# Chapter – II

# *Materials and Methods*

## 2.1 Area of study

### 2.1.1 The District of Paschim Medinipur

The district of Paschim Medinipur is one of 23 districts of the state of West Bengal. As per census 2011, the total area of this district is 6,308 $Km^2$. However, only about 11% people are inhabiting the urban regions of the district. It has achieved a literacy rate of 79.04%. This district is well connected with important parts of State, as well as various other parts of the country. Two major highways, NH 14 and NH 16 are passing through this district. Census of India in 2011 reported that this district contains the highest number of villages than any other districts in India. It has got 3 sub-divisions, namely Kharagpur, Medinipur Sadar and Ghatal.

#### 2.1.1.1 Geographical location

The Paschim Medinipur district is situated on the south-western part of West Bengal and created after several partitions from the undivided Midnapore, which was the biggest District in West Bengal during that time, considering the geographical area as well as population. The district was first split in 1$^{st}$ January, 2002 and a new district named Purba Medinipur was created. Again on 4$^{th}$ April 2017, Jhargram has emerged as a new district. The creation of smaller districts is for administrative and socioeconomic developments of the districts. The district is positioned between 21$^{o}$47′- 23$^{o}$0′ north latitude and between 86$^{o}$40′- 87$^{o}$52′ east longitude. The Paschim

Medinipur district is surrounded in north by Bankura district, in East by Hugli and Howrah districts, in south by Purba Medinipur district and in west, by newly constructed Jhargram district.


*Source: www.maps.google.com*

Figure 2.1: Map showing the location of Paschim Medinipur district in West Bengal and India

### 2.1.1.2 Administrative Distribution

The district of Paschim Medinipur consists of a huge number of villages, big towns and cities. Midnapore is the district headquarter and the oldest urban town in the district. Kharagpur is the largest city in the district which also called the industrial town of the district. It also has the biggest railway workshop along with the longest

railway platform in the whole of world. Paschim Medinipur district is consisting of 3 Sub-divisions, namely Midnapore Sadar, Kharagpur and Ghatal. Midnapore Sadar is comprised of Midnapore municipality and six other community development blocks/ tehsils, viz. Medinipur Sadar, Garhbeta–I, Garhbeta–II, Garhbeta–III, Keshpur and Shalboni.

### 2.1.1.3 Climate: Temperature, rainfall & seasons

The climate of the northern part of the district is hotter tropical compare to southern part of the district for the reason of more land coverage. So a climatic variation can be observed in different parts of the district. A dry hot & parched weather found in northern & western part of the district and a warm and humid weather at the southern & western part of the district. The average rainfall of this district is near about 1450 mm. For the last few years the rain is very irregular in nature. There is a huge variation found between the minimum & maximum temperature. It varies as per the different season between maximum of 39 degrees Celsius to minimum of 10 degrees Celsius.

### 2.1.1.4 River and Drainage system

The river system of Paschim Medinipur district consists of the Silai or Silabati, Kansai or Kansabati, Subarnarekha, Rasulpur, Darakeswar etc. All the river passes through this district belong to an interstate category. The canals from the river Kangsabati is the main irrigation system in the district.

The Subarnarekha River comes from Singbhum of Jharkhand, enter this district and then passes to Balasore district of Odisha and falls into Bay of Bengal. This is a rain fed river and having a smallest river basin.

### 2.1.1.5 Soil type

Red laterite soil or red sandy loam deep soil is mainly found in this lower Gangetic Region of agro climatic zone – III as per agricultural classification. The soils are erosion prone, abrasive in texture. It also tastes acidic in nature (pH 5.5 to 6.2). It also has a characteristic of honeycomb type of ferruginous absorption at a depth of 15 to 30cm in highly drainage procedure. The crop productivity of the soil is very limited because of poor nutrient and low moisture holding capacity. There is mainly 5-6 orientation of soil type in different part of the district region wise, from coarse loamy to fine loamy to very fine loamy and clayey loamy to sandy loamy. The south & eastern part of the district is scattered with fine -very fine and sandy loamy soil. The northern and western part is mainly fine, coarse and fine-coarse loamy soil.

### 2.1.1.6 Floral and faunal wealth

The district of Paschim Medinipur has its richness of flora and fauna and it shows tremendous biological diversity. The people of the district depend largely on agriculture for sustaining livelihoods. Paddy, wheat, pulses are the important cultivated crops. Varieties of fruits like banana, guava, mango, jackfruit, as well as a variety of tubers and vegetables such as potato, onion, cabbage, cauliflower and the like are grown. In addition, verities of medicinal plants are also available in different parts of the state. The main trees that spread across the district are Sal, Teak, Mahua, Neem, Arjun, Minjri, Wattle, Piasal etc.

The total forest area of the district can be collectively distributed as Reserved forest (6192.17 hectare), Protected forest (160185.05 hectare), Unclassed state forest

(8774.37 hectare), Vested waste land (3733.43 hectare), Forest owned by corporate bodies (1577.75 hectare), Forest owned by private individuals (576.1 hectare).

The important fauna of the district includes many species of mammals, like cheetah, buffalo, cow, dog, cat, goat, sheep and many more,varieties of birds, butterflies,and reptiles are also seen. This district falls within the belt of a snake, named *Chandrabora* (*Daboia russelii*). In addition to this, many snakes are found in the district namely *Chiti* (*Lycodon aulicus*), *Kalach* (*Bungarus caereus*), *Kharish* (*Naja naja*), *Hele* (*Amphiesma stolata*) and so on. Moreover, cattle, sheep, goat, chicken were their main livestock.

#### 2.1.1.7 Population of the district

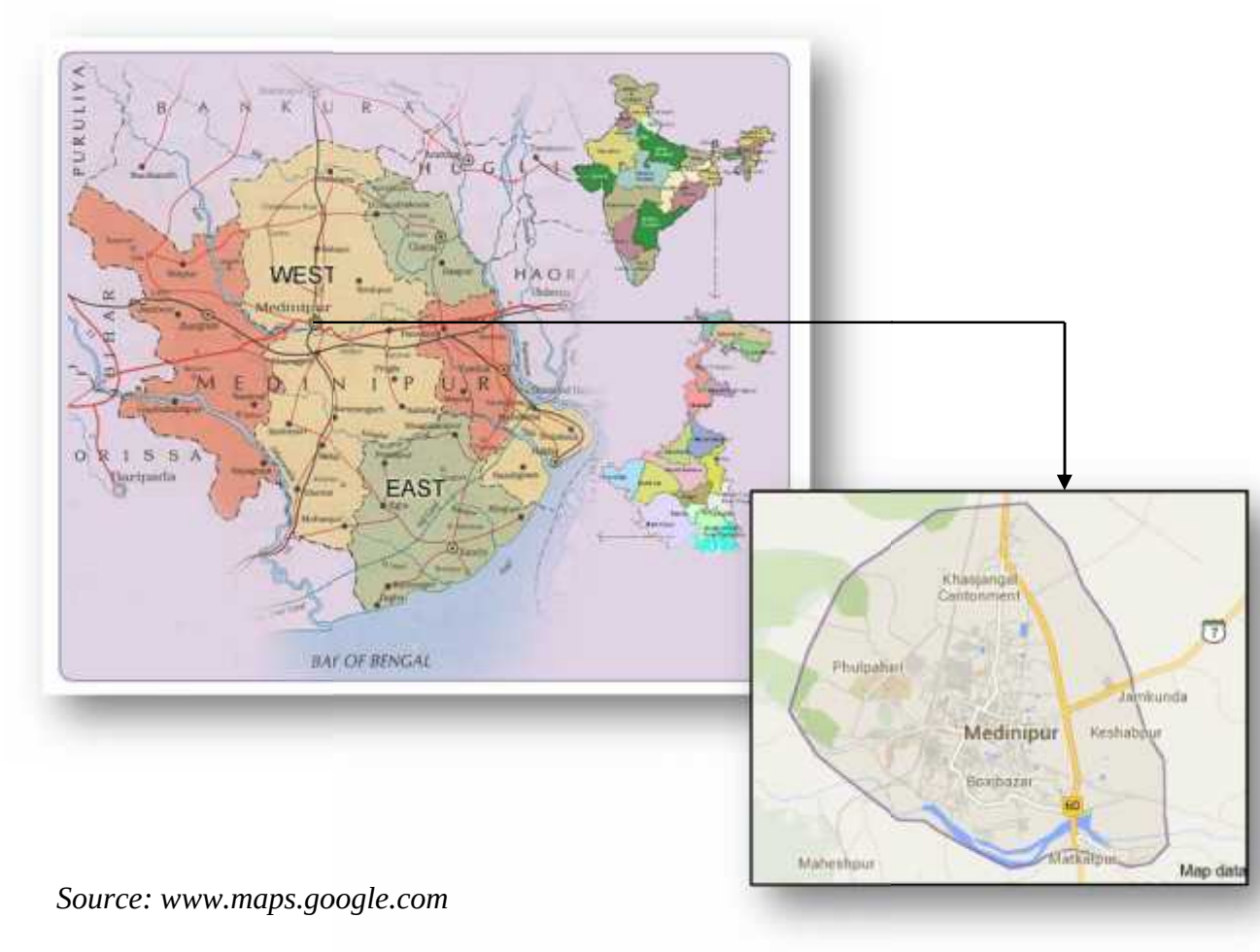
As per Census 2011, Paschim Medinipur has a population of 59,13,457 people including the Jhargram Sub-division. After 4$^{th}$ April 2017, careful consideration of Census 2011 data, the population of Paschim Medinipur district excluding the Jhargram district is about 47,76,909 people (Approx.). The male population is 30,07,885 i.e. 50.86% and female population is 29,05,572, i.e. 49.13% of total population. The sex ratio of the district is 966. For urban part of the district the sex ratio increases to 974 per 1000 male, but for rural area it decreases to 965 per 1000 male. The Child Sex-ratio (CSR) has increased from 959 (Census, 2001) to 963 (Census, 2011) compare to state's upsetting decline from 960 (2001 census) to 956 (2011 census). The number of Scheduled Castes (SC) people is 11,28,269 which is 19.08% of the whole population out of which 18.95% male and 19.21% female. More than that, the district holds 9$^{th}$ position in terms of SC populations in the state and acquire top most position in terms of male to female sex ratio, i.e. 979 females per 1000 males. This district holds the highest number of Scheduled Tribe (ST) people in

the state. The total number of ST people are 8,80,015 which is 14.88% of the total population. It is worth stating that, the percentage of female Scheduled tribe population (15.15%) is more than the percentage of male scheduled tribes population (14.62%) and the sex ratio is 1001 female per 1000 male.

### 2.1.2 The town of Midnapore: A snapshot

The district headquarter and the area of present study is Midnapore town. There are few mystifying stories about the naming of this oldtown. It is said in ancient history that, during 1200 AD, a king from Kalingya (Now, Odisha) named *Prankar* reigned this province. The town was named after his son *Medinikar*, who also wrote a book *'Medinikosh'*, a dictionary in Sanskrit language in that era (District Census Handbook, Paschim Medinipur, Series 20). As per provisional reports of Census of India, population of Midnapore in 2011 is 1,69,264; of which male and female are 84,977 and 84,287, respectively. The sex ratio is reported to be 992 and the child sex ratio is 985. The average literacy rate is 88.99%. Hinduism is the major religion in this town with 82.61 % followers, while Islam is the second most popular religion in the town with approximately 16.09 % followers. 0.92 % of the total population of the town follows Christianity and Jainism is followed by 0.01 %, Sikhism by 0.03 % and Buddhism by 0.03 %. Around 0.06 % stated 'Other Religion' and approximately 0.18% stated 'No Particular Religion'.

Midnapore is the town from where many freedom fighters have emerged during the pre-independent time period. Many historical movements have been initiated from this town. Moreover, blueprints of several movements against the British dynasty were also originated from this place.




*Source: www.maps.google.com*

Figure 2.2.: Map showing study area in Midnapore town.

The town is populated by people of all categories, like general, SCs, STs and OBCs. The majority of the population are engaged in service and business. Agriculture and other types of occupation were also seen. The prevalence of elderly population are regularly increasing as is the case in other parts of the country. Kansai or Kansabati is the main river which flows within the town. National Highway (NH 14) runs through the town. The town is having a fairly good amount of forest area.

## 2.2 Study population: The Bengali Hindus

### 2.2.1 Distribution

The present study was carried on the Bengali speaking Hindu population, which is distributed in all the rural and urban areas. Bengali Hindus are the predominant population throughout the state of West Bengal so as the district of Paschim Medinipur.

The Bengal Hindu people prefer to live in an extended family where both male and female shares all the domestic works. However, nuclear families are gradually increasing. They are predominantly homogenous pertaining to different cultural practices, as well as dietary habit and daily living pattern. “Bangla” is the *lingua franca*, while Hindi and English languages were rarely used. Bengali language comes under Indo-European group of language. However, it is influenced by many other language groups of South-east Asia, namely, Tibeto-Burman, Dravidian and Austroasiatic. The property is generally divided equally among the sons and daughters. Presently, women are found to work outside in different offices. Marriage is no longer restricted within the religious group, though clan exogamy is still practiced. Monogamy is the norm, however, widow re-marriage and cases of polygamy were also observed.

The rationale behind choosing Bengali Hindus as study population are many folds. Firstly, this particular group is numerically highest in the study area. Secondly, they are homogenous in major aspects, and thirdly, due to operational convenience.

### 2.2.2 The biological and social characteristics

Information on nutritional status among the children of different population, both single and multiethnic, are predominantly available. Bose and Bisai (2008) reported that undernutrition was more common among the adolescents. They have also shown a consistent decreasing trend in the rate of undernutrition among boys and girls of 11 to 18 years. The prevalence of undernutrition was higher in boys as compared to girls. This study provides evidence of high prevalence of adolescent undernutrition. However, these rates were lower than those reported from other parts of India. More than 69% cases of anaemia among the women has also been reported (Sinha *et al*, 2013). Studies have also done among the elderly people of Midnapore town pertaining to their general health status. The health condition of the oldest old females of Midnapore town relied on self-reported ailments and in spite of the fact that the respondents have some health problems. In terms of availability of health care, the oldest old women of Medinipur town are in better position since majority receives health care support from their immediate or distant kin. Like other parts of the world, India is also experiencing an increase in elderly population (Chakrabarty & Bankura, 2014).

## 2.3 Study design

The present study is aimed to assess the psychosocial health by means of depression, loneliness, cognitive function, activity of daily living, instrumental activity of daily living and quality of life. Additionally, the plausible socioeconomic associate of the psychosocial health has also been examined along with the assessment of nutritional status of the oldest-old population.

In order to assess such health status and in order to examine such relationship, the oldest-old males and females were randomly chosen from the Bengali Hindu population residing in Midnapore town. Comparison of each psychosocial parameter as well as other confounding variables is made between sex to understand the sexual dimorphism in each trait and in its socio-cultural associates.

### 2.4 Study participants

A total of 500 (249 males and 251 females) Bengali speaking Hindu study participants of 80 years and above have been selected randomly to participate in the present study. Only those individuals, who do not have any problem in talking and who are not seriously ill at the time of fieldwork, have been selected.

### 2.5 Sampling method

Random sampling method has been adopted to select the study participants, by using statistical random sampling table. For the purpose of locating and sampling the oldest-old population inthe study area, the voters' lists of 80 years and above aged voters of all the 25 wards of Midnapore town were consulted. These lists have been prepared and published by Election Commission of India in the year 2011, and are available in the office of the District Magistrate of Paschim Medinipur district. From the collected lists the persons aged 80 and above of both sexes were identified separately. In case of sampling of study participants provisions has been kept for one substitutes from each ward so as to replace the same in case of the absence of initially selected participants during the field survey.

## 2.6 Age estimation

Accurate age reporting is crucial in studies dealing with the elderly, especially the oldest old. Often, older persons in developing countries and in some subpopulations in Western countries such as African Americans in the United States were unable to report their age accurately (Elo and Preston, 1992; Mosley and Gray, 1993; Coale and Kisker, 1986). Therefore, the present study relies on the voters' list. According to this list, initially, there were altogether 1545 oldest old voters in Midnapore town among whom female is 803 and male is 742 and this sub-population was distributed all over the 24 municipal wards. However, after the municipal election in 2013, when the municipal wards were reformed, the population is now found to be distributed in 25 municipal wards. Finally, another voter list for the oldest-old voters was published by the Election Commission of India in the year 2015. According to this latest voter list, there are altogether 1795 oldest old voters in Midnapore town among whom female is 974 and male is 821. From that final list, 249 females and 251 males were selected as the study participants of the present study.

## 2.7 Research Ethics

Verbal consent from each study participant has been taken prior collecting any data after explaining the objective of the study.

## 2.8 Period and duration of field work

Fieldwork was carried out initially during July, 2017 to March, 2019 in several installments, without any breaking in between. A good rapport was established with the study participants through frequent visits to their homes.

## 2.9 Data type

### 2.9.1 Demographic Profile

The demographic data were collected by using pretested household questionnaire. The questionnaire elicited the information on age, sex, source of age, marital status, age of marriage, family type, cast/community, number of living/dead offspring, living arrangements, status of their spouse and so on.

### 2.9.2 Socioeconomic Profile

The data on socioeconomic profile was also collected by using the pre-tested structured questionnaire. The data on socioeconomic profile includes educational status, occupational status, present working status, occupation before the attainment of 60 years of age, source of income, and family income of the study participants.

### 2.9.3 Depression

Data on depression has been collected by using the self-administered questionnaire named “Geriatric Depression Scale” or GDS-15 (Yesavage *et al.,* (1983). The GDS-15 is one of the most commonly used instruments for the screening of depression in later life (Stiles and McGarrahan, 1998). Each questionnaire requires yes/no response. Following questions are included in the GDS-15:

1. Are you basically satisfied with your life?
2. Have you dropped many of your activities and interest?
3. Do you feel that your life is empty?
4. Do you often get bored?

5. Are you in good sprit in most of the time?

6. Are you afraid that something bad is going to happen to you?

7. Do you feel happy most of the time?

8. Do you often feel helpless?

9. Do you prefer to stay at home, rather than going out and doing new things?

10. Do you feel you have more problems with memory than most?

11. Do you think it is wonderful to be alive now?

12. Do you feel pretty worthless the way you are now?

13. Do you feel full of energy?

14. Do you feel that your situation is hopeless?

15. Do you think that most people are better off than you are?

Questionnaire on depression was of Likert type scale. Scoring is done after adding all the score of depression which can range between 0 and 15.

Categories of depression were as follows:

Normal (Score: <5),

Mild Depression (Score: 5-8),

Moderate Depression (Score: 9-11), and

Severe Depression (Score: 12-15).

### 2.9.4 Loneliness

The data on loneliness was collected by UCLA Loneliness scale (Russel, 1996). It is the third version of the UCLA Loneliness Scale which shows a reliable and valid assessment of loneliness across a variety of populations and data collection methods. It consists of ten questions and each question has four point rating ranging from 1 to 4 i.e. 4 as “I often feel this way”, 3 as “I sometime feel this way”, 2 as “I rarely feel this way”, and 1 as “I never feel this way”. Following are the questions include in the loneliness:

1. How often do you feel unhappy doing so many things alone?
2. How often do you feel you have no body to talk to?
3. How often do you feel you cannot tolerate being so alone?
4. How often do you feel as if nobody really understands you?
5. How often do you find yourself waiting for people to call or write?
6. How often do you feel completely alone?
7. How often do you feel you are unable to reach out and communicate with those around you?
8. How often do you feel starved for company?
9. How often do you feel it is difficult for you to make friends?
10. How often do you feel shut out and excluded by others?

Questionnaire on loneliness was of Likert type. Scoring is done after adding all the scores which can range between 1 and 40. Scoring of loneliness are follows:

Score: 15-20 = Normal

Score: 20-30 = Loneliness

Score: 30+ = Severe loneliness

### 2.9.5 Cognitive Function

Cognitive function has been measured by the Mini Mental State Examination (MMSE) questionnaire of Jorm *et al.*(1991). It offers a speedy and simple way to quantify cognitive function and screen for cognitive loss. The individual's orientation, attention, calculation, recall and motor skills has been tested by using this questionnaire. The individual receives one point for each correct answer. The following are the questions/tasks to perform that comprise MMSE questionnaire:

1. Is it morning or afternoon or evening?
2. What day of the week is it?
3. What is today's date?
4. What is the month?
5. What season of the year is this?
6. What is the name of your state?
7. What is the name of your country?
8. What is the name of your city?
9. Which place is this?

10. Whose house is this?

11. Immediate recall

    Name the following objects after I tell you: Mango, Chair, Coin.

12. Attention

    a. Ask the individual to begin with 100 and count backwards by 7. Stop after 5 subtractions.
    b. Ask the individual to narrate days of the week backward.

13. Delayed verbal recall

    Ask the individual to recall the 3 words you previously asked him/her to remember.

14. Naming (identification)

    Show the individual a wristwatch and pencil, and ask what it is.

15. Repetition

    Ask the individual to repeat the following statement “neither this, nor that”.

16. 3-stage command

    Give the individual a plain piece of paper and say, “Take the paper with right hand, fold it into half once and give it back to me”.

17. Reading

Hold up the card reading: “Close your eyes” so that the individual can see it clearly. Ask to read it and do what it says. Those who cannot read, did the task as instructed by the investigator.

18. Writing

Give the individual a piece of paper and ask to write a sentence. It must contain a subject and verb. Those who were unable to write, were asked to construct a sentence of his/her choice and tell that to the investigator.

19. Copying

Give the individual a piece of paper and ask to copy a design.

Scoring is done after adding all the scores which may range between 0 and 30.

Categories of cognitive function are:

- 24–30 points= uncertain cognitive impairment (uncertain CI),
- 18-23 points = mild to moderate cognitive impairment (mild to moderate CI)
- 0-17 points = severe cognitive impairment (severe CI).

**2.9.6 Nutritional Status**

Their nutritional status was assessed by using the Mini Nutritional Assessment (MNA) questionnaire, prepared by Nestle Nutritional Institute. Following are the questions include in the Mini Nutritional Assessment (MNA) questionnaire:

A. Has food intake declined over the past 3 months due to loss of appetite, digestive problems, chewing or swallowing difficulties?

0 = severe decrease in food intake

1 = moderate decrease in food intake

2 = no decrease in food intake

B. Weight loss during the last 3 months

0 = weight loss greater than 3kg (6.6lbs)

1 = does not know

2 = weight loss between 1 and 3kg (2.2 and 6.6 lbs)

3 = no weight loss

C. Mobility

0 = bed or chair bound

1 = able to get out of bed / chair but does not go out

2 = goes out

D. Has suffered psychological stress or acute disease in the past 3 months?

0 = yes 2 = no

E. Neuropsychological problems

0 = severe dementia or depression

1 = mild dementia

2 = no psychological problems

F. Body Mass Index (BMI) = weight in kg / (height in m)$^2$

0 = BMI less than 19

1 = BMI 19 to less than 21

2 = BMI 21 to less than 23

3 = BMI 23 or greater

G. Lives independently (not in nursing home or hospital)

0 = no 1 = yes

H. Takes more than 3 prescription drugs per day

0 = yes 1 = no

I. Pressure sores or skin ulcers

0 = yes 1 = no

J. How many full meals does the patient eat daily?

0 = 1 meal 1 = 2 meals 2 = 3 meals

K. Selected consumption markers for protein intake

• At least one serving of dairy products (milk, cheese, yoghurt) per day

• Two or more servings of legumes or eggs per week

• Meat, fish or poultry every day

0.0 = if 0 or 1 yes

0.5 = if 2 yes

1.0 = if 3 yes

L. Consumes two or more servings of fruit or vegetables per day?

0 = no 1 = yes

M. How much fluid (water, juice, coffee, tea, milk...) is consumed per day?

0.0 = less than 3 cups

0.5 = 3 to 5 cups

1.0 = more than 5 cups

N. Mode of feeding

0 = unable to eat without assistance

1 = self-fed with some difficulty

2 = self-fed without any problem

O. Self-view of nutritional status

0 = views self as being malnourished

1 = is uncertain of nutritional state

2 = views self as having no nutritional problem

P. In comparison with other people of the same age, how does the patient consider his / her health status?

0.0 = not as good

0.5 = does not know

1.0 = as good

2.0 = better

Q. Mid-arm circumference (MAC) in cm

0.0 = MAC less than 21

0.5 = MAC 21 to 22

1.0 = MAC greater than 22

R. Calf circumference (CC) in cm

0 = CC less than 31

1 = CC 31 or greater

Total Assessment of MNA Score (max. 30 points). Malnutrition Indicator Score is as follows:

- 24 to 30 points = Normal nutritional status
- 17 to 23.5 points = At risk of malnutrition
- Less than 17 points = Malnourished

### 2.9.7 Quality of Life

In order to assess the psychological aspect of quality of life the 28-item version of the General Health Questionnaire (GHQ-28) was used. The General Health Questionnaire-28 is frequently used as an indicator of psychological well-being and this latter construct resembles the psychological dimension of quality of life (Goldberg and Hillier 1979, Sanderman and Stewart 1990, EURIDISS 1990, Krol *et al.,* 1994). The 28 questions of the scaled version of the General Health Questionnaire (Goldberg and Hillier 1979) are given below:

1. Been feeling perfectly well and in good health?
2. Been feeling in need of a good tonic?
3. Been feeling run down and out of sorts?
4. Felt that you are ill?
5. Been getting any pains in your head?
6. Been getting a feeling of tightness or pressure in your head?
7. Been having hot or cold spells?
8. Lost much sleep over worry?
9. Had difficulty in staying asleep once you are off?
10. Felt constantly under strain?
11. Been getting edgy and bad-tempered?
12. Been getting scared or panicky for no good reason?
13. Found everything getting on top of you?
14. Been feeling nervous and strung-up all the time?
15. Been managing to keep yourself busy and occupied?
16. Been taking longer over the things you do?

17. Felt on the whole you were doing things well?
18. Been satisfied with the way you've carried out your task?
19. Felt that you are playing a useful part in things?
20. Felt capable of making decisions about things?
21. Been able to enjoy your normal day-to-day activities?
22. Been thinking of yourself as a worthless person?
23. Felt that life is entirely hopeless?
24. Felt that life isn't worth living?
25. Thought of the possibility that you might make away with yourself?
26. Found at times you couldn't do anything because your nerves were too bad?
27. Found yourself wishing you were dead and away from it all?
28. Found that the idea of taking your own life kept coming into your mind?

Questionnaire of GHQ – 28 was of Likert type. Four answer possibilities are available for each question i.e. 1-not at all, 2-no more than usual, 3-rather more than usual, 4-much more than usual. In this study the Likert scoring procedure (1,2,3,4) is applied and the total score ranges from 28 to 112 in case of each individual. The higher the score indicates poorer the psychological well-being of the respondents.

### 2.9.8 Activities of Daily Living

Activities of Daily Living (ADL) denotes the functional status with respect to eating, dressing, getting in and out of bed or chair, using the toilet, bathing and continence, which are used to measure the elderly's' degree of independence in daily living. In this study, the functional status of the study population was assessed by the Katz Index of independence in ADLs i.e. commonly called Katz ADL Scale. Respondents are scored yes/no for independence in each of the above mentioned six functions.

The individual score of 6 points indicates “full functional”, 4 points indicates “moderately functional impairment”, and 2 point or less indicates “severely functional impairment” (Katz, 1983). The Katz index of independence in Activities of Daily Living (ADL) is as follows:

| **ACTIVITIES**<br><br>POINTS (1 OR 0) | **INDEPENDENCE:**<br><br>(1 POINT)<br><br>No supervision, direction or personal assistance | **DEPENDENCE:**<br><br>(0 POINT)<br><br>With supervision, direction, personal assistance or total care |
|---|---|---|
| **BATHING**<br><br>POINTS:_____ | (1 POINT) Taking bathes him/her-self completely or needs help in bathing only a single part of the body such as the back, genital area or disabled extremity. | (0 POINT) Needs help in bathing more than one part of the body, getting in/or out of the tub or shower. Requires total bathing. |
| **DRESSING**<br><br>POINTS:_____ | (1 POINT) Getting clothes from closets and drawers and puts on clothes and outer garments complete with fasteners. May have help even tying shoes. | (0 POINT) Needs help in dressing or needs to be completely dressed. |

| | | |
|---|---|---|
| **TOILETING**<br><br>POINTS:_____ | (1 POINT) Goes to toilet, gets on and off, arranges clothes, cleans genital area without help. | (0 POINT) Needs help transferring to the toilet, cleaning self or uses bedpan or commode. |
| **TRANSFERRING**<br><br>POINTS:_____ | (1 POINT) Moves in and out of bed or chair unassisted. Mechanical transferring aides are acceptable. | (0 POINT) Needs help in moving from bed to chair or requires a complete transfer. |
| **CONTINENCE**<br><br>POINTS:_____ | (1 POINT) Exercises complete self-control over urination and defecation. | (0 POINT) Is partially or totally incontinent of bowel or bladder. |
| **FEEDING**<br><br>POINTS:_____ | (1 POINT) Gets food from plate into mouth without help. Preparation of food may be done by another person. | (0 POINT) Needs partial or total help with feeding or requires parenteral feeding. |
| TOTAL POINTS= _____ 6 = High (patient independent) 0 = Low (patient very dependent) | | |

### 2.9.9 Instrumental Activities of Daily Living (IADL)

The Lawton Instrumental Activities of Daily Living Scale (IADL) is an appropriate instrument to assess independent living skills (Lawton & Brody, 1969). The Lawton Instrumental Activities of Daily Living Scale are as follows:

**A. Ability to Use Telephone**

1. Operates telephone on own initiative; looks up and dials numbers.....1
2. Dials a few well-known numbers .....1
3. Answers telephone, but does not dial .....1
4. Does not use telephone at all .....0

**B. Shopping**

1. Takes care of all shopping needs independently.....1
2. Shops independently for small purchases .....0
3. Needs to be accompanied on any shopping trip .....0
4. Completely unable to shop .....0

**C. Food Preparation**

1. Plans, prepares, and serves adequate meals independently .....1
2. Prepares adequate meals if supplied with ingredients .....0
3. Heats and serves prepared meals or prepares meals but does not maintain adequate diet.....0
4. Needs to have meals prepared and served .....0

**D. Housekeeping**

1. Maintains house alone with occasion assistance (heavy work).....1
2. Performs light daily tasks such as dishwashing, bed making .....1

3. Performs light daily tasks, but cannot maintain acceptable level of cleanliness……..……1
4. Needs help with all home maintenance tasks .....1
5. Does not participate in any housekeeping tasks.....0

**E. Laundry**

1. Does personal laundry completely .....1
2. Launders small items, rinses socks, stockings, etc .....1
3. All laundry must be done by others .....0

**F. Mode of Transportation**

1. Travels independently on public transportation or drives own car .....1
2. Arranges own travel via taxi, but does not otherwise use public transportation……..1
3. Travels on public transportation when assisted or accompanied by another....1
4. Travel limited to taxi or automobile with assistance of another ..... 0
5. Does not travel at all .....0

**G. Responsibility for Own Medications**

1. Is responsible for taking medication in correct dosages at correct time .....1
2. Takes responsibility if medication is prepared in advance in separate dosages...0
3. Is not capable of dispensing own medication .....0

**H. Ability to Handle Finances**

1. Manages financial matters independently (budgets, writes checks, pays rent and bills, goes to bank); collects and keeps track of income .....1
2. Manages day-to-day purchases, but needs help with banking, major purchases, etc.....1
3. Incapable of handling money .....0

For each category, one has to circle the item description that most closely resembles the client's highest functional level (either 0 or 1). A summary of score range from 0 (low functioning, dependent) to 8 (high function, independent) for women and 0 through 5 for men to avoid potential gender bias.

### 2.9.10 Anthropometric measurements

The under mentioned anthropometric measurements were collected following standard techniques as suggested by Lohman *et al.*, (1988):

1. Height (cm.)
2. Weight (Kg.)
3. Mid upper arm circumference (MUAC) (cm.)
4. Waist circumference (WC) (cm.)
5. Hip circumference (HC) (cm.)

### 2.9.11 Derived anthropometric indices

The following indices were derived by using different anthropometric measurements:

A. Body Mass Index (BMI): Weight (kg) / Height ($m^2$)

Overweight and obesity were defined in the present study following WHO (2000):

1) Overweight: BMI: 25.0 – 29.9 $Kg/m^2$

2) Obese: BMI: ≥ 30.0 $Kg/m^2$

3) Obese: WC: >102 cm for males and >88 cm for females

4) Obese: WHR: >1.0 for males and >0.85 for females

5) Obese: WHtR: > 0.5 (Ashwell and Hsieh, 2005)

B. Waist-Hip ratio (WHR): Waist circumference (cm) / Hip circumference (cm)

C. Waist-Height ratio (WHtR): Waist circumference (cm)/Height circumference (cm)

### 2.10 Statistical Analyses

#### 2.10.1 First Set of Statistical Analysis

Since the total number of demographic and socioeconomic variables is large and the data collected were initially categorised into a large number of categories, re-categorization was done for some selected demographic and socioeconomic variables to handle the inferential statistical analyses in a smoother way.

#### 2.10.2 Second Set of Statistical Analysis

In order to substantially reduce the skewness and kurtosis values of anthropometric variables, log-transformation was done. Logarithmically transformed values were used in subsequent analyses.

#### 2.10.3 Third Set of Statistical Analysis

Sex differences pertaining to different demographic and socioeconomic variables were obtained through Test of equality of proportion (z-value). Simultaneously, in order to identify the sex differences in different categories of each psychosocial health related traits, z-values have been obtained. Moreover, mean and standard error of mean values of individual scores of all the selected traits were obtained and student t-tests were performed to identify the sex differences for each sub-categories of each

psychosocial traits. Irrespective of the significance status, further inferential analyses were done separately for sex.

### 2.10.4 Fourth Set of Statistical Analysis

In order to evaluate the association of anthropometric variables with the nutritional status of the study participants, adjusted multiple linear regression analysis was performed using score of Mini Nutritional Assessment as dependent and anthropometric variables as independent variables.

### 2.10.5 Fifth Set of Statistical Analysis

One of the important objectives of the present study is to identify the significant demographic and socioeconomic predictor(s) of each psychosocial health related traits. To fulfil this particular objective, adjusted multinomial logistic regression analyses were performed separately for each psychosocial trait. The categorized demographic and socioeconomic variables were used as independent and each psychosocial trait variable was used as dependent variable. The results were interpreted by the value of odds ratio (OR) and 95% confidence interval (CI). To ascertain the significant demographic and socioeconomic associate(s) of general health condition, two way ANOVA was performed using the GHQ-28 score as dependent, and demographic and socioeconomic variables as independent variables.

Finally, the chronic morbidity profile of the study population was obtained by simple frequency and the significance of differences was obtained by test of equality of proportion (z) value.

All the statistical analyses were performed with the help of SPSS (version 16.0) software (Chicago; Illinois) and the significance level has been fixed at $p<0.05$.