cost of services. Viewed in the short run, utility is based on the time lost having a physical checkup tomorrow. The rational man would consider the time required in the future for a lengthy hospital stay due to late diagnosis, but few people act in totally rational ways.

The relationship between cost, income, and the marginal utility of preventive health care is not as obvious as would be assumed. There have been many studies tying income to utilization. Interestingly, it has been found that even when direct cost is minimized or removed, income continues to be associated with health behavior.[27] Most investigation results in findings which correlate higher income levels with client propensity to follow preventive or diagnostic recommendations. Conflicting evidence is also found relating care to income, implying that although income does appear to have some influence on

health oriented behavior, income itself is most often influenced by education.[28] This again emphasizes the interrelatedness of factors and difficulty in isolating them for purposes of study.

A final major consideration in the determination of utility as reviewed in the literature is the medical care system itself. The rapidly advancing technology of the past years has fragmented our medical care delivery system causing it to be everything but a personal and comfortable experience upon its encounter. As this fragmentation has increased, the resulting alienation has decreased the use of informal preventive health care. When the general practitioner was a part of the community providing stable system-consumer relationships, he was often sought as a "listening post" for early detection of disease. Today, the preventive care is a much more formal and formidable experience and thus often rejected in lieu of the lay referral, reassurance channels.[29] Clinics, free and fee, are seen as just one more fragment in a fragmented system which results in greater feelings of helplessness and resulting inability to cope with the perceived hostile environment. As demonstrated earlier, there appears to be less middle- and upper-class alienation. The middle-class orientation of the system encourages middle-class use while the upper-class continues to use the family practitioner for preventive health care needs.

The medical care system perpetuates some beliefs in "illness care" rather than "preventive health care." The medical education system

promotes the study of surgery, internal medicine, and other illness care specialities while offering little emphasis to its preventive health program. The students view preventive health, through observation of their superiors attitudes, with disdain. It does not take a student long to realize that there are true economic advantages to curing that are close to nonexistent in preventing. These thoughts are reinforced by the health insurance system which reimburses much greater returns for therapeutic care than for preventive care.[30] It is not suprising that the remark is often heard: "What I wanted him to do was to tell me what to do, but all he did was to give me a prescription."[31]

From a review of the literature it is evident that there is no simple, convenient way to measure utility of a consumer for preventive health services. The variables are closely interwoven and interdependent rendering almost impossible statements such as, "this individual has a high utility" or "this one has a low utility" for a preventive health service. Some general conclusions can be drawn which provide a framework for possible population trends. These can be outlined as follows:

1. Age--Older age has less utility for preventive health services than middle or young ages.

2. Sex--Women seek more health care than men.

3. Marital Status--Married consumers utilize health services more than unmarried consumers.

4. Educational level--The higher the formal and health care educational level, the greater the utilization of preventive care.

5. Social structure--Lower class, socially deprived, ethnic individuals have less utility for preventive health care.

6. Perception of need--The greater the factors of perception, the more health care pursued.

7. Cost--The higher the out-of-pocket cost, the lower the utilization, and the higher the time-distance cost, the lower the utilization.

8. Income--Individuals with greater annual income will have higher utility for preventive health services.

9. Health care system--The greater the perception of the system as alienating, formidable, and impenetrable, and the less personal it is perceived, the lower the utility for pursuing health care in that system.

As a result of the foregoing literature review, it can be concluded that in a military health setting, several of the variables examined are controlled. Age remains varied due to the population of retired served as well as dependents (young) but by limiting the study to active duty personnel only, the age group is stabilized to approximately seventeen to fifty years old with the majority between eighteen and thirty. Although there are more males than females in the active service, both are represented. Marital status also becomes balanced in this group of

respondents, except that a higher percentage of the younger, less educated, with less experience are single and therefore may influence results. Educational level is standardized to require a high school education or equivalent for entrance into the military. This minimum, required level of formal, general education permits more valid study of the effects of health care education. Although the respondents in the military hail from many social structures (therefore giving the sample a broad base), the structure of the military is assumed to modify the original to present a more homogeneous composition. Perception of need is one of the variables which will be tested through the variable of health care education. With greater knowledge of the possible outcomes of not pursuing preventive care, perception of need for pursuing these services would be expected to be elevated. Dollar cost becomes an almost nonexistent factor since there is no out-of-pocket cost to the military person for preventive health services at the military health facility. Time-distance cost is also negligible in this sample due to the proximity of work area to the health facility and the general, although not universal, policy of allowing time free from duty, without loss of pay, for appointments. Income, although varying throughout the sample (from enlisted to general), exists at at least a minimum level with other additional benefits for all personnel. This factor may influence results. The health care system is the final variable. It is

from this variable that the second factor of major interest in this paper, familiarity with the system, is drawn.

Problem Solving Methodology

The methodology used to collect data for this project was a questionnaire (see Appendix B) which was presented to a sample of Army officer and enlisted personnel. The results of these data will be presented in the format of regressions between total use or individual preventive services and the individual variables which may affect that use. The determination of results will be accomplished with the assistance of a computerized program of regression using a dummy variable. Evaluation and interpretation of the data will be both a review of the statistical significance of the differences between independent variable categories and the trends observed within those categories.

The main concern of this study is the use of preventive health care services as affected by the factors of health care education or familiarity with the health care system. Due to the aforementioned interdependency of the influences on use, this sample will also be checked for validity by determining if it produces results similar to other studies on factors such as civilian education and marital status.

FOOTNOTES

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[17]Rosenstock, p. 187.

[18]Bonnie Bullough, "The Source of Ambulatory Health Service as It Relates to Preventive Care," American Journal of Public Health 64, no. 6 (June 1974): 588.

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[20]Michael Zubkoff and David Dunlop, "Consumer Behavior in Preventive Health Services," in Consumer Incentives for Health Care, ed. Selma J. Mushkin (New York: Prodist, 1974), pp. 71-72.

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[28]Sorkin, p. 149.

[29]Rita Ricardo Campbell, Economics of Health and Public Policy (Washington, D.C.: American Enterprise Institute, 1973), p. 100.

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II. DISCUSSION

General Discussion

Questionnaires (see Appendix B) were distributed to a sample of active duty Army personnel at Fort Carson, Colorado, and Fort Sam Houston, Texas. Four hundred questionnaires were disbursed with a return of three hundred eighty six valid questionnaires. The results of these questionnaires became the data base for the regression manipulations.

The dependent variables were physical examinations, immunizations, preventive dental examinations, and the use of all three. Each of these variables was measured by their use or nonuse (binary) pursued out of choice within the previous two year time frame. If the service variable used had been ordered or required by regulation, the individual was asked if he/she would have used the service if it were not so required. If the response to this question were affirmative, use of that service was considered to be pursued out of choice. If the response were negative, the utilization of that service was considered to be negative. Utilization was examined separately to evaluate trends of each individual preventive health service. A composite of the three was also evaluated to draw some general conclusions.

The method of evaluation of data was multiple regression using a

dummy variable. A significance level of 95% on a two tailed "t" test was employed. Each category of a particular service was individually compared to the results of the first category of that independent variable. The independent variables used were: (1) amount of medically oriented health care education, (2) familiarity with the health care system defined as time spent working within a health care facility, (3) marital status, (4) amount of formal civilian education and, (5) years of active military service.

The categories of the independent variables are explained in Appendix C. The first two variables were selected as described in the literature review (pp. 16 and 18). Variables 3 and 4 were chosen to compare with previous studies for validity. The final variable was selected for several reasons to be explained later in the evaluation of the data.

Evaluation of Physcial Exam Data

When the voluntary utilization of physical exams was regressed against the categories of health care education, it was found that the individual with no health care education had a 46.8% probability of voluntarily pursuing that service. Compared to that category, those respondents in the categories 3 and 4 had a significantly higher probability (69.4% and 77.4%, respectively). The comparability of the results of the other categories to category 1 was not significant.

Table 1

Physical Exams and Health Care Education

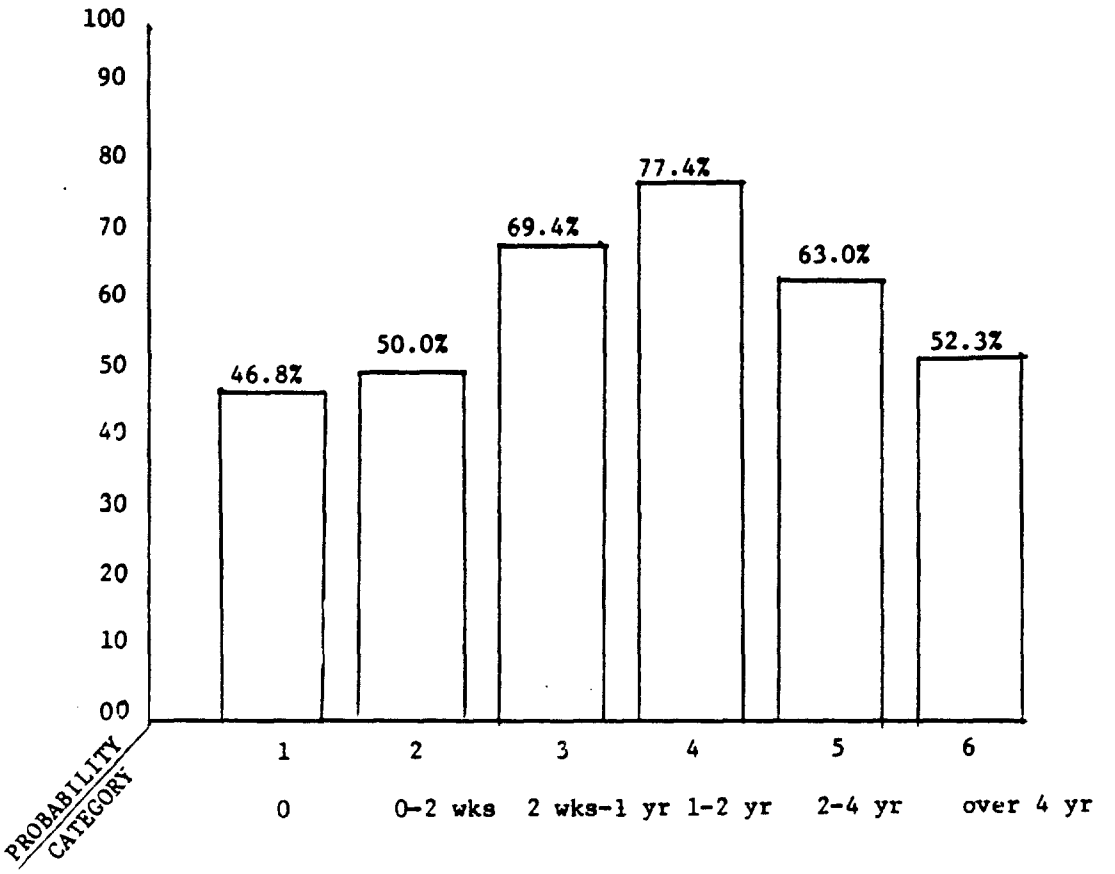
Categories of Health Care Education	β	Probability of Utilization	t Score	Significance
1	.4680	46.8%	--	--
2	.4999	50.0%	0.3361	No
3	.6936	69.4%	3.6659	Yes
4	.7741	77.4%	3.1826	Yes
5	.6295	63.0%	1.5856	No
6	.5226	52.3%	0.6527	No

In addition to the statistical significance, a trend was revealed in voluntary utilization of physical exams. This trend is shown at Figure 2. It is seen that although the statistical evaluation of each of the categories may fall below the test of significance, there is a definite trend in the probability of use. As would be expected, the least usage is found with those individuals who have no health care education. The interesting aspect of the trend is that there is an increasing propensity to seek the physical exam service progressively to the health care education level of one to two years (also a level of significant difference from zero health care education). Beyond that category, there is a decreasing utilization with increasing health care education.

Familiarity with the health care system showed a slightly different influence on the utilization of physical exams. The probability of voluntarily having a physical exam and never having worked in a health care system or facility was 54.9%. The only category of familiarity which showed a significant difference from no familiarty was category 4

FIGURE 2

UTILIZATION OF PHYSICAL EXAMS
AS INFLUENCED BY
HEALTH CARE EDUCATION



with an 87.5% probability of pursuing physical exams. Category 4 is one to two years of work in a health care facility. Table 2 shows the results of the regression within the categories.

Table 2

Physical Exams and Familiarity

Categories of Familiarity	β	Probability of Utilization	t Score	Significance
1	.5490	54.9%	--	--
2	.5000	50.0%	0.4960	No
3	.5238	52.4%	0.2236	No
4	.8570	85.7%	3.0783	Yes
5	.6212	62.1%	1.0387	No
6	.5399	54.0%	0.1095	No

The trend of utilization is not as clearly defined as that in health care education when the probabilities are plotted graphically. Figure 3 shows this relationship. There is a decreasing tendency toward utilization through the first three categories, then a quantum jump to category 4. The remaining categories then fall to a probability much closer to that of categories 1 and 2.

To test the validity of the results against the information obtained from previous published studies, the utilization of physical exams was regressed against marital status and formal civilian education. The results of these regressions are shown at Tables 3 and 4.

FIGURE 3

UTILIZATION OF PHYSICAL EXAMS AS INFLUENCED BY
FAMILIARITY WITH THE
HEALTH CARE SYSTEM

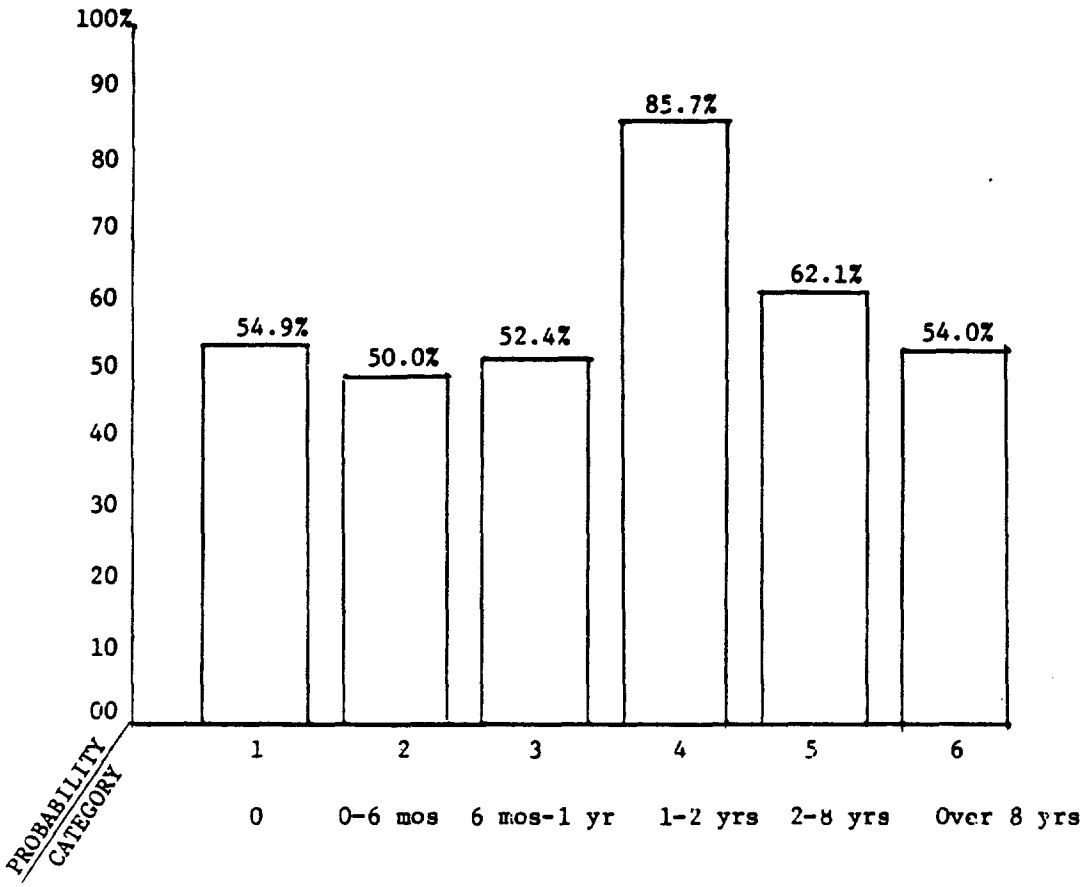


Table 3

Physical Exams and Marital Status

Categories of Marital Status	β	Probability of Utilization	t Score	Significance
1	.0685	60.9%	--	--
2	.5312	53.1%	1.4297	No
3	.7272	72.7%	0.7823	No
4	.2728	27.3%	2.2125	Yes
5	1.0000	100.0%	0.7944	No

Table 4

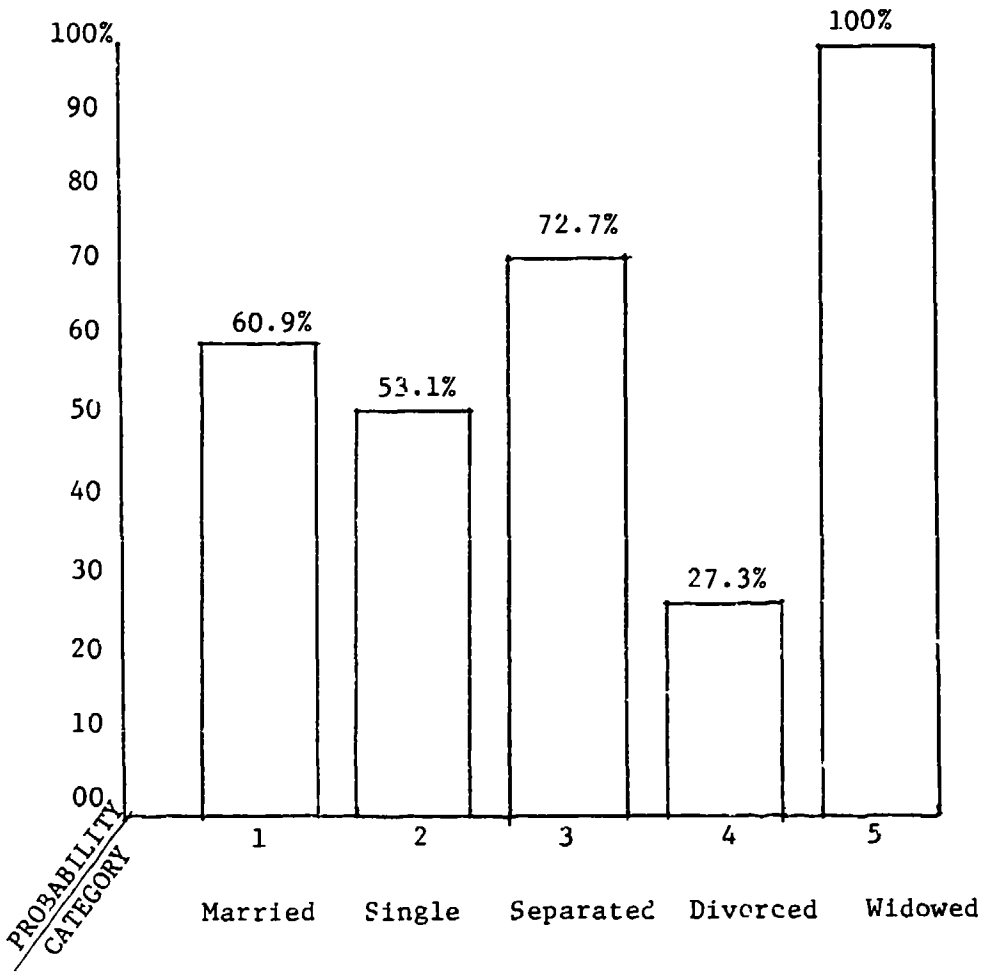
Physical Exams and Formal Civilian Education

Categories of Civilian Education		Probability of Utilization	t Score	Significance
1	.4869	48.7%	--	--
2	.5949	59.5%	1.7911	No
3	.6460	64.6%	2.4415	Yes

Although the results of physical exam usage and category 5 of marital status (widowed) appears to be 100% probability, this result may be erroneous due to the limited sample size responding in this category. If there were a larger sample size, the results may, in fact, be valid due to the influence that death of a spouse might have on the perception of need for preventive health care services for the survivor. The only significant difference in probability of physical exam utilization and marital status, is the decreased probability between married and divorced respondents (60.9% and 27.3%, respectively). These results plus the trends shown by the sample (see Figure 4) do correspond with results proven in previous studies, therefore supporting the validity of this

FIGURE 4

UTILIZATION OF PHYSICAL EXAMS
AS INFLUENCED BY
MARITAL STATUS



study. The one interesting trend is that separated individuals had a higher probability (although not statistically significant) of pursuing this care than marrieds.

The probability of having a physical exam as influenced by formal civilian education also showed the trend expected from a review of previous studies. Although the category 1 and 2 differences were not significant, the trend was visible. Categories 1 and 3 showed a statistically significant rise in probability of utilization with a rise in formal education (see Figure 5).

The final physical exam regression was run on categories of length of service (see Table 5).

Table 5

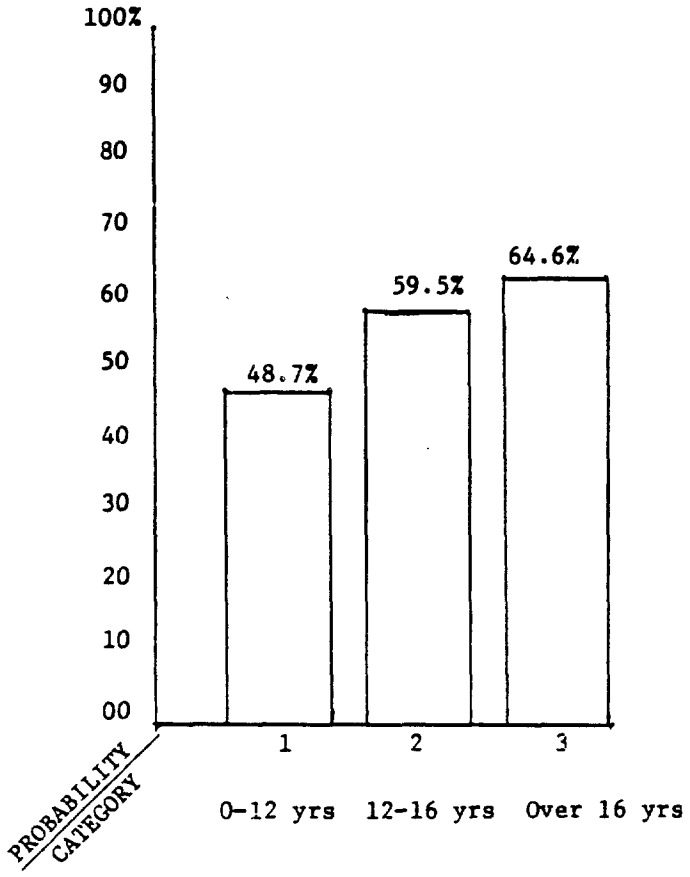
Physical Exams and Military Service

Categories of Length of Military Service	β	Probability of Utilization	t Score	Significance
1	.6792	67.9%	--	--
2	.4655	46.6%	2.6281	Yes
3	.5777	57.8%	1.0203	No
4	.6615	66.2%	0.1949	No
5	.5981	59.8%	0.9843	No

The value for category 1 is significantly higher than that of category 2. This would seem to be contradictory to what is expected and may be explained by the prior-to-entry physical each of these soldiers is required to undergo. Peer pressure may have been in effect in volunteering that they would have had the exam even if it had not been

FIGURE 5

UTILIZATION OF PHYSICAL EXAMS
AS INFLUENCED BY
FORMAL CIVILIAN EDUCATION



required. The trend (Figure 6) shows that with the exception of category 1 (explained above) the individual's probability of seeking this service will rise with increasing time in service until 6-10 years are reached. After that point, the utilization drops off slightly.

Evaluation of Immunization Data

Some interesting repetition of trends noted with physical exams can be noted in the results of the regressions of voluntary utilization of immunizations. The regression results of immunizations as influenced by health care education and familiarity can be respectively seen at Tables 6 and 7.

Table 6

Immunizations and Health Care Education

Categories of Health Care Education	B	Probability of Utilization	t Score	Significance
1	.4468	44.7%	--	--
2	.5312	53.1%	0.8826	No
3	.6216	62.2%	2.8192	Yes
4	.8066	80.7%	3.7101	Yes
5	.6667	66.7%	2.1417	Yes
6	.5227	52.3%	0.8994	No

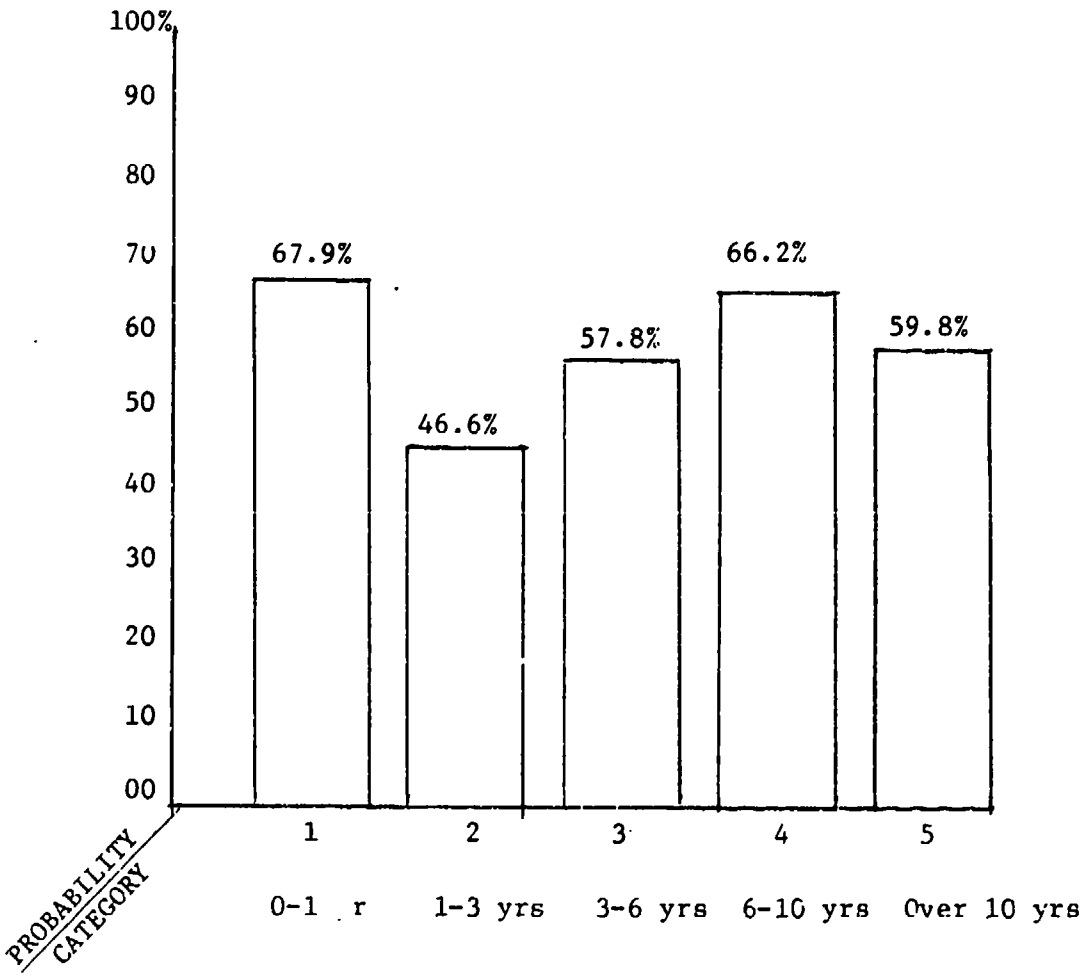
Table 7

Immunizations and Familiarity with the Health Care System

Categories of Familiarity	B	Probability of Utilization	t Score	Significance
1	.4804	48.0%	--	--
2	.5357	53.6%	0.5594	No
3	.6191	61.9%	1.2324	No
4	.7917	79.2%	2.9381	Yes
5	.6818	68.2%	2.8974	Yes
6	.5814	58.1%	1.2259	No

FIGURE 6

UTILIZATION OF PHYSICAL EXAMS
AS INFLUENCED BY
MILITARY SERVICE



Except for categories 2 and 3 in familiarity, the probabilities and trends run very close for both physical exam utilization and immunization utilization. The trends can be easily visualized by comparison between Figures 2 and 7, 3 and 8.

Category 5 in both Health Care Education and Familiarity with the Health Care System maintains significance in view of the dependent variable immunizations. There is less of a decline in utilization after the peak of category 4 than in the physical exam utilization.

Marital Status and Civilian Education also affect the utilization of immunization probabilities similarly to the probabilities of physical exam utilization (See Tables 8, 9 and Figures 9, 10).

Table 8

Immunizations and Marital Status

Categories of Marital Status	R	Probability of Utilization	t Score	Significance
1	.6042	60.4%	--	--
2	.4843	48.4%	2.2099	Yes
3	.6363	63.6%	0.2098	No
4	.2727	27.3%	2.1765	Yes
5	.9999	100.0%	0.8000	No

Table 9

Immunizations and Formal Civilian Education

Categories of Formal Civilian Education	R	Probability of Utilization	t Score	Significance
1	.4869	48.7%	--	--
2	.5696	57.0%	1.3590	No
3	.6105	61.1%	1.8812	No

FIGURE 7

UTILIZATION OF IMMUNIZATIONS
AS INFLUENCED BY
HEALTH CARE EDUCATION

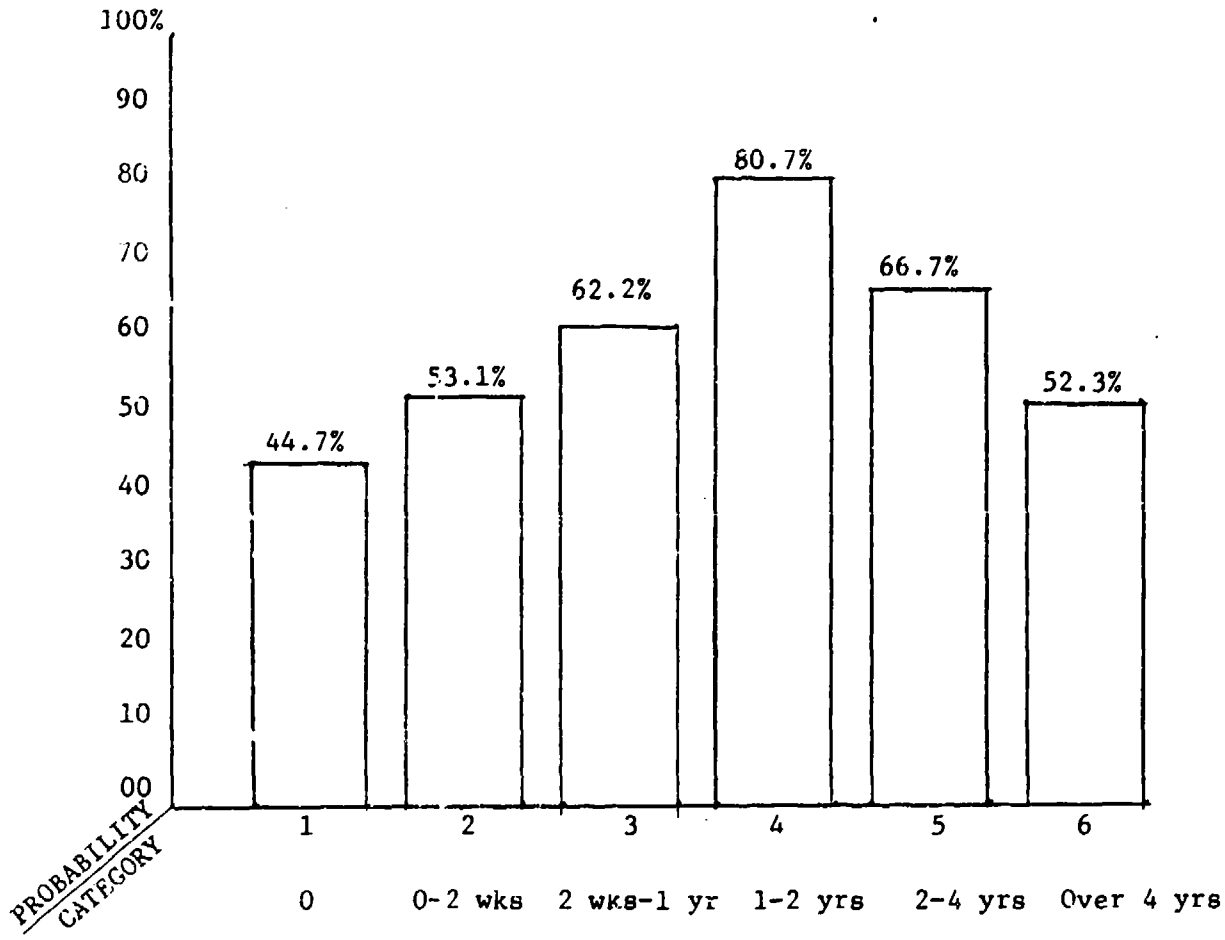


FIGURE 8

UTILIZATION OF IMMUNIZATIONS AS INFLUENCED BY
FAMILIARITY WITH THE
HEALTH CARE SYSTEM

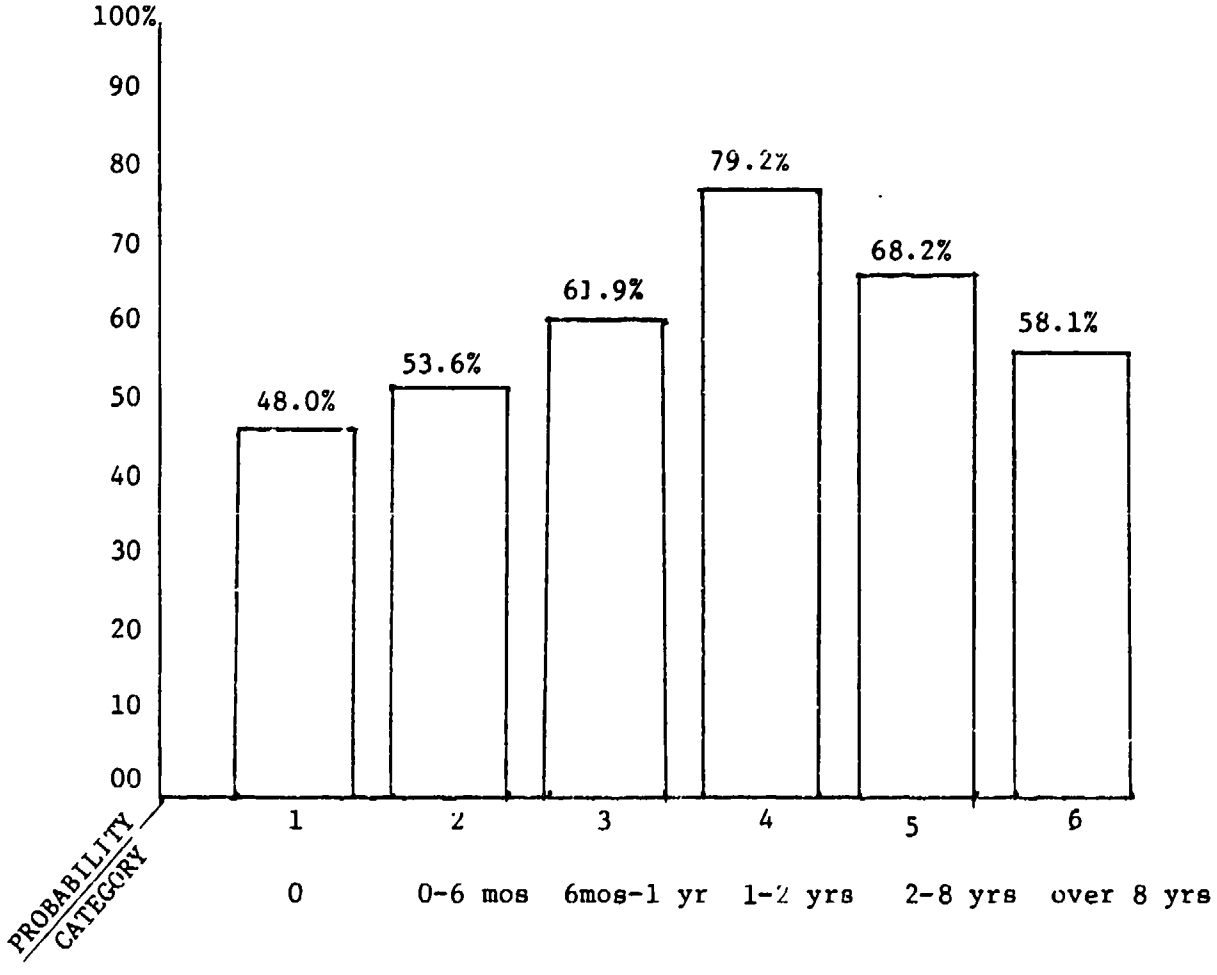


FIGURE 9

UTILIZATION OF IMMUNIZATIONS
AS INFLUENCED BY
MARITAL STATUS

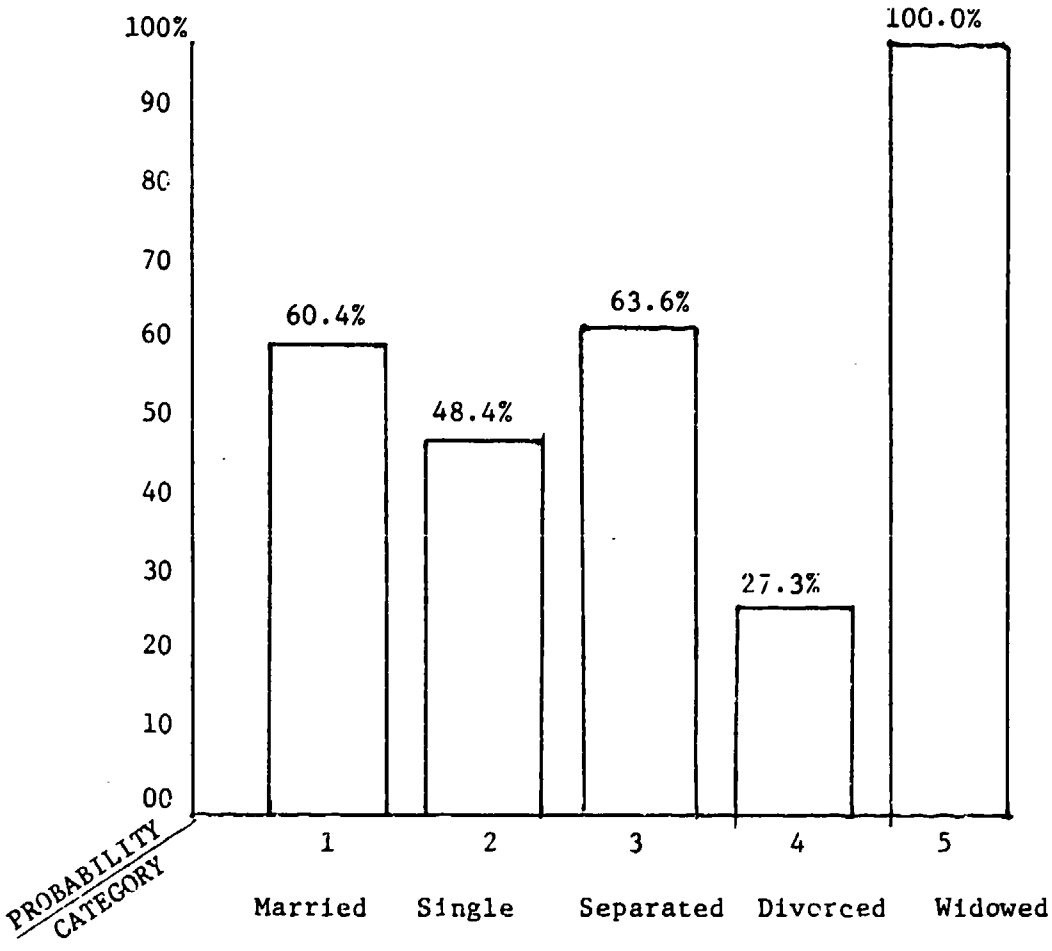
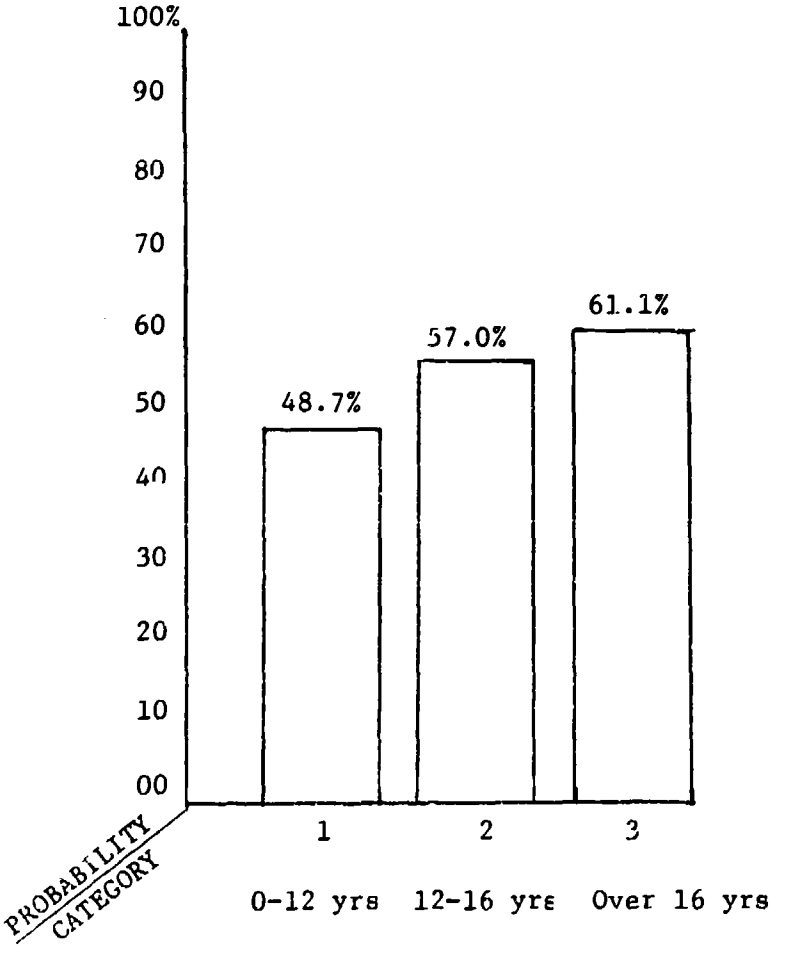


FIGURE 10

UTILIZATION OF IMMUNIZATIONS
AS INFLUENCED BY
FORMAL CIVILIAN EDUCATION



The category 5 of marital status (widowed) again may need to be eliminated due to the sample size. Superimposed, the trends for immunization and physical exams are almost identical.

The trend for immunization utilization as influenced by service follows a more logical pattern. The apparent influence on utilization of physical exams by category 1 is absent in the utilization of immunizations. The trend for the remainder of the categories is similar (see Table 10 and Figure 11).

Table 10

Immunizations and Military Service

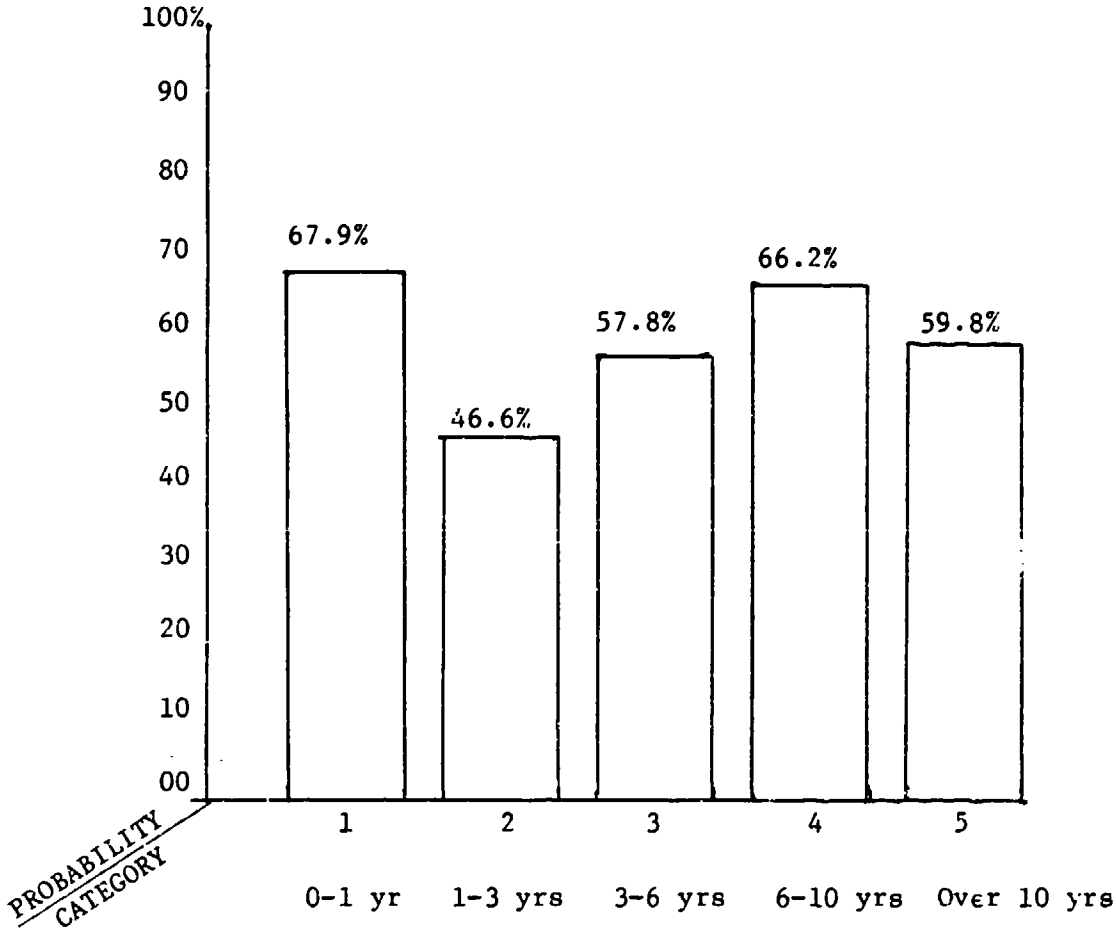
Categories of Military Service	β	Probability of Utilization	t Score	Significance
1	.6792	67.9%	—	—
2	.4655	46.6%	2.6281	Yes
3	.5777	57.8%	1.0203	No
4	.6615	66.2%	0.1949	No
5	.5981	59.8%	0.9843	No

Evaluation of Dental Exam Data

The regressions involving dental exams as the dependent variable reveal a much different picture than those using physical exams or immunizations. The trends varied and there appear to be very few influences which affect probability of utilization with statistical significance. The most important difference is that the probability of voluntary utilization does not fall below 72.7% for any independent variable category. The lowest probability of voluntary utilization is 27.3% for physical exams and 27.3% for immunizations. On the average,

FIGURE 11

UTILIZATION OF IMMUNIZATIONS
AS INFLUENCED BY
MILITARY SERVICE



total utilization of dental exams is higher than the other dependent variables. The results for this variable can be seen at Tables 11-15 and Figures 12-17.

Table 11

Dental Exams and Health Care Education

Categories of Health Care Education	β	Probability of Utilization	t Score	Significance
1	.8085	80.9%	--	--
2	.7812	78.1%	0.3493	No
3	.7656	76.6%	0.8444	No
4	.9032	90.3%	1.1971	No
5	.7778	77.8%	0.3661	No
6	.8409	84.1%	0.4701	No

Table 12

Dental Exams and Familiarity with the Health Care System

Categories of Familiarity	β	Probability of Utilization	t Score	Significance
1	.7696	77.0%	--	--
2	.8214	82.1%	0.6458	No
3	.9524	95.2%	2.0030	Yes
4	.8333	83.3%	0.7416	No
5	.8182	81.8%	0.8614	No
6	.8372	83.7%	1.0119	No

Table 13

Dental Exams and Marital Status

Caegories of Marital Status	β	Probability of Utilization	t Score	Significance
1	.8340	83.4%	--	--
2	.7421	74.2%	2.1050	Yes
3	.7272	72.7%	0.8712	No
4	.9090	90.9%	0.6124	No
5	.9999	100.0%	0.4171	No

FIGURE 12

UTILIZATION OF DENTAL EXAMS
AS INFLUENCED BY
HEALTH CARE EDUCATION

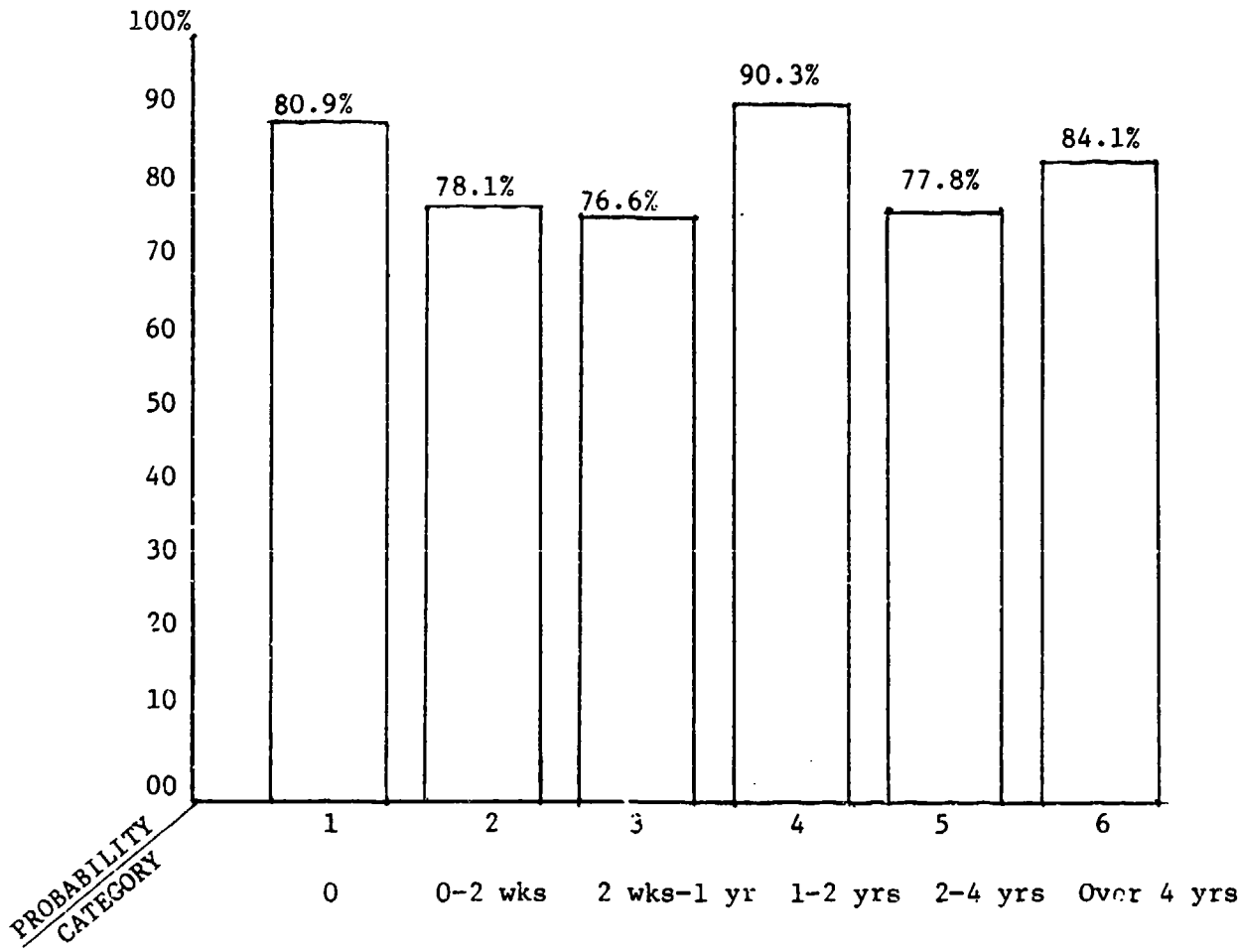


FIGURE 13

UTILIZATION OF DENTAL EXAMS AS INFLUENCED BY
FAMILIARITY WITH THE
HEALTH CARE SYSTEM

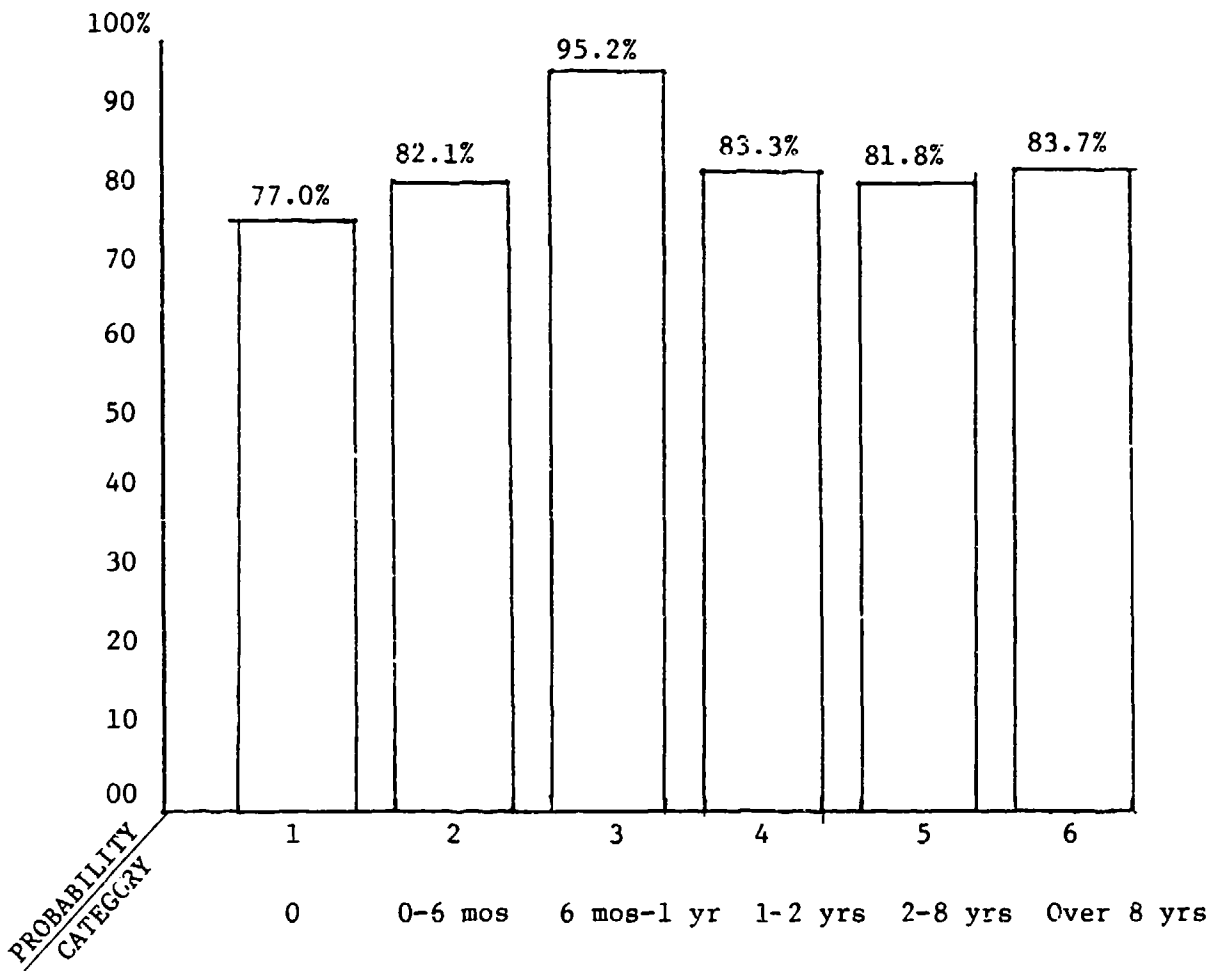


FIGURE 14

UTILIZATION OF DENTAL EXAMS
AS INFLUENCED BY
MARTIAL STATUS

FIGURE 15

UTILIZATION OF DENTAL EXAMS
AS INFLUENCED BY
FORMAL CIVILIAN EDUCATION

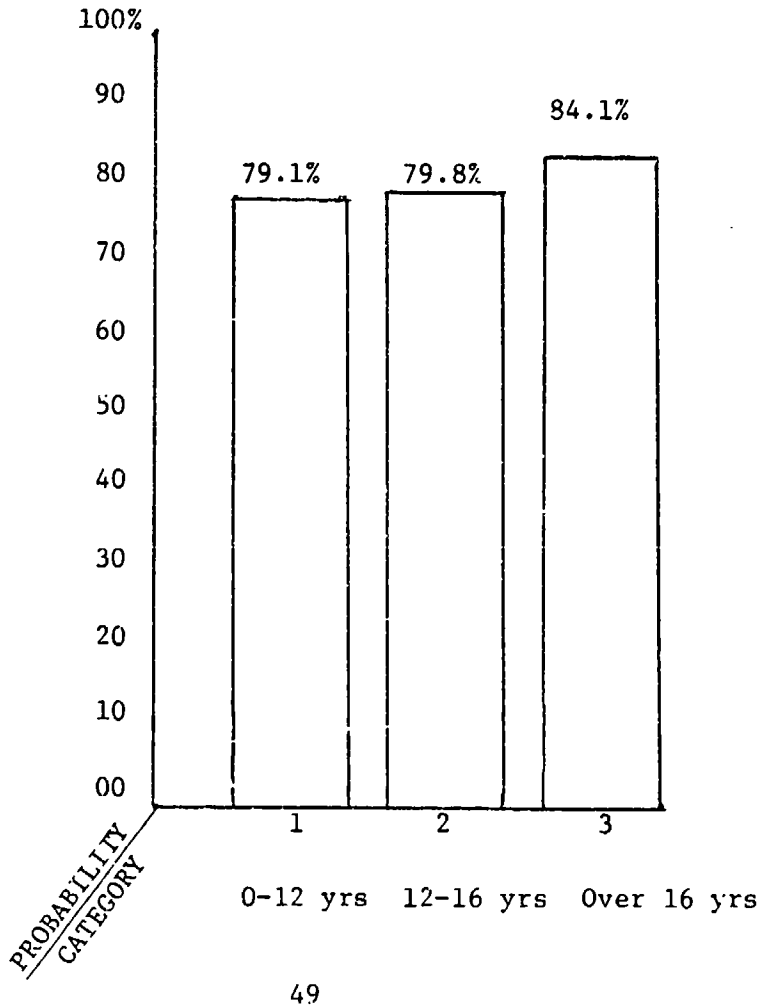


FIGURE 16

UTILIZATION OF DENTAL EXAMS
AS INFLUENCED BY
MILITARY SERVICE

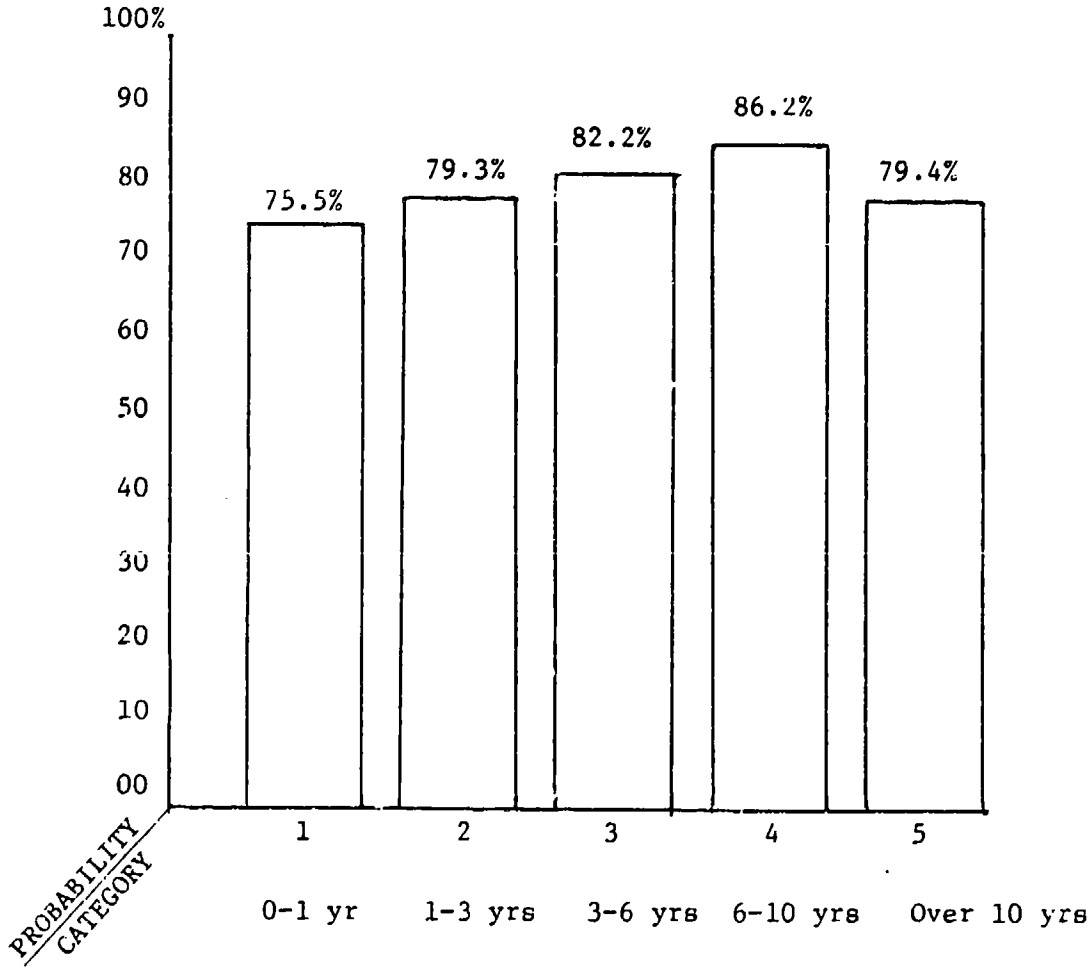


FIGURE 17

TOTAL USE
AS INFLUENCED BY
HEALTH CARE EDUCATION

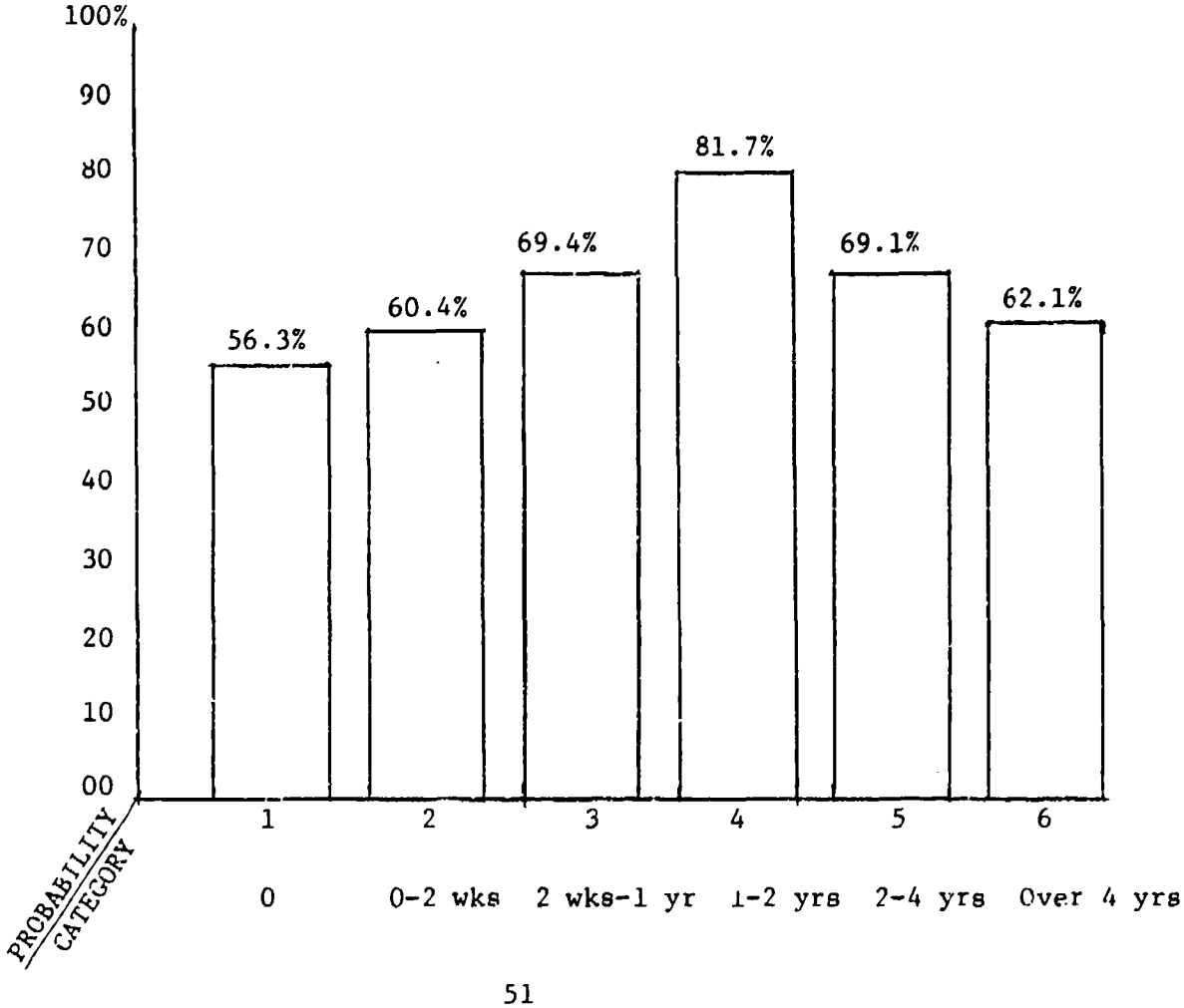


Table 14

Dental Exams and Formal Civilian Education

Categories of Civilian Education	β	Probability of Utilization	t Score	Significance
1	.7913	79.1%	--	--
2	.7978	79.8%	0.1342	No
3	.8407	84.1%	0.9359	No

Table 15

Dental Exams and Military Service

Categories of Military Service	β	Probability of Utilization	t Score	Significance
1	.7547	75.5%	--	--
2	.7931	79.3%	0.5805	No
3	.8222	82.2%	0.8349	No
4	.8615	86.2%	1.4467	No
5.	.7944	79.4%	0.5916	No

Evaluation of Use Data

After each dependent variable was examined for its own trends and the statistical significance of those trends, a composite picture of the overall utilization of the three services (as an indicator of general preventive health care services) was reviewed. The regressions reveal the amount of services that, on the average, can be expected to be voluntarily utilized by individuals in each category of independent variables. It is seen in Tables 16-20 and Figures 17-21 that the trends within the independent variables follow closely those of physical exams and immunizations. Because of the similarity of the results of those

two services, their 66% influence on the overall picture can be readily seen.

Table 16

Use and Health Care Education

Categories of Health Care Education	β	Incidence of Utilization	t Score	Significance
1	1.6879	56.3%	--	--
2	1.8124	60.4%	0.6550	No
3	2.0810	69.4%	3.1914	Yes
4	2.4515	81.7%	3.9656	Yes
5	2.0740	69.1%	1.8934	No
6	1.8636	62.1%	1.0479	No

Table 17

Use and Familiarity with the Health Care System

Categories of Familiarity	β	Incidence of Utilization	t Score	Significance
1	1.7696	59.0%	--	--
2	1.8571	61.9%	0.4449	No
3	2.0952	69.8%	1.4546	No
4	2.4999	83.3%	3.4647	Yes
5	2.1060	70.2%	2.4321	Yes
6	1.9767	65.9%	1.2637	No

Table 18

Use and Marital Status

Categories of Marital Status	β	Incidence of Utilization	t Score	Significance
1	2.0298	69.9%	--	--
2	1.7423	58.1%	2.6685	Yes
3	2.0910	69.7%	0.2025	No
4	1.3637	45.5%	2.2009	Yes
5	3.0000	100.0%	0.9869	No

Table 19

Use and Formal Civilian Education

Categories of Civilian Education	β	Incidence of Utilization	t Score	Significance
1	1.7478	58.3%	--	--
2	1.9177	63.9%	1.4071	No
3	2.0973	69.9%	2.6790	Yes

Table 20

Use and Military Service

Categories of Military Service	β	Incidence of Utilization	t Score	Significance
1	1.8867	62.9%	--	--
2	1.6809	56.0%	1.2692	No
3	1.9110	63.7%	0.1224	No
4	2.2460	74.9%	1.9859	Yes
5	1.9999	66.7%	0.6892	No

FIGURE 18

TOTAL USE AS INFLUENCED BY
FAMILIARITY WITH THE
HEALTH CARE SYSTEM

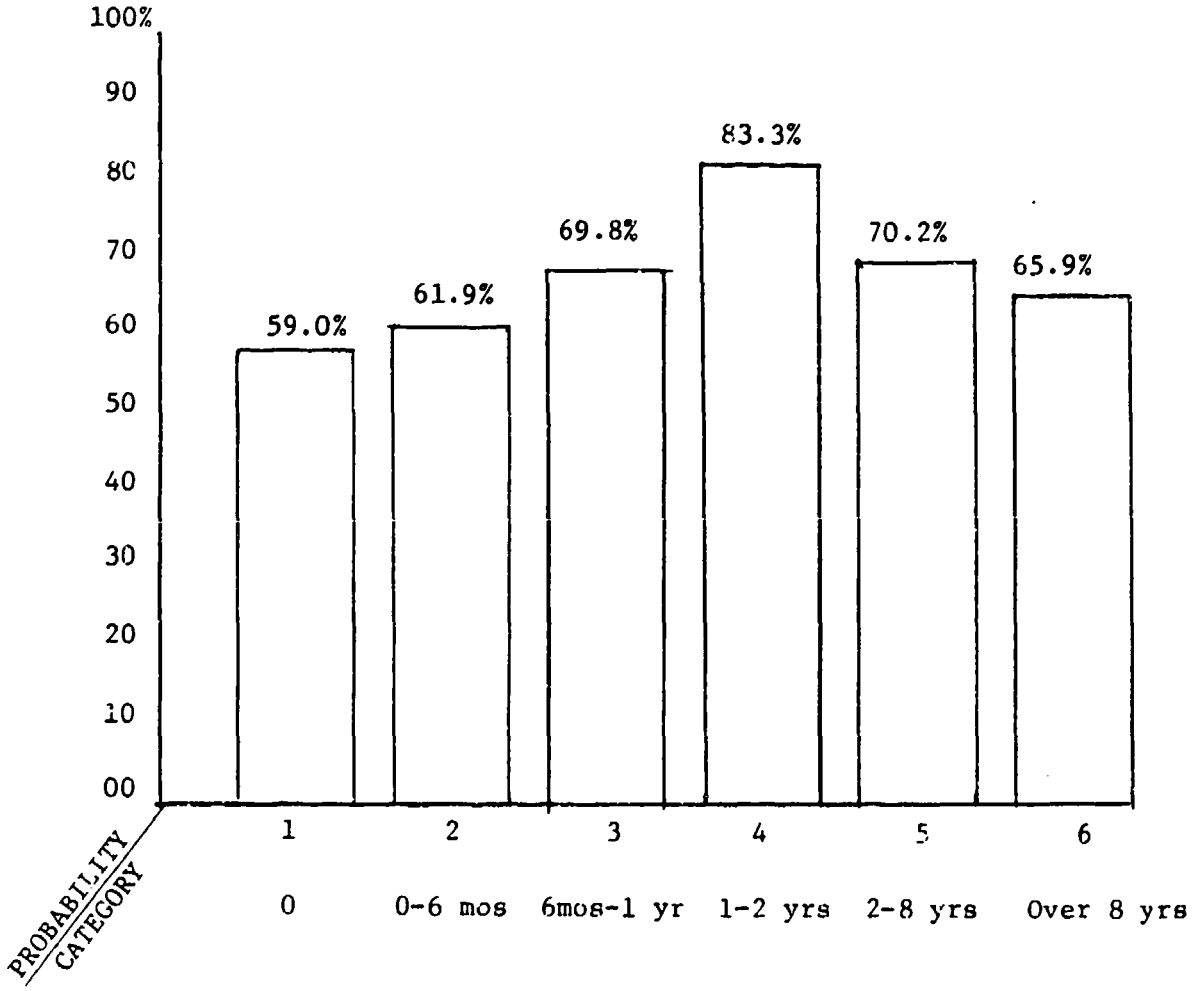


FIGURE 19

TOTAL USE
AS INFLUENCED BY
MARITAL STATUS

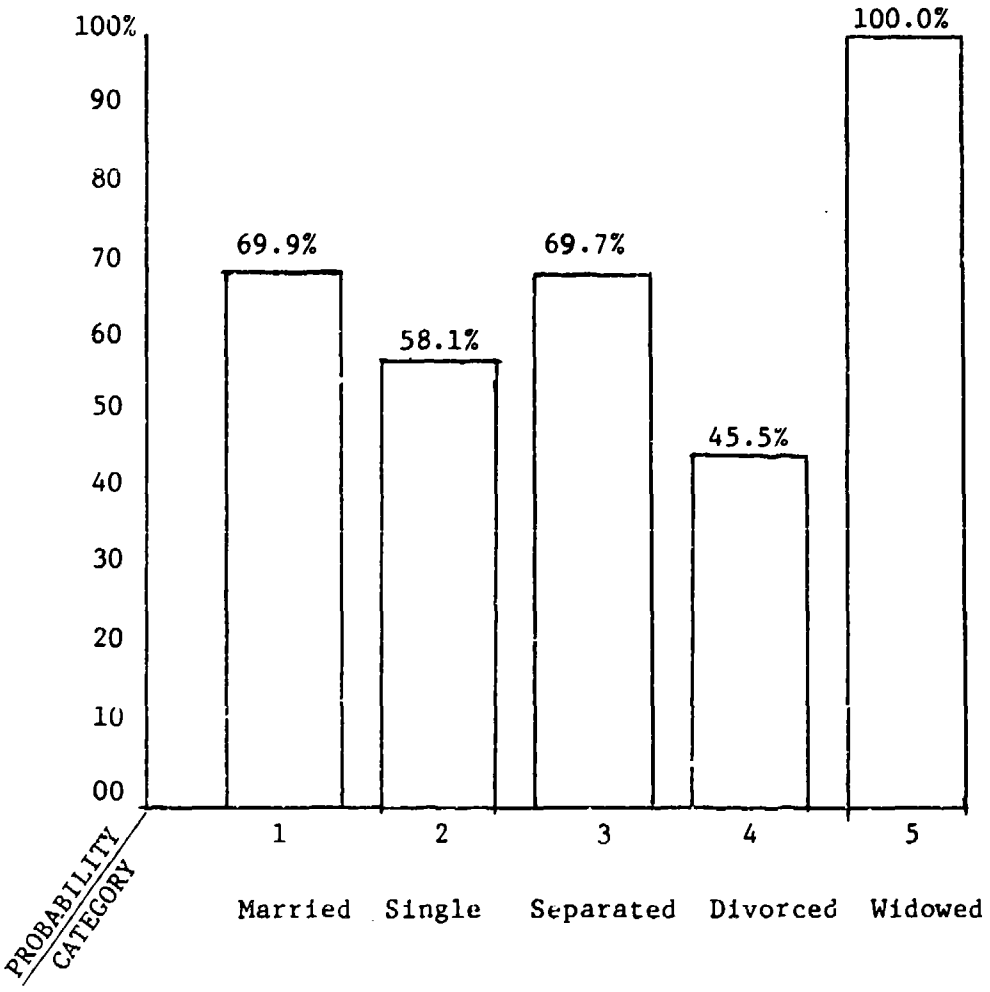


FIGURE 20

TOTAL USE
AS INFLUENCED BY
FORMAL CIVILIAN EDUCATION

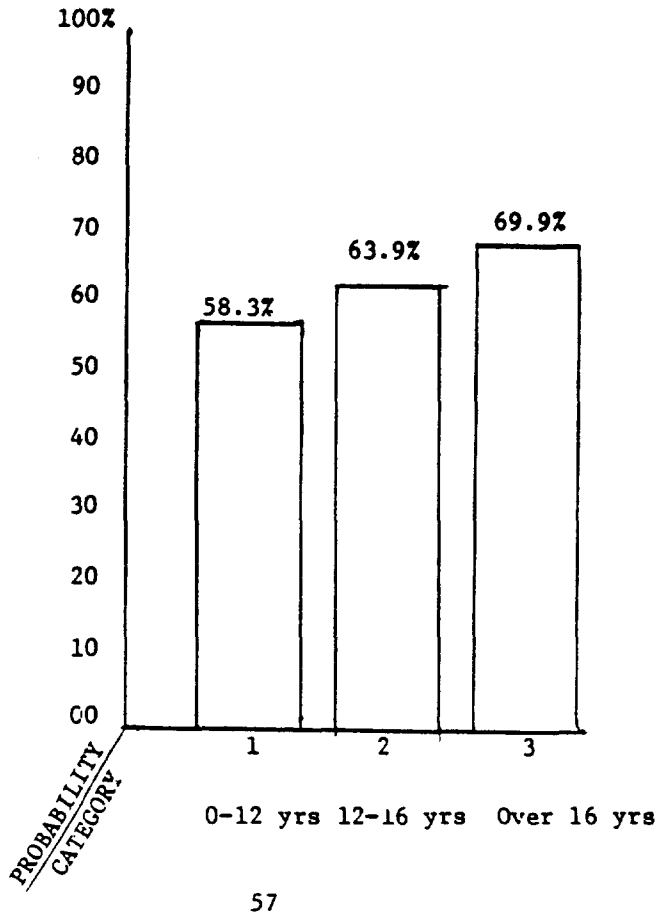
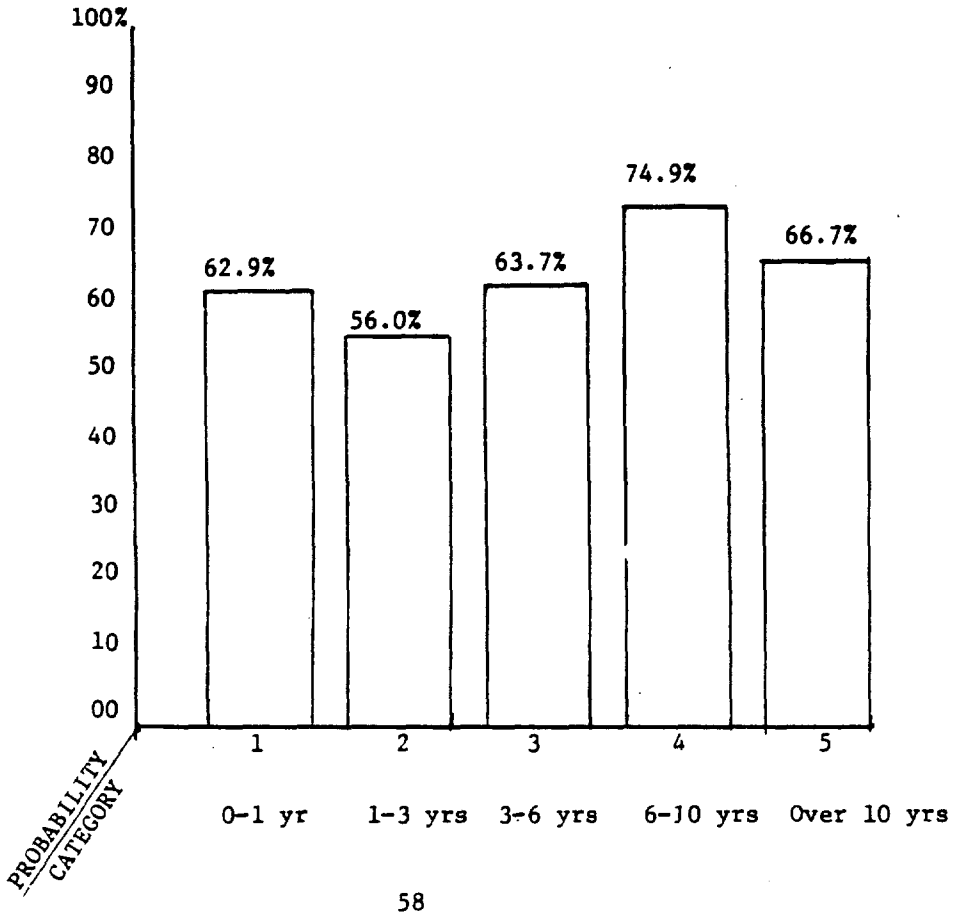


FIGURE 21

TOTAL USE
AS INFLUENCED BY
MILITARY SERVICE



Comparison of the Independent Variables

Reviewing the results of the regressions, several general trends are revealed. The influence of the two independent variables of concern, health care education and familiarity with the health care system, is obvious. There is a definite impact on utilization of preventive health services with both 1-2 years of health care education and 1-2 years of time spent working in a health care facility. Beyond that point in both variables, there is a diminishing return in utilization. There may be several influencing factors: (1) a little knowledge increases perception of need while greater knowledge begins to produce greater skepticism regarding the real efficacy of some of the preventive procedures; (2) some familiarity with the system reduces its alienating aura and increases ease of entry into the system for personal health care while greater familiarity produces a blase' attitude toward pursuit of preventive self treatment (the long term health care worker often begins to seek fragmented care for himself due to the ease of "side-walk consultation" and, therefore, avoids more universal preventive health care measures); (3) as both health education and familiarity increase, knowledge from formal and on-the-job observation of treatment for some illnesses and/or disease entities increase; it appears that after 1-2 years this knowledge may increasingly be used for self-treatment and avoidance of the formal preventive health measures.

The trend observed in immunization is confusing. Individuals with

greater time spent in working within a health care system and greater time spent within the military service (generally some of the older respondents) would be expected to have a greater perception of need for immunizations. Because of the mobility between both this country and less developed nations, these individuals would be expected to have either seen non-immunized populations and the resultant spread of disease or have knowledge of it through other personnel. This effect obviously is not being seen since even in the immunization regressions there is a reduction of utilization in the latter categories.

There would appear to be other factors interacting here than strictly perceived susceptibility or perceived seriousness of the consequences of not maintaining current immunizations as discussed on page 15. Health care workers and individuals with greater health care education may reach a point where their "illusion of immortality" is strengthened by their educational or working experience. Although not unaccustomed to seeing death, it is always someone else's. The ability to help others avoid death may influence a health care worker's feeling that he/she can avoid serious complication of disease or illness without the pursuit of preventive measures, an "it can't happen to me" belief. Although not addressed by this study, physicians would probably be the most susceptible to this influence.

One result of this study is obvious; the senior health care provider does not put into personal practice those preventive health care

measures which he espouses to others as an integral part of their health regimen. Although the senior provider has a slightly greater incidence of utilization of preventive health care, it is not significantly more than the individual with no education in the health field or familiarity (as defined by this study) with the system.

Discussion of Questionnaire Development

Although there was little indication that the questionnaire was not clear and comprehensible, some areas evolved which did not yield the expected results. Some of these are as follows:

1. Question 12 should have been directed to any category of marital status who presently has or has had a spouse. Although divorced, widowed, or separated, the spouse's influence may still be evident.

2. Question 13 should have been allowed one or more answers. There was also a typographical error--food source instead of food service which may have caused confusion.

3. Question 14c-f was confusing to those persons having multiple experiences which resulted in possible yes and no responses. It would have produced an answer closer to the one desired if the question would have requested the usual experience of the individual in those categories.

4. Question 17 did not elicit the needed response because of poor wording and unclear intent. To have elicited the desired information, the question should have been directed to all respondents asking for

their impression of what prompts them to seek preventive health care services.

Although the questionnaire appears to request a great amount of information which has been unused in this study, it was so designed to provide information for other studies.

III. CONCLUSIONS AND RECOMMENDATIONS

Conclusions

The study of preventive health care utilization as influenced by health care education and familiarity with the health care system has revealed some interesting and unexpected results. Although the statistical significance of the results appeared only in a minimum number of the regressions, the trends revealed adequate information to draw some valid conclusions. It becomes obvious that the trend toward utilization of preventive services increases with additional health care education and familiarity with the health care system to 1-2 years in either category. After 1-2 years there is a decreasing utilization of the services.

The applicability of these results in the marketing of preventive health care services would be valuable. Since there is no significant increase in utilization of the services in up to one year of health education or familiarity, there would be little effect on use by employing short courses or simply exposure to the system. The trends are seen in length of service and utilization can help pinpoint specific evidences to which emphasis on preventive health care services should be directed.

One significant consideration in marketing preventive services

would be to examine closely the reason that within the military service there is such a high percentage of voluntary utilization of dental exams. This high utilization within the military community can be contrasted with previous studies in the civilian community which show that due to dollar costs of dental services, these services have a low marginal utility when compared to other household needs.

The results of this survey appear valid in their reaffirmation of results from previous studies regarding preventive health care utilization as influenced by marital status and formal civilian education. While the results of the regression of use with formal civilian education reaffirms the previous studies discussed in the literature review (pages 11-13), the results of the regression of use with health care specific education refutes previous studies. The opposite trends also indicate that there is a definite differentiation of affect based on the subject matter (i.e., health care) studied in higher education. One population in which marketing or preventive health care services would be important, if it is believed that these services will reduce health care costs and illness, would be our more senior health care providers.

Recommendations

Due to the great diversity in the trends resulting from physical exam and immunization use vis a vis dental exam use, this would provide fertile ground for further study and possible application to marketing of the other health care services. Additionally, the further research

into the reasons why dental exams are so well utilized in the military when they are poorly pursued in the civilian sector may provide interesting data for use in the evaluation of limits of National Health Insurance coverage in this area.

Other studies which may be performed from the data available from the data collected would be in any of the factors already discussed in this paper and their interrelationship with the following: sex, rank, income, years of military service, marital status, spouse education or familiarity, knowledge of how to get an appointment, perceived knowledge of the system, time required to get an appointment, and time free from duty to go to an appointment. Additional conclusions could be drawn regarding the use of preventive health care services.

Because the military provides free health care, emphasis on the use of preventive forms for care could reduce the drain on scarce resources, especially physicians. It, therefore, behooves the researcher to continue to determine the efficacy of the present preventive care delivered and the reasons individuals do or do not utilize that care. It remains the burden of the health care system itself to help its eligible population change its preference from Montagu's "spear" to the "shield."

APPENDIX A

DEFINITIONS

DEFINITIONS

Familiarity--knowledge of the health care system measured in terms of time spent working in a health care facility.

Health care education--formal education within a medical or health discipline.

High school education or equivalent--diploma from a high school, successful results on a high school G.E.D. test, or successful completion of the Army entrance examinations.

Preventive health care--activity undertaken by persons who believe themselves to be healthy, for the purpose of preventing or detecting disease in an asymptomatic state.

Preventive health care services--physical examinations, dental examinations, immunizations, Papanicolaou smear/breast examinations.

APPENDIX B

COPY OF QUESTIONNAIRE

QUESTIONNAIRE

The purpose of this questionnaire is to determine how medical education and familiarity with the health service system affect the use of preventive health services. Your honest response to the questions presented below would be sincerely appreciated. Please complete the questionnaire by filling in the blank on the first question with the appropriate answer. On the remaining questions, place an X on the line indicating the one response which best describes your experience.

1. Age:_____ Rank (CPT, E-4, etc.):_____ Sex: Male_____ Female_____

2. Years in the active military:
   _____Less than 1, _____1-3, _____3-6, _____6-10, _____More than 10

3. Present job status:
   _____Student, _____On-the-job training, _____Working on the job

4. Marital status:
   _____Married, _____Single, _____Separated, _____Divorced, _____Widowed

Questions 5-8 refer to your experience during the <u>last two years</u>:

5. a. Have you had a physical exam or checkup? Yes____ No____

   b. If <u>a</u> is yes, was it required by regulation or order? Yes____ No____

   c. If required, would you have had it if it were not required or ordered? Yes_____No_____

6. a. Have you had any immunizations? Yes_____No_____

   b. If <u>a</u> is yes, were they required by regulation or order? Yes_____No_____

   c. If required, would you have had it if it were not required or ordered? Yes_____No_____

7. a. Have you had a dental checkup? Yes_____No_____

   b. If a is yes, was it required by regulation or order? Yes_____No_____

   c. If required, would you have had it if it were not required or ordered? Yes_____No_____

8. (Question 8 to be answered by Females only).
   a. Have you had a breast exam or PAP smear? Yes_____No_____

   b. If a is yes, was it required by regulation or order? Yes_____No_____

   c. If required, would you have had it if it were not required or ordered? Yes_____No_____

9. Are you a high school graduate? Yes_____No_____

10. How many years of civilian education have you completed?
    _____12 or less _____12-16 _____More than 16

11. a. Have you had any health care or medically oriented education after high school (to include any medical training given by the military)?
    _____Yes _____No

    b. If a is yes, how much?
    _____Less than 2 weeks _____2-4 years
    _____2 weeks to 1 year _____More than 4 years
    _____1-2 years

    c. If a is yes, where did you receive it?
    _____Civilian _____Military _____Both

12. (Question 12 to be answered by married respondents only).
    a. Has your spouse had any health care or medical education?
    _____Yes _____No

    b. Has your spouse ever worked in a hospital or other health care facility? _____Yes _____No

13. a. Have you ever worked in a hospital or health care facility?
_____Yes _____No

b. If a is yes, how long?
_____Less than 6 months
_____6 months to 1 year
_____1-2 years
_____2-8 years
_____More than 8 years

c. If a is yes, where?
_____Civilian _____Military _____Both

d. If a is yes, what kind of job did you have?
_____Direct Patient Care (Ward)
_____Direct Patient Care (Clinic)
_____Ancillary (Physical Therapy, Occupational Therapy, X-ray, lab, food source)
_____Support or Administrative (HQ, Supply, Maintenance, Clerical)
_____Other

Questions 14-16 refer to the health care system on the post where you are located for your present duty (or student) assignment:

14. a. Do you know how to get an appointment at the hospital? Yes_____No_____

b. Have you ever tried to get an appointment? Yes_____No_____

c. If b is yes, was an appointment available within a reasonable period of time? Yes_____No_____

d. If b is yes, were you able to have time free from duty to go to the appointment? Yes_____No_____

e. If b is yes, were the hospital personnel cooperative? Yes_____No_____

f. If b is yes, did you have to wait long in the clinic for your appointment? Yes_____No_____

15. a. Do you believe you know what health care services are available? Yes_____No_____

b. Do you know where the different clinics, emergency room, pharmacy, and dental clinic are physically located? Yes_____No_____

c. Do you have transportation to and from you duty assignment to an appointment? Yes_____No_____

16. How well do you think you understand how the military health care system is organized and functions on your post?
_____Very well, _____Well, _____Some but not well, _____Not at all

17. If you have not had any of the health care services listed in questions 7-10 (physical exam, immunizations, dental checkup, or breast/PAP smear) in the past 2 years, what would have prompted you to do so?

(Mark as many of the following answers as you believe apply).
_____An on-duty orientation on how to get an appointment.
_____Being able to get appointment sooner.
_____Time free from duty to go to an appointment.
_____More cooperation from hospital personnel.
_____Less waiting time when you arrive at the clinic for your appointment.
_____An on-duty orientation on what services are available.
_____An on-duty orientation on the physical layout of this post's hospital facility.
_____Transportation provided to and from the appointment.

Thank you for your time and sincere responses.

Sandra L. Hamper
Major, Army Nurse Corps
Health Care Administration Student
Academy of Health Sciences

CATEGORIES OF INDEPENDENT VARIABLES

(A) Health Care Education (HCE)

Category	Explanation
1	No formal HCE after high school
2	Less than 2 weeks of HCE after high school. This would include MOS 91A training.
3	2 weeks to 1 year HCE after high school. This would include MOS 91B, some 91C (or Licensed Practical/Vocational Nurse), and several non-nursing medical specialties.
4	1-2 years HCE after high school. These are advanced specialists within the MOS.
5	2-4 years HCE after high school. These are highly trained specialists and some of the professional personnel (Registered Nurses, Pharmacists, Laboratory, etc.).
6	More than 4 years HCE after high school. Included here are personnel with graduate education. (Physicians, dentists, veterinarians, and advanced education in previous categories).

(B) Familiarity

Category	Explanation
1	Never worked in a hospital or health care facility.
2	Less than 6 months of work in a hospital or health care facility.
3	6 months to 1 year of work in a hospital or health care facility.
4	1-2 years of work in a hospital or health care facility.
5	2-8 years of work in a hospital or health care facility (first and second termers).
6	More than 8 years of work in a hospital or health care facility (medical careerists).

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(C) Marital Status

Category	Explanation
1	Married
2	Single
3	Separated
4	Divorced
5	Widowed

(D) Years of Civilian Education

Category	Explanation
1	12 years or less
2	12-16 yeears (some college and baccaleaureate graduates)
3	More than 16 years (graduate education)

(E) Years of Active Military Service

Category	Explanation
1	Less than 1 year
2	1-3 years (1st termers)
3	3-6 years (2nd termers)
4	6-10 years (3rd termers)
5	More than 10 years (career)

APPENDIX C

CATEGORIES OF INDEPENDENT VARIABLES

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