5.1 Summary of the study

Cardiovascular disease (CVA) is one of the main factors, affecting the quality of life of an elderly person. In countries where routine statistical data are available up to 75% of the deaths of those over 65 years of age are attributable to cardiovascular disease.

The WHO report on mortality from cardiovascular diseases indicated that CHD was more prevalent in the industrialized as compared to the developing nations of the world.

It has been well established that smoking, hypercholesterolemia, hypertension, obesity and a family history of CHD are strong independent risk factors for CHD.

Science and technology changes our way of living from vigorous occupation, keeping always safe from the attacks of wild beasts and to survive from various natural calamities by our ancestors into an easy, comfortable and less-vigorous life of present world. Scientific inventions have changed our style of living.

Following birth, children grow and develop according to similar patterns until maturity. This growth and development process includes physical, cognitive, social psychological and motor
aspects, all of which are interrelated. Physical activity and childhood seem natural partners common to all young animal or growing child. However, cultural change is now laying a firm restraining hand on the instinctive movement patterns of the youngsters. Various features of our late 20th Century civilization; television, spectator sports, cars, labour saving gadgets and urban over crowding have conspired to create a generation of inactive children.

Aging is a universal process of growing old. It touches everyone regardless of age, gender or socio-economic level. We are all traveling at different speeds to the same destination. With respect to the entire range of human life, physical and motor performance measures and physiological function in general improve rapidly from early childhood to a maximum somewhere between the late teens and about 30 years of age.

Cardiovascular disease is the most frequently recorded single cause of death in persons over 65 years of age and in developed countries, accounts for one third of the admissions to hospital and more than one-quarter visits to the doctor. In addition, it causes much of the disability in the elderly and thus has an enormous influence on health care needs.

The prevalence of coronary disease increases as the population ages, roughly 25% of individuals of 65 years and above age have significant coronary disease. Older coronary patients are at particularly high risk for disability. There has been an emphasis on research funding for preventing disability in the elderly, and
along with this has come an interest in the effects of cardiac rehabilitation on physical functioning in elderly patients.

In most populations blood pressure increases with age. In the elderly systolic hypertension is particularly prevalent. It is the one risk factor to have been clearly shown to persist after the age of 70 years. It is thus important to measure the blood pressure of an elderly patient regularly, at least once a year, and to start treatment if there is a significant elevation.

Life-style is essentially the way we chose to live. The fact is that certain fundamental life-style choices ultimately dictate health and longevity for each of us.

The ill effects of bad diet, lack of exercise stress and smoking are cumulative and interconnected. In the final analysis, ill health is not an isolated event but the result of an accumulation of abuses, each a seemingly in consequential life-style decision. Our life-style habits directly affect our health and longevity, particularly where coronary heart disease is concerned.

By 2020, of the 10 countries with largest elderly populations in the world, five will be in the developing world. China (23 crores), India (14.2 crores), Indonesia (2.9 crores), Brazil (2.7 crores) and Pakistan (1.8 crores).

As a person ages the heart undergoes a number of changes, such as a decrease in the rigidity of the myocardial wall due to an increase in collagen, or calcification of the mitral ring and the mitral, aortic and pulmonary valves. At the same time, systolic
blood pressure tends to increase because of the progressive increase in peripheral resistance caused by the loss of elasticity in the arteries. While diastolic pressure remains at the same level or decreases. This physiological aging of the body as a whole may indirectly affect the heart.

American Heart Association has categorically mention that the chance of dying from CHD increases progressively and dramatically after age 35 in male and 45 in female: between ages 55 and 65, about 13 of every 100 male and about 06, of every 100 women die from coronary artery disease (CAD).

Various personal characteristics and environmental factors have been identified over the past 30 years that appear to play causative roles in making individually more susceptible to CHD. The risk factors identified are as follows:

(1) Age and gender
(2) Elevated blood lipids
(3) Hypertension
(4) Cigarette smoking
(5) Physical inactivity
(6) Obesity
(7) Diabetes mellitus
(8) Diet
(9) Heredity
(10) Personality and behavior patterns
(11) Sedentary life-style
The present problem is almost a survey type study and the specific research problem is "physique and health status of senior citizen in relation to life-style and cardiac ailments".

Purpose of the study are as follow:

(1) To compare the physique of male and female cardiac patients (senior citizen) with that of normal male and female subjects.
(2) To compare the body composition among the said subjects of the study.
(3) To compare the physiological health of the said subjects of the study.
(4) To compare, various habits of the subjects of the study.
(5) To compare the various aspects of life-style of the subjects of the study.
(6) To compare the anxiety level of the subjects of the study.
(7) An attempt will be made to identify prospective risk factors of cardiac ailments, in respect of the subjects of the present study.

The related literature of about 70 research studies have been reviewed in chapter II and incorporated in the text proper. 200 persons were pursued to act as volunteers of the research project. Data of 100 deceased persons, collected from various sources, are also considered as one of the group of subjects for the purpose of the study.

There are three groups of subject and each group again subdivided into male and female sub-groups. First group is marked as cardiac ailments (CA), they had a history of cardiac ailments and
were hospitalized for treatment of cardiac ailments. This group was comprised of 75 male and 25 female subjects.

The second group cardiac death (CD) comprised of 75 male and 25 female subjects, who succumbed due to previous history of cardiac ailments at the hospitals. The detail information regarding the subjects were collected from hospital record and from the subject's close relatives.

The third group was formed with the Normal Subjects (NS) who had no history of cardiac ailments and belong to the same age group of CA & CD groups are actually control group. This group is also comprised of 75 male and 25 female subjects. All the subjects were mainly from two districts – Hooghly and Howrah of West Bengal, India.

Mean age of the male subjects was 67.24 years and mean age of female subjects was 65.63 years.

Physique, health status and life-style were the criteria of the study. Physique was measured by height, weight and body composition variables (Fat %, Fat mass & Lean body mass) and Body mass index (BMI).

*Health status was assessed by ascertaining*

(i) case history

(ii) personal health

(iii) psychological health; by measuring anxiety (State & Trait) level.
Life-style was assessed by collecting information related to

(i) habits
(ii) work culture
(iii) Socio-economic status
(iv) nutritional condition

All the tests and measurements were conducted as per standard norms and practice, details of which are given in chapter-III of the text proper. To ascertain health status and life-style data, specific questionnaires were used.

For statistical analysis group data were converted to mean and SD first. For comparison of various means, analysis of variance was computed followed by \( t \) test.

MANOVA was also conducted to investigate whether the population mean vector are the same and if not which mean components differ significantly. When MANOVA was significant, post hoc test was conducted to arrive in to definite conclusion.

The data collected according to the procedure laid down in the Chapter-III are presented, adopting standard statistical procedures. The data gathered from three ‘groups’ are marked as CA (cardiac ailments), CD (cardiac death) and NS (Normal subject) groups respectively. There are three groups of subjects and each group again sub-divided into male & female.

While analyzing the data on the basis of statistical technique, many interesting information came to the light, relevant to health and life-style. Detail discussions are incorporated in the Chapter-IV.
of the text. Here under the summary some pertinent facts are depicted below.

There was slight variation in mean heights among the male groups and also for the female groups. Body weight of CD group of both male and female subject was significantly higher than both CA & NS groups respectively. Body fat percentage determined for CA & NS groups as per procedure. For CD group no assessment was possible. However, for CD group, body fat percentages, fat mass and lean body mass are predicted by using Linear Model.

For male groups, out of three sets of paired means, one set that is difference between CA & NS was insignificant. Others two sets were significant. In case of female group, all the three sets were insignificantly different. Fat mass was computed from body fat percentage. In the post hoc test out of three sets only in one set; the difference between CA & NS was not significant.

In case of female group in all the three sets, the mean difference appeared insignificant. Variation among the groups was observed in mean lean body mass. Out of three sets of paired means, in one set; difference between CD & NS was significant. Among the female groups variation in the group means was statistically insignificant.

Body mass index of the subjects of the present study are either below normal or normal. 57% males of CA group were below normal, and 37% are with in normal range, only 4% were overweight and 1% obese. In case of male CD group 38.6% below normal, 40% normal, 14.6% over weight and 2.6% obese. On the
other hand 53.33% male, NS group were below normal and 40% are within normal range. BMI score of the three male groups are different from each other. It may be seen that out of three sets of paired means two sets were significant. Only the difference between CA & NS was insignificant. In case of female groups out of three sets, in one set the difference between CA & NS was insignificant. Three male groups were not much different in their physique variation do exist in one set of height, two sets of weight, body fat%, fat mass and body mass index. In the female groups difference in physique parameters are limited and three groups may be considered as almost homogenous.

Other than physique, health status was one of the important criteria of the study. Health status was assessed by ascertaining case history of various diseases suffered by the subjects within last 5 years. Percentage wise analysis and comparison have been made in the text proper. It appears that subjects of CA & CD groups, both male and female had a considerable higher % of subjects suffered from respiratory problem, urinary problem, gastrointestinal problem. In comparison to the normal subjects (NS). A detail analysis of nature of cardiac ailments among the subject of CA & CD group had also been made. It appears that of the various cardiac ailments, AMI secured highest percentage (24%) among the male subjects of CD group. In case of CA group 13 to 16% subjects had IHD. Similarly analysis also made on other ailments and gout. The distributions of diabetic patients of the study are also noted and discussions have been made.

Heart rate, blood pressure and blood sugar level were the criteria of physiological health. Resting heart rate of the subjects of
the study are not very high but slightly above the normal range in CA & CD groups. Similarly in blood pressure (Systolic), difference between CA & NS and CD & NS respectively were significant.

Blood sugar level of CD group (both male and female) was significantly higher than that of CA & NS group respectively. In case of female subject's percentage of suffering from diabetes are reasonably more than normal subjects. Anxiety (both State & Trait) level of the subject was also assessed and comparisons among the groups have been made.

In ascertaining life-style of the subjects, habits related to smoking, morning walk, food habits, salt-intake were considered for comparison among the groups. Extensive statistical techniques were used to find the relationship between cardiac health and lifestyle.

Socio-economic status was also a criteria and attention has been made to relate socio-economic condition and others cardiac ailments.

Elaborate discussions on the basis of findings of the study were critically analyzed and are incorporated in the text. On the basis of findings specific conclusions are drawn and are presented parameter wise later in this chapter at 5.2.

5.2. Conclusion of the study
The present study has its own limitations. However, following specific conclusions are drawn on the basis of the findings.
5.2.1 On physique:

A) Height:

A (i) Height of male CA group was significantly higher than NS group. Difference of other paired group was insignificant.

A (ii) There exist no difference among three female group in their height.

B) Weight:

Body weight of CD group of both male and female subjects was significantly higher than both CA & NS groups respectively.

C) Body composition:

a. Fat %

a (i) Fat% of male CD group was significantly higher than both CA & NS groups. Difference between CA & NS was insignificant.

a (ii) Three female groups were not much different from each other in their body fat%.

b. Fat mass

Fat mass of male CD group was significantly higher than both CA & NS groups respectively. Variation among the three female groups was insignificant.

c. Lean body mass

c. (i) All the three male groups were insignificantly different from each other (on the basis of Post Hoc Test)

c. (ii) Female groups are not different from each other in their LBM.

d. Body mass index

d. (i) BMI, out of three sets of paired means two sets were significant and only the difference between CA & NS was insignificant, in case of male subjects.
d. (ii) For female groups the mean difference between CA & NS was insignificant. Mean difference of others two sets were significant.

5.2.2 On health status:
A. Case History
A(i) Both male and female subjects of CA group had the highest percentage (more than 80%) of respiratory diseases suffered within last five years. In case of CD group the said % was around 55%.
A(ii) More than 60% of the CA group female subjects and CD group male subjects had a history of urinary problem. In case of male CA & female CD groups the respective percentage was around 50%.
A(iii) More than 60% of CA & CD groups both male & female subjects had a history of gastrointestinal problem.
A(iv) In case of female 84% CA & 64% CD group subjects were suffering from gout problem. In case of male respective percentage was 48% CA & 46% CD and in NS group 37% male & 44% female had gout problems.
A (v) CA & CD group subjects had a number of ailments other than cardiac problems probably due to deterioration of their general health.
Case history of diseases was relatively less in NS group subjects.
A(vi) Nature of Cardiac ailments:
Regarding nature of cardiac ailments incident of AMI was highest in female CD group subjects, in male CD group it was, 24%. In CD group other major incident were IHD, HTN with LVF, with range of percentage being 4 to 8%.
In 13.3% male & 16% female of CA group subjects had IHD. Other major ailments of CA group was IHD with HTN, IHD with Asthma, HTN with C.C.F, LVF with COPD and the percentage ranged between 4 to 8%.

A (vii) Diabetes

44% male and 40% female of CD group were diabetic. In case of CA group the respective percentage was 34 for male and 32 for female. The incidence of diabetes was significantly less in NS group, only 5% male and 12% female were diabetic. Diabetes in all probability is a risk factor for cardiac ailments.

Diabetes in all probability is a risk factor for cardiac ailments.

B. Personal health

B(i) Visual: General visual health of the subjects was not good. Around 50% of the subjects, (considering male and female of all the three groups) had poor vision.

B(ii) Oral health: 60 to 80% of the female subjects had good gum health, for male, it was only around 60%.

B(iii) Health of skin: 28 to 36% female subjects had problematic skin and for male 24 to 28% had some skin problem.

C. Physiological health

C(i) RHR: For male subjects, RHR of CD & CA groups were significantly higher than NS group. RHR of three female groups are not distinctly different, through NS group was significantly lower than CD group. Subjects with cardiac problems had slightly higher RHR but within normal range.
C(ii) Systolic blood pressure
   Male subjects: Both CD and CA groups had significantly higher systolic blood pressure than NS group.
   Female subjects: Systolic BP of CA group was considerably higher but as per post hoc test only difference between CD and CA was significant.

C(iii) Diastolic blood pressure
   Male: Both CD and CA groups had significantly higher diastolic pressure than NS group.
   Female: There were no significant difference in diastolic blood pressure among the groups, male CA and CD and female CA groups maybe categorized as hypertensive stage- I.

C(iv) Blood sugar level
   Among male groups CD was significantly higher than both CA & NS groups. CA group in tern was significantly higher than NS group.

   In female also CD group was significantly higher than both CA & NS groups. CA in tern was significantly higher than NS.

   Relative distribution of diabetes was distinctly higher among the subjects with cardiac problem (CD & CA).

D. Psychological health
   Male subject: State anxiety score of CA group was significantly higher than NS group. In trait anxiety the difference between CA & NS groups was insignificant.
   Female subject: Both state and trait anxiety scores of CA group were insignificantly higher than NS group.
5.2.3 On life-style

A. Habits

A(i) Smoking: 80% of CA group, 78% of CD group, and 70% of NS group male subjects were habitual smokers. 4% of both CA & CD groups' female subjects were also smokers.

A(ii) Morning walk: 92% female and 96% male subjects of NS group had the habits of doing manual work or walking in the morning. Only 10 to 13% subjects of CA & CD male groups respectively were used to such activity.

A(iii) Food habits: Regarding food habits, 80 to 90% of the CA & CD groups (both male and female) were used to normal diet. 10 to 20% of CD group and 9 to 12% of CA group were under restricted diet. There were no restrictions in the NS group.

A(iv) Salt-Intake: 49% male and 48% female of CA group were used to high salt intake. In CD group, 30.6% male and 48% female were among the high salt intaker. In NS group, only 6.6% male and 4% female were among the high salt intaker.

A(v) Leisure pursuit
CD group male subjects had 42 hours per week leisure time. For CA group, it was 32 hours/week and 30 hours per week for NS group. Female CD group had 35 hours/week as their leisure time. Both CA and NS groups each had 25 hours/week as their leisure.
B. **Work culture**

B(i) Nature of occupation

57.3% of CA, 20% of CD and 10.6% NS male groups were factory labourer. 41.3% CD, 13.3% CA and 8% NS male group subjects were engaged in supervising work. 30% of NS group subjects were farming labourer. 50.67% NS, 14.67% CD & 10.67% CA group subjects were farmer.

82 to 96% of the female subjects (CD, CA, NS together) were house-wives.

B(ii) Nature of work:

**Male:** 49.33% CA, 52% CD, and 9.33% NS group subjects were basically light worker. 22.67% CA, 20% CD group and 36% NS group subjects were moderate worker. 2.66% CA, 2.67% CD and 49.33% NS group male subjects were under "heavy work" group.

**Female:** 24% CA, 16% CD & 80% NS (all female) subjects were moderate worker. 52% CA, 64% CD, and 12% NS group female subjects were sedentary worker.

C. **Socio-economic status**

C(i) Cultural activity

In case of male subjects 62% to 81% (three groups together) had no cultural activity. 76% to 96% (three groups together) female subjects had no cultural activity.
C(ii) Community
6.6% CA, 8% CD and 13.3% of NS group male subjects were of SC community. 25% CA, 10.6% CD and 2.6% of NS group male subjects were from OBC community.
4% CA, 8% CD and 16% NS group female subjects were from SC community. 8% CA, 16% CD were from OBC.

C(iii) Educational status
64% CA, 36% CD and 68% NS groups (all male) subjects were literate but without qualification. Among the female subjects 40 to 52% were literate but no formal qualification.
18.67% CA, 58.67% CD and 4% NS group were educated with formal qualification.

C(iv) Family size
Average no. of family size of the CA male group was 5.15, for CD group it was 5.81 and for NS group 6.81. In the female group for CA, it was 5.52, for CD 5.84 and for NS it was 6.40. Number of female children was comparatively more than the male children in CA & CD male and CA & NS female groups.
No. of male children was more in female CD group, and male NS group.

C(v) Family income
Family income of male CA group was Rs. 4764.66 and for female subjects it was Rs. 4724.00. In CD group male average income was Rs. 4845.27 and Rs. 5060.00 for female subjects (CD). In NS group for male average income Rs. 4220 and for female it was Rs. 3604.00.
C(vi) Economic status

27% of CA group (male & female together) may be considered as high middle income group. In case of CD, it is 38% and for NS, it is 13%.

38% CA, 32% CD and 53% of NS group subjects were middle income group. 35% CA, 30% CD and 34% NS group subjects were of low-income group.

D. Nutritional status:
D(i) Highest Calorie intake among the male subjects was that of NS group. They were followed by CA & CD groups respectively.

D(ii) Carbohydrate intake was highest in NS group followed by CA and CD groups. However, regarding fat and protein intake CD group was highest, followed by CA & NS groups.

D(iii) In case of female subjects highest calorie intake was that of NS group, followed by CD & NS groups.

D(iv) Regarding carbohydrate intake NS group was at the top, followed by CA & CD groups.

D(v) Fat intake was highest in CA group, followed by NS & CD groups respectively. However, protein intake was highest in CD group, followed by NS & CA groups.

D(vi) Total calorie intake and per capita macro-nutrients intake in all groups were less than corresponding Indian standard. The subjects of the present study were economically low, educational and conscious level was also low; and these factors perhaps influenced their health status.
Considering all aspects it may be concluded that subjects of CA & CD groups were neither conscious nor taking care about the potential risk factors. Their life-style itself showed they live with potentional hazards and inviting risk of their life. They require life-style intervention.

Smoking, diabetes and inactive life-style are potential risk factors for cardiac ailments of the subjects of CA and CD groups, which are common to may other findings. However the subjects were economically not sound, not conscious about good nutrition and other health awareness which are unique in them.
5.3. **Recommendation of the Study**

The present study has its own limitations but an enthusiastic researcher may find it interesting for further study on the following aspects:

1) The present study was conducted over a limited area of Hooghly and Howrah districts, where the samples may not be considered as true representative of the whole population. To achieve a better population information further study may be conducted on a larger population.

2) In the present study socio-economic condition was considered as a fact but there exists further scope to look into more detail socio-economic aspects.

3) Blood sugar was a factor in this study but some more biochemical variable could have been considered. Further study require in this area.

4) Nutrition, careful eating habits are very much related to health of heart and specially for aged. Enough scope is there for further study.

5) Health education and various forms of interventions are useful for the cardiac patients. Elaborate planning for further study in this area may explore possibility of research in a new area.