

Classification of patients seeking dental care using Discriminant Analysis

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ABSTRACT

Objective:

1. To classify patients seeking preventive or curative dental care and determining factors important to classify them using discriminant analysis.
2. To determine factors considered important by patients for choosing a dentist and to determine most important factors considered by patients using factor analysis.

Methods: An exploratory research design was used to get insights to develop the attributes for classifying dental patients seeking dental care either preventive or curative care using discriminant analysis, conducted in few private hospitals and clinics in Delhi and NCR region. The study is largely based on the primary data collected from respondents using questionnaires. Second part of the study is FACTOR ANALYSIS for determining factors considered most important for choosing a dentist amongst various factors studied or surveyed using SPSS software. Fourteen variables were grouped into components and correlation between various variables was studied. Factors were identified which explained correlation amongst set of variables.

Conclusion: Amongst all predictor variables - AGE, INCOME, DISTANCE and ATTITUDE TOWARDS DENTAL TREATMENT, were variables responsible for discriminating between dependent variables .i.e., preventive and curative dental care. i.e., amongst all predictor variables.

Keywords: Predictor variables, Exploratory study, Dependent Variables, Independent Variables, Preventive care, Curative care, Discriminant Analysis, Factor Analysis.

INTRODUCTION

Preventive care is a modern approach to dentistry. Preventive dentists and hygienists aim to reduce the amount of dental treatment that you need by working together with you to maintain a healthy mouth. The hope is to avoid the traditional cycle of fillings and extractions. Preventive dentistry can help you to keep your own teeth for a lifetime. With the advent of new technologies, though curative treatment is easily available but the emphasis for good dental health is on preventive dental care.

OBJECTIVES

1. To classify patients seeking preventive or curative dental care and determining factors important to classify them using discriminant analysis.
2. To determine factors considered important by patients for choosing a dentist and to determine most important factors considered by patients using factor analysis.

In consistent with the broad objective, the specific objectives are as follows:

- i. To develop discriminant function of the predictor, or independent variables, which will best discriminate between the categories of the criterion or dependent variable.
- ii. To examine whether significant differences exist among the groups 'in term of the predictor variables'.

iii. To determine which predictor variables contribute to most of the inter group differences.

iv. To classify cases to one of the groups amongst preventive or curative dental care based on the values of the predictor variables.

THEORY

Discriminant function analysis is used to determine which continuous variables discriminate between two or more naturally occurring groups.

Discriminant Analysis

Discriminant analysis is a technique for analyzing data when the criterion or dependent variable is categorical and the predictor or independent variables are interval in nature.

Factor Analysis

Factor analysis using SPSS software is used for determining factors considered most important for choosing a dentist amongst various factors studied or surveyed.

RESEARCH METHODOLOGY

Sampling Design Process:

i. **Instrument:** An exploratory research design was used to get insights to develop the attributes for classifying dental patients seeking dental care either preventive or curative care using **discriminant analysis**. The study is largely based on the primary data collected from respondents using

questionnaires for conducting the survey we developed a questionnaire to collect data. By conducting survey with closed ended structured questionnaire and collecting data using questionnaire for collecting attributes classifying patients seeking either preventive or curative dental care and collecting information for various factors responsible for classifying it. Discriminant analysis is used to find determinant factors responsible for differentiating types of dental treatment i.e., preventive treatment and curative treatment. Factors were considered and using factor analysis was categorized to determine the factors important, while choosing a dentist. Data is collected using questionnaire. The response on this questionnaire will be on five point scale (**likert scale**) for factor analysis of describing factors responsible for choosing a dentist.

ii. Target Population:

The target population for the study was as follows:

Outpatient department patients coming for dental care in private dental college, i.e., Krishna dental college and various private clinics.

iii. Sample size

Sample size: The respondents were 150 patients in private dental college and hospital and clinics.

iv. Sample characteristics: 150 Respondents were being chosen from dental college and hospitals of diverse age group where mean age was 35.67 ± 11.87 , with different education background dividing into illiterate, school education and higher group education having 14 years of education as mean, i.e., $14 \text{ years} \pm 5.8$, though majority of people were from higher education group. Respondents were surveyed by a questionnaire from various income groups, i.e., unemployed, business people, skilled jobs and unskilled workers. Amongst all income groups half of the subjects were from population of unemployed or housewife i.e. approximately 74. Respondents were also coming from various distances in which average distance was $5 \text{ kms} \pm 4.3 \text{ kms}$. Both gender i.e., males and females were approximately equal in proportion.

RESULTS & DISCUSSIONS

Survey results were checked for any missing data and analyzed using SPSS. The following is the summary of the results generated using SPSS. Descriptive analysis was used to study various factors responsible for differentiating between preventive and curative factors.

Amongst various factors studied, Predictor variables considered under this study were: *Age, Gender - M / F, Education, Occupation, Income (Annual Income in lacs), Distance from clinics, Attitude towards requirement of dental treatment-*

(Very Important / Important / Casual / Not important). Also Dependent variables were preventive and curative dental care:

- a) Preventive – Routine check – up, Fluoride application Scaling or cleaning of teeth.
- b) Curative - Filling, RCT , Extraction (removal of teeth) , Prosthesis (artificial teeth) , Implant , Gum Surgery

Amongst all predictor variables - AGE, INCOME, DISTANCE and ATTITUDE TOWARDS DENTAL TREATMENT, were variables responsible for distinguishing between dependent variables .i.e., preventive and curative dental care. i.e., amongst all predictor variables.

In this study, Majority of the study subjects (70%) sought curative treatment as compared to preventive(30%) treatment, but differences amongst preventive and curative treatment were best discriminated for factors - age, income, distance and attitude towards dental treatment.

Considering factors of age, Preventive treatment was sought more by subjects up to 35 years of age as compared to subjects aged more than 35 years. Curative treatment was sought more by subjects aged more than 35 years. Subjects seeking preventive treatment under 35 years of age were 4 times more than Subjects who were above 35 years of age.

Preventive treatment was sought more by subjects with higher education as compared to subjects who are illiterate and having school education and Curative treatment was also sought more by subjects with higher education as compared to subjects who are illiterate and having school education. The difference between subjects seeking preventive and curative treatment on the basis of education i.e. illiterate, school education and higher education being insignificant.

Preventive treatment was sought more by subjects with income group up to 2 lacs as compared to subjects who have nil income and income group greater than 2 lacs. Curative treatment was also sought more by subjects with nil income groups as compared to subjects who have income up to 2 lacs and greater than 2 lacs respectively.

There was no significant difference between subjects seeking preventive treatment subjects residing up to 5 Kms and greater than 5 Kms.

Curative treatment was sought more by subjects coming from distance group greater than 5 Kms as compared to subjects who are coming from distance up to 5 Kms.

Preventive treatments were sought more by males as compared to females and Curative treatment was sought more by female subjects.

Subjects who were unemployed, or retired personnel or may be female subjects who were housewives were seeking approximately three times

curative care as compared to preventive dental care. Though there was major difference in seeking curative care as compared to preventive care in subjects who are housewives and unemployed, which is not the case with subjects who are unskilled workers in which subjects have more preferences towards curative treatment but there are less difference than preventive treatment

CONCLUSION

Amongst various factors studied, Predictor variables considered under this study were: Age, Gender - M / F, Education, Occupation, Income (Annual Income in lacs), Distance from clinics, Attitude towards requirement of dental treatment- (Very Important / Important / Casual / Not important). Also Dependent variables were preventive and curative dental care:

- a) Preventive – Routine check – up, Fluoride application Scaling or cleaning of teeth.
- b) Curative - Filling, RCT, Extraction (removal of teeth), Prosthesis (artificial teeth), Implant, Gum Surgery

Amongst all predictor variables - AGE, INCOME, DISTANCE and ATTITUDE TOWARDS DENTAL TREATMENT, were variables responsible for discriminating between dependent variables. i.e., preventive and curative dental care. i.e., amongst all predictor variables

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