SUMMARY
AND
CONCLUSION
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The dietary structure, levels of physical activity, obesity, and diet-related non-communicable disease (DR-NCD) patterns are changing rapidly throughout the developing world. India, the most populated nations in the world, reflects many of these changes. It has achieved remarkable economic progress in recent decades. At the same time, larger numbers of people continue to live in conditions of extreme economic deprivation. India has experienced rapid urbanization, but is still predominantly in rural societies, where the economic and nutritional transitions are different ways both face comparable rapid increases in DR-NCD problems, albeit manifested in different ways. India has problems of dietary deficit to problems of dietary excess and there is shift in economics costs linked with this transition. (Popkin, et. al, 2001)

Diseases of cardiovascular system currently account for a large proportion of morbidity and mortality in various parts of the world. The disease has equally affected India. Every year 27 lakhs people die of heart attack After menopause women are equally affected as men. These account for a quarter of total number of death every year. (Chadha , 1995, Singh, 2001).

The investigator conducted a study on the “Effect of dietary factors and lifestyle on the prevalence of cardiovascular diseases among urban and rural population”. The summary and conclusion of the study are given below.

The investigator confined her study to the geographical area as Thiruvananthapuram district, the capital of Kerala State in South India. From the 52 wards in Thiruvananthapuram district, six wards from each, urban and rural areas were selected using multistage sampling techniques. These primary stage units were selected
randomly. The wards selected were Poovar, Malamukal, Venganoor, Venjaramoodu, Kattakada and Kilimanoor from rural area and Poojappura, Kawdiar, Peroorkada, Perumthanni, Manacaud and Jagathy from urban area. From these primary units, two residential associations from each ward were selected randomly. And from each selected residential association households were selected randomly using lottery method and the sample were selected using judgement sampling technique. In total, the sample size for the study was 3000. Out of this, 1500 were from urban areas and 1500 from rural areas. Six urban and six rural wards were selected from the 52 wards. From each ward, 2 residential association were selected and 125 households from each residential associations were selected for the study. Both males and females between the age group of 24-64 years were included in the study.

Survey method was used to collect data. In the first phase, questionnaire was used and in the second phase, interview was used. Using the questionnaire, the socio-economic background data and the prevalence of cardiovascular diseases among the sample were collected. In the second phase the cardiovascular patients were selected as sub sample. Interview was done to collect data regarding the dietary factors, lifestyle patterns, anthropometric and clinical data of sub sample. The collected data were coded, tabulated and analysed using statistical methods with SPSS computer package (version. 8) and the results were found out. Based on it summary and conclusions were drawn. The investigator has tried her level best to make the data valid and reliable, thus making the study a significant one.

In the present study, out of the 3000 sample from the rural and urban households, 84.3 percent belong to the nuclear family. 81.1 percent of the rural and 87.4 percent of the urban sample are with nuclear family pattern. 13.8 percent of the rural and 5.5 percent of the urban sample live in joint family. 5.1 percent of the rural and 7.1 percent of the urban sample are with extended family pattern.

The technological growth due to industrialisation leads to the disruption of joint family in India. In search of better employment opportunities people tend to break away from the traditional joint family and move towards cities and towns. This trend is seen
very evidently in the collected data. The small family norm is adopted both in the rural and urban areas.

Out of the 61 rural sub-sample, 55.7 percent and out of the 151 urban sub sample, 74.8 percent are from nuclear families. 84.3 percent of the sample and 69.3 percent of the sub sample belong to nuclear family. As the majority of the sample and sub-sample come from the nuclear families, the changing trends of families (disintegrating from the joint families) are very evident. Statistical analysis shows strong significance between family type and place of residence. Chi-square was done between the family type and place of residence (Chi-square = 9.06, df = 2, p = 0.011). 27.9 percent of the rural and 19.2 percent of the urban sub-sample are living in joint families, 16.4 percent of the rural and 6 percent of the urban sub sample are with extended families.

1.77 percent of rural and 2.1 percent of urban sample are with three members. The majority of the sample have 4-5 members in their family, 68.2 percent of rural and 81.2 percent of urban sample belong to this group. About 21.5 percent of rural and 14.5 percent of urban sample have 7-9 members in their family. 8.6 percent and 2.2 percent of the rural and urban, respectively, have above 10 members in their family. As the joint families are disintegrating, families with members above 10 are less.

Analysis of data regarding the composition of the family shows that about 8.2 percent of rural and 7.8 percent of urban sub-sample have below 3 members in their family. There are 4-6 members in 39.4 percent of rural and 32.5 percent of urban sub-sample, 36.1 percent of rural and 47.2 percent of urban sub-sample have 7-9 members in their families. There are above 10 members in 16.4 percent of rural and 12.5 percent of urban sub-sample.

The data collected on the educational status of the sample reveal that 5.4 percent of rural and 4.5 percent of urban sample were illiterates. There were 42.4 percent of rural and 22.8 percent of urban sample below SSLC. 31.5 percent of rural and 32.8
percent of urban sample have SSLC or Pre Degree level education. 14.6 percent of rural and 21.2 percent urban sample have graduation. 6.1 percent of rural and 18.7 percent of urban sample have post graduation. As the opportunities are more in urban areas, the number of postgraduates are more there.

The data reveal that 8.2 percent of rural and 4.6 percent of urban sub sample were illiterates. 39.3 percent of rural and 10.6 percent of urban sub sample have education below SSLC. About 37.7 percent of the rural and 19.2 percent of the urban sub-sample have SSLC - Pre-degree level of education. 19.7 percent of rural and 39.7 percent of urban sub-sample are graduates. 9.8 percent of rural and 25.9 percent of urban sub-sample have post graduation.

The higher prevalence of cardiovascular diseases among highly educated persons maybe due to the following reasons. These highly educated persons hold a sedentary occupational pattern. They also have higher income and hence the diets are rich in protein and fat. High dietary fat intake and less physical activity are risk variables of cardiovascular disease and hence they have a high rate of cardiovascular disease. This result agrees with the findings of the study conducted by Gopinath, et.al, 1994, which shows that the prevalence of coronary disease was higher among literate than illiterate subjects.

Data of the religious status revealed that 26.6 percent of males and 26.2 percent of females of the rural sample and 29.3 percent of males and 20.4 percent of the females of urban sample were Muslims. 52.4 percent of males and 55.9 percent of females of the rural sample and 52.1 percent of males and 50.1 percent of females of the urban sample belong to the Hindu community. 21 percent of the males and 17.9 percent of the females in the rural sample and 18.6 percent of males and 29.5 percent of the females from the urban sample were Christians.

The data collected from the cardiovascular patients, i.e. sub sample, reveal that 37.7 percent of rural and 37.1 percent of urban sample were Muslims. 27.9 percent of
the rural and 29.1 percent of urban sample were Hindus. 34.1 percent of the rural and 33.8 percent of the urban sample were Christians. According to Doshi (1995), the avoidance or preference of food is largely determined by religion. However there is no uniformity in preference or avoidance of food in a single ethnic community though it is found that generally Hindus do not consume beef. Statistical analysis was done between the religion and place of residence and it was found to have negative association. (Chi-square = 0.01, df=2, p =0.99). Religious influence was the same in urban and rural areas in the prevalence of cardiovascular diseases.

The data reveals that 25.8 percent of rural and 19.5 percent of urban sample belong to the age group 24-33 years. Between the age group 34-43 years, there were 32.8 percent rural and 44.7 percent urban sample. In the age group 44-53 years, there were 25.9 percent of rural and 16.8 percent of urban sample. 15.5 percent of rural and 19 percent of urban sample were of the age group 54-63 years.

The data reveals that majority of the cardiovascular patient were with in the age group of 43-53 years. There were 23 percent of rural and 41.7 percent of urban sub-sample in the same age group. While 8.2 percent of rural and 8.6 percent of the urban sub-sample are of age group 24-33 years. 18 percent of rural and 17.9 percent of urban sub sample are of the age group 34-43 years. 23 percent of the rural and 41.7 percent of the urban sub sample were in the age group 44-53 years. 50.8 percent of rural and 31.8 percent urban sub sample, are of the age 54-63 years.

The result is in agreement with the fact that ageing is one of the risk variables of cardiovascular diseases. From the data it was found that among rural sample, 17 percent of males belonged to the age group of 24-33 years, while 35.4 percent of females belonged to the same age group, but in the case of urban sample it was 15.2 percent of males and 23.4 percent of females. In the age group 34-43 years, there were 36 percent of males and 29.3 percent of females in the rural sample and 41.3 percent of males and 47.9 percent of females in the urban sample.
The data reveals that 8.2 percent of rural and 8.6 percent of urban sub sample belong to the age group 24-33 years, while 18 percent of rural and 17.9 percent of urban sub sample belong to the age group 34-43 years. In the age group 44-53 years 23 percent of rural and 41.7 percent of urban sub sample were there. Between the age group 54-63 years, 50.8 percent of rural and 31.8 percent of urban sub sample are there.

It has been well established that men are at higher risk for the entire spectrum of coronary artery disease, its onset, severity and consequences. In postmenopausal women, the heart attack risk becomes identical to that of men. (Murray, 2001).

It is clear from the collected data that 32.8 percent of rural and 43 percent of urban sub samples were females while 67.2 percent of rural and 57 percent of urban sub sample were males. After the menopause, the changes in females are almost equal to that of men. This fact is very evident from the data.

The data reveal that 62.5 percent of rural and 38 percent of urban sample are doing heavy work. 22.3 percent of rural and 17.2 percent urban sample do moderate type of work. 15.2 percent of rural and 44.8 percent of urban sample do sedentary work.

19.7 percent of rural and 17.2 percent of the urban sub sample did heavy work. 18 percent of rural and 12.6 percent of urban sub sample did moderate type of work. 62.3 percent of the rural and 70.2 percent of the urban sample did sedentary work. From the data collected it was clear that rural and urban sample that were doing sedentary work had more incidence of cardiovascular diseases. This result is in agreement with the fact that sedentariness is a risk variable of cardiovascular disease.

The collected data reveal that 13.7 percent of rural and 20.7 percent of urban sample have monthly income below Rs.1000. 72.7 percent of rural and 13.5 percent of
the urban sample had income between Rs.1001 and Rs. 3000. 8.3 percent of rural and 51.5 percent of urban sample have monthly income between Rs.3001 and Rs.6000. 5.3 percent of rural and 14.3 percent of urban sample had monthly income above Rs.6001.

11.5 percent of the rural and 10.6 percent of the urban sub sample had monthly income below Rs.1000. 24.6 percent of rural and 19.2 percent of urban sub sample had monthly income between Rs.1001 and Rs.3000. 34.4 percent of rural and 22.5 percent of urban sub sample had monthly income between Rs 3001 – Rs. 6000. 29.5 percent of rural and 47.7 percent of urban sub sample had monthly income above Rs.6001.

From the collected data it was clear that the incidence of cardiovascular diseases also increases as the monthly income increases, 34.4 percent of the rural and 22.5 percent of the urban sub sample were from the income group Rs 3001-Rs.6000. 29.5 percent of rural and 47.2 percent of urban sub sample were with monthly income above Rs.6001. There is significant association between monthly income and area of residence. (Chi square = 12.83, dt = 3, p=0.003). According to Devadas et.al, (1978) as the income level increases the serum cholesterol level also increases, which directly increase the chances to get cardiovascular diseases.

The height of the sample ranged between 151 - 176 cms. Out of the 3000 sample, 25.3 percent of rural and 19.4 percent of urban sample have height between 156-160 cms. 14.1 percent of rural and 13.5 percent of urban sample have height range of 161-165 cms. There were 2.3 percent of rural and 14.4 percent of urban sample with the height range 166-170 cms. There were 0.1 percent of rural and 2.5 percent of urban sample in the height range of 171-175 cms. About 0.3 percent of the urban sample have height above 176 cms.

The height distributions of the patients are given below. There were 8.2 percent of rural and 9.3 percent of urban sample in the height range of 151 – 155 cms. There were 21.3 percent of rural and 51 percent of urban sample between 156- 160 cms height. There were 50.7 percent of rural and 23.8 percent of urban sample between 161 – 165 cms in height. 19.7 percent of rural and 9.9 percent of urban sample were in the
height range 166 – 170 cms. 6 percent of urban sample has height between 171 – 175 cms. There is strong statistical association between the height and area of residence of the sub sample (chi-square = 24.31, df = 4, p = 0.001).

In the present study, 8 percent of rural and 4.2 percent of urban sample are of weight range 41-50 Kgs. 46.3 percent of rural and 14.2 percent of urban sample are of weight range between 51-60Kgs. 27.5 percent of rural and 34.2 percent of urban sample have weight between 61-70 kgs. 11.7 percent of rural and 21.6 percent of urban sample have 71-81 kgs of weight. About 5.1 percent of rural and 14.7 percent of urban sample have weight between 81-90 kgs. 1.6 percent of rural and 10.2 percent of urban sample have weight between 91-100 kgs.

The weight distribution of the cardiovascular patients given below: 19.7 percent of rural and 3.3 percent of urban sample were between the weight range 61-70 kgs. 47.5 percent of rural and 10.6 percent of urban sample have weight between 71-80 kgs. 27.9 percent of rural and 72.2 percent of urban sample have weight range between 81-90 kgs. 4.9 percent of rural and 13.9 percent of urban sample have weight range between 91-100 kgs. There is strong statistical association between weight and area of residence (Chi square = 64.12, df = 3, p = 0.000). fig (4.20).

Analysis of variance test was done to check whether the weight of the sub sample differ in urban and rural areas has any influence on the prevalence of cardiovascular diseases. The results of the analysis of variance test (ANOVA) revealed that the mean weights of the urban sub sample were 83.6 kg while those of rural sub sample were 74.5 kg. The SD of the weight of urban sub sample were 7.02 and 7.9 for rural sub sample. The 95% confidence intervals for mean of rural sub sample were 72.5 at lower bound and 76.6 at upper bound. The 95% confidence intervals for mean of urban sub sample were 82.5 at lower bound and 84.8 at upper bound. The F value was 67.34 and P = 0.000. the result is in accordance with the fact that weights of the sub sample in urban and rural area have influence in the prevalence of cardiovascular diseases of the sub sample. As obesity was more prevalent in the urban sub sample and the prevalence rate was also higher.
Comparison of the height (cms) and weight (kgs) matrix of males, it was clear that in urban males 35 out of 85 sub sample fall under the category of 161-165 cm of height and 81-90Kg of weight. Among the 41 rural males 13 out of 41 sample under the category 161-165 cms of height and 71-80 kgs of weight. Outs of 85 urban male sub sample 46 are in the group with 156-160 cms of height and 61 are in the group with 81-90kgs of weight. Out of 41 rural male sub sample 20 of them fall under the category 161-165 cms of height and 21 fall under the group with 71-80 kg of weight.

After comparison of the height (cms) and weight (kgs) matrix of females, of the sub sample it was clear that in urban females 19 out of 65 sub sample fall under the category of 156-160 (cms) of height and 81-90 (Kgs) of weight. Among the rural females 6 out of 20 comes under the category 161-165 cms and 71-80 Kgs weight. Outs of the 65 urban female sub sample 29 are in the group with 156-160 cms of height. While 9 are of the category 71-80 Kgs of weight.

An analysis of the body mass index (BMI = wt/ht² = kg/m²) showed that 57% of males and 41% of the female of the urban sub sample have BMI above 25 and 24 respectively. About 62.1% of males and 26.3% of females in the rural sub sample have BMI above 25 and 24 respectively. In the urban sub sample the maximum number of males and females are in the age group 44-53 years. In the case of females the highest of males and females are in the age group 54-63 years. So it is clear that in the urban areas the sub sample between age group 44-53 are affected by cardiovascular diseases. In the rural sub sample prevalence of BMI above 25 were seen more in the age group 54-63 years.

From the data collected it was observed that sample from urban area have a higher prevalence of cardiovascular diseases such as 10.1 percent of the urban sample and 41 percent of the rural samples have cardiovascular diseases.

In the present study, the data related to the food habits of the sample are discussed. 21.5 percent of rural and 9 percent of urban sample consumed vegetarian foods. 65 percent of rural and 78.6 percent of urban sample consumed non-vegetarian
foods. Another type of food habits was, non vegetarian, but usually takes vegetarian foods, 13.5 percent of rural and 12.4 percent of urban sample belong to this group.

The food habits of sub sample shows that 6.6 percent of rural and 12.5 percent of urban sub sample were vegetarians. 80.3 percent of rural and 76.2 percent of urban sub sample were non-vegetarians. 13.1 percent of rural and 11.3 percent of urban sub sample were non-vegetarians, but usually takes vegetarian food.

It is clear from the collected data that 77 percent of the sub sample are non vegetarians. As the monthly income of the sub sample increases, (Table No. 4.1. (xvii), they are more prone to get cardiovascular diseases. This may be due to the fact that, as the income increases, the purchasing capacity of the sub sample also increases, which might have led the sub sample to consume more non vegetarian food stuffs.

Comparison was done between the food habits among various income groups and the following results were found. Among the Cardiovascular disease patients who had monthly income below Rs 1000, 7 out of the 61 rural and 13 out of the 151 urban patients consumed non-vegetarian food items. Cardiovascular disease patients with monthly income between Rs 1001 – Rs 3000, 11 out of the 61 rural patients were consuming non - vegetarian food items. The majority of the cardiovascular disease patients with monthly income between Rs 3001 – Rs 6000 consumed non- – vegetarian food items. In the case of cardiovascular disease patients whose monthly income was above Rs. 6001, 13 of rural and 50 of the urban patients were consuming non-vegetarian food items.

The vegetarians are less prone to the cardiovascular disease, shows that 6.6 percent rural and 12.5 percent of the urban sub sample are vegetarian. Income and area of residence are compared with food habits, the data reveal that as the income increases the life style improves and it may lead to cardiovascular disease. The data reveals that in the urban areas, the maximum number of patients are found in the income group, above Rs. 6001 per month, that means 33 percent of the total urban sub sample, while maximum number of rural sub sample are found in monthly income between Rs 3001 –
Rs. 6001 per month, that means 33 percent of the total urban sub sample, while maximum number of rural sub sample are found in monthly income between Rs 3001 – Rs 6001 range, that means 25.5 percent of the total rural sub sample. Another notable factor is that both belong to the non-vegetarian groups.

Comparison was done between food habit, educational status and place of residence of the sub sample and it was found that the maximum number of patients are found to consume non-vegetarian foods both in urban and rural areas. It is very clear that 62.3 percent of the rural and 70.2 percent of the urban sub sample are doing sedentary type of work, so the risk factors like non-vegetarian food habits and sedentary life style are the contributing factors for the occurrence of the cardiovascular disease.

As educational level increases, people get better jobs which are more of sedentary types. These can also lead to increase in the prevalence of cardiovascular disease among highly educated sample. Comparison of the food habits, among both sexes was collected and the analysed data revealed that 64 out of the 84 male patients in the urban area and 32 out of the 41 male patients in the rural areas are non-vegetarians. 50 out of the 65 female patients in the urban area and 18 out of the 20 females, patients in the rural area are non-vegetarians. From the data it is clear that 57 percent of male patients in the urban areas and 67 percent of the female patients are having cardiovascular disease. When the food habits, type of family and area of residence of the patients were correlated, it was found that out of the 113 patients of nuclear family in the urban area, 91 are non-vegetarian while in the rural area out of 34 patients, 27 are non-vegetarian. In the joint family, 16 out of 29 patients in urban area and 14 out of 17 patients in rural area are non-vegetarians. In the extended type of families, 7 out of the 9 in urban area and 7 out of 10 in rural area are non-vegetarians.

The Indian Council of Medical Research has designed Recommended Dietary Allowances for various nutrients. They have also formulated composition of balanced diets for various groups. These allowances are designed to serve as guide to find out the consumption of balanced diet by the people.
The data regarding the consumption of balanced diet by the sub sample revealed by the 24 hour recall method and weighment data shows that 66.3 percent of rural and 44.4 percent of urban sub sample consumed balanced diet 55.6 percent of urban and 37.7 percent of rural sub sample did not consume balanced diet. Statistical analysis revealed that there is significant association between the prevalence of cardiovascular diseases and consumption of balanced diet with area of residence by the sub sample. (Chi square = 4.89, df= 1, p = 0.002).

The data reveals that the consumption of balanced diet by the sub sample were seem more in the rural areas, and it may be the reason for the lesser prevalence rate of cardiovascular disease in the rural areas.

The non-vegetarian foods consumed by the sub sample consist of chicken, fish and egg in both rural and urban areas. Of the 212 patients, 124 patients 32 rural patients and 92 urban patients consumed beef. 17 rural patients and 24 urban patients consume pork. 29 rural patients and 132 urban patients consumed mutton.

The details regarding the frequency of consumption of non-vegetarian foodstuffs by the sub sample was analysed in details. 21 of the rural and 102 of the urban sub sample consumed beef or veal weekly. Fish was consumed daily by 40 rural and 78 urban sub sample. Egg was consumed daily by 28 of rural and 52 of urban sub sample.

As the consumption pattern of egg and beef / veal was high in the urban areas, (daily and weekly) the fact that the occurrence of cardiovascular diseases are more among urban population can be justified.

Mean daily intake of important foods in both the populations is shown in Table 4.3.(x). Higher intake of cereals, leafy vegetables and pulses are seen in the rural patients, while the urban patients showed an increased intake of milk and milk products, oils and fat, sugar and jaggery.
Mean intake of calories, fat, and protein was found by recall method. The urban female patients consume more fatty foods. From the data it is clear that there is an excess consumption of fat and protein by the sub sample. Though the net energy consumption up to the standard the protein and fat consumption is above the requirements. The weighment method was used to get approximately the correct amount of foods consumed by the sub sample. It was found that in the case of pulses of fleshy foods, oils and fats, milk and milk products, sugar and jaggery there were excess consumption than the requirement by the sub sample.

Mean intake of nutrients by the sub sample by weightment method. From the data it is clear that there is an excess consumption of fat and protein by the sub sample. Though the net energy consumption up to the standard the protein and fat consumption is above the requirements.

Antioxidants help protect against free radical damage. Antioxidant nutrients, such as beta – carotene, selenium, vitamin E, and Vitamin C, have been shown to be very important in protecting against the development of heart disease. (Murray, 2001). The collected data shows that only 21 of the rural and 32 of the urban sub sample consume fruits daily. Only 31 of rural and 43 of urban sub sample daily consumes leafy vegetable. 36 of rural and 61 of urban consumed other vegetables daily. The rest of the sub samples were consuming it weekly, monthly or rarely which may be the cause of occurrence of cardiovascular disease.

Data was collected regarding the breakfast skipping habit of the cardiovascular patients. 14.8 percent of the rural and 27.8 percent of the urban sample skip their breakfast while 85.2 percent of rural and 72.2 percent of the urban sample do not skip their breakfast.

According to a study conducted by Sakata, et.al, (2001) shows that skipping breakfast is related to cardiovascular risk factors. The results of the study were the younger the generation, the higher the rate of skipping breakfast. The rate of skipping breakfast in men was twice as high as that in women. The breakfast skippers tended to intake less energy and calcium, both in men and women, than non- – skippers.
Female skippers tended to intake less iron and vitamin D. The number of steps per day was smaller in breakfast skippers than that in non-skippers, both in men and women. Male skippers tend to have higher blood pressure than non-skippers, and female skippers tend to have a higher serum total cholesterol level than non-skippers. The breakfast skippers tended to smoke more than non-skippers. The breakfast skippers tend to drink more alcohol and take less exercise.

Detailed data collected on the type of oil consumed by the sub sample revealed that 34.4 percent of the rural and 23.2 percent of the urban sub sample used coconut oil, 18 percent of the rural and 19.2 percent of the urban sub sample used sunflower oil. 9.8 percent of the rural and 24.5 percent of the urban sub sample used coconut oil and sunflower oil. 11.6 percent of rural and 13.9 percent of the urban sub sample used palm oil. 26.2 percent of rural and 19.2 percent of urban sub sample used a variety of oils, ie, coconut, palm oil and vanaspathi. There is a remarkable change among Keralites with regard to the use of oil. The traditional oil consumption was confined to coconut oil alone. But due to the awareness of its saturated fatty acids and its effect on the cholesterol level, people are shifting their choice of oil from coconut oil to other oils.

The oil used by different ethnic groups was compared with the area of residence. It was found that 17 out of the 50 Muslim sample used a combination of coconut oil and sunflower oil in the urban area. 12 out of 56 sample used coconut oil, while 7 out of 23 rural patients used coconut oil alone for cooking. In the case of Hindu patients, 9 out of 44 urban patients and 7 out of 17 rural patients used coconut oil. 12 urban patients and 5 rural patients used a combination of coconut oil, palm oil and vanaspathi. Among Christian patients, 15 out of 51 urban patients and 7 out of 21 rural patients used coconut oil. 13 of urban and one of rural patients used coconut oil and sunflower oil.

Data regarding the daily consumption of miscellaneous foods by the sub sample were collected. Papad was consumed daily by 57 of the rural and 99 of the urban sub sample. 47 of rural and 100 of urban sub sample consumed pickles. 15 of rural and 42 of urban sub sample consumed sweets. Coffee was consumed by 69 of the total sub
When the monthly income was compared with the consumption of miscellaneous foods it was found that the middle and high income groups in both urban and rural areas are consuming it more.

The data reveal that 23 percent of the rural and 80.1 percent of the urban sub sample consume food from outside catering units. 77 percent of rural and 19.9 percent of urban sub sample do not consume fast food items. There is a strong significant association between the fast food consumption pattern and the area of residence (Chi-square = 61.42, df = 2, p = .001).

The prevalence of cardiovascular diseases is higher in the urban areas, which may be associated with the consumption of outside foods, which are rich in saturated oils and artificial flavourings. In fast foods non-vegetarian items are cooked with a large amount of lard (animal fat) to give extra taste. The usage of this animal fat (lard) is very much injurious to health and this leads to cardiovascular diseases. As sub standard food items and reheated oils are used, the fast food items have a very bad influence on our health.

Alcohol consumption pattern of the sub sample was collected. 39.3 percent of rural and 51.7 percent of urban sub sample consumed alcohol. City dwellers are prone to alcohol consumption and this may be one of the reasons for the high rate of cardiovascular disease among urban population.

The alcohol consumption patterns of different ethnic groups were found out. It was found that among the sub sample, 16.7 percent of Muslims, 25 percent of Hindus and 58.3 percent of Christian in the rural area consumed alcohol. Among the urban sub sample 19.2 percent of Muslims, 32.1 percent of the Hindus and 48.7 percent of Christians consumed alcohol. This is in agreement with the fact that alcohol consumption is a risk variable of cardiovascular disease. The data also shows that compared to the Christians and Hindus; the percentage of people consuming alcohol among Muslims is very less. But there is higher prevalence of cardiovascular disease
among them. The high prevalence Table 4.1.(viii) may be attributed to other factors like dietary fat intake, sedentariness, heredity etc.

The data reveal that 15.9 percent of the rural and 54.3 percent of the urban sample have smoking habit, while 54.1 percent of rural sample and 45.7 percent of urban sample do not smoke. The result shows that the urban sub-sample have a greater risk as they smoke more.

British Regional Heart Study, 1991, shows that smokers have two or three times the risk of developing coronary heart disease than non-smokers. The risk increases with the number of cigarettes smoked and the number of years during which one smokes. The diagrammatic representation of the smoking habit of the sub-sample is given below Fig 4.4.(ii). When the ethnic groups table 4.1 (viii) were compared regarding smoking habit it was found that Christians had the habit of smoking more than the Hindus and Muslims. This may be an added risk factor for the greater prevalence of cardiovascular diseases.

Exercising habit was there for 34.4 percent of rural and 25.8 percent of urban sub sample. Exercising habit was not there for 65.6 percent of rural and 74.2 percent of urban sub sample. A number of studies have suggested that wholly sedentary people have a greater risk of coronary heart disease than regular exercisers. The reason for this may be associated with increased levels of obesity and limited opportunities for coronary arteries to be flushed through, as a result of increased blood flow during exercise.

The data reveal that 12 males and 9 females in rural area and 26 males and 13 females in urban area have the habit of exercising. Walking was the most common form of exercise 5 males and 4 females in the rural area and 6 males and 4 females in the urban area have adopted walking as their exercise activity. There are 13 rural patients and 19 urban patients who exercise for a period of less than 30 minutes benefits of exercising in less, as the duration of exercising was less. Since the treatment for cardio
vascular disease includes, exercise, 34.4 percent of rural and 25.8 percent of the urban patients included exercise in the life pattern.

Out of the 61 patients in the rural area 11.5 percent of them have occupational stress and out of patients of the 151 urban area, 7.9% have occupational stress. 4.9% patients in the rural area and 11.9 percent of the patients in the urban area have family tension as the main cause of stress. Financial stress is reported by 14.8 percent of the patients in rural area and 23.8 percent of the patients in the urban areas. Statistical analysis shows significant association between the prevalence of cardiovascular disease and the stress pattern and place of residence. (Chi square = 13.53, df = 6, p = 0.04).

There were 11.4 percent of rural and 7.3 percent of urban sub sample, who were sensitive and social. There were 18 percent of rural and 28.5 percent of urban sample were reserved. 3.3 percent of rural and 6 percent of urban sample were social. 23 percent of rural and 21.1 percent of urban sample reported worrying nature. 21.3 percent of rural and 12.6 percent of urban sample reported sensitive and worrying nature. 16.4 percent of rural and 10.6 percent of urban sample reported sensitive and reserved nature.

In the present study, 77 percent of the rural and 87.4 percent of the urban sub sample are with Type A personality. 23 percent of rural and 12.6 percent of urban sub sample are of Type B personality.

Heredity is a very important factor for the occurrence of cardiovascular diseases. It is clear from the collected data that 60.7 percent of the rural and 58.9 percent of the urban sample have a history of cardiovascular disease in their family. 39.3 percent of the rural and 41.15 percent of the urban sample did not have it.

The type of treatment taken by the cardiovascular patients was collected. There were 63.9 percent of rural and 93.4 percent of urban sample that were under allopathic treatment. Ayurveda treatment was taken by 23 percent of rural and 21.7 percent of urban sample Homeopathy treatment was taken by 13.1 percent of rural and 2 percent of urban sample. There is a strong significant association between the prevalence of
cardiovascular disease and the type of treatment with the area of residence by the sub sample. (Chi square = 22.58, df = 2, p = 0.01).

The bivariant frequency table shows the blood pressure level of urban sub sample that is systolic and diastolic pressure. Increased level of both systolic and diastolic pressure has an influence on the occurrence of high blood pressure. On statistical analysis it was found that there was no significance between the blood pressure of the female and the area of residence. (t = 0.039, P = 0.844). The t distribution test was done to check whether the Blood Pressure diastolic of male sub sample have difference in the area of residence in according to the prevalence of cardiovascular disease.

Or. statistical analysis, the data revealed that the mean value of Blood Pressure diastolic of urban sub sample was 148.3 while the SD was 14.8 and upper bound 95% confidence interval for mean was 151.5. In the case of the rural counter part, the mean was 147.8, SD was 15.3 and upper bound 95% confidence interval for mean was 152.4. The t value was 4.382 and P value is 0.039. The t- distribution shows a positive test. The urban and rural areas have a difference in the prevalence of cardiovascular diseases when blood pressure diastole was concerned. As the blood pressure diastole increase have more influence in the occurrence of cardiovascular diseases.

Many studies have confined earlier impression that the incidence of cardiac enlargement, heart failure, coronary artery diseases like stroke are correlated more closely with systolic pressure than diastolic. Therefore systolic hypertension is recognised as clinical entity and is treated accordingly.

The bivariant table shows the blood pressure level of rural sub sample that is systolic and diastolic pressure. The chest discomfort of cardiovascular patients while walking in speed was collected. There were 77 percent of rural and 85.4 percent of urban sample, responded, positively to it.
Data regarding the difficulty of the patients in climbing uphill or hurriedly walking were collected. There were 47.5 percent of rural and 78.8 percent of urban sample who have difficulty in climbing up hill or hurriedly walking. There is a strong significant association between difficulty in climbing and the area of residence. (Chi square = 12.50, df = 2, p = 0.002). Urban people may not be familiar with such exercise or life pattern, so they find difficulty in climbing uphill or hurriedly walking.

The data reveals the cholesterol level of the sub-sample, 62.3 percent of the rural and 28.5 percent of the urban sub sample are with cholesterol level between 180 – 220 mg / dl. 31.1 percent of the rural and 51 percent of the urban sub sample have their cholesterol level between 221 – 260 mg / dl. 6.6 percent of the rural and 20.5 percent of the urban sub sample have their cholesterol level within 261 – 300 mg / dl. There is strong significant association between the prevalence of cardiovascular diseases and cholesterol with the area of residence. (Chi square = 41.75, df = 2, p = .001).

Medical Information Foundation in a report (1996) has revealed that total cholesterol level less than 200 mg / dl is considered reliable; those between 200 —239 mg / dl are at bordering, while those between 240 mg / dl and over are high. Various studies have found that generally for every one percent increase in total cholesterol over 200 mg / dl, the rise of coronary heart disease increases by 2 percent.

Analysis of variance test (ANOVA) was done to check whether the cholesterol level of the sub sample differ in urban and rural areas. The mean value of cholesterol of the urban sub sample was 240.4 while that of rural sub sample was 191.9. The standard deviation of urban sub sample was 26.5 and rural sub sample was 14.1.. The F value was 3.165 and P = 0.035. The result reveals that there was variance between the urban and rural sample as far as the cholesterol level was concerned.

Srikantan (1991) stated that the serum cholesterol levels with respect to the income group among Indian population group showed a positive correlation, that means as the income of the group increases, the serum cholesterol level ≥2 increases. The 20
- 50 yrs old subjects of the Trivandrum district had serum cholesterol levels of 161 – 173 mg / dl, where as high income group had the serum cholesterol level of 183 – 228 mg / dl, respectively.

According to Devadas, et. al, 1978 as the income level increases, the serum cholesterol level also increases. The collected data revealed that 37 rural and 94 urban sample have diabetes mellitus. High blood pressure was present in 48 percent of rural and 112 percent of urban sub sample. Obesity was there in 44 rural and 120 urban sub sample.

To conclude, cardiovascular disease is one of the major cause of morbidity all over the world and is of a great concern to health professionals. The present study on the “effect of dietary factors and lifestyle on the prevalence of cardiovascular diseases among urban and rural population” proved that dietary factor and lifestyle plays an important role in the occurrence of cardiovascular diseases.

The risk factors predisposing to cardiovascular disease patients were identified as obesity, stress, and lack of exercise smoking and faulty dietary practices, all of which are controllable. The prevalence rate is higher in urban people as they are more prone to faulty dietary factors and lifestyle.

Cardiovascular diseases can be prevented by following the five golden rules i.e., take adequate diet properly, avoid smoking, regular exercise, regular health check-up, regular muscular exercise and avoid unnecessary stress and tension.

**Recommendations:**

1. Environmental factors influencing prevalence of cardiovascular diseases can be studied.
2. Formulation of a risk assessment index to predict cardiovascular diseases among adults.