A Study on Vehicular Air Pollution and Its Impact on Public Health in Tamilnadu With Reference To Chennai City

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ABSTRACT:
Chennai,capital city of Tamil Nadu is one of the most rapidly growing cities in India.Vehicular pollution becomes a serious problem contributing significantly towards total air pollution.The Greater Chennai region has a population of about 10 million. Thirteen percent of households own a car and 47% of households own a motorcycle.The main objective of their paper is to analyse the problems of vehicular air pollution in Urban Areas and to determine whether the increase in fuel price affect the usage of private vehicles and to determine that vehicular pollution affects public health and leads to global warming. The researcher has followed the empirical research with the convenient sampling method and the sample size is 328. The results observed from the analysis is that the public uses the motor vehicle which results to save time and laziness to approach public transport and the people were affected due to air pollution which causes breathless,skin problems and irritation to eyes.

Keywords:Chennai,vehicular pollution,motorcycle,global warming and skin problems.

I. INTRODUCTION:

Air pollution has been drastically increasing due to rapid urbanization and motorization. Ambient particulate matter in polluted air is one of the major health threats and is found to be associated with cardiovascular diseases, lung cancer, asthma and adverse pregnancy outcomes such as preterm birth and low birth weight babies . Chennai is the highly polluted city in eastern coast of India with a rapid explosion of vehicular population. Chennai ranks fifth in carbon emission from the transport sector among the 54 South Asian cities according to a study done by the International Council for Local Environment Initiative (ICLEI).Vehicular population in Chennai has been steadily increasing from 600,000 in 1992 to 3 million in 2015. With a vehicular density of 2093 vehicle per kilometer on road, Chennai ranks highest among Indian cities. The issue of air pollution has been gaining importance in India since 1990 and it has become a genuine cause of concern during the last few years. The air quality in

Chennai is not as alarmingly bad as it is in some of the major centres of the country, yet it is a matter of concern. The air quality in Chennai is worst in those areas, where there are no factories and is primarily commercial or residential areas. Therefore, vehicles can be said to be the main source of air pollution The air (prevention and control of pollution)act was passed in 1981 to regulate air pollution but failed to reduce pollution because of poor enforcement of rules and the Chennai represents a different pollution challenges.Its annual average pollution levels though lower than other megacities still vary between moderate to critical.The main aim of the study is to analyse the serious vehicular air pollution which affects the public health .

OBJECTIVES:

To analyse the problem of vehicular air pollution in urban areas.

To determine whether the increase in fuel price affect the usage of private vehicles

To determine that vehicular pollution affects public health and leads to global warming.

II.   REVIEW OF LITERATURE :

The occurrence of mortality and morbidity in different groups in India due to the level of PM10 and their impacts into economic values. The results indicated 2.5 million premature deaths and total morbidity and mortality costs of Rs 885 billion to Rs 4250 billion annually.(**Teri,1998**)In the article explained how harmful air pollution was to human when caused by automobiles. The study found that road transport users were less aware about air pollution and to identify the measures by road vehicles users to reduce the air pollution.(**Sherin Fathima 2013**) In the Article had observed the status and trend of air pollutants namely sulphur dioxide, oxides of Nitrogen, Respirable Suspended Particulate matter and Total Suspended Particulate Matter in the premises of Sowdeswari College where the air quality monitoring station had been set up by the NAME of the TNPCB. Air quality data between 2010 and 2011 revealed that air pollution was not very serious in respect to sulphur dioxide, oxides of nitrogen and total suspended particulate matter.(**R. Gunasekaran et. al., March 2012**)In this study Air Quality Modeling (AQM) had provided a quantified analysis and recommended how best to improve air quality in the city of Tuticorin and to reduce greenhouse gas (GHG) emissions, while meeting critical health and economic development objectives. (**Joyce Vetha Evelyn 2014**)In this conducted survey in Taiwan to elicit willingness to pay (WTP). The study estimated a model in which WTP depended on the attributes of the illness - duration and number of symptoms, and nature of the illness.(**Alberini et al. 1997**) In this study highlighted that rapid urban growth and industrialization degraded urban ecosystem. Among the various urban ecosystem components impact on ambient air quality was more detectable and the share of vehicular exhaust emissions showed an increasing trend due to the increase in vehicular population.(**Banerjee R., Dutta. M, Roy S and Sinha S 2012 Microscopic Modeling of Air Pollution from road traffic**, in May 2005, the study by Jin Young Park, aimed at developing a microscopic air pollution model that can describe the various traffic conditions based on the detailed simulation of vehicle activity in a traffic network.**B.Aravind Kumar** in his article expressed that Air quality in major cities, especially in Chennai had high levels of particulate matter and that was slowly decreasing with the city topping the State in both Respirable Suspended Particulate Matter (RSPM) and Total Suspended Particulate Matter (TSPM).**Gurumurthy Ramachandran (1998)** division of Environmental and Occupational Health, School of Public Health, University of Minnesota, stated that Indian mega cities were among the most polluted in the world. Air concentrations of a number of air pollutants were much higher than levels recommended by the World Health Organization.**According to Bhama Devi Ravi**, in the article, PCB to Monitor Air Quality at Koyambedu, Chennai, the Tamil Nadu Pollution Control Board (TNPCB) had set up the online monitoring station in Koyambedu, it being the nerve hub for markets and the nodal point for all kinds of transport, apart from the city's industrial and residential centres such as Manali, Royapuram and Kathivakkam were under continuous online monitoring for the first time. **According to the encyclopedia America (1970)**, air pollution is one of the severe, serious effects that automobiles have on the system. They also dictate land use requiring millions of miles of streets and highways and consume many resources, the extraction and refinement of cars require a great amount of electricity, which is generated at high cost to the environment. **Krupnic (1990)** stated that rapid urbanization of the developing world had led to major fall in the ambient air quality standards and was probably responsible for significant degradation of health. **According to the World Development Report (1992)**, air pollution had three principle man made sources, energy use, vehicular emissions and industrial production all of which would tend to expand with economic growth unless adequate pollution abatement measures were put in place . **According to Hakler (1995),** the share of transport sector in the total energy consumption was as high as twenty five percent of the World and the same was primarily responsible for 22 percent omission of carbon dioxide (co2) .The Energy use and CO2 emission showed an upward trend in almost all the countries of the world particularly in the third world nations**. According to the Centre for Science and Environment (1996)** Report, rapid growth of personalized transport was very unsustainable and resulted in avoidable energy consumption and pollution**. Anil Agarwal et al (1997)** stated that the speed with which urban air pollution had grown across India in the last decade was alarming. The World Health Organization has ranked Delhi as the

fourth most polluted mega city of the world**Cooper and Alley (1986)** defined air pollution as the presence of population in the atmosphere from antopogenic or natural substances in quantities likely to harm human plant or animal alike to damage human made materials and structures to bring about changes in weather or climate or to interfere with enjoyment of life or property .**Toman et at. (1996)** stated that vehicles contribute less to total emissions than the coal burning and industrial processes and it was probably because vehicle ownership is still relatively low in Poland. Even so vehicle contributes more that 30 percent of No emissions 37 percent of carbon monoxide; 24 percent of HC, and 35 percent of lead**World Resource Report (1996-97)** stated that motor vehicles were responsible for 90 percent of the carbon monoxide emission; 85 percent of hydrocarbon emission; and 59 percent of nitrogen oxide (NOx) emission, and 13 percent of suspended particulate matter (SPM) emission in Delhi during 1987. **Park(1997)** stated thatMotor

vehicles are major sources of air pollution throughout the urban areas. They emitted hydrocarbons, Carbon monoxide, Lead, Nitrogen oxides, and particulate matter . In strong sunlight, certain of these hydrocarbons and oxides of nitrogen might be converted in the atmosphere into "hoto chemical" pollution of oxidizing nature.

III.   METHODOLOGY:

The Research method followed here is empirical research. A total of 328 samples have been taken out of which is taken through the convenient sampling. The sample frame taken by the researcher is public area and general public. The independent variable taken here is Age and gender. The dependent variables are motor vehicle is a source of air pollution,vehicular air pollution in urban areas,public health affected due to air pollution. The statistical tool used by the researcher is graphical representation.
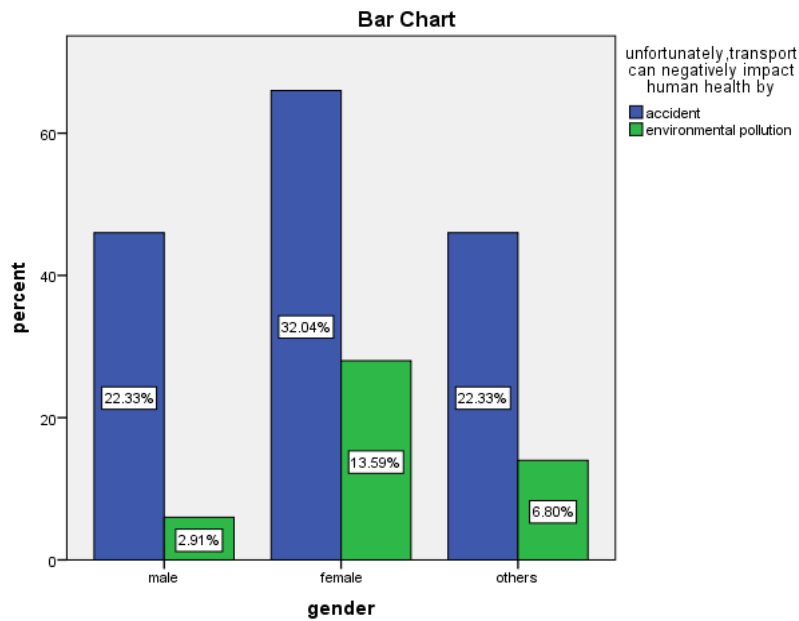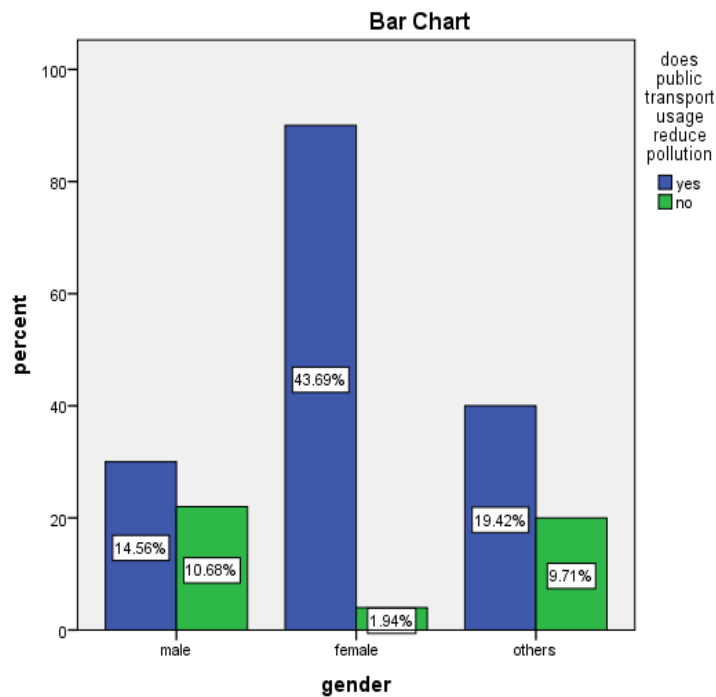
IV.   DATA ANALYSIS:
Figure 1:
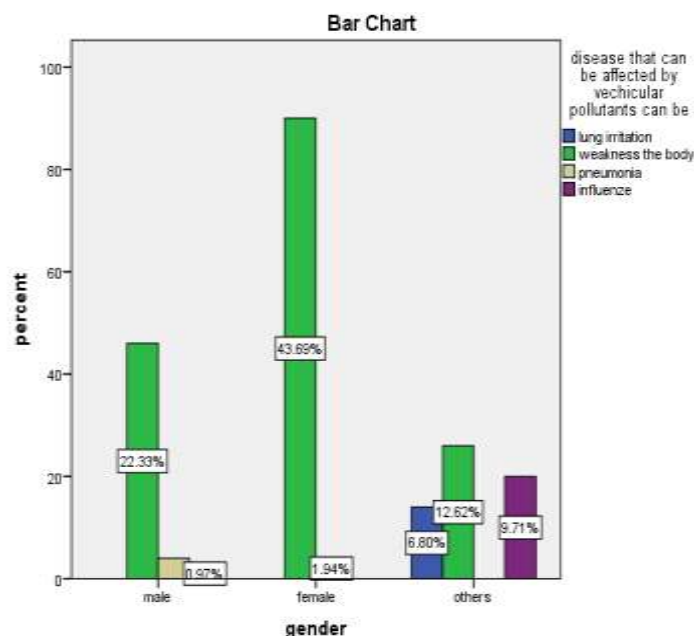
Legend. The Fig.1 shows about the gender and the graph about the disease that can be affected by vehicular pollutants.
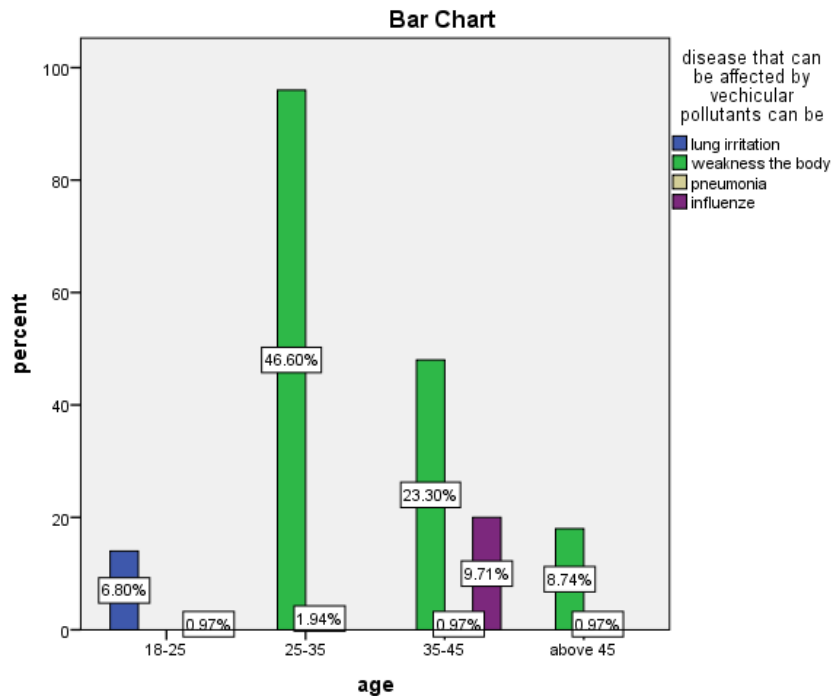
Figure 2:

Legend: The Fig.2, shows about the gender and the graph says about the unfortunately transport can negatively impact human health.
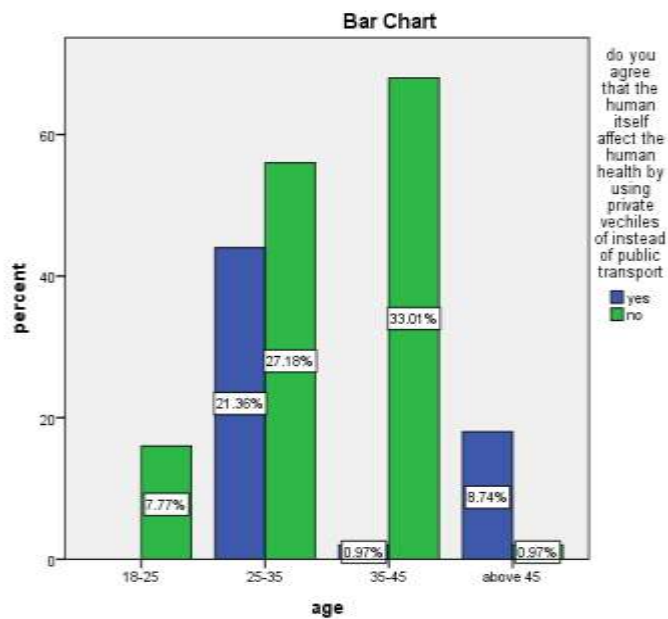
Figure 3:

Legend: The Fig.3, shows about the gender and the graph says about the public transport usage to reduce pollution.
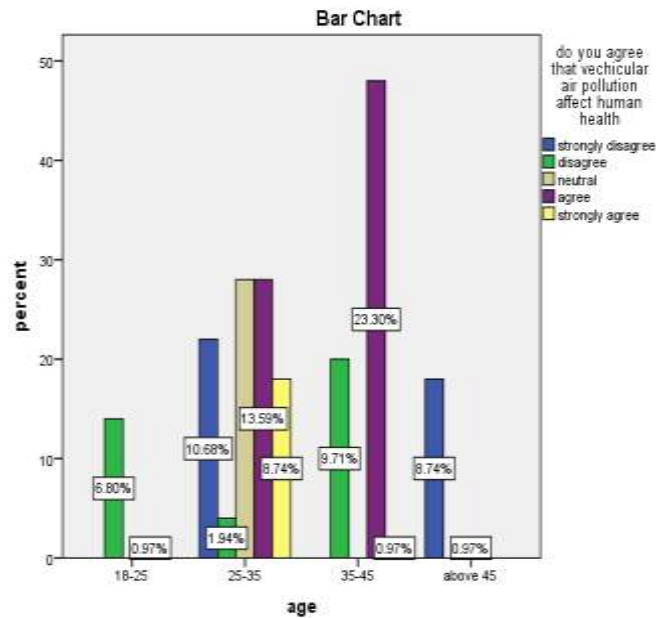
Figure 4:

Legend: The Fig.4, shows about the age and the graph says about the disease that can be affected by vehicular pollutants
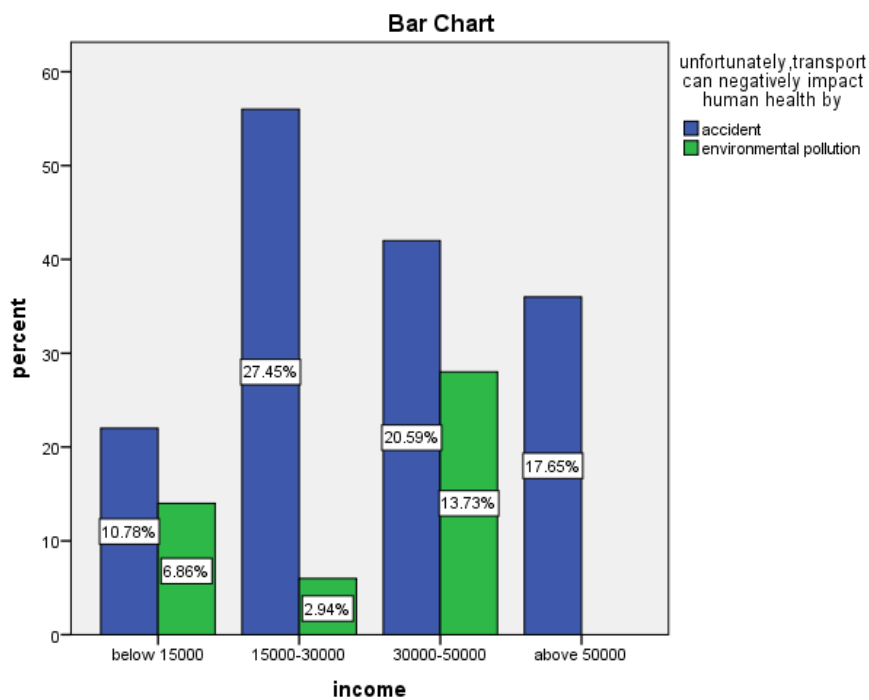
Figure:5

Legend: Fig 5 shows about the age and the graph says about the human itself affect the human health by using private vehicles of instead of public transport

Figure 6:

Legend : fig 6 shows about the age and graph says about the vehicular air pollution affect human health
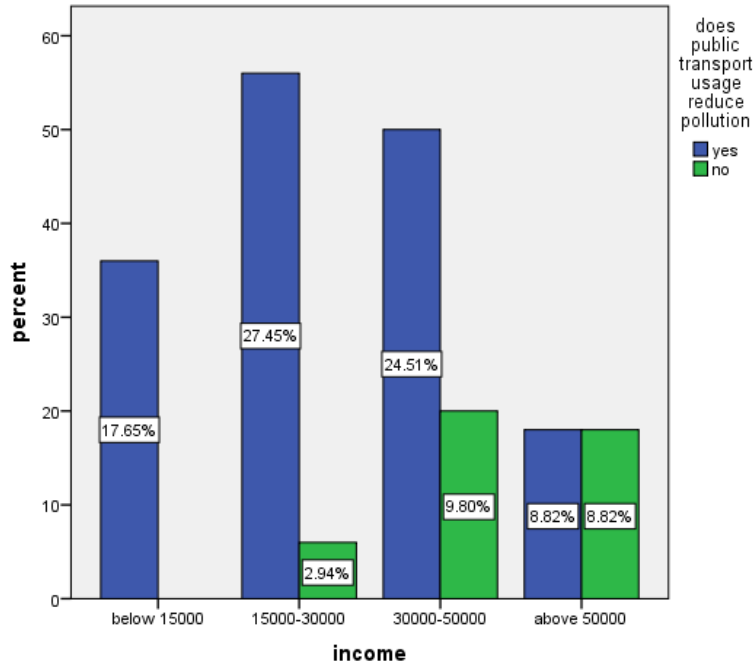
Figure:7

Legend : fig 7 shows about the annual income and the graph says about the unfortunately transport can negatively impact human health
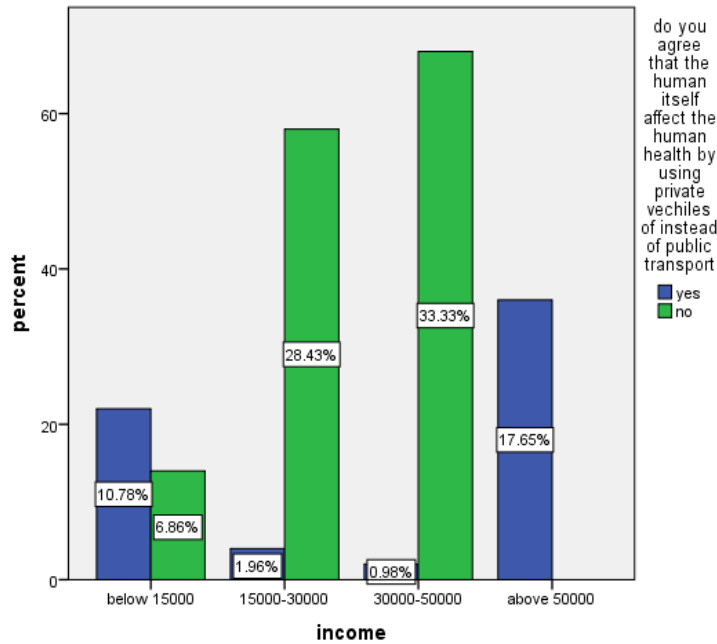
Figure:8

Legend:fig 8 shows about the annual income and the graph says about the public transport usage reduce pollution.
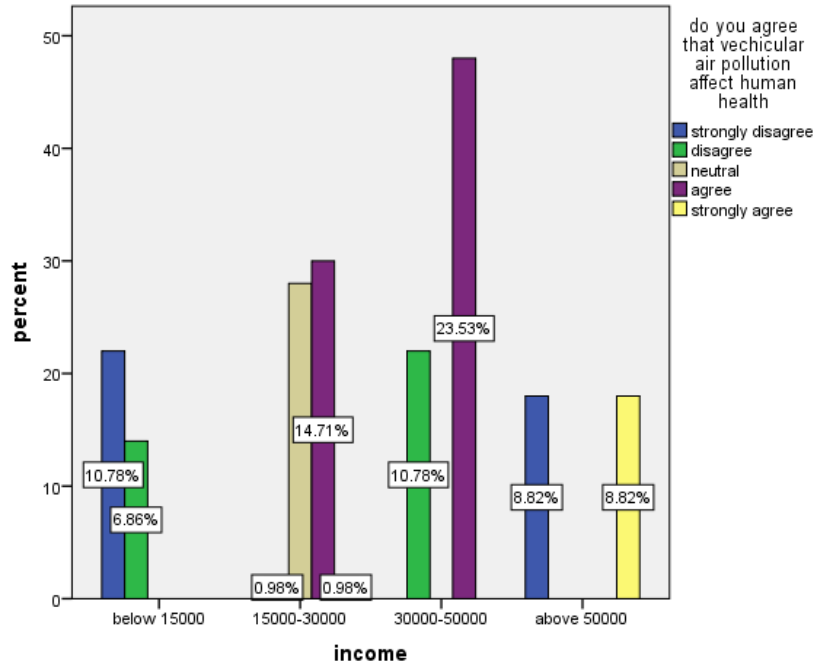
Figure:9

Legend:fig 9 shows about the annual income and the graph says about the human itself affect the human health by using private vehicles of instead of public transport
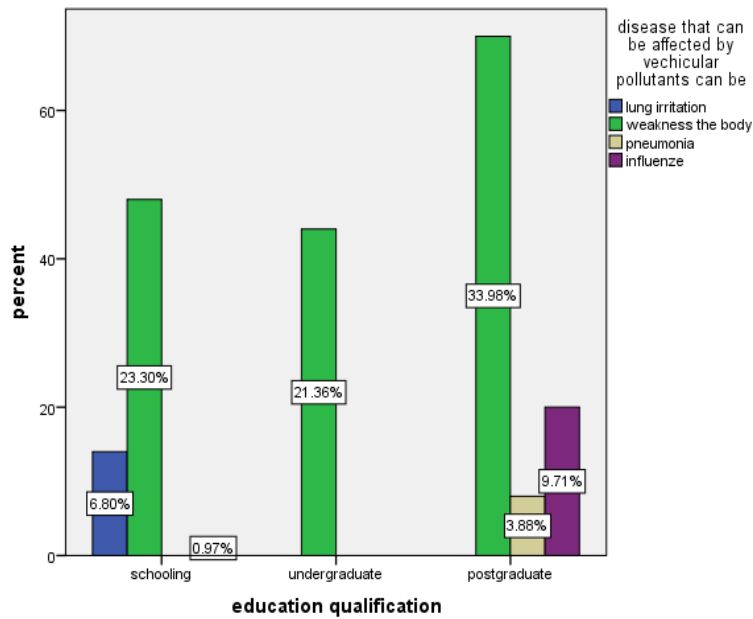
Figure:10

Legend:fig 10 shows about the annual income and the graph says about the vehicular air pollution affect human health.

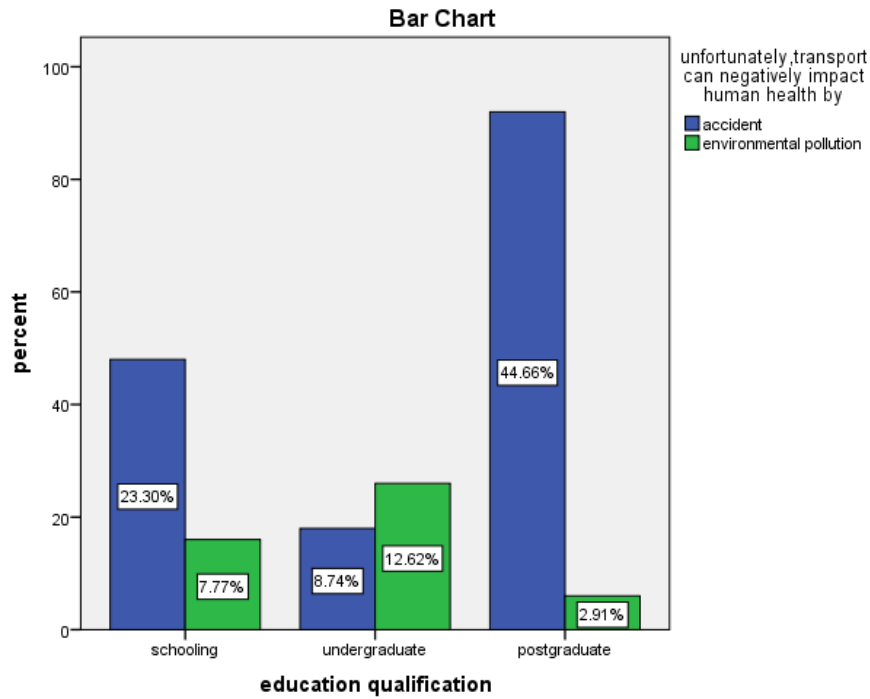**Figure:11**

Legend:fig 11 shows about the educational qualifications and the graph says about the disease that can be affected by vehicular pollutants.

Figure:12

Legend:fig 12 shows educational qualifications and the graph says about the unfortunately transport can negatively impact human health.

Figure:13

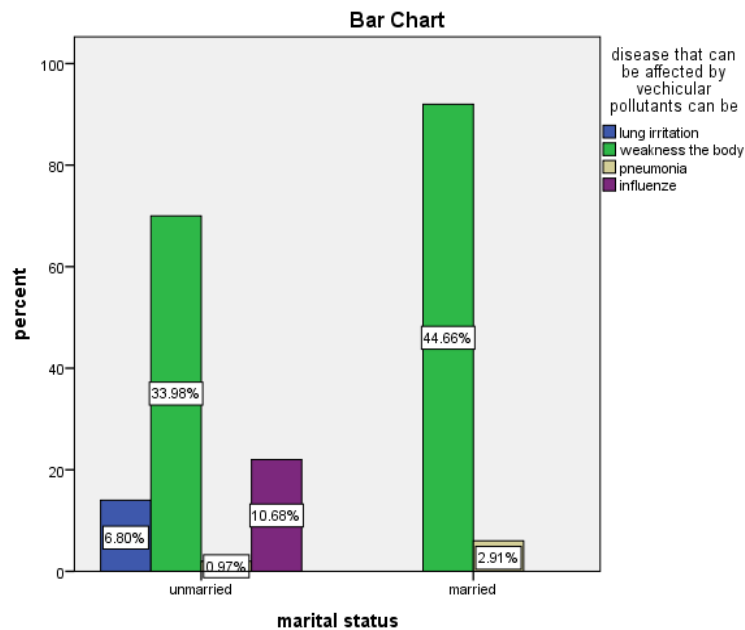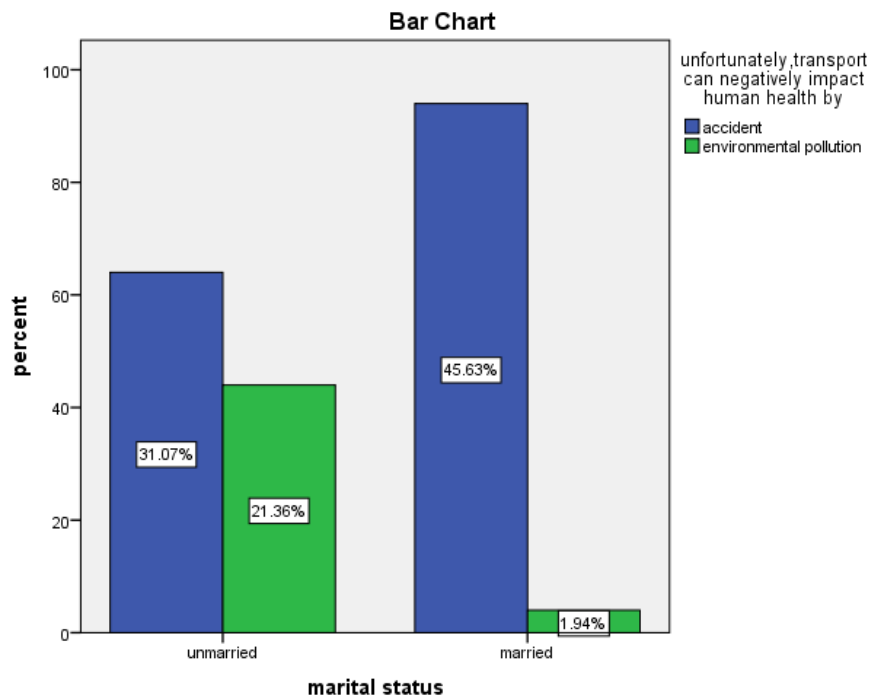**Legend:**fig 13 shows about the Marital status and the graph says about the disease that can be affected by vehicular pollutants.

Figure:14

Legend:fig 14 shows about the marital status and the graph says about the unfortunately transport can negatively impact human health.

Figure 15:
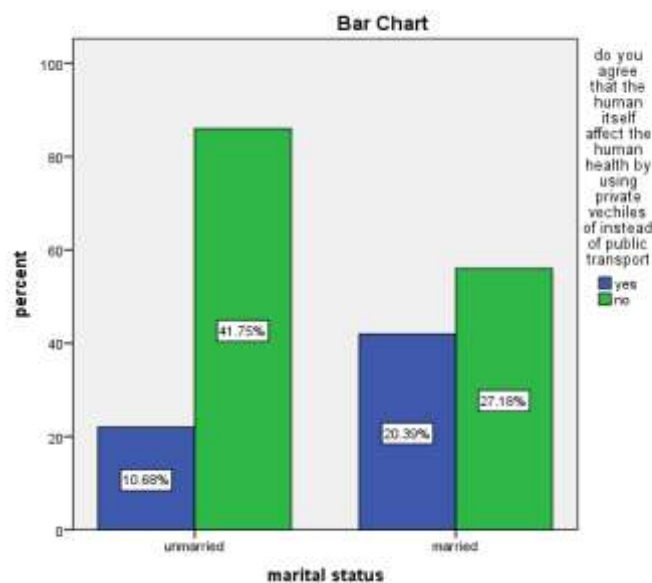
Legend:fig 15 shows about the marital status and the graph says about the human itself affect the human health by using private vehicles of instead of public transport

V. RESULT:

In Fig.1, there were no third gender respondents from all age group, and the standard opinion from the age group of 20-25 male has stated air pollution is the source of vehicle results because laziness among the people and age group from 35-40 and above 40 there were neutral responses vehicles is been used because of laziness among the people.In Fig.2, there were no third gender respondents, the standard opinion of vehicular air pollution in urban areas among male is less than female.In Fig.3, there were no third gender respondents, the standard opinion of air pollution due to vehicle affects the public health among majority of age groups by both male and female.In Fig.4, there were no third gender respondents , the standard opinion of continuation of vehicular air pollution leads to the survey among majority of age groups responded by both Male and female.Fig 5 represent the overall performance of the sample population which regards to the occupation and majority response is 31.79% says that main pollutants for motor vehicle Fig 6 represent the overall performance of the sample population which regards to the annual income and the majority response is 28.90% that the agree that air pollution caused by industries Fig7 represent the overall performance of the sample population which regards to the annual income and majority response is 42.01% that the do we control air pollution fig 8 shows about the annual income and the graph says about the public transport usage reduce pollution.fig 9 shows about the annual income and the graph says about the human itself affect the human health by using private vehicles of instead of public transportfig 10 shows about the annual income and the graph says about the vehicular air pollution affect human health.fig 11 shows about the educational qualifications and the graph says about the disease that can be affected by vehicular pollutants.fig 12 shows educational qualifications and the graph says about the unfortunately transport can negatively impact human health.fig 13 shows about the Marital status and the graph says about the disease that can be affected by vehicular pollutants.fig 14 shows about the marital status and the graph says about the unfortunately transport can negatively impact human health.fig 15 shows about the marital status and the graph says about the human itself affect the human health by using private vehicles of instead of public transport

VI. DISCUSSION:

From the survey, the Fig.1, shows that age and gender distribution which pertains to Vehicles is the source of air pollution. There were no third gender respondents from all age group, and the standard opinion of vehicular air pollution among the male and female have neutral responses of 20-25 year and above 40 years.It shows that the source of vehicles is due to laziness among the people to approach public transportFrom the survey, the Fig.2, shows about the age which pertains to gender and their standard opinion on vehicular air pollution in urban areas. There were no third gender respondents, the standard opinion of vehicular air pollution in urban areas among female is less than male respondent . Thus most of the female respondents agreed the Chennai vehicular air pollution is moderatFrom the survey, the Fig.3, shows about the age distribution pertains to gender and their standard opinion about in what ways the air pollution due to vehicles affects the public health. The standard opinion on aged above 25-30 years. The male aged above 25-30 years feels that skin problems,breathless are the major problems faced by people due to vehicular air pollution.From the survey, the Fig.4, shows the age which pertains to gender distribution and their on continuation of vehicular air pollution leads to., the standard opinion of irrespective of gender majority of age groups has stated that vehicular air pollution will lead to no rain.Fig 5 represent the overall performance of the sample population which regards to the occupation and majority response is 31.79% says that main pollutants for motor vehicle Fig 6 represent the overall performance of the sample population which regards to the annual income and the majority response is 28.90% that the agree that air pollution caused by industries Fig7 represent the overall performance of the sample population which regards to the annual income and majority response is 42.01% that the do we control air pollution fig 8 shows about the annual income and the graph says about the public transport usage reduce pollution.fig 9 shows about the annual income and the graph says about the human itself affect the human health by using private vehicles of instead of public transportfig 10 shows about the annual income and the graph says about the vehicular air pollution affect human health.fig 11 shows about the educational qualifications and the graph says about the disease that can be affected by vehicular pollutants.fig 12 shows educational qualifications and the graph says about the unfortunately transport can negatively impact human health.fig 13 shows about the Marital status and the graph says about the disease that can be affected by vehicular pollutants.fig 14 shows about the marital status and the graph says about the unfortunately transport can negatively

impact human health.fig 15 shows about the marital itself affect huma

VII.   LIMITATIONS:-

The major limitation of my study is the sample frame. The sample frame is public area and college students. The college campus is also one of the major drawback. The restrictive area of sample size is also another major drawback. Most of the students are afraid to share pictures for survey.The physical factors are the most impactful and a major factor limiting the study.

VIII.   CONCLUSION:-

From all the analysis part from the research it is found that the most of the70% of people uses motor vehicles due to their laziness to approach public transport and around 20% to save time .80% of people says vehicular air pollution in urban areas are moderate.Majority of people says that vehicular air pollution affects the human health and leads to no rain.By concluding the study,The policy and laws controlling of vehicular air pollution is not so effective and the people can reduce or eliminate fireplace and keep the vehicle well tuned tires inflated property to reduce exhaust emissions and people should avoid idling. Passing a law (or) implementing it will not be a solution. Individual counseling, seminars and workshops on pollution control, motivation, etc.. are other methods.

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