CHAPTER III

MATERIAL AND METHODS
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The present research work intends to study the relationships between nutritional status with functional ability, well-being and self-rated health in a free living elderly subjects from two major tribal communities, i.e, the Sugali and the Yanadi tribes of Andhra Pradesh, India. To this end, this chapter provides various methodological aspects adopted and discussed under the following headings: Study area, sample design and sample size, description of variables, tools used in data collection and analysis.

Profile of the Kadapa District

The field work was carried out in Kadapa District of Andhra Pradesh, India. A brief profile of study area is given below.

Kadapa is one of the 23 districts of Andhra Pradesh in India. The district has further been subdivided into 3 revenue divisions and 51 mandals. The district is located towards the south central part of Andhra Pradesh and lies 8 kilometers to the south of the Penna River. Kadapa district covered by many undulations between 259' and 3787' from the mean sea level. The district is situated within 13°43’ and 15°14’ of the northern latitude and 77°55’ & 79°29’ of the eastern longitude. The district spreads northwards beneath the Western slopes of the Eastern Ghats mountain range as a rough parallelogram, dented deeply in its Southern, Western and Northern boundaries. It is surrounded by Kurnool district on the North, Chittoor district on the South, Nellore district and Prakasam district on the East and Anantpur District on the West. The total geographical area of the Kadapa district is 15,359 sq.km. with a density of population of 169 per sq km. The total population of the district is 26.02
lakhs of which 20.14 lakhs are in rural and 5.88 lakhs are in urban. The male and the female population in the district are 13.18 lakhs and 12.84 lakhs respectively. The percentage of rural population in the district is 77.40 while that of urban population is 22.60. The scheduled caste population in the district is 4.09 lakhs and scheduled tribe accounts for 0.61 lakhs.

The district is blessed with a series of beautiful valleys through which holy rivers like Pinakini (Pennar), Papagni, Chitravathi, Mandavya, Cheyyuru cut across the district. The river Pennar is the most important river flowing right through the District whose legend is incorporated in a sasanam (inscription) at Gandikota. The Seshachalam range of hills passes through this district and is ultimately crowned with the Holy shrine of Tirumala in the Chittoor district.

Crops which are commonly grown in the district of Kadapa are rice, jowar, cotton, turmeric, maize, arhar, chillies, sugar cane, sesame, peanuts, and melons. Good quality timber and rare sandalwood are important features of the Kadapa flora. Generally several dams, canals and reservoirs meet the water requirement of the district.

Study area

The present study is carried out in the Kadapa District of Andhra Pradesh, India. Data collection was initiated using personal contacts and having house-to-house visits. The intimate contact of the researcher with the area of study facilitated collection of valuable information relevant to the investigation.
Map showing the study area
Duration of data collection

Data was collected during February 2007 to February 2008. First few days were spent talking and befriending study subjects and explaining to them the purpose of the study. When they were more receptive data collection was started. Subjects were encouraged to speak freely.

Sample

The World Assembly on Aging (1982) adopted the population aged 60 and above as its main focus of concern. Hence, the term old age or elderly refers to that segment of population, which is sixty years of age or above (Kumar et al., 2002).

The study population comprises 300 Sugali’s (138 males + 162 females) and 300 Yanadi’s (134 males + 166 females) aged ≥60 years from the Kadapa District of Andhra Pradesh, India. The Sugali and Yanadi tribes are the predominant tribes in Andhra Pradesh. Kadapa District is having 51 mandals and for the present study 20 mandals have been selected randomly. The distribution of the sample is given in the following table. All the eligible healthy elderly subjects from Sugali and Yanadi tribes above 60 years were enrolled into the study to get the data. The inclusion criteria for the present study are subjects who are 60 and above years of age, and willing to give consent to participate in the study. The exclusion criteria is who are bedridden and under treatment for chronic diseases and have no known terminal or mental illnesses. The study was approved by the ethics committee of our Institute. Informal consent was taken from all the subjects before participation.
## Distribution of the sample

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59
Electoral roles were checked to ascertain the age of the participant to establish the correct age. Each person was interviewed individually and subjects were encouraged to give free responses to narrate their life events. Additional support is taken from the local key person in the respective tribes to ascertain some of the information like age etc. Age was confirmed by matching (random) with ration cards or their identity card issued for election purpose. In the present study the sample is further divided into three age groups for comparison i.e., 60-69 yrs age group, 70-79 yrs age group and ≥80 yrs age group.

Methods of data collection

Standard anthropological methods like structured questionnaire, and in-depth interviews were used to gather data. Interviews were conducted individually within their residence. Structured questionnaire was used to get information regarding their general physical health and social-demographic information about living arrangement, marital status and their educational attainment.

Since flexibility of the in depth informal interview helps to bring out the affective and value-laden aspects of the subject's responses and determines personal significance of their attitudes, this method was liberally utilized for data collection. Respondents were encouraged to talk freely on whatever event in their life course seemed significant to them. Information regarding details of their major and minor health complaints, living arrangements, and relationship with their family members, issueless ness and/or migration of children, level of family integration, was supplemented by in depth interviews.
Each interview took nearly one and half hours and extensive information was collected on the socio-demographic and physical health details. Some anthropometric measurements were performed like height, sitting height, weight, circumferences of waist and hip, skin fold thickness at triceps, subscapular and abdomin as specified by Reddy et al. (1998).

As a part of general structured interview conducted in the subject's own home, several questions were asked about Self-Rated Health (SRH), Activities of Daily Living (ADL), Well-Being (WB) and Memory and Cognitive Function (MCF) (WHO, 1983; Fillenbaum, 1984; Cress et al., 1995; Reddy et al., 2004).

Self-rated health

Self rated health was evaluated using the response to the question, "How would you rate your health at the present time?" with possible responses being poor, fair, good or excellent (Fillenbaum, 1984). The last two categories were combined and labelled as good, due to the limited sample size in the excellent category for the present study.

Activities of daily living

Physical function was assessed using an instrument adapted from the WHO 11 Country Study (WHO, 1983). The 15-item questionnaire is as follows;

a) walk between rooms
b) use stairs
c) walk at least 400 meters
d) get to places out of walking distance [e.g., bus stop, shops]
e) use the toilet
f) wash and bathe your self
g) dress and undress
h) take care of your appearance
i) get in and out of bed
j) do your own cooking
k) feed your self
l) do light house work
m) do heavy house work
n) take medicine by your self
o) manage finances.

These questions included about physical functional limitations (item a–d), basic activities of daily living (ADL) including self-care (items e–k), and instrumental activities of daily living (items i–o). For each item, the level of competence was measured on a four-point scale.

Degree of difficulty scores were assigned to categories defined in terms of the ability to perform an activity within a numerical range from one to four. A score of one denoted that the subject was unable to perform the activity, whereas a score of four indicated that the subject could accomplish the activity without any difficulty. The other two possible responses indicated the ability to perform activities only with outside help (score=2) and with difficulty, but without help (score=3). The aggregate scores on the ADL questions ranged from 15 to 60.

Mobility Index

From the ADL questions, a mobility index (MI) was calculated as the sum of items a – d, based on a model used in the Euronut Survey in Europe on nutrition and the elderly, a concerted action (SENECA) Study on Nutrition and the elderly (Osler et al., 1991). Scores ranged from 4 to 16 with higher scores indicating better mobility.
Well-being

In addition to physical function, well-being (WB) was included to help describe the subject's emotional status (Cress et al., 1995). Wellbeing was measured by a seven-item, binary-coded, closed-ended questionnaire (Wahquist et al., 1995). Item scores were summed to develop the WB index with aggregate scores ranging from 7 to 14, with higher scores indicating a higher sense of WB. Questions were recoded so that a positive response was indicated by a higher score (e.g. “Do you worry more than usual about little things?” Yes=1; No=2 and “Do you laugh easily?” No=1; Yes=2). The questions included were as follows:

a) Do you worry more than usual about little things?

b) Have you lost interest in doing things you usually cared about or enjoyed in the past?

c) Have you ever felt so sad or depressed that you thought you wanted to die?

d) Do you feel tired most of the time?

e) Are you happy with every day of your life?

f) Do you laugh easily?

g) Do you enjoy listening to music?

Memory and cognitive function

Memory and cognitive function (MCF) was measured by a five item questionnaire (Reddy et al., 2004). Item scores were summed to develop the MCF index with aggregate scores ranging from five to 10, with higher scores indicating a higher sense of MCF. The questions included were as follows:

a) What year is it (now)?

b) What month is it (now)?
c) What day or date of the month is it (now)?

d) What is your address?

e) Do you forget where you left things more than you used to or forget the names
of close friends or relatives?

Anthropometry as a health indicator

Anthropometric characteristics of individuals and populations are simple and
strong predictors of future ill health, functional impairment, and mortality: in turn,
they may be modified by disease. For these reasons, anthropometric data are used in
many contexts to screen for or monitor disease. In the elderly, however anthropometry
is a relatively new tool (WHO, 1995). Using this simple non-invasive technique of
anthropometry in the present study, some age related changes were studied in elderly
subjects.

Height

The height was measured in centimeters using an anthropometer. The subject
was asked to stand on a horizontal platform with the heels together, stretching upward
to the fullest extent, aided by the measures on the mastoid processes and by
encouraging the subject to 'stand tall, take a deep breath and relax'. The subject's
back was as straight as possible with the head in Frankfort horizontal (F.H) plane
while taking the measurement, which was achieved by rounding or relaxing the
shoulders and manipulating the posture. The subject's heels were watched to make
sure that they did not leave the ground. The reading was recorded to nearest 0.1 cm.

Sitting height

The subject was asked to sit on a wooden stool, preferably 40 cm height, with
F.H position and the body was stretched to its maximum. The shoulder run parallel to
the ground and knees should not be allowed to bend. Anthropometer was vertically held in contact with back of sacral and interscapular regions. The reading was recorded to nearest 0.1 cm.

**Weight**

Weight was taken using weighing machine and it was measured to the nearest one-half kilogram. Precautions were taken that the subjects wore a minimum light clothes. They were weighed wearing without footwear or any heavy clothing such shawl or sweater. No correction for clothing was thus needed. The reading was recorded to nearest 0.5 kg.

**Waist Circumference**

The waist circumference was taken as the minimum circumference between the umbilicus and xiphoid process and measured to the nearest to 0.1 cm using measuring tape.

**Hip Circumference**

The hip circumference was measured as the maximum circumference around the buttocks posteriorly and the symphysis pubis anteriorly and measured to the nearest to 0.1 cm using measuring tape.

**Triceps skin fold thickness**

The triceps skinfold thickness was measured on the posterior aspect of the right arm, over the triceps muscle, midway between the lateral projection of the acromion process of the scapula and the inferior margin of the olecranon process of the ulna.
Subscapular skin fold thickness

The subscapular thickness was measured 1cm below the inferior angle of the scapula, which was identified by gentle palpation of the lower end of the scapula with the patient standing with his arms by his side.

Abdomen skin fold thickness

The study subjects were asked to stand erect with their body weight evenly distributed on both feet. They were then asked to breathe evenly and relax their abdominal muscles. A horizontal fold of skin 1 cm below the umbilicus and 3 cm laterally (to the right) was then measured.

By using above anthropometric measurements body mass index (BMI) and waist hip ratio (WHR) are calculated by using below the formula.

$$\text{BMI} = \frac{\text{Weight in Kg}}{\text{Height in meter}^2}$$

$$\text{WHR} = \frac{\text{Waist Circumference}}{\text{Hip Circumference}}$$

Statistical Considerations

Statistical analysis was carried out via SPSS-15.1 and alpha levels were set at P<0.05. Subjects were classified into three age groups: 60-69, 70-79 and ≥80 years. Differences in mean values between sexes and tribes were analyzed using the students “t” test and differences between age groups and categories of self-rated health were checked by analysis of variance. Bivariate relationships between self-rated health with anthropometry and other factors using pearson correlation coefficients and $\chi^2$ analysis. Further, multivariate logistic regression was fitted to investigate the relationships that affect an individual SRH. The variables entered into the model were: BMI, and scores of M1, ADL, WB and MCF controlled for age.