

Some Statistical Models to Study Blood Pressure Phenomena in the Western Region of Saudi Arabia

Bakri M. Assas, Abd-Allah M. Abdelfattah and Ezz H. Abdelfattah
Dept. of Statistics, Faculty of Science, King Abdulaziz University
Jeddah, Saudi Arabia

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Introduction

The normal blood pressure in adults is approximately 120mm Hg systolic, and the diastolic pressure is approximately 70-80 mm Hg. Hypertension or high blood pressure occurs when the systolic blood pressure is more than 140 mm Hg and the diastolic more than 90 mm Hg.

Hypertension or high blood pressure is sometimes known as "silent killer". If hypertension is not kept under control, it may lead to the damage of heart and vessels, and consequently lead to stroke, heart attack, and kidney failure or heart failure.

With increase in the changes in the environments such development of cities, industries, and the life style of the population, a healthy ancestral values of keeping a person energetic, healthy, strong and fit, have been replaced by easy way of lifestyle with full artificial facilities of air-conditioning, easy transportation and consumption of fattening garbage food and chemical drinks.

The human blood pressure is affected by many factors such as food (red meat, high cholesterol food, and salts) habits, age, obesity, sex, marital status, occupation, smoking, diseases such as tumor, cancer, kidney, HIV etc. AbdulRahman (1995), Assas (1999), Puvath (1995), Campbell (1994),

Dresster (1992) and Maedougall (1992) discussed various aspects on the causes of hypertension and the statistical analyses.

Method of Study

Blood pressure is a very common disease in Saudi Arabia. Due to this factor, the research study was targeted in this work. Last year, data was collected from two private clinics in the Holy City of Makkah to execute the work. The medical experts gave us good medical aspects for the disease and briefed us about record keeping of all patients treated, which consists of recording the observations as the disease progresses and the treatments given to each patient.

The considered variables include gender, marital status, occupation, weight, age, height, number of sons and daughters, smoking and food habits, and blood pressure, through a sampling of 350 patient cases. For data recording purposes, a file was created for each patient that contains all the necessary information. The information supplied was in the form of data matrix consisting of 350 observations for each of 186 male and 164 female patients suffering from high blood pressure

The statistical techniques employed for analyzing the data included analysis of variance, multiple regression analysis and the Chi-square tests for testing the association between pairs of variables.

The importance of statistics stems from its usefulness. Statistics is concerned with the collection and analysis of data in order to obtain a better understanding of a phenomenon and its methods have proved relevant to a very wide range of subjects.

The aim of this study is to demonstrate the usefulness of various statistical tools, using the information collected about blood pressure.

Discussion

High blood pressure is an important risk factor. This risk increases progressively with increasing blood pressure. The blood pressure is usually recorded as two measures, namely diastolic blood pressure and systolic blood pressure. We concentrate on diastolic blood pressure because it is more reliable than the systolic, since the last one is affected by the environment.

There are two types of factors that affect on the Blood Pressure: the "risk factors" (RF) which are beyond the human control and the "life -style factors" (LS) that is the factors that the man is responsible for its effect. Among the RF, our study includes the age and the gender, while among the LS, our study includes the following factors: the marital status, the smoking habit, the number of sons, the number of daughters, the occupation, and to some measure includes the round body mass (RBM), the food habits which includes the fats and the carbohydrates and, of course, the blood pressure. Our study was based on the concentration on the Diastolic Blood Pressure (DBP). This study is based on a random sample of size 350 patients, registered at some randomly selected clinics of the western region of Saudi Arabia. At first, we described the sample and discussed the significance of the correlation coefficients between the DBP and other measured factors. Then we discussed the effect of both the RF and the LS on the DBP. Also, we discussed the one-way Analysis of Variance (ANOVA) tests. Finally, we interpreted the Regression model for the data matrix.

The data matrix in this study was provided by the health department in the Holy City of Makkah. The data was recorded in two private clinics. It contains information on male and female patients suffering from Blood pressure, obtained during their interview with the doctor. The clinic creates a file for each patient and then records his condition during subsequent visits, which are made when the patient feels that he needs treatment. The clinics serve patients from Mekkah and the surrounding villages. The following measurements were recorded for 350 male and female patients with Blood pressure:

1. Weight, in kilogram
 2. Height, in Centimeter.
 3. Age, in years.
 4. Smoking habit.
 5. Marital statues.
 6. Gender.
 7. Number of children.
 8. Occupation.
 9. Eating habits.
- and
10. Diastolic Blood Pressure.

Conclusion

The handling of any large data matrix, begins by putting it onto a computer file, and checking it for obvious errors. Then versatile statistics computing package is essential which will enable us to handle the file easily

and produce simple plots, histograms and descriptive measures. SPSS Package is found to be ideal for this purpose, especially with its interactive facility. The next step is to formulate some questions of interest in order to set up some desirable hypotheses to test, using relevant statistical methods. The MINITAB package is also easy to use for this purpose. However, a more sophisticated package is needed for some of our multivariate analysis.

Finally, the statistician needs to be able to interpret the statistical results obtained from the packages. The results from this data matrix are found to be very useful and interesting.

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بعض النماذج الإحصائية لدراسة أسباب انتشار مرض ضغط الدم في المنطقة الغربية في المملكة العربية السعودية

بكري عساس ، عبد الله عبد الفتاح و عز عبد الفتاح
قسم الإحصاء - كلية العلوم - جامعة الملك عبد العزيز
جدة ، المملكة العربية السعودية
بحث رقم : ٤٢١ / ١٦٢

المستخلص : لقد ساهمت تغيرات نمط الحياة ونظام الغذاء والتحديثات الجارية في المملكة العربية السعودية خلال العقود الثلاثة الأخيرة في ارتفاع انتشار من الأمراض والتي منها مرض ضغط الدم والذي يعتبر الآن مرضا شائعا في المملكة العربية السعودية .

وأهداف هذا المشروع شملت جمع بيانات عن مجموعة من المتغيرات الملائمة لدراسة مرض ارتفاع ضغط الدم من عينة مصابة بهذا المرض والمسجلين في بعض المستشفيات بالمنطقة الغربية من المملكة العربية السعودية . وقد تم تلخيص وتحليل تلك البيانات والتوصل إلى معلومات مفيدة عن ذلك المرض وعلاقته بخصائص المرضى .

والمتغيرات التي جمعت بيانات عنها شملت :

النوع ، الحالة الاجتماعية ، العمل أو الوظيفة ، الوزن ، العمر ، الطول ، العادات الغذائية وعدد الأبناء البنين ، عدد الأبناء البنات ، عادة التدخين والضغط الانبساطي من خلال عينة حجمها ٣٥٠ تم جمع البيانات عن تلك المتغيرات .

والأساليب الإحصائية التي استخدمت شملت تحليل التباين وتحليل الانحدار المتعدد وكذلك استخدام اختبار مربع كاي لاختبار وجود علاقة بين أزواج المتغيرات .