# Effect of Dietary Habits, Disease Pattern and Psychological Stress on Known Essential Hypertensive Patients.

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**Abstract:**

Multiple and largely unidentified genetic factors influence individual susceptibility to different

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aspects of diet and lifestyle: these will determine interindividual variations in blood pressure between subjects exhibiting common behavioral patterns that promote blood pressure elevation.Though the employment status contributes to lifestyle factors,there are other factors which can influence hypertension like behavioural patterns which include irregular diet patterns, over consumption of alcohol,soft drinks etc, usage of tobacco in any form, reduced physical activity etc.The aim of this study is to determine the effect of diet,disease pattern and stress on known hypertensive patients. Questionnaire based survey consisting of 25 questions was circulated via an online platform,Survey planet.100 participants who were known hypertensive patients were included in the study.Inclusion criteria were available & exclusion criteria were established. Responses were tabulated and Chi square analysis was performed using SPSS software version.The results showed that irrespective of the age category , reversible factors play a major role in the disease .Within the limitations of study it can be concluded that there is a significant relation between hypertension and reversible factors like habits,stress,obesity and lifestyle balances. Whether the environmental or socioeconomic reasons played a role in the disease needs to be further evaluated with larger sample size and multicentre studies among our population.

Keywords: Hypertension; Diet; Personal health; Psychological; Disease

**Introduction:**

Lifestyle or behavioral factors majorly determines the level of blood pressure in individuals and the prevalence of hypertension in populations irrespective of age and gender.Multiple and largely unidentified genetic factors influence individual susceptibility to different aspects of diet and lifestyle: these will determine interindividual variations in blood pressure between subjects exhibiting common behavioral patterns that promote blood pressure elevation[1].The study was carried out in a population of male and female considered to be working under relatively high levels of stress.Though the employment status contributes to lifestyle factors,there are other factors which can influence hypertension like behavioural patterns which include irregular diet patterns, over consumption of alcohol,soft drinks etc, usage of tobacco in any form, reduced physical activity etc.Cigarette smoking is not a recreational habit, and in contrast it has taken an enormous amount of effort to reach some partial results in some countries, but not

everywhere[2,3].In some countries, smoking habits are still reported to be on the increase.Work-related and family related stress has been considered as an important risk factor for hypertension,obesity and cardiovascular diseases (CVDs). Many reasons have been stated possible for triggering hypertension, stress, anxiety, and depression during the last decades, a full understanding of the underlying pathophysiological mechanisms and other causes has not been satisfactorily achieved, especially in young adults. Moreover it has been proven that the use of cigarettes and other forms of tobacco are mostly due to stress as people feel them as stress relievers[4–6].A combined intervention of stress management techniques seems to be beneficial for blood pressure(BP)reduction. Such interventions could possibly serve as a complementary treatment along with drug therapy or in the early treatment of high normal BP. A call to action for designing epidemiological studies and evaluating the efficacy of such non-pharmacological treatment strategies is therefore warranted[7]. Essential hypertension accounts for 90% of cases of hypertension in adults. Secondary causes ofhypertension account for the remaining 10% of cases of chronically elevated BP.

According to the Framingham Study, hypertension accounts for about one quarter of heart failure cases. In the elderly population, as many as 68% of heart failure cases are attributed to hypertension[8].It is anticipated that the magnitude of the observed stress–eating relationships will increase over a period.Chronic stress is suspected of playing a role in the rising global burden of hypertension and diabetes**.** Lifestyle-medicine strategies have been shown to be effective in the prevention and treatment of most chronic conditions.Medication therapy management (MTM) services have become a hallmark of pharmacy practice for patients with chronic conditions such as hypertension[9].The prevalence of hypertension in India ranges from 70-80% of the population.If left undiagnosed or untreated may leave potential damage further. The aim of this study is to assess the factors for hypertension and their effects irrespective of age category.

**Materials and methods:**

*Study type and setting:*

This is an original study and data were collected by reviewing the response of participants. Participants who were known hypertensive patients were included and others were excluded. The

total sample size was 100 which accounted for 52 male and 48 female patients.Within the study population 41 patients were in the 4th decade followed by 38 patients of 5th and 21 patients from 3rd decade. The other systemic illnesses associated with the patients were also included in this study.

*Sampling and verification:*

All data were obtained and are approved by the Institutional Ethical Committee and cross verified by 2 reviewers.Subjective sampling was done.The external and internal validity were applicable.

*Data analysis:*

All data retrieved were compiled in an excel sheet and imported to SPSS by IBM for statistical analysis. Chi square statistical analysis was performed and the independent variables include age and dependent variables include diet, stress and behaviour respectively.

**Results & Discussion:**

The results were tabulated and analysed.From Figure-1 representing frequency distribution of patients based on age it can be stated that 41% of participants were of 4th decade followed by 38% from the 5th and 21 % from 3rd decade.Figure-2 represents the frequency distribution based on gender.Around 52% of participants were males and the rest 48% were females.Fig-3 representing association of occupation among hypertensive patients of various age groups it can be seen that hypertension was predominantly found in people engaged in business in comparison to office workers.This shows that the work pressure has an influence in inducing hypertension[10].

Figure-4 representing association of diet among hypertensive patients of various age groups it can be clearly seen that 70% of population on all the three age groups were preferring non vegetarian based diet which accounts for high cholesterol level that can potentially build up plaque and cause vessels to be damaged[11].Figure-5 representing association of habits among hypertensive patients of various age groups it can be seen that around 75% of the participants had no habits of consumption of alcohol or tobacco by any forms and were still diagnosed with

hypertension which was contrary to finding by Nathalia[12].From Figure-6 representing the association between stress among hypertensive patients of various age groups it can be seen that 93% of the participants were feeling stressed which is a major factor for major complications like hypertension.This is a reversible factor and hence practicing healthy habits like performing exercises,meditation and yoga regularly can help us overcoming stress thereby reducing the effect and damage to the body[13].

From Figure-7 representing the association of addiction among hypertensive patients of various age groups it can be stated that 50% of participants were addicted to junk foods.Addictions particularly not only mean substance addictions but can be of any form like eating, playing or even overdoing an activity. Potential addictive substances at any form tend to increase the level of stress in the body by increasing cortisol levels which has a direct relation with hypertension as the body is under stress for prolonged duration[14].Figure-8 representing association of work-life balance among hypertensive patients of various age groups it can be seen that in the 3rd decade around 90% participants were not maintaining the balance and hence were diagnosed with hypertension at a comparatively lower age.This again is a reversible and alterable factor which needs public attention.

Figure-9 representing the association of physical activity among hypertensive patients of various age groups shows that majority of participants around 80% are performing a satisfactory level of physical activity but are still diagnosed with hypertension.This is in contrary to literature by Keith as they concluded that physical activity showed a significant reduction in hypertensive behaviour[15].Figure-10 representing the association of depression among hypertensive patients of various age groups it can be seen that 29/41 people belonging to the 4th decade where depressed which can either directly or indirectly be associated with hypertension.Figure-11 representing the association of presence of tremors among hypertensive patients of various age groups indicate that only 4% of study population are suffering from tremors.Figure-12 representing the association of heart ailments among hypertensive patients of various age groups it can be seen that about 90% of participants are not diagnosed with heart ailments.This is in contrary to literature as it has been previously stated that heart ailments like ventricular hypertrophy are usually associated with hypertension[16].

From Figure-13 representing the association of prevalence of ulcers among hypertensive patients of various age groups it can be seen that 75% of participants diagnosed with hypertension had no encounters of ulcers.Figure-14 representing association between age and usage of medications it can be seen that 98% of participants were taking medication for controlling hypertension.Figure-15 representing the association of location among hypertensive patients of various age groups it can be seen that 63 % of total population were from urban areas especially Chennai.This kind of relation is found as there is increased stress level in the urban areas due to the high populated dense nature of cities,the problems in meeting daily requirements,the competition in jobs and due to less recreational time and space.This is a major underestimated concern which need to be looked into to control the damage not only to environment but also to the physiological and also psychological well being.Similar study conducted in China has been proving similar results[17].

Figure-16 representing the association of sleep cycle among hypertensive patients of various age groups showed that 35 % of participants in the 4th decade were reported to be sleeping less than 6 hours.Optimum sleep is required for the body to program its functions and relieve stress.Prolonged reduction in sleep cycle especially of REM type can lead to serious illness like hypertension[18].Figure-17 representing the association of other medical conditions among hypertensive patients of various age groups shows that 87% of population included in the study were diagnosed with both hypertension and diabetes.Diabetes is a chronic condition which might lead to secondary complications like diabetic nephropathy, diabetic retinopathy, cardiomyopathy etc.In all these cases there is micro level damage to blood vessels which can be an aggravating factor for hypertension.Figure-18 representing the association of health checkups among hypertensive patients of various age groups shows that 47% of participants in the 5 th decade were requiring health checkups to be done at least twice a year to keep the values under control.

The study was done to evaluate the association of hypertension based on age and other factors.Hypertension appears to lessen life expectancy markedly, especially among younger adults.Many public health officials and organizations have tried to warn the public about the dangers of it alongside with its ability to cause obesity[19].The incidence of depression is increasing and experts suggest this is linked with the increased prevalence of hypertension,obesity and stress related ailments[20,21]. Previous studies had demonstrated that

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changes in lifestyle are effective in preventing high-risk in adults[22,23].Even at the youngest school ages, hypertension is more likely reported. Primary prevention must begin very early among these children[24][25,26].

Changes in the lifestyle factor have a significant impact on health. Non communicable diseases qualify as a major public health concern and hence proper awareness and treatment to be done.Thus understanding the epidemiological factors can be helpful in early detection and testing of susceptible individuals. The factors like age, gender and hereditary transmission of hypertension cannot be modified.But factors like reducing stress level through physical activity, proper diets, reducing usage of alcohol,tobacco alongside with junk foods and aerated drinks,maintaining a good work life balance and reducing depression are alterable.

## Conclusion:

Thus this study was conducted and it showed that alterable factors were the major causative factors for disease which includes stress, diet patterns and behavioural patterns and is of global consensus.This study has certain limitations like very small group wherein results cannot be generalized,neglection of genetic transmission etc. All these can be eliminated by taking into account every detail of the patient. Future scope can be association of disease based on other systemic illness,foodhabits,demography etc.

**Acknowledgements:** Nil

**Conflict of Interest:** Nil

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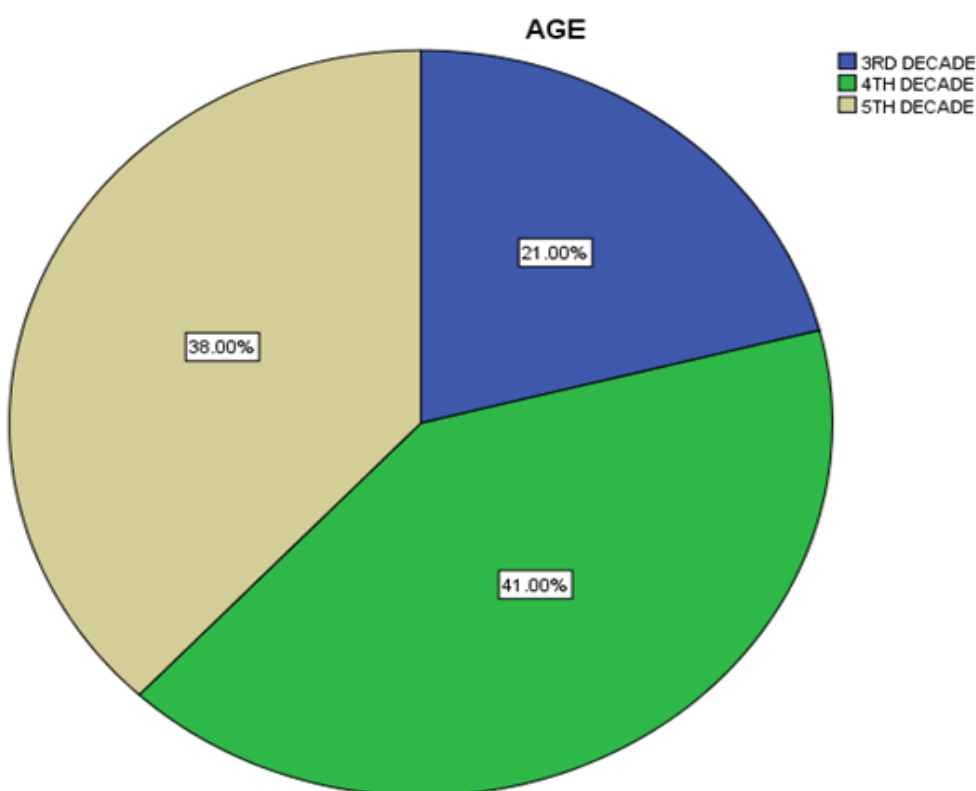
Figure-1: Pie chart representing frequency distribution of patients based on age category
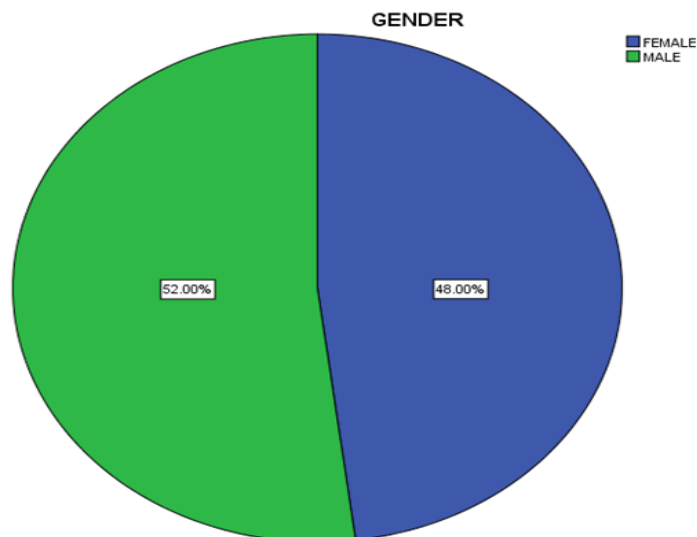
Figure-2: Pie chart representing frequency distribution of patients based on gender
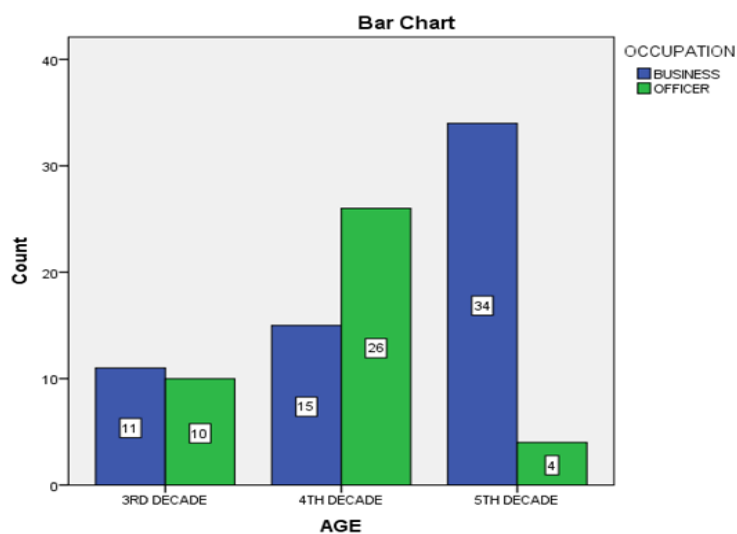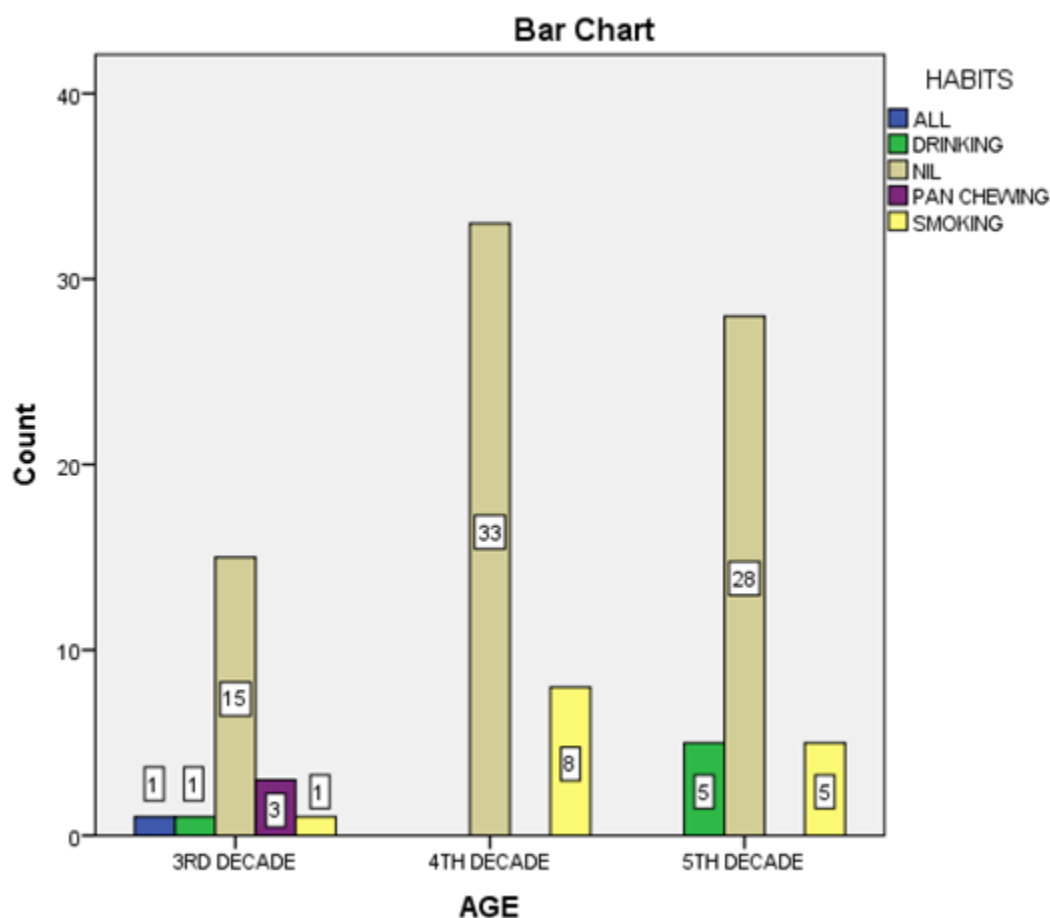


Figure-3: Bar graph representing association of occupation among hypertensive patients of various age groups. X-axis: Representation of hypertensive patients of various decades( 3rd decade, 4th decade, 5th decade);Y-axis:Representation of responses for occupation (Blue-Business; Green-Officer).Chi square statistical test was performed and the p- value was found to be 0.0001 i.e p <0.05 and there is statistically significant association between occupation and hypertensive patients of various age groups

http://annalsofrscb.ro
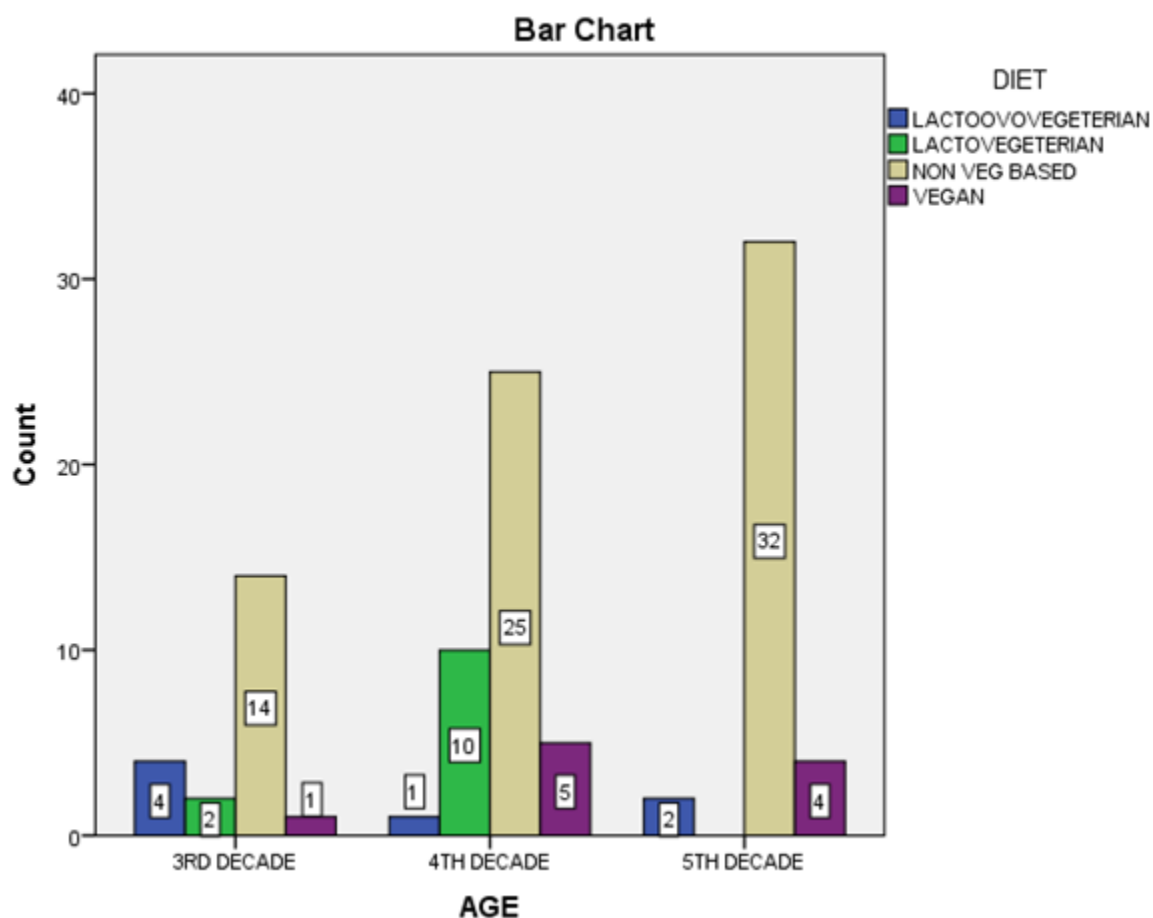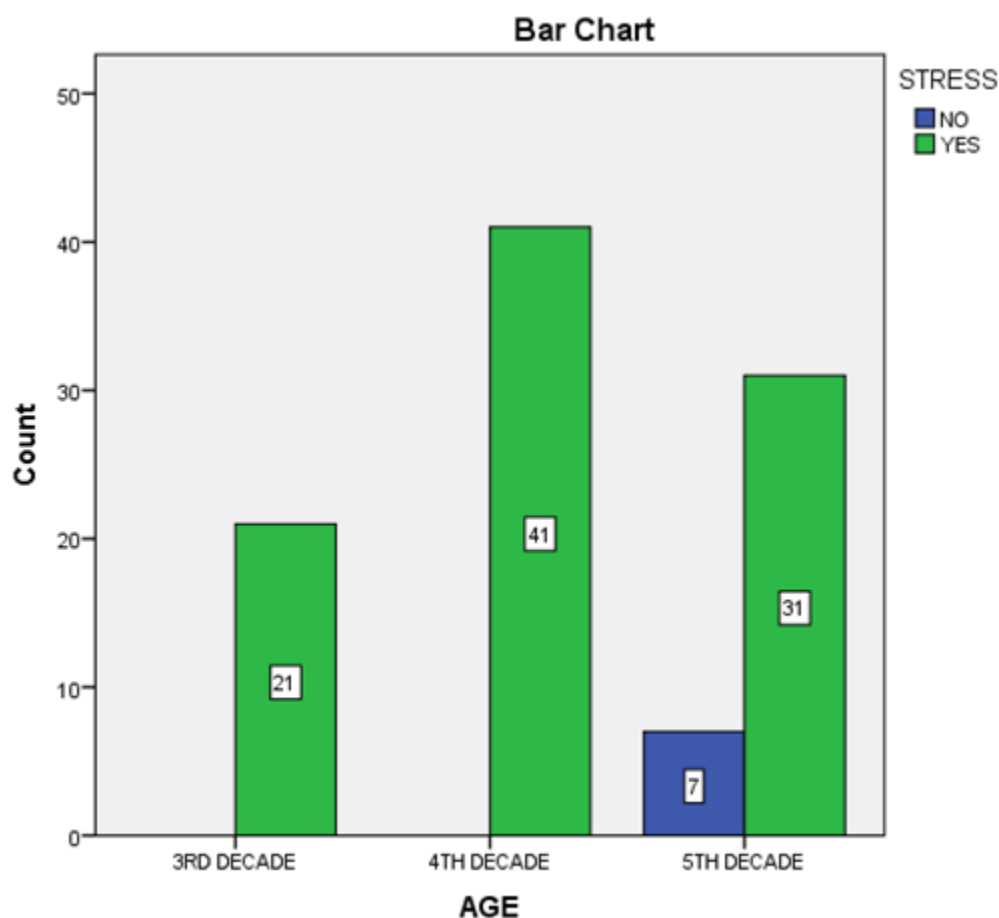
Figure-4: Bar graph representing association of diet among hypertensive patients of various age groups. X-axis: Representation of hypertensive patients of various decades( 3rd decade, 4th decade, 5th decade);Y-axis: Representation of responses for diet pattern ( Blue-Lacto Ovo Vegetarian;Green-Lacto Vegetarian;Grey-Non Vegetarian;Violet-Vegan ).Chi square statistical test was performed and the p- value was found to be 0.163 i.e p <0.05 and there is statistically significant association between diet pattern and hypertensive patients of various age groups

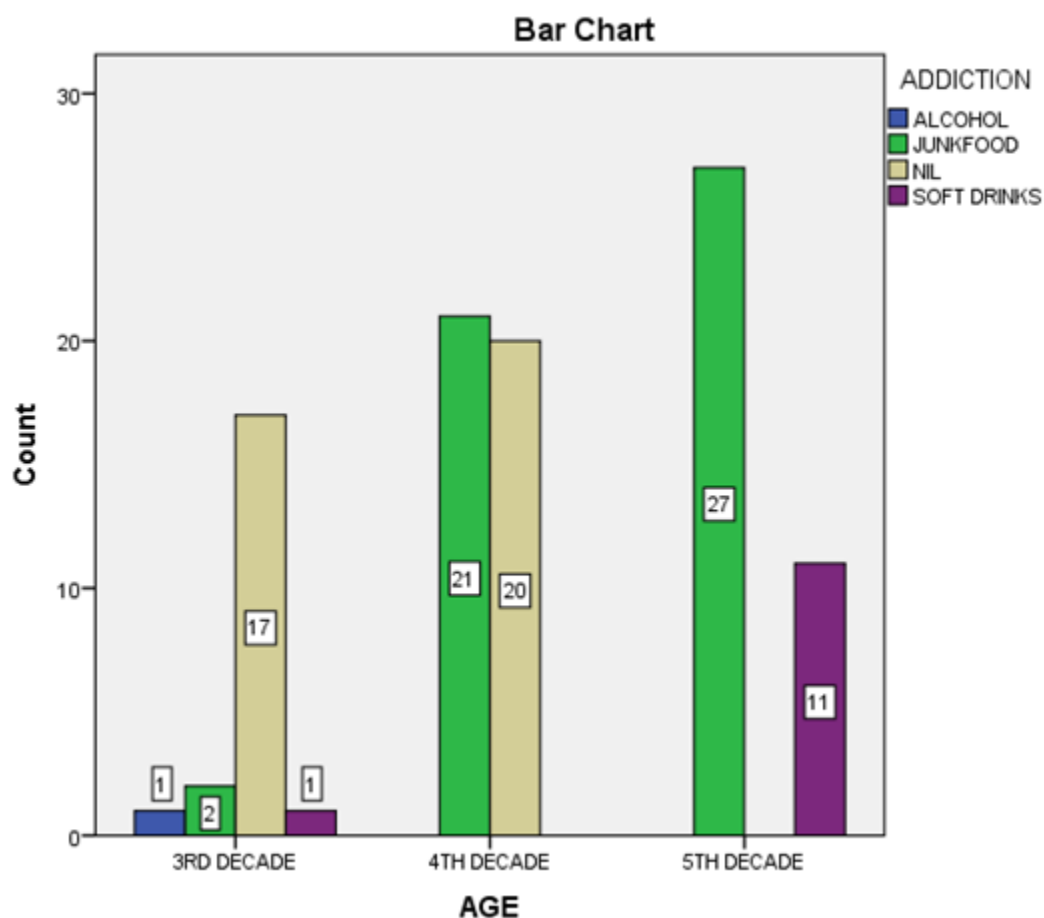Figure-5: Bar graph representing association of habits among hypertensive patients of various age groups .X-axis: Representation of hypertensive patients of various decades( 3rd decade, 4th decade, 5th decade);Y-axis: Representation of responses for habits ( Blue-All; Green-Drinking; Yellow-Smoking ;Violet-Pan chewing ;Grey-Nil).Chi square statistical test was performed and the p- value was found to be 0.211 i.e p >0.05 and there is no statistically significant association between habits and hypertensive patients of  various age groups
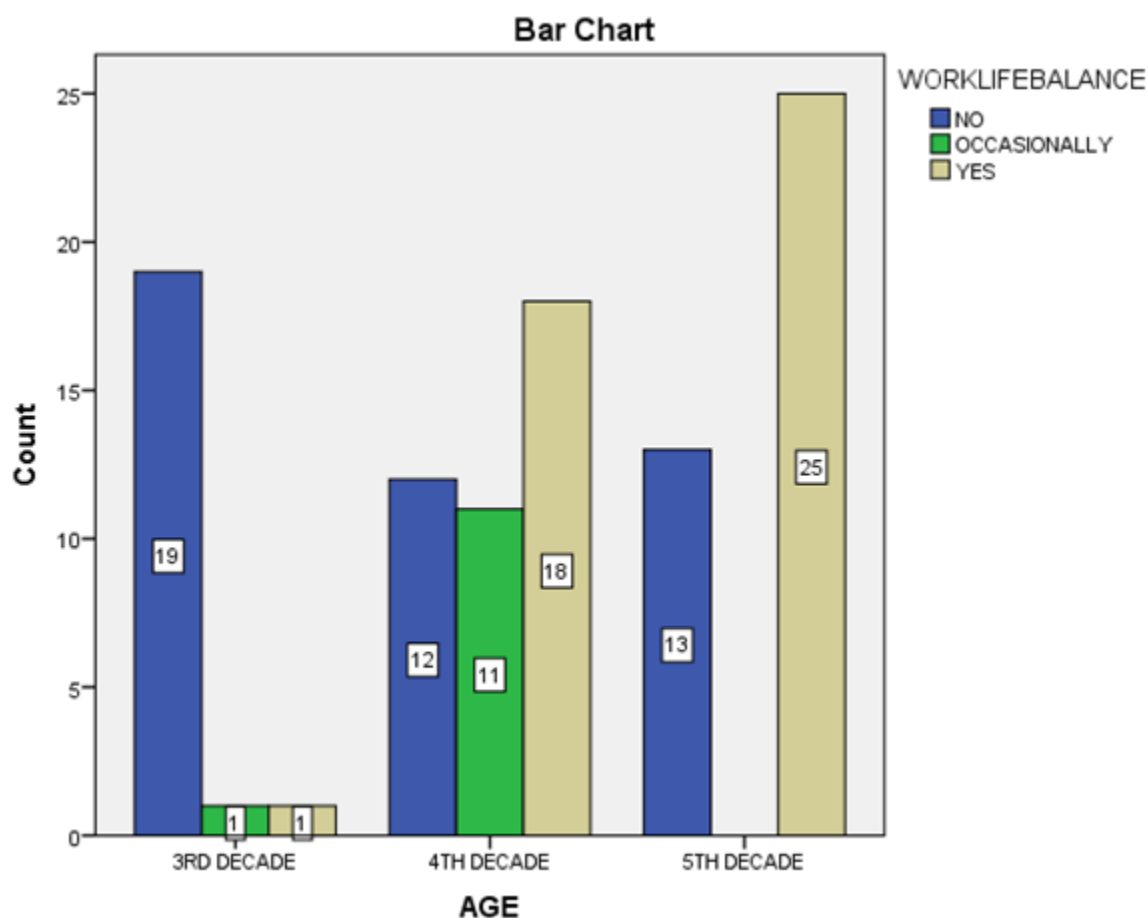
Figure-6: Bar graph representing association of stress among hypertensive patients of various age groups. X-axis: Representation of hypertensive patients of various decades( 3rd decade, 4th decade, 5th decade);Y-axis: Representation of responses for stress ( Blue-No;Green-Yes).Chi square statistical test was performed and the p- value was found to be 0.015 i.e p <0.05 and there is statistically significant association between stress and hypertensive patients of various age groups

Figure-7: Bar graph representing association of addictions among hypertensive patients of various age groups. X-axis: Representation of hypertensive patients of various decades( 3rd decade, 4th decade, 5th decade);Y-axis: Representation of responses for addictions (Blue-Alcohol;Green-Junkfoods;Grey-Nil;Violet-Soft Drinks).Chi square statistical test was performed and the p- value was found to be 0.0001 i.e p <0.05 and there is statistically significant association between addictions and hypertensive patients of various age groups
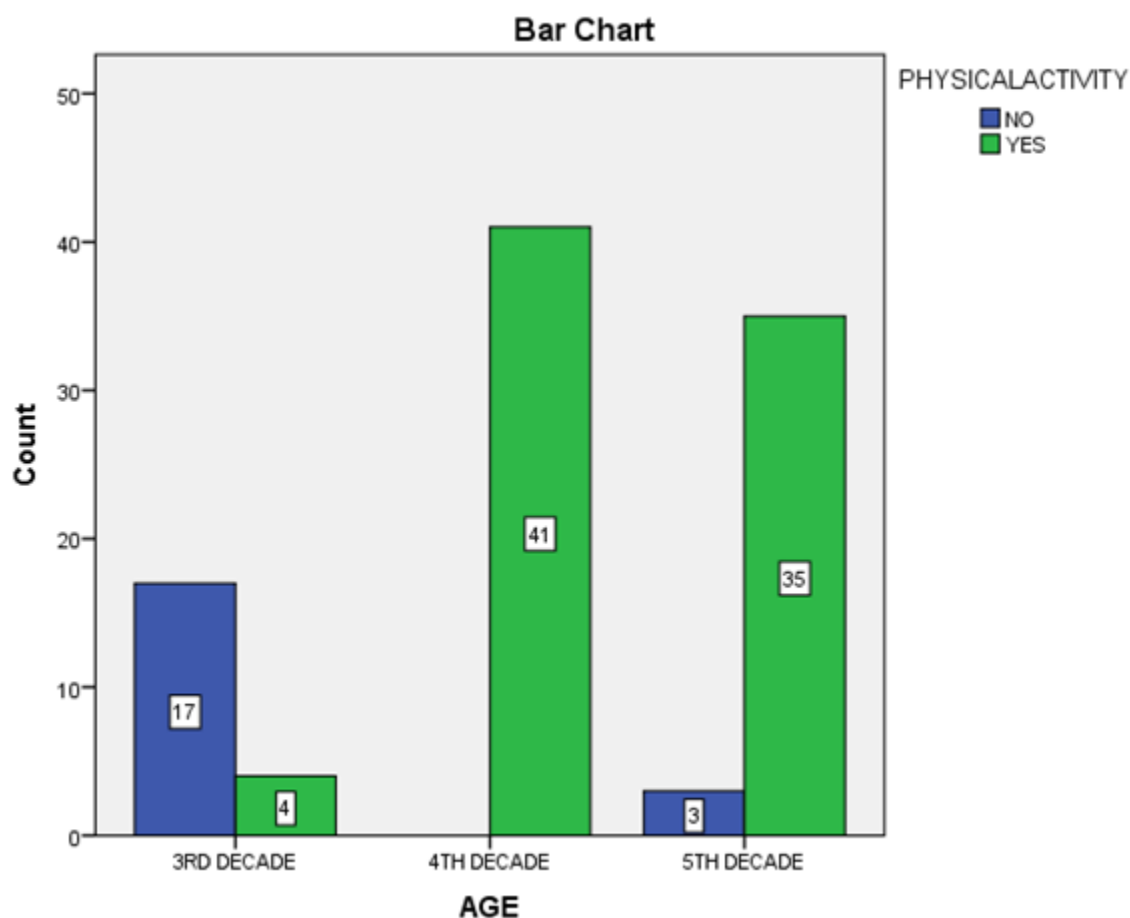
Figure-8: Bar graph representing association of work and life balance among hypertensive patients of various age groups. X-axis: Representation of hypertensive patients of various decades( 3rd decade, 4th decade, 5th decade);Y-axis: Representation of responses for work life balance ( Blue-No; Green-Occasionally;Grey-Yes).Chi square statistical test was performed and the p- value was found to be 0.0001 i.e p <0.05 and there is statistically significant association between occupation and hypertensive patients of various age groups
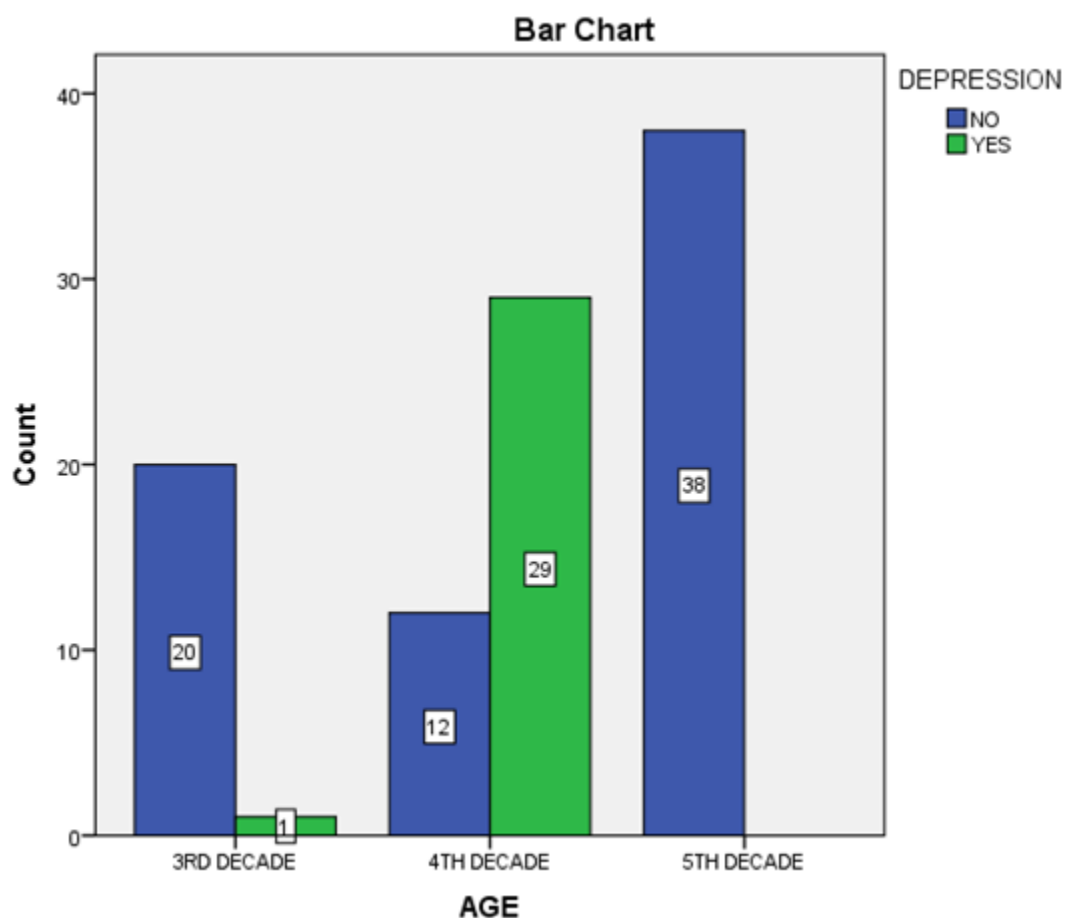
Figure-9: Bar graph representing association of physical activity among hypertensive patients of various age groups. X-axis: Representation of hypertensive patients of various decades( 3rd decade, 4th decade, 5th decade);Y-axis: Representation of responses for physical activity ( Blue-No;Green-Yes).Chi square statistical test was performed and the p- value was found to be 0.0101 i.e p <0.05 and there is statistically significant association between physical activity and hypertensive patients of various age groups
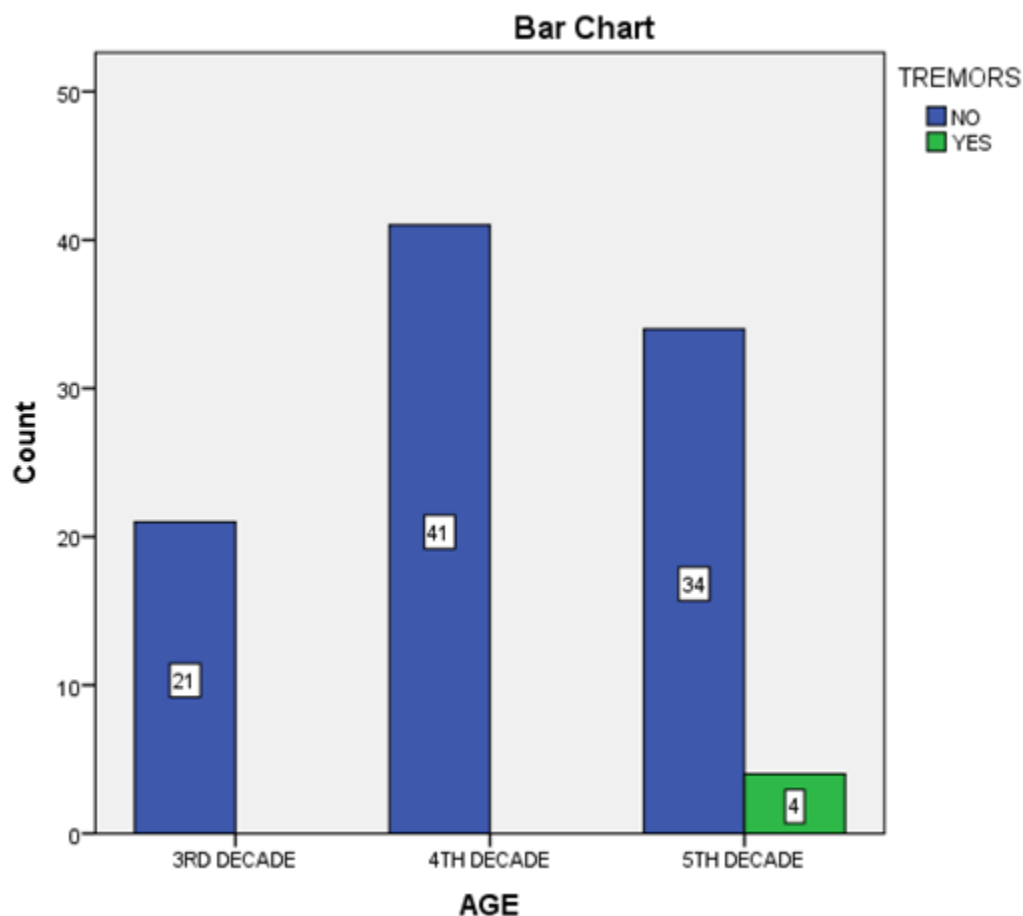
Figure-10: Bar graph representing association of depression among hypertensive patients of various age groups. X-axis: Representation of hypertensive patients of various decades( 3rd decade, 4th decade, 5th decade);Y-axis: Representation of responses for depression ( Blue-No;Green-Yes). Chi square statistical test was performed and the p- value was found to be 0.0201 i.e p <0.05 and there is statistically significant association between depression and hypertensive patients of various age groups

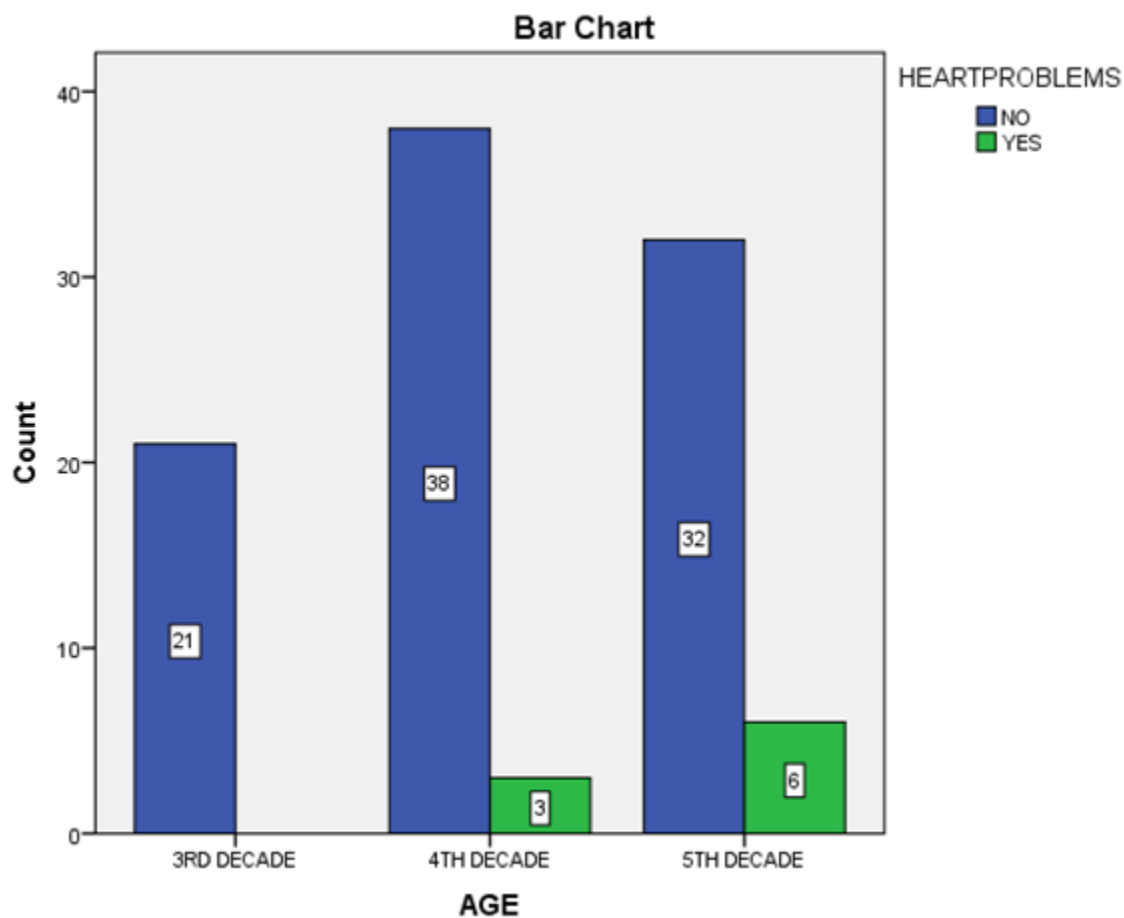Figure-11: Bar graph representing association of tremors among hypertensive patients of various age groups .X-axis: Representation of hypertensive patients of various decades( 3rd decade, 4th decade, 5th decade);Y-axis: Representation of responses for tremors ( Blue-No;Green-Yes).Chi square statistical test was performed and the p- value was found to be 0.281 i.e p >0.05 and there is no statistically significant association between tremors and hypertensive patients of various age groups

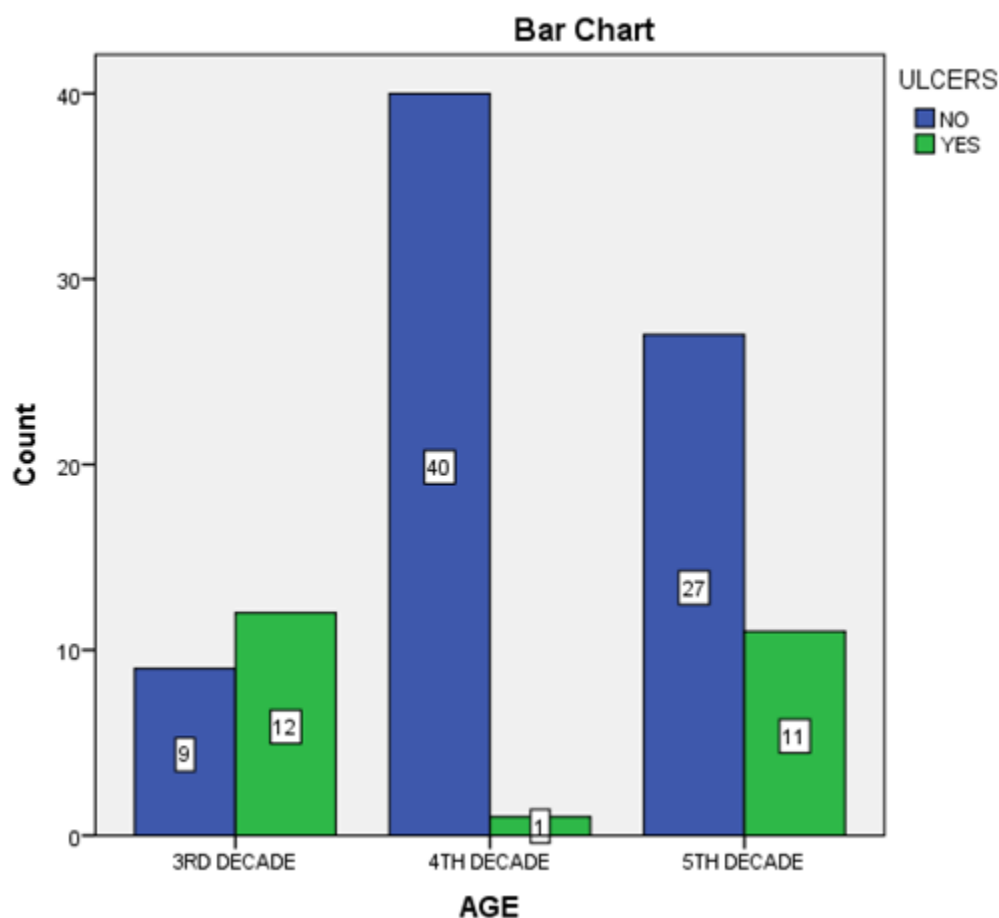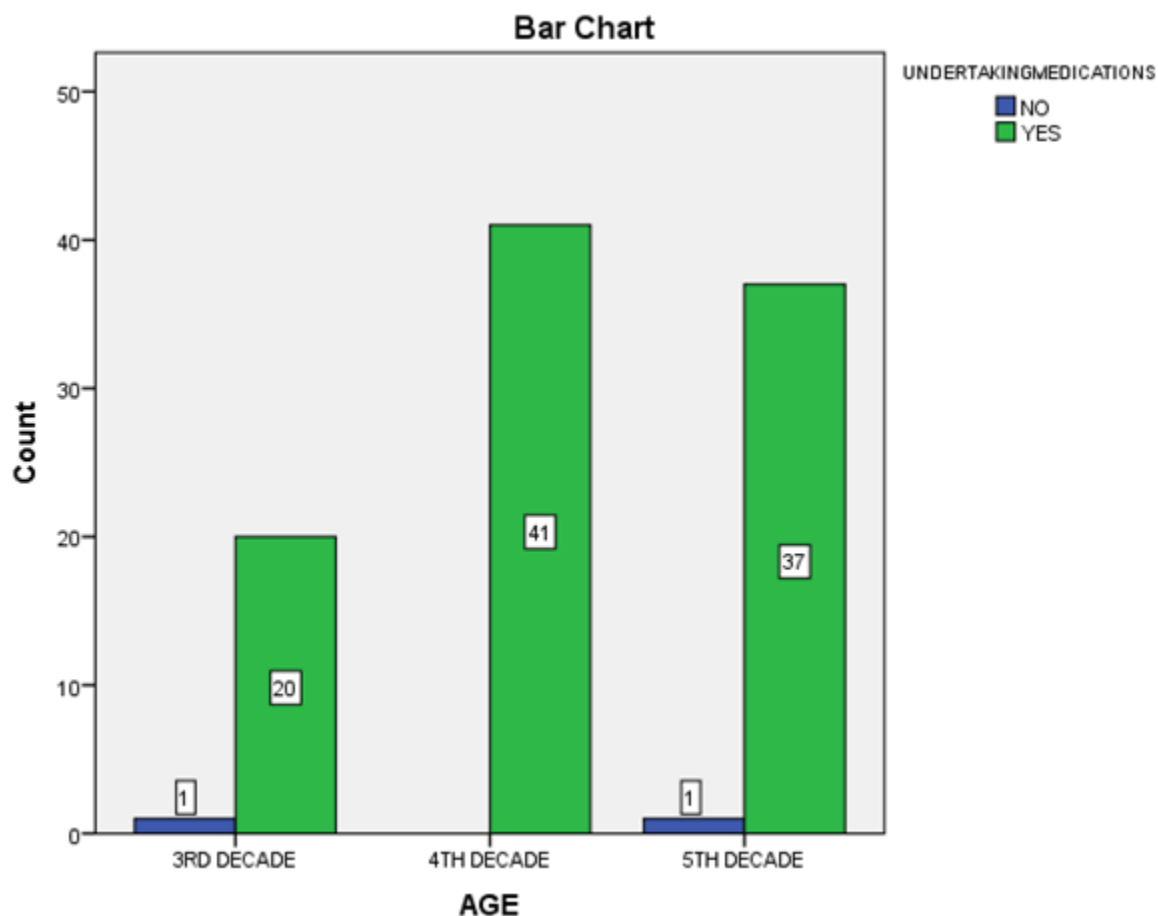Figure-12: Bar graph representing association of heart problems among hypertensive patients of various age groups. X-axis: Representation of hypertensive patients of various decades( 3rd decade, 4th decade, 5th decade);Y-axis: Representation of responses for occupation (Blue-No;Green-Yes).Chi square statistical test was performed and the p- value was found to be 0.287 i.e p >0.05 and there is no statistically significant association between heart problems and hypertensive patients of  various age groups

Figure-13: Bar graph representing association of ulcers among hypertensive patients of various age groups. X-axis: Representation of hypertensive patients of various decades( 3rd decade, 4th decade, 5th decade);Y-axis: Representation of responses for occupation (Blue-No;Green-Yes).Chi square statistical test was performed and the p- value was found to be 0.310 i.e p >0.05 and there is no statistically significant association between ulcers and hypertensive patients of various age groups

Figure-14: Bar graph representing association of participants undertaking medications among hypertensive patients of various age groups. X-axis: Representation of hypertensive patients of various decades( 3rd decade, 4th decade, 5th decade);Y-axis: Representation of responses for medications taken ( Blue-No;Green-Yes).Chi square statistical test was performed and the p-value was found to be 0.864 i.e p >0.05 and there is no statistically significant association between medications and hypertensive patients of various age groups
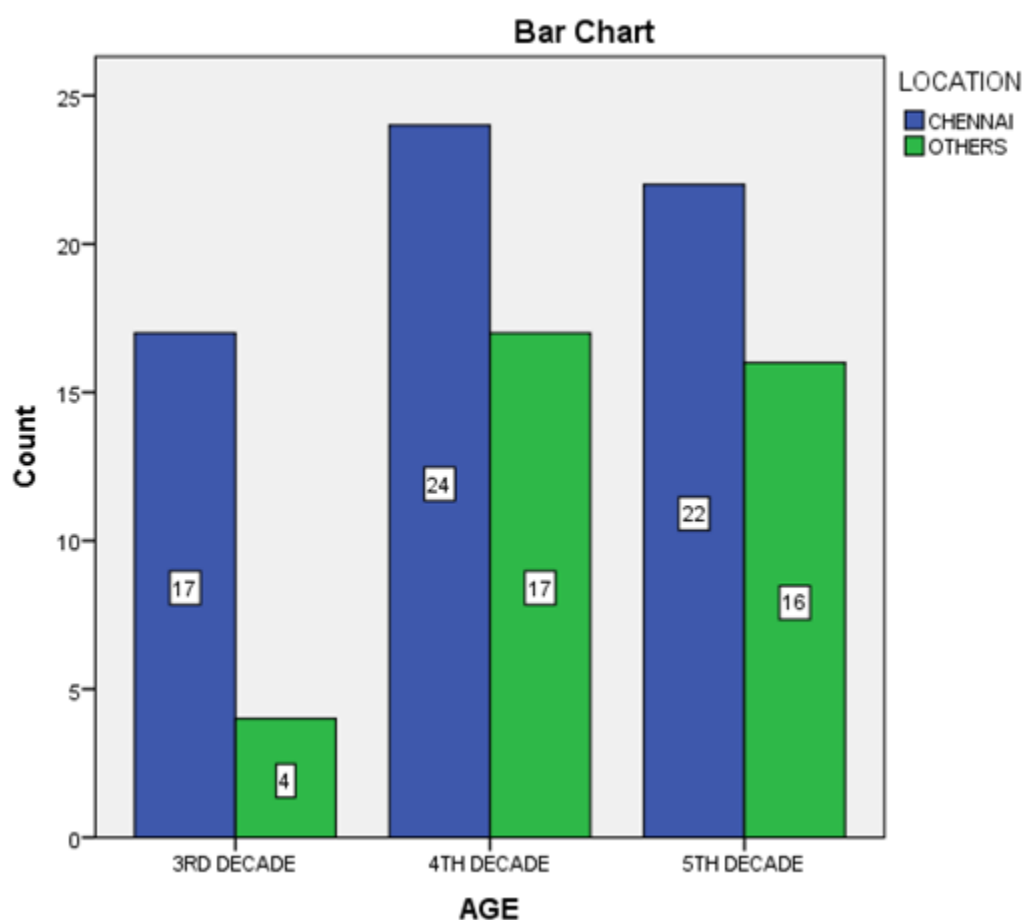
Figure-15: Bar graph representing association of location among hypertensive patients of various age groups. X-axis: Representation of hypertensive patients of various decades( 3rd decade, 4th decade, 5th decade);Y-axis: Representation of responses for location ( Blue-Chennai year;Green-Others).Chi square statistical test was performed and the p- value was found to be 0.015 i.e p <0.05 and there is statistically significant association between location and hypertensive patients of various age groups
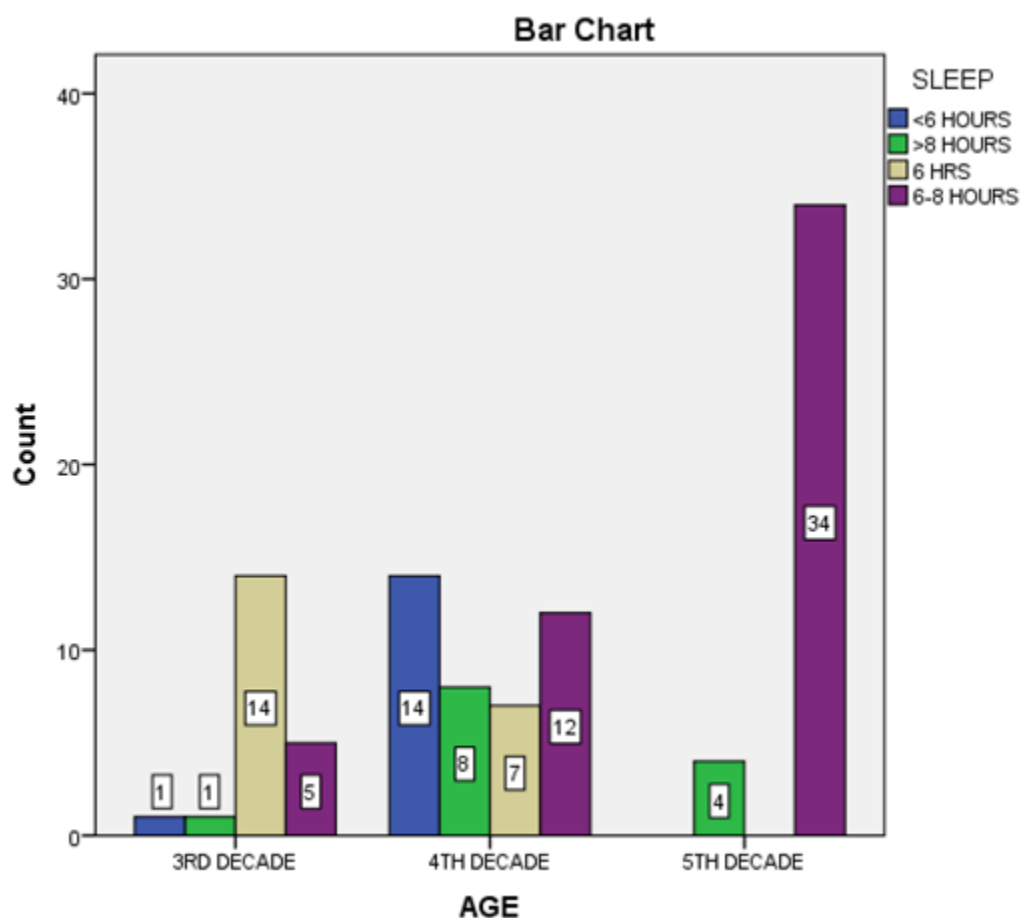
Figure-16: Bar graph representing association of sleep cycle among hypertensive patients of various age groups. X-axis: Representation of hypertensive patients of various decades( 3rd decade, 4th decade, 5th decade);Y-axis: Representation of responses for sleep cycle ( Blue-Less than 6 hours;Green-More than 8 hours; Grey-6 hours;Violet-6-8 hours).Chi square statistical test was performed and the p- value was found to be 0.0301 i.e p <0.05 and there is statistically significant association between sleep cycle and hypertensive patients of various age groups
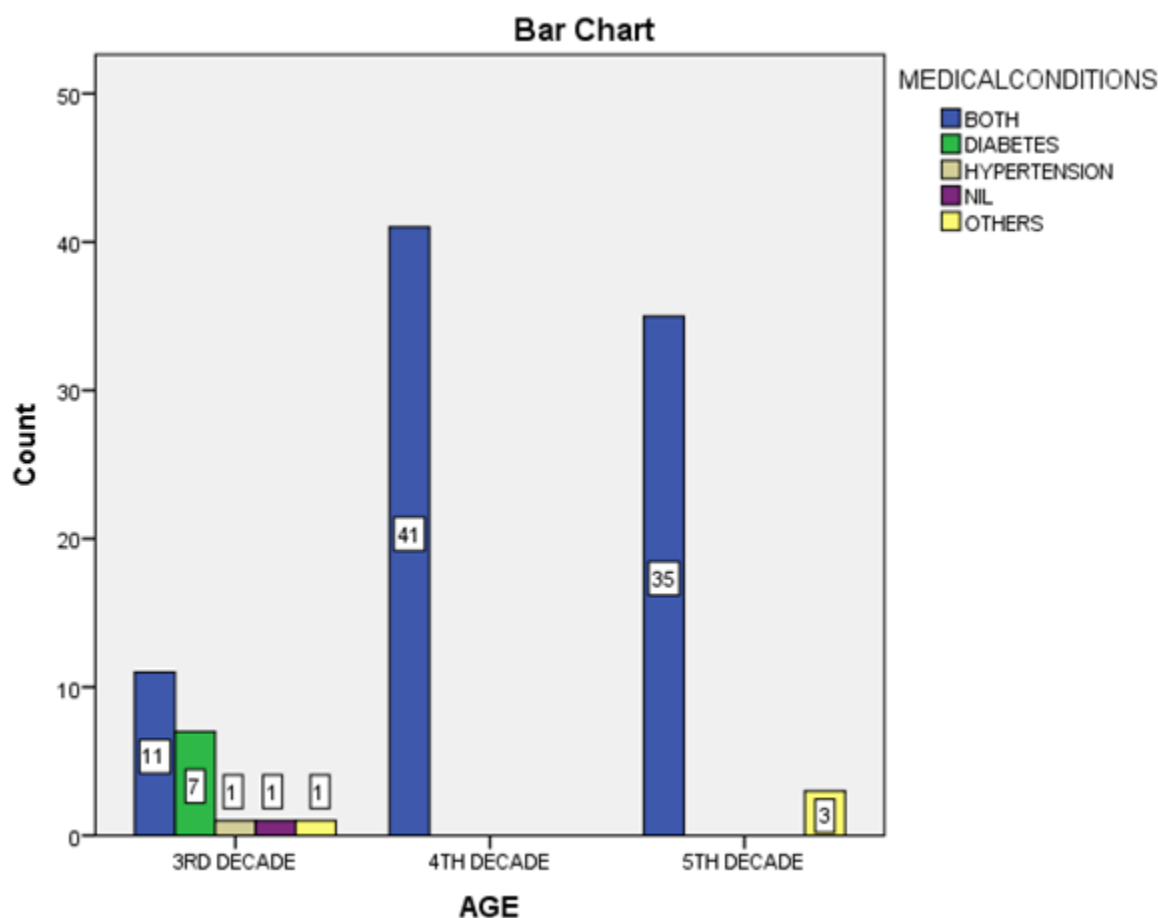
Figure-17: Bar graph representing association of medical conditions among hypertensive patients of various age groups. X-axis: Representation of hypertensive patients of various decades( 3rd decade, 4th decade, 5th decade);Y-axis: Representation of responses for medical conditions ( Blue-Both; Green-Diabetes;Grey-Hypertension;Violet-Nil;Yellow-Others ).Chi square statistical test was performed and the p- value was found to be 0.00235 i.e $p < 0.05$ and there is statistically significant association between underlying diseases and hypertensive patients of various age groups
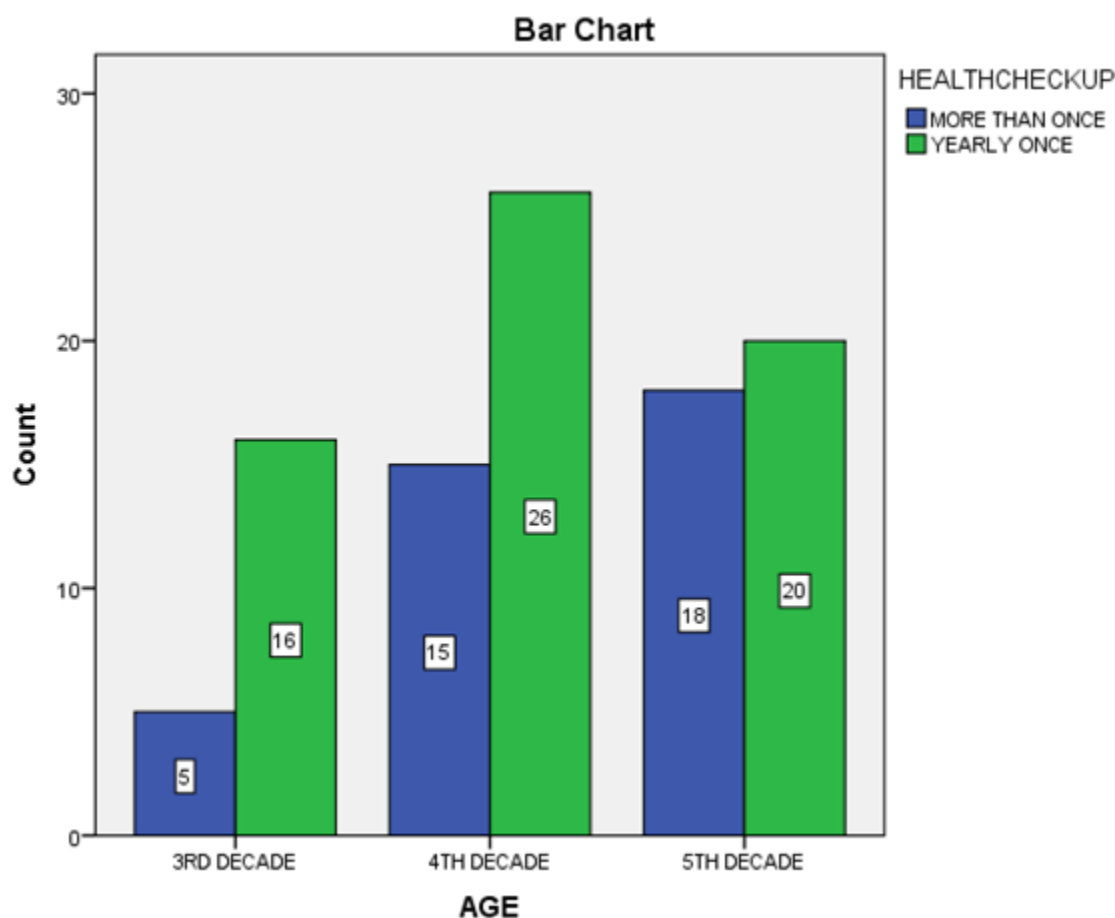
Figure-18: Bar graph representing association of number of health checkups done among hypertensive patients of various age groups.X-axis: Representation of hypertensive patients of various decades( 3rd decade, 4th decade, 5th decade);Y-axis: Representation of responses for health checkup ( Blue-More than once a year;Green-Once a year).Chi square statistical test was performed and the p- value was found to be 0.0193 i.e p <0.05 and there is statistically significant association between health checkups and hypertensive patients of various age groups