

**EVALUATION OF THE LEVEL OF COMMUNITY
INTEGRATION AMONG POST- STROKE PATIENTS IN
THIRUVANANTHAPURAM DISTRICT**

VARKEY ABRAHAM. K

*Dissertation submitted in partial fulfilment of the requirements
for the award of the degree of
Master of Public Health*

**Achutha Menon Centre for Health Science Studies,
SCTIMST, Thiruvananthapuram
May, 2000**

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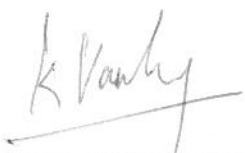
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DECLARATION

I hereby certify that the work embodied in this dissertation entitled **'Evaluation of the Level of Community Integration among Post-Stroke patients in Thiruvananthapuram district'** is the result of original research and has not been submitted for any degree in any other University or Institution.

Thiruvananthapuram
May, 2000


Varkey Abraham. K

CERTIFICATE

Certified that this dissertation entitled '**Evaluation of the Level of Community Integration among Post-Stroke patients in Thiruvananthapuram district**' is a record of bonafide original research work undertaken by Varkey Abraham. K in partial fulfilment of the requirements for the Degree of Master of Public Health, under our guidance and supervision.

Guide: **Dr.Mala Ramanathan**
Asst. Professor
AMCHSS, SCTIMST.



Co-guide: **Dr.P.Sankara Sarma**
Associate Professor
AMCHSS, SCTIMST.



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Varkey Abraham. K

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ABSTRACT

Objective: To evaluate the level of community integration and estimate degree of functional independence, awareness of preventive and rehabilitative aspects of stroke among patient and family members and psychological and financial impact on patient and family due to stroke and its management.

Design: A cross-sectional descriptive study of subjects who had stroke between September 1997 to September 1999.

Setting: Urban and rural community, Trivandrum district, Kerala.

Participants: 65 individuals (27 F, 38 M), mean age 60.78 ± 14.33 years, mean duration of stroke 16.66 ± 8.51 months.

Intervention: Imparting awareness about preventive and rehabilitative aspect of stroke management to patient and his family members.

Main Outcome Measure: The level of community integration, the level of functional independence, awareness of preventive and rehabilitative aspect of stroke management and psychological and financial impact on patients and family due to stroke and its management.

Results: Patients were found to be moderately integrated into the community. There was a significant relationship with age of person, sex, functional level and monthly per-capita household expenditure. No significant association with total expenditure on stroke management. Functional Independence Measure (FIM) for this sample was 93.80 ± 25.15 , suggesting degree of independence between moderate dependence and complete independence. Beck's Depression Inventory (BDI) estimated the post-stroke depression with a score of 26.61 ± 15.75 to have moderate depression. Financial impact on patient and

his family due to stroke and its management showed that self, loan, and relatives managed resources rather by the government

Discussion: The result suggest that there is need for awareness among medical professional and lay public through continuing medical education, mass media campaigns and community participation for need for attaining total integration. Ways to bring down financial burden on person and their family has to be explored in collaboration with private and government establishment.

I. INTRODUCTION

1.1 Introduction

Stroke is the major consequence of cerebrovascular disease. The World Health Organisation defines stroke as " the rapidly developing clinical symptoms and/ or signs of focal (or global) disturbance of cerebral function; with symptoms lasting more than 24 hours or leading to death, with no apparent cause other than vascular origin (Hatano, 1976) ".

Cerebrovascular disease, or stroke is a world wide health problem. It makes an important contribution to morbidity, mortality and disability in developed as well as developing countries. Stroke is the third leading cause of death and ranks eleventh in disabling conditions that restricts activity. Mortality from stroke varies by country, with the highest rates reported for Japan and the lowest rates for Switzerland and Canada.

WHO estimates that in 1990, out of a total of 9.4 million deaths in India, 619,000 deaths were due to stroke. This gives a stroke mortality rate of 73 per 100,000 (estimated total population 849 million). Applying even the same crude and proportional mortality to an estimate 940 million populations in 1996 yields a figure of 686,000 deaths due to stroke in our country, which would translate to approximately 1880 deaths due to stroke per day (Murray and Lopez, 1994).

Table 1: No. of deaths in India (1990) due to various causes

Cause of death ICD 9)	Number of deaths(* 100,000)		
	Male	Female	Total
All causes	48.75	44.96	93.7
<u>Stroke</u>	2.80	3.39	6.19
IHD	4.47	3.36	7.83
RHD	0.42	0.99	1.41
TB	2.92	1.60	4.52
Malaria	0.14	0.14	0.28

Source: Murray and Lopez, 1994

In 1990, the estimated number of deaths due to stroke were 22 times that due to malaria, 1.4 times that due to tuberculosis, 4 times that due to rheumatic heart disease and almost equal to that due to ischaemic heart disease

(Table # 1).

1.2 Epidemiology

A WHO Collaborative Study in 12 countries showed, in the populations studied, stroke incidence rates ranged from 0.2 to 2.5 per 1000 population per year, the variation being mainly due to difference in the age structure of the populations involved (Aho et al, 1980).

Age -standardised rates for men were 2/1000 in Colombo (Sri Lanka), 4-8/1000 in most European countries, but 15/1000 in Akita (Japan). Female rates were on average 30 per cent lower. The highest morbidity figures come from Japan.

There is no reliable information on stroke in India. Analysis of data from major urban University Hospitals suggest that nearly 2 percent of all hospital cases, 4.5 percent of medical and 20 percent of neurological admissions are due to stroke (Dalal, 1981).

A random survey of 258,576 residents in urban areas of Vellore revealed only 147 subjects with hemiplegia caused by stroke (presumed to be of vascular origin). Thus the prevalence rate for hemiplegia in South India was reported to be 56.9 per 100,000 as compared to 150 to 186 per 100,000 for USA and Europe (Abraham et al, 1970).

Table 2: Disability-adjusted Life years (DALYs) lost in 1990 in India (in thousands)

	Male	Female	Total	Ratio (against malaria)
Stroke	2,752	3,496	6,248	6
IHD	4,953	3,189	8,142	8
RHD	602	1,272	1,874	2
TB	6,282	4,518	10,800	11
Malaria	476	475	951	1

It is apparent that loss of DALYs due to stroke is six times that due to malaria and three times that due to rheumatic heart disease.

1.3 Risk Factors for Stroke

Based on the WHO Task Force report on Stroke (1989), risk factors for stroke are divided into *modifiable* and *non-modifiable*.

Modifiable risk factors: large artery atherosclerosis and arteriolosclerosis, hypertension, smoking, elevated blood lipid levels and diabetes, high blood pressure, heart disease, high cholesterol, personal history of stroke or Transient Ischemic Attack (TIA), smoking, alcohol and obesity.

Non-Modifiable Risk Factors: age, sex, family history of stroke or TIA, and diabetes.

1.4 Medical Management

- a. Primary prevention consists of detection and control of modifiable risk factors like hypertension, diabetes, smoking, sedentary lifestyle and intake of saturated fats. This is aimed at prevention of development of atheroma, small vessel lipohyalinosis and arteriosclerosis. Prevention of rheumatic heart disease will predictably lead to reduction of stroke due to cardioembolism. WHO Task Force (1989) recommends use of alternate day aspirin for individuals in the fifth and later decades with a strong

family history and other identifiable risk factors for vascular disease.(WHO, 1989)

- b. Secondary Prevention: The Pan-European Consensus Meeting on Stroke Management arranged by the WHO Regional Office for Europe and The European Stroke Council between 8-10 November, 1995 at Helsingborg, Sweden has defined the strategies and research priorities for secondary prevention of stroke. The meeting adopted the 'Helsingborg Declaration'. The declaration identifies lifestyle intervention, general medical and specific intervention for secondary prevention of stroke.

Life style changes, which would be expected to reduce the incidence of a recurrent stroke, are smoking cessation, dietary control and physical activity. General medical interventions should include the monitoring and control of blood pressure, blood lipids and diabetes. Specific interventions should include antiplatelet treatment with low dose aspirin. In-patients with atrial fibrillation and anticoagulant should be used if rigorous monitoring of prothrombin time is feasible.

In India, for most patients, monitoring may not be feasible, in which case aspirin should be given for prevention of a recurrent stroke. Carotid endarterectomy is effective and recommended for patients with transient ischaemic attacks and ischaemic non-disabling stroke.

1.5 Community Level Preventive Strategies

Under the community level preventive measures, the first priority is to control of arterial hypertension, which is a major cause of stroke. Transient ischaemic attacks (TIA) being one of the earliest manifestations of stroke, their early detection and treatment is important for the prevention of stroke.

Control of diabetes, elimination of smoking, and prevention and management of other risk factors at the population level are the other approaches. Treatment for acute stroke is largely the control of complications. Facilities for the long term follow up of patients are essential. The education and training of health personnel and of the public form an integral part of the program. For any such program, reliable knowledge of the extent of the problem in the community concerned is essential (WHO, 1971).

1.6 Rehabilitative Management

Stroke is a condition with high incidence and mortality rates, leaving a large proportion of survivors with significant residual physical, cognitive, and psychological impairments. The increasing number of older adults and the emergence of new therapies for acute stroke suggest there will be an increase in the number of stroke survivors living with disabilities. Furthermore, secular trends in stroke severity document a decrease in those most severely affected (Wolf et al, 1992). This shift to more moderately affected survivor's places increased demands on rehabilitation efforts and services, making the limitation of stroke-related disabilities and health risks a major concern for healthcare providers in rehabilitation. At this time, preventive efforts towards stroke must be balanced with the pragmatic efforts to prevent disabilities and maximise the quality of life for those who have suffered the consequences of stroke.

The rehabilitation process involves six major areas of focus. They are: preventing, recognising, and managing co-morbid illness and medical complications; training for maximum independence; facilitating maximum psychosocial coping and adaptation by patient and family; preventing

secondary disability by promoting community reintegration, including resumption of home; family, recreational, and vocational activities; enhancing quality of life in view of residual disability; and lastly preventing recurrent stroke and other vascular conditions such as myocardial infarction that occur with increased frequency in-patients with stroke (Roth, 1992).

Stroke rehabilitation is an active process beginning during acute hospitalisation, progressing for those with residual impairments to a systematic program of rehabilitation services, and continuing after the individual returns to the community. It is an organised effort to help stroke patients maximise all opportunities for returning to an active and productive lifestyle. A well-conceived rehabilitation management plan is the basis for all rehabilitation.

Several measures are used to assess, construct, and evaluate the rehabilitation process over the recovery phases. During the acute phase of stroke, baseline assessment should include a standardised level of consciousness, a neurological deficit scale, and a measure of global disability. In addition, the type and severity of stroke, presence of co-morbid diseases, and functional health patterns should be documented.

Because rehabilitation focuses on retraining in a number of domains, referred patients should have demonstrated minimum cognitive skills on screening. For documentation of severity of physical disability, the best-validated assessment instruments are the Barthel Index (Mahoney et al, 1965) and the Functional Independence Measure (FIM)(Guide, 1993). These scales measure a range of activities essential to independence, including mobility, self-care, and continence.

Beyond these basic assessment domains, formal assessment and interventions are needed in a number of other areas of impairment. The choice of specific impairment measures depends on the patient's neurological impairments and most often include assessment of motor skills, balance, mobility, affect/depression, communication disorders, dysphagia, functionally oriented cognition, functional health patterns, and continence. Measures of family functioning, instrumental activities of daily living (I-ADLs), and quality of life are helpful in documenting areas related to normal life patterns for those who return to the community.

1.7 Role of Occupational Therapy

Occupational therapy practitioners are important members of the health care team working with people recovering from stroke. They teach individuals who have had stroke to cope with disability and to become as independent as possible so they can continue their work and personal lives, manage stress and fatigue, and participate fully in family and community life. Problems resulting from a stroke may include temporary or permanent weakness of one side of the body, problems with vision and reading or difficulties with memory or speech. These problems may interfere with the ability to care for personal needs, like bathing and dressing or prepare meals and care for home or move about in the community, drive a car, or use public transportation or participate in work, educational, and leisure activities.

While recovering, occupational therapy can help to learn new ways to manage daily tasks such, as eating, dressing, and bathing, or to obtain special assistive equipment to help function more independently, or to discover ways to increase physical strength, endurance and mobility, or to

compensate for losses of sensation and vision, or to develop the skills necessary to return to work, household tasks, and community activities.

An Occupational Therapist gives recommendations to alter the home setting to eliminate hazards to walking or using a wheelchair, for special devices or aids that help to perform home and work tasks, methods of dressing and bathing, techniques and resources for improving mobility in the home and community to help the patient gain physical independence.

II. REVIEW OF LITERATURE

2.1 Incidence and Prevalence of Stroke in India

The burden of stroke on the community is best reflected by its incidence, but during the last twenty-five years no study of community-based incidence has been reported in India. Two incidence studies conducted in late sixties or early seventies have been reported. The population-based study was conducted in Vellore (Tamil Nadu, South India) in two phases.

In the first phase (1968-69), a population of 258,576 in and around Vellore was surveyed to detect the prevalent cases of hemiplegia and the second phase was conducted in 1969-71. An incidence of 13 per 100,000 per year was obtained (Abraham et al, 1970). The second study was carried out as a part of WHO collaborative study in Rohtak, Haryana between 1971 and 1974 (Table # 3). Eighty-two cases of stroke were recorded yielding an annual incidence of 33 per 100,000 (Aho et al, 1980).

Table 3: Prevalence Rate by Survey of Hemiplegia Presumed to be due to

City/Area	Stroke		Number of hemiplegia	Crude Prev. Rate per	Age adjusted
	Rural/Urban	Sample size			
Kashmir	U	63,645	91	143	274
Rohtak	U	79,046	35	35	44
	R	51,165	23	45	47
Ballabgarh	R	4,786	6	125	NA
Bombay(Parsi)	U	14,010	118	843	424
Bombay	U	5,723	14	245	NA
Vellore	Semi-urban	2,58,576	147	57	84

2.2 Trends in Stroke Mortality

Stroke is one of the leading causes of death and disability throughout the world. In developed countries, coronary heart disease and cerebrovascular diseases (particularly stroke) are responsible for between 40 and 50 per cent of all deaths. Of these 10 to 12 percent are due to stroke (WHO, 1986).

The WHO Collaborative Study showed that both in developed and developing countries, nearly one-third of stroke patients died within 3 weeks and 48 percent died within one year. The unfavourable prognostic factors were old age, hypertension and impairment of consciousness (Aho et al. 1980).

While stroke mortality rate is declining steadily since 1940s in the United States and other Western Countries, it is likely to increase in India. There are several reasons for the expected rising trends: (i) Increase in life expectancy; and (ii) Urbanisation with changing lifestyle. Therefore, unless preventive steps are taken, the stroke mortality rates are likely to increase in coming years. Stroke and ischaemic heart disease together will soon surpass the infections as the top killer in India.

2.3 Stroke in Young

Stroke in young individuals poses a major problem, as these young men and women are the major bread earners of their families. This poses a major socio-economic challenge in the field of neuro rehabilitation. Community based surveys from the West and Japan indicate average annual incidence of stroke as 111-180/100,000 population and 9-28 / 100,000 young

persons, below the age of 45 years (Krutzke, 1985). Community based surveys and data are lacking.

Abraham et. al, (1970) from Vellore (south India) reported that 25% of cases were of less than 40 years of age. Various studies have highlighted a high incidence (24-35%) of stroke population (Bansal et al, 1973, Chopra et al, 1979, Prabhakar et al, 1999). Higher incidence of stroke in young population has been reported from Spain (Leno et al, 1993); Salt Lake City, USA (Kerr et al, 1993); Italy (Guidetti et al, 1993) and Saudi Arabia (Awada, 1989).

2.4 Risk Factors

The greater susceptibility of Indians to stroke is also evident from the study by Balrajan et al, 1991. He found that the immigrants to England and Wales from the Indian subcontinent had a higher risk of dying due to stroke (53 % higher for males and 25 % higher for females) than the average population of England and Wales.

2.5 Rehabilitation

Rehabilitation is effective. At present, however, we cannot easily differentiate between the influence of specific interventions and the natural recovery process.

The Copenhagen Study, a community-based population study of 1197 acute stroke cases examined neurological impairments and functional disability over a 6-month period. It demonstrated that the best neurological outcome was reached within 11 weeks from stroke onset and best recovery of basic self-care and mobility skills within 12.5 weeks in 95% of the cohort (Jorgenson et al. 1997).

Ottenbacher and Jannell (1993) performed a meta-analysis of 3717 patients from 36 studies that examined the outcome of rehabilitation for poststroke patients. Each study compared two or more treatments designed to improve functional performance in subjects with hemiparesis. The authors found that those patients in a focused stroke rehabilitation program performed functional tasks better than approximately two thirds of patients in comparison groups.

A critical review of 165 studies, (Wagenaar and Meijer, 1991), concluded that stroke patients with hemiplegia benefit from expert care if it is offered early and intensively but cautioned that retraining because of deficits in activities of daily living may be more effective when it is task specific.

The state of the science in stroke rehabilitation was summarised in the 1995 AHCPR (Agency for Health Care Policy and Research), USA (Post-Stroke Rehabilitation Practice Guideline, 1995). More than 1900 clinical research articles were reviewed, and nearly 500 were cited in the text of the guidelines. From this evidence base, recommendations were made according to the quality and level of research to support them. Four recommendations met the highest criteria, which were two or more randomised trials with good internal and external validity and most of these recommendations have implications for rehabilitation.

2.6 Post-Stroke Depression

Studies have confirmed the presence of depression in between 30-60 % of all stroke patients (Folstein et al 1977, Feibel et al 1979, Robinson et al 1982 & Robinson et al 1983).

Post stroke depression represents more than a similar reaction to the accompanying functional impairment, that such a depression has features similar to those of major depressive episodes, that its severity appears to be related to the intra-hemispheric location of the brain lesion (Robinson et al 1981, Robinson et al 1982, Robinson et al 1983 & Robinson et al 1984).

There is potential negative impact of depression on patient participation in the rehabilitation process and the associated rehabilitation outcomes (David et al 1986).

The reported prevalence of post-stroke depression varies from 20% to 65%, depending on the selection of the patients, diagnostic criteria, and the time elapsed after stroke (House et al 1991 & Robinson et al 1997).

2.7 Cognitive Impairment

Stroke may cause cognitive impairment, and the domains most likely to be defective are memory, orientation, language, and attention (Tatemichi et al, 1994).

2.8 Cost

Stroke accounted for 10% of the total number of hospital bed-days in Sweden, and the direct cost of stroke (costs directly involved in health care production or direct cost of stroke is largely determined by the duration of hospital stay) accounts for 70% of the total cost of stroke (Wester et al 1992). The direct cost of stroke is largely determined by the length of hospital stay (LOHS)(Jorgenson et al 1997).

Information concerning the influence of various social and medical factors, such as initial stroke severity, age, sex, marital status, diabetes,

hypertension, ischemic heart disease, and other disabling comorbidity, on LOHS is needed to reduce cost. (Jorgenson et al 1997). The direct cost can be measured in units (days) of in-patient hospital care. It is also similar to the economic unit of bed-days. (Jorgenson et al 1997). There are very few studies, which measured the cost of care for families of patient hospitalised with stroke (Chin et al 1998).

2.9 Community Integration

Community integration as it relates to stroke has not been much explored. Community integration is a relatively new concept that has been emerging in rehabilitation over the past 10 to 15 years.

Willer, Rosenthal, Kreutzer, Gordon, and Rempet (1993) defined community integration as "effective role performance in community setting" and empirically identified community integration and its components, including home, social and productivity (work, school, volunteer) integration. They developed the Community Integration Questionnaire (CIQ) as a measure of "reduced handicap," as conceptualised by the World Health Organisation (WHO, 1980). The definition of handicap examines the "disadvantage" for persons with impairment or disability that interferes with the fulfilment of normal life roles (Willer et al 1993).

The advisory board of the National Centre for Medical Rehabilitation Research (NCMRR, USA) has conceptualised a classification of disability related categories to include (a) pathophysiology, (b) impairment, (c) functional limitation, (d) disability, and (e) societal limitation (NIH, 1993).

Therefore, the extent of the person's integration into the community can be seen as the reduction of handicap as defined by WHO or the decrease in societal limitation as defined by NCMRR (Burleigh et al 1998).

The NCMRR proposed the societal limitations category as a "legitimate and separate aspect of functional problems of disability "(NIH, 1993). This category included the attitudes and structural obstacles to actualising life roles or accessing services that would full social participation. (NIH, 1993). If the degree of societal limitations or community integration can be adequately evaluated and measured, more effective interventions to reintegrate persons with disabilities into their communities as active, independent, and productive members of society can follow (Whiteneck, 1994).

Today, rehabilitation services are beginning to identify the returning to home and the community as the primary goals of treatment. Unfortunately, these goals are not adequately addressed in many rehabilitation programs (Willer et al., 1994). The functional assessment and treatment approaches typical in inpatient rehabilitation settings rarely include indicators of community integration, professionals are not adequately trained in how to improve their client's community integration (Willer et al, 1993). The basic emphasis is placed on physical performance and Activities of Daily Living (ADL), not on social dimensions (Wood-Dauphinee et al 1988).

2.10 Leisure Activity

Sjogren observed a reduction in recreational activities after the patients return home (Sjogren, 1982). Drummond observed that almost all activities are practised to a lesser degree after a stroke (Drummond, 1991).

2.11 Social Activities

Social activities decline, whether or not the patient has made a complete recovery (Labi et al 1980). According to the patient, the causes of reduction in practising various activities are (in decreasing order of importance) difficulties in walking, manual dexterity and concentrating, language defects, sphincter control, inadequate transport, medical problems and lack of physical assistance. These results confirm the importance of factors not linked to the disability itself, such as fear of being criticised, depression, loss of social roles, and lack of self-confidence and knowledge about the facilities and equipment available (Angeleri et al 1993).

2.12 Return to work

Persons who return to work improve considerably in their overall outlook on life, daily and leisure activities, working environment, and financial situation (Fugl et al 1991).

2.13 Role Acquisition

Role acquisition and development of community living skills are primary goals of occupational therapy intervention (Burleigh et al, 1998). Integrating persons within the community would definitely help to improve the well being of the individual.

2.14 Occupational Therapy

Occupational Therapy interventions through Community Based Rehabilitation (CBR) can play facilitatory role for an early integration of person into the community.

2.15 Need for the Study

Rehabilitation scenario in Kerala is in its nascent stage with only three Physical Medicine and Rehabilitation Departments in Government sector. There are many rehabilitation centres in the private sector (charitable institutions) which focus on vocational rehabilitation rather than core aspect of rehabilitation. Rehabilitation services are completely neglected by the medical community and no research is being done on this aspect. This study investigates the practices relating to rehabilitating a stroke patient that currently obtaining in Thiruvananthapuram district. If any kind of currently effective rehabilitation is taking place, then the aim is to evaluate how well the post-stroke patients are integrated into the community. What is the current level of awareness of patient and their relatives about rehabilitation aspect of stroke management? Finally, to find the level of post-stroke depression and the economic burden faced by the individual and their family and patterns in ways of managing their financial difficulties.

Evaluation of the impact of stroke on an individual and community has to be done, so that appropriate planning can be carried out to adopt the most cost-effective approach. Important issues in cost-effectiveness in rehabilitation are selection of patients most likely to benefit, and selection of the most appropriate setting, timing, and duration and intensity of the process. Patient-valued outcomes such as functional ability, life satisfaction, quality of life, and minimal burden on family and society should also be considered.

The relevant cost of post-acute care includes but is not limited to the direct cost of rehabilitation. Recurrence, complications of treatment, and

long-term care costs are also important, as are the indirect cost of impact on caregivers and losses of economic productivity of the patient and caregiver. Recovery from stroke occurs over a prolonged period of time. Therefore, both the effectiveness of rehabilitation and the total cost must be measured over the entire episode of care.

2.16 Objectives

The main objectives of this study are,

- (1) To evaluate the level of Community Integration among post-stroke patients.
- (2) To estimate the degree of functional independence among patients.

In addition, it is also proposed to,

- (1) To evaluate the awareness of patient and caregivers regarding the preventive and rehabilitative aspect of stroke,
- (2) To analyse the psychological and economic impact of stroke and its management on the patients and their family.

III. METHODOLOGY

3.1 Study Type

A cross-sectional descriptive study was undertaken to find out the level of community integration, evaluate the awareness of patient about the preventive and rehabilitative aspect of stroke management and psychological and economic impact due to stroke. Both qualitative and quantitative research methods were used.

3.2 Variables and Definitions

Information regarding background characteristics, nature of stroke, management, level of functional independence using FIM, economic burden and community integration were collected using a carefully structured questionnaire. With regards to the nature of the stroke, details like duration, risk factors, severity were obtained. Community integration was studied in terms of the following items, viz., home; accessibility and mobility; transportation and its accessibility; geographical orientation; work; community accessibility; leisure; social functions and awareness about community resources, services, facilities and organisation. To measure the level of depression, Beck's Depression inventory validated for Indian conditions was used.

3.3 Data Collection Technique

Procedure

A questionnaire was designed to include all of the items mentioned earlier. In addition, the Functional Independence Measure (FIM), Beck's Depression Inventory (BDI), both of which have been validated in the Indian cultural settings were also included in the questionnaire to measure the level

of functional independence of post stroke patients and BDI to understand the post-stroke depression, which undermines the level of community integration. This questionnaire was pre-tested and necessary changes were made. The questionnaire had both open and close-ended questions covering various aspects of community integration, functional independence, awareness of preventive, rehabilitative aspect of stroke and associated psychological well being.

Measures

Functional Independence Measure (FIM). The FIM estimates independent performance in self-care, sphincter control, mobility, locomotion, communication, and social cognition. FIM scores ranges from one to seven: a FIM item score of seven is categorised as "complete independence," while a score of one is "total assist " (perform less than 25 % of task). Scores falling below six require another person for supervision or assistance. By adding the points for each item, the possible total score ranges from 18 (lowest) to 126 (highest) level of independence. The investigator observing patient function rates the scores (Granger et al, 1993).

Beck's Depression Inventory (BDI). BDI (Malayalam version) was used to measure post-stroke depression among these patients. The BDI is a 21 -item form, which requires the patient to indicate on a 4-point scale, how they have been feeling today and for past one week due to stroke. The highest score for the 21 questions would be 63 and the lowest score would be zero. The higher the score the more severe the depression. The lower the score the better the patient is feeling (Beck et al, 1961).

Community Integration Index (CII). An index was developed to assess community integration quantitatively as such a measure is not currently available. There were 40 questions in a community integration questionnaire, concerning various aspects of community integration like home integration, social integration, productivity integration, transportation and accessibility, geographical orientation, leisure and awareness of community resources, services, facilities and organisations for disabled person. Awareness of each of these aspects was given a positive score of '1' and negative a score of '0' except for the q # 1.3 had score varying from '0' to '2', q # 3.1 from '1' to '4' and q # 4.1 from '1' to '2'. The total community integration score was computed as the sum of all these scores and this ranged from a minimum of '2' to a maximum of '67'. The higher the score better the integration.

3.4 Sample and Plan for Data Collection

Patients who had stroke between September 1997 to September 1999 were selected for the study from Thiruvananthapuram District. The reason for choosing this period was the assumption that once a patient passes the acute stage, he or she would have some kind of further management v.z., Physiotherapy, Occupational Therapy, Speech Therapy, Psychiatric consultation over next two years of his illness. Once the patient had gone through some kind of management during this period, this is the best period to evaluate, how well he or she had integrated back into their community. A list of 200 patients was compiled from a Government aided private tertiary care hospital, the Physical Medicine Rehabilitation Department of the Medical College Hospital, the Government District hospital and Government

Ayurvedic College Hospital. Patients from these hospitals were selected to get a better representation with respect to socio-economic status, different systems of medicine and geographical distribution of patients. Out 200 patients in the list, 102 were visited at their residence during study period and 65 were interviewed. Of the others, 23 died, five had a duration of stroke more than 2 years, six were not case of stroke and three were unwilling to participate in the study.

3.5 Plan for Data Processing and Analysis

A codebook was made before the entry of data into Excel computer program. Data was analysed using SPSS package.

3.6 Duration of Data Collection

Data collection was started on 3rd January 2000 and completed on 25th February 2000.

3.7 Ethical Considerations

The Study objectives were explained to patient prior to the interview and their co-operation was requested. Verbal consent was taken for photographing their current level of functioning. The investigator was faced with a dilemma whether to impart information about the disease and its management especially about its various risk factors, methods of prevention, who are at risk, probability of its recurrence and prognosis of the condition. Since imparting this information would affect the quality of the interviews by having an effect on the responses of patient to various questions, the investigator took a short session covering entire details of stroke and its management, its causation, effects, prognosis and so on at the end of interview. After this session, the patient's specific doubts regarding the disease were cleared.

3.8 Pre-Test

The questionnaire was pre-tested and necessary changes were made.

3.9 Problems Faced Doing Field Work

Addresses collected were from several leading hospitals in Thiruvananthapuram, which treat stroke victims. Often such addresses were incomplete and it was not possible to locate the patients using them. The local post-office or ration shop was consulted to locate patients.

IV. RESULTS

4.1 Background

Out of 65 patients interviewed, 27(41.5%) were female and 38(58.8%), males. The average age of the whole group was 60.8 years. Very few (just 3) had never been married and slightly more than 12 percent of the study sample was widowed. The average duration of stroke was 16.7 months. It was found that most of the patients were able to communicate on their own (89.2%).

4.2 Occupation

About 19(29.2%) patients, were unemployed [house wife (17), student and Christian preacher]. Professional workers at the office level [accounts Officer, KSEB; administrator, International Firm in Middle East; assistant General Manager, Kerala Financial Corporation] and field level [electrical supervisor, Hindustan Latex; electrical-Army, farm Supervisor] were 21(32.3%).

4.3 Education

About 41(63.1%) patients had education on up to high school level. There were 12(18.5%) illiterates among the 65 patients studied (Table # 4)

Table # 4: Distribution of Patients by Educational Levels Achieved

S #	Level of edn.	Number	Percentage
1	Primary	11	16.9
2	Middle	9	13.8
3	High School	21	32.3
4	Higher Secondary	2	3.1
5	Graduate	8	12.3
6	Post-Graduate	2	3.1
7	Professionals	0	0.0
8	Illiterate	12	18.5
Total		65	100

4.4 Nature of Stroke

Type of Stroke: Ischemic stroke constituted about 35(53.8%) of all stroke patient and the least was hemorrhagic stroke, which was 2(3.1%) patients (Table # 5).

Table # 5: Distribution of Patients by Type of Stroke

S #	Type	Number	Percentage
1	Ischaemic	35	53.8
2	Hemorrhagic	2	3.1
3	Embolic	4	6.2
4	Thrombolytic	4	6.2
5	Unconfirmed diagnosis	20	30.8
Total		65	100.0

Risk Factors: High blood pressure was reported in 44(67.7%) patients and 21(32.3%) of them reported diabetes mellitus. An equal proportion reported other cardiac diseases or smoking, and a small proportion (10.8%) had experienced TIA. About 33(50.8%) experienced other diseases [bronchial asthma, cancer, chronic renal failure, fracture, hypercholestrolemia, kidney stones, palpitations, sclerotic AV disease, thyroid anomaly, vitilago (skin lesion), iron deficiency anaemia].

Severity:

Parts of Body Affected: There were 30(46.2%) patients with left hemiplegia, 33(50.8%) with right hemiplegia and 2(3.1%) patients with all four limbs affected (Table # 6).

Table # 6: Distribution of Patients by Part of Body Affected

S #	Part of Body affected	Number	Percentage
1	Left	30	46.2
2	Right	33	50.8
3	Both Sides	2	3.1
Total		65	100

Associated Dysfunction: Weakness [paresis] was noticed with 30(46.2%) patients, 26(40%) had paralysis and 31(47.7%) patients had other dysfunctions including motor dysfunction [shoulder dislocation, stiffness of affected arm, stiffness of one side till waist, decreased hand power, fatigue], sensory dysfunction [UMN facial palsy, spasticity, numbness of affected side, numbness of affected side due to prolong sitting, pain in joints, pain in muscles], perceptual dysfunction [homonymous hemianopia, poor vision, ptosis, squint(strabismus), unilateral neglect], speech and language disorder [aphasia, dysarthria] and others[catastrophic reaction, sexual - difficulty in erection, cough while consuming fluids].

Recurrent Stroke: About 10 patients (15.4%) had repeated stroke and number of attacks varied from one to three.

4.5 Burden of Care: Physical and Financial support

Care of Physical Needs of Patient: Physical needs of 41(63.1%) patients were taken care of by their spouses. Those under the care of their children were about 12(18.4%)(Table # 7).

Table # 7: Distribution of Patients by Persons Taking Care of Physical Needs of Patient

S #	Person	Number	Percentage
1	Spouse	41	63.1
2	Children(Male)	3	4.6
3	Children(Female)	9	13.8
4	Parent	2	3.1
5	Relatives	8	12.3
6	Others	2	7.7
Total		65	100

Financial Support to Patient: Patients had their own financial support in more than half cases (53.8%) and others supports comprised of spouse, children and others like friends, relatives, church and political party in

18(27.7%), 22(33.8%), 21(32.3%), 22(33.8%) patients respectively. (Table # 8)

Table # 8: Distribution of Patients by Type of Financial Support Used (n=65)

S #	Type of support	Percentage
1	Self	53.8
2	Spouse	27.7
3	Children(Male)	33.8
4	Children(Female)	32.3
5	Parents	4.6
6	Others	33.8

Means of Financial Support: Means of support consisted of loans, employer paid, government schemes and sold property[others] in 43(66.2%) patients. Pension was the important means of supporting the patient in 20(30.8%) patients, along with salary and daily wages of their spouses, relatives and children in 74.7% (Table # 9).

Table # 9: Distribution of Patients by Means of Financial Support (n=65)

S #	Means	Percentage
1	Salary	38.5
2	Wages	36.2
3	Pension	30.8
4	Disability Benefits	0.0
5	Insurance	0.0
6	Others	66.2

4.6 Stroke Prevention and its Awareness

About 29(44.4%) of patients and their relatives were aware about primary prevention of stroke. Ways of primary prevention included mainly of changes in life style and regular medical check-up. Other ways were exercises, yoga, ayurvedic massage and engagement of self in some activities.

Primary prevention of stroke included control of modifiable risk factors like hypertension, diabetes, smoking, sedentary lifestyle and intake of saturated fats. About 27(93.1%) were aware of changes in life style (avoid smoking,

avoid consumption of alcohol, diet restriction, to lead an active life) as means of preventing stroke. Regular medical check-up was seen as means by 3(10.3%) patients. Other ways (ayurvedic oil massage, can be prevented to certain extent, exercise, yoga, does not know the details, to be engaged in some activities (active life)) for 10(34.5%) patients.

Inability to Follow Primary Prevention: Majority of patients (n = 55) were not aware whether the occurrence of stroke could be prevented. Ten of the (15.4%) patients thought stroke could not be prevented. Reasons reported for inability to prevent were its sudden onset and lack of time to take initial steps for 7(70%) of the patients. Other reasons included "emotional shock" and "God's will" in about 3(30%) patients.

Secondary Prevention of Stroke and its Awareness: About 28(43.1%) were aware of secondary prevention of stroke. The important means of secondary prevention identified were the administration of injection in a medical facility to reduce severity of disability following a sudden attack. This knowledge was acquired through medical professional for 18(27.7) patients and mass media like newspaper and television for 11(16.9%) patients and about 10(15.4%) patients from other interpersonal namely relatives, friends.

4.7 Complications of Stroke

About 45(69.2%) patients were not aware of complications due to stroke. Of those aware (n = 21), important complications reported included neurological, communicative and cardiac. Among these 13(20%) patients were aware of neurological complications which included paralysis, coma and memory loss. Others complications mentioned included clotting of blood, rise in blood pressure, bowel problems, death, dependency on others

for daily activities, deformities and socio-economic difficulties in for 7(10.8%) patients. Cardiac and communicative problems were seen 2 patients respectively.

4.8 Stroke Management and its Awareness

Out of 65 patients, 50(76.9%) were aware of some facilities available for stroke management. These facilities included Physical Medicine and rehabilitation department (PMR), Physiotherapy, Speech therapy, Ayurveda and Psychiatric treatment. Of these, more persons were aware of Physiotherapy and Ayurvedic management, that is 41 and 36 patients respectively, out of the total 65(Table # 10).

Table # 10: Distribution of Patients by Awareness about Various Facilities of Stroke Management (n=65)

Type of Facility	Unaided Awareness(%)	Aided Awareness(%)	Total(%)
PMR	7.7	10.8	18.5
Psychiatric	4.6	3.1	7.7
Physiotherapy	43.1	20.0	63.1
Ayurvedic	33.8	21.5	55.3
Massage	10.8	9.2	20.0
Specialised ins	0.0	0.0	0.0
Associations	0.0	0.0	0.0
Others	6.2	1.5	7.8

Source of Information for Stroke Management: Source of information about facilities had been from medical professionals (doctors and nurses) for 42(64.6%) patients. About 10(15.4%) patients were aware through other interpersonal sources like friends, relatives and patients who had availed similar facilities for stroke management.

4.9 Rehabilitation

Knowledge about Rehabilitation: Only 14(21.5%) patients were aware of Occupational Therapy. Out of 65 patients, about 12(18.5%) thought that rehabilitation of disabled people is a treatment to "bring back to normal life",

4(6.2%) to provide vocational opportunities, 2(3.1%) patients for exercises and others had the idea like government-help, benefits, schemes; make the person independent, etc.

Visit to Physical Medicine and Rehabilitation Department: About 21(32.3%) patients had made visit to Physical Medicine and Rehabilitation department.

Satisfaction of Services: Out of 21(32.3%) patients who visited the PMR Dept., 12(18.5%) were satisfied with services provide by the department. Reasons for dissatisfaction were "lack of attention given by professionals" for 4(6.1%), financial difficulties for 2(3.1%) patients, 1(1.5%) due lack of facilities for a patient and 2(3.1%) patients could not continue as it was contra-indicated due to cardiac disease and non availability of dependent to accompany the patient.

Knowledge about the Usefulness of Rehabilitation for Long Term Management of Post-Stroke Patients: About 25(38.5%) were aware that rehabilitation is useful for long term management of post stroke patients. Almost half of patient (n = 31) were not aware of its usefulness, and 9 (13.85) thought that rehabilitation was not useful.

Out of 25 patients who thought that rehabilitation was useful for stroke management, 15(23.1%) patients thought that rehabilitation taught specialised management techniques, which would bring them back to normal life. Two (3.1%) patients thought that it aimed at psychological management.

Reasons for Non-usefulness of Stroke Rehabilitation: The 9 patients who believed that rehabilitation is not useful none could cite any valid reasons for holding this opinion.

4.10 Level of Functional Independence

According to the score by FIM, out of 65 patients, 22 were partially dependent in their functional activities, 26 were independent and 13 patients were between partial dependence and full independence (Table # 11).

Table # 11: Distribution of Patients by Total Score of Functional Independence Measure (FIM)

Score	Functional Level	Number	Percentage
18 - 36	Dependent	0	0.0
37 - 53		4	6.2
54 - 90	Partially Dependent	22	33.8
91 - 107		13	20.0
108 - 126	Independent	26	40.0

Within components of FIM, self care and locomotion aspects were affected most with means of 26.26 and 9.09 respectively (Table # 12) and least affected component of function was sphincter control. The sample had a mean total FIM score of 93.8 ± 25.15 indicating that their functional independence lies between partially dependency to full independence.

Table # 12: Comparison of Various Components of FIM

Variable	Mean	SD	Minimum	Maximum
Self care	26.26	12.68	6.00	42.00
Sphincter Control	13.77	1.16	6.00	14.00
Mobility	16.37	5.67	3.00	21.00
Locomotion	9.09	4.47	2.00	14.00
Communication	12.31	2.18	5.00	14.00
Social Cognition	16.34	4.43	5.00	21.00
Total FIM	93.80	25.15	44.00	126.00

4.11 Community Integration

Home Integration:

Method of Mobility Around the House: Out of 65 patients, 56(86.2%) did not use any aids for moving within the house. Seven (10.8%) used walking stick, wheelchair used by a patient and a ropeway was used by another (Table # 11).

Difficulty to Move Within the House and Outside the House: Almost half of patients (i.e.. 32(49.2%)) had difficulty in moving within the house and 50 (76.9 %) patients had difficulty in moving outside the house. This difficulty varied according to the barriers faced with or with respect to their body. Mobility outside the house was related to the terrain in the neighbourhood. Sixteen patients (24.6%) were staying on even terrain, 25(38.5%) on uneven, 25(38.5%) on a hilly terrain and 17(26.2%) were staying in close proximity to main road, drainage canal, crowded habitat, narrow lanes, im-proper pathway, steep pathway. Further the condition of the road in which they lived and the distance to be covered also had a bearing on mobility. For 19(29.2%) patients the roads were Kutcha and pucca roads were available for only 22(33.8%) and for 24(36.9%) patients they were poorly maintained. The mean distance form their place of residence to nearest shop were 0.46kms and that of nearest shop were 0.61kms. This is not a great distance if the roads were proper for the patient to use.

Transportation and Accessibility:

Use of Transport: Out of 65 patients, 56(86.2%) used some kind of transport. 49(75.4%) used public transport as their means for their locomotion and 13(20%) used private. Of the patients using public transport, 35(53.8%) used autorickshaw as means of transport, 20(30.8%) patients used bus, 15(23.1%) used other means like taxi car, trekker, company bus, company car and only 2(3.1%) used railways.

Out of 22(33.8%) patients who used public transport (bus and railways), 19(86.4%) patients were aware about time schedule. Only two (3.1%) patient had difficulty due to their inability to remember the schedule. About

16(24.6%) patients were able to read name on the vehicle and only 4(6.2%) patients were not able to read. Reasons for their inability to read were due to affected vision (15.4%) and illiteracy (7.7%).

Ability to Get in, Take a Seat and Get Out of the Conveyance: The conveyance considered here are bus, autorickshaw, taxi-car, trekker and private vehicle. 23(35.3%) patients were able to get into the conveyance, take seat and get down from conveyance independently. 25(38.5%) patients were not able to carry out this task independently and 17(26.2%) did not use this facility.

Use of Private Vehicles: Out of 65 patients, 12(18.5%) used private vehicle. Of these 11(16.9%) patients used four wheeler and one used a two wheeler. Only one patient was able to drive a four wheeler. None of them had used a vehicle modified to suit their needs.

Geographical Orientation:

Ability to read name/sign boards in places: Out of 65 patients, 34(52.3%) were able to read name/sign boards, 23(35.4%) patients were not able to read and 8(12.3%) were not included because they were fully bed-ridden. Of 23 patients, who were not able to read name /signboards, 12(52.2%) patients had were not able to carry out this task due to motor disturbance], 5(21.7%) patients had perceptual dysfunction, 1(4.3%) had cognitive dysfunction 6(26.1%) were illiterate.

Ability to Obtain Directions: About 45(69.2%) patients were able to obtain direction to any place, 12(18.5%) patients were not able and 8(12.3%) were not included because they were fully bed-ridden. Of 12 patients who had difficulty in getting direction, everyone had a motor disturbance.

Productivity:

Role Status Now: All patients had a productive occupational role prior to having stroke. Only 11(16.9%) patients were back in their occupation role post-stroke.

Difficulty in Role Performance Now: Difficulty in role performance in the post-stroke period were barriers due to motor disturbance, social and environmental factors. Of 11 patients who were working now, 2(18.2%) patients had motor disturbance, 2(18.2%) had social barriers and 1(9.1%) patient had an environmental barrier as he was a mechanic who found it difficult to get under a vehicle to repair it.

Reasons for Non-performance of Occupational Role Now: Out 65 patients 55(84.6%) patients were not currently working due to barriers which included motor disturbance, cognitive dysfunction, personality and emotional problems, speech and language disorder, social and others.

Same Occupation Role after Stroke: Out of 11(16.9%) who have been performing their occupational role after having stroke, only one patient had a change in occupational role. Reason for change in occupation was due to motor disturbance [difficulty in mobility].

Community Accessibility:

Visit to Places: Close to three fourths (72.3%) of the patients had difficulties in visiting places. Currently most of patients visit the bank [22(33.8%)], post-office [21(32.3%)], shops [22(33.8)], ration shops [18(27.7%)], bazaars [20(30.8%)], pharmacy [16(24.6%)], than restaurants [11(16.9%)] visit gas agency [3(4.6%)], visit coffee/tea shop [8(12.3%)], use public telephone

booth [3(4.6%)], cinema theatre [8(12.3%)], auditorium [9(13.8%)], park [6(9.2%)] and beach [2(3.1%)].

Other Difficulties: Difficulties were classified in terms of barriers to community accessibility due to effects of stroke and also other associated socio-economic factors on the patient. These included motor disturbance, sensory disturbance, cognitive dysfunction, personality and emotional problems, speech and language disorder, social, financial, environment (architectural).

Out of 47 patients who experienced difficulties, 26(55.3%) had motor disturbance, 4 (8.5%) had cognitive dysfunction, 4(8.5%) had personality and emotional problems, 3(6.4%) had environmental barriers, 1(2.1%) had sensory disturbance, 1(2.1%) had speech and language disorder, 1(2.1%) had social barrier and 17(36.2%) had other barriers.

Ability to Go Alone to above Places: About 13(20%) were able to go alone to places for carrying out their personal task. There were 28 patients who never did this task all alone even before having stroke.

Ability to Move in a Crowd: Out of 65 patients, 46(70.8%) were able to move through the crowd and 19(29.2%) had difficulty in doing so. Of 19 who had difficulty, 14(73.7%) patients had personality and emotional problems 3(15.8%) had motor disturbances, 3(15.8%) had social factors, 1(5.3%) had perceptual dysfunction.

Use of any Aids/Equipment: About of 14(21.5%) patients were using some kind of aids/equipment for their mobility. Of these 13(92.9%) were using aids for walking [calipers, elbow crutches, walking stick, tripod, quadripod] and 4(28.6%) were using hand splint. Only 3(21.4%) patients had difficulty in

using the aids/equipment. Out of 3 patients having difficulty, 2 were unable to get into balance with the aid and discontinued its use due to discomfort.

Leisure:

Engagement in Leisure Activity: Out of 65 patients, 60(92.3%) used to be engaged in some leisure activity prior to having stroke.

Of 60 patients who were having some kind of leisure activities, 28(46.7%) had outdoor leisure activities, 54(90%) also had indoor activities and 2(3.3%) had other leisure activities. Out of 60 patients who were engaging in some kind of leisure activity prior to having stroke, only 38(63.3%) patients continue to engage in similar activities, even though they faced some difficulties in doing so. Of these, 38(63.3%) who continued to participate in leisure activities, 7(18.4%) had motor disturbance as barrier in engaging in leisure activity, 5(13.2%) patient had personality and emotional problems, 1(2.6%) patient sensory disturbance, 1 patient (2.6%) had perceptual dysfunction, 1(2.6%) had cognitive dysfunction and 9(23.7%) had other barriers.

Reasons for not Engaging in Leisure Activity Now: From among the 60 who had participated in leisure time activity prior to stroke, 22 did not continue after the event. Of these, 12(54.5%) had personality and emotional problems, 9(40.9%) patients were not able to engage due to motor disturbance, 4(18.2%) had cognitive dysfunction, 3(13.6%) had perceptual dysfunction, 3(13.6%) had speech and language disorder and 1(4.5%) had other barriers.

Social Function:

Changes in Social Functions: There were changes in 62(95.4%) patients in participating various social activities.

Table # 13: Participation in Pre- and Post-Stroke Social Activities (n=65)

S #	Activities	Pre-Stroke(%)	Post-Stroke(%)
1.	Visit to Religious Institutions	26.2	26.2
2.	Participate in Marriage fn.	92.3	21.5
3.	Sports	4.6	1.5
4.	Picnics	10.8	1.5
5.	Social Parties	6.2	1.5
6.	Cinema	38.5	9.2
7.	Walk/jog for Health Reasons	30.8	15.4
8.	Meeting other for Discussion	29.2	7.7
9.	Visit Places of Recreation	10.8	4.6
10.	Watch T.V	70.8	49.2
11.	Go to a Fair	10.8	1.5
12.	Visit a Friend/Relative	86.2	10.8

Reasons for the change in participation in social functions: Changes in participation in social functions among the 62 who were not entirely bed ridden were motor disturbance in 48(77.4) patients, 18(29%) had personality and emotional problems, 9(14.5%) had speech and language disorder, 4(6.5%) had environmental barriers, 3(4.8%) had social barrier, 2 (3.2%) had perceptual dysfunction, 1(1.6%) had cognitive dysfunction and 5(8.1%) had other barriers.

Community Resources:

Awareness of various Community Resources: Community resources, here means, availability of local infrastructure like a specialised institution; or a health worker, or a health professionals for their rehabilitation and possibility for community participation in managing these through training people to take care of rehabilitation services. None of 65 patients were aware of any community resources either for stroke patients or any other disabled person.

Community Services:

Awareness of various Community Services: Community services include financial aid and provisions of aids/equipment. Out of 65 patients, 16(24.6%)

were aware of some of community services. Source of information for 7(43.8%) patients were from medical professionals, 5(31.3%) from mass media, 3(18.8%) from other interpersonal and 13(81.3%) from other sources.

Nature of Services the Patients were Aware of: Out of 16 patients who were aware of some kind of community services, 9(56.3%) were aware of religious institutions, which provides financial aid, 2(12.5%) for non-religious institution which provide financial aid and 5(31.3) patients were aware of other services.

Community Facilities:

Community facilities include facilities for vocational rehabilitation. Only 1(1.5 %) patient was aware of community facilities. The source of information was from mass media (newspaper). Cheshire home for vocational rehabilitation was the only known facility for disabled people. None of the patients were aware of any organisation for disabled (Table # 14).

Table # 14: Distribution of Patients by Awareness regarding Community- Resources, Services, Facilities and Organisations. (n=65)

Aware	Yes	Percentage
Resources	0	0.0
Services	16	24.6
Facilities	1	1.5
Organisation	0	0.0

4.12 Depression Profile of Patients

According to Beck's Depression Inventory, out of 65 patients, 25(38.4%) have moderate to severe depression, 13(20%) have extreme depression, 2 (3.1%) had a score of '0' and 6(12.3%) were not included in this evaluation for reasons of patient and their relative being illiterate. Mean depression level for this sample being 26.61 ± 15.75 which is categorised under to have moderate depression.

Table # 15: Beck's Depression Inventory

Score Range	Depression level	Number	Percentage
0	-	2	3.1
1 - 10	Normal	10	15.4
11 - 16	Mild Mood Disorder	6	9.2
17 - 20	Borderline Clinical Depression	3	4.6
21 - 30	Moderate Depression	11	16.9
31 - 40	Severe Depression	14	21.5
> 40	Extreme Depression	13	20.0
N/A	-	6	12.3

4.13 Household Profile:

A profile of household in which the stroke are locate is included. This serves to contextualise the patient's life in terms of socio-economic conditions.

Number of earning members in the household: 40(61.5%) patients' household had less than 2 earning members. There were 17(26.2 %) without any earning member in their household.

House Hold Size: Household size with 5 or less than were found in 42(64.6%) patients. Out of 65 households, 10 had only 2 persons, the patient and another person.

Twenty five of the household had one or more aged persons and 34 households had one or more children below the age 15.

4.14 Cost

On expenditure for stroke management, mean percentage of hospitalisation was about 47.3%(n=51) of total expenditure, followed by 34.22%(n=52) for medicines and least was accounted 0.7 % for aids/equipment. (Table # 16) where as mean expenditure on hospitalisation was Rs. 20851.21(n=62), for medicines was Rs. 7570.44(n=57) and for aids/equipment was Rs. 398.41(n=63)(Table # 17).

Table # 16: Mean percentage of Expenditure on Stroke Management

S #	Variable	Mean(%)	SD	Range	Min.	Max.
1	Hospitalisation	47.33	30.22	96.65	0	96.65
2	Medicines	34.22	30.42	100.00	0	100.00
3	Transportation	5.89	8.20	39.13	0	39.13
4	Therapy	6.47	15.00	80.54	0	80.54
5	Aids/equipment	0.72	2.17	14.13	0	14.13
6	Attendant	1.87	12.26	95.73	0	95.73
7	Others	1.21	5.36	34.25	0	34.25

Table # 17: Expenditure on Stroke Management(Rs.)

S #	Variable	Mean	SD	Minimum	Maximum
1.	Hospitalisation	20 851.21	28765.60	0.00	172000.00
2.	Medicines	7570.44	8599.25	0.00	40000.00
3.	Transportation	1212.41	2032.03	0.00	10000.00
4.	Therapy	3537.30	9050.50	0.00	60000.00
5.	Aids/Equipment	398.41	1131.75	0.00	6000.00
6.	Attendant	382.54	1531.34	0.00	9000.00
7.	Others	419.11	1601.45	0.00	10520.00
	Total	33306.19	33659.44	1665.00	193650.00

Here therapy included physiotherapy, ayurvedic, and the cost of the attendant included home nurse. Mean duration for medicines was 472 days (n=57), for therapy was 51 days (n=58) and for hospitalisation was 43(n=63).

(Table # 18)

Table # 18: Duration of various Inputs for Stroke Management (days)

S #	Variable	Mean	SD	Minimum	Maximum	N
1.	Hospitalisation	42.79	55.22	0	365	63
2.	Medicines	472.11	274.28	0	990	57
3.	Therapy	51.28	92.19	0	365	58
4.	Attendant	10.00	38.10	0	210	63
5.	Others	3.75	27.81	0	210	57
6.	Total	506.67	255.70	120	990	63

The expenditure by the family on various items for the previous month, showed that mean percentage on food & fuel was 62.8%(n=56) of the total monthly family expenditure, and the least was for recreation about 1.1%(n=57)(Table # 19). Here recreation included cable television, cinema and others were electricity bill, water bill and telephone bill.

Table # 19: Monthly Household Expenditure (Rs.)

S #	Variable	Mean	SD	Range	Minimum	Maximum
1.	Education	10.71	15.28	64.10	0	64.10
2.	Health	3.52	3.48	13.42	0	13.42
3.	Food & Fuel	62.80	17.76	79.88	15.96	95.85
4.	Clothing	6.05	5.58	32.64	0	32.64
5.	Transportation	10.23	9.74	53.13	0	53.13
6.	Recreation	1.10	2.62	17.91	0	17.91
7.	Others	5.19	6.23	27.17	0	27.17

Twenty-four (36.9%) patients have one other members of the family affected by some chronic disease. Out of these, 9(13.8%) had diabetes, 5(7.7%) had asthma, 4(6.2) had cardiac disease and other disease found were back pain, mental retardation, psychiatric illness, rheumatoid arthritis, deep vein thrombosis, poliomyelitis in each of the patient. The mean duration of illness was 8.94 months.

Financing Management of Disability:

Source of Financing of Expenditure due to Disability: Out of 65 patients, 46(70.8%) have financed this expenditure by self, 25(38.5%) by loan, 18(27.7%) by relatives, 8(12.3%) by employer, 5(7.7%) had sold property, 4(6.2%) by charity, 2(3.1%) by government.

Current Means of Financing Medical Bills: Current means of financing medical bills were 32(49.2%) through relatives, 22(33.8%) through self, 15(23.1%) through loan, 4(6.2%) through employer, 2(3.1%) through charity, 1(1.5%) through government, 1(1.5%) through sold property and 11(16.9%) through others.

Management of Financial Burden: The financial burden due to post-stroke care was managed for 26(40%) patients through relatives, 21(32.3%) through loan, 14(21.5%) through self, 5(7.7%) through employer, 1(1.5%) through charity and 28(43.1%) through others.

4.15 Community Integration Index

An index was formulated to give quantitative measure to the level of community integration. The maximum score was 67 and the minimum 2. Higher the score better the integration. The patients' were categorised into three groups according to the scores of index. Group I with a score less than 16, Group II score between 17 and 23 and Group III with a score greater than 24. Group I had 26(40%) patients, Group II with 20(30.8%) and Group III with 19(29.2) patients (Table # 20).

Table # 20: Distribution of Patients by Level of Community Integration Index

S #	Groups	NO.	Percentage
I	< 16	26	40
II	17-23	20	30.8
III	>24	19	29.2
Total		65	100

Community Integration and Sex

More women tend to be less integrated within the community when compared to men. This relationship was found to be statistically significant (Table #21)

Table # 21: Distribution of Patients by Level of CII and Sex

Group	Male(%)	Female(%)	Total(%)
I	26.3	59.3	40
II	36.8	22.2	31
III	36.8	18.5	29
Total	100(38)	100(27)	100(65)

Significance level: $p=0.027$

Community Integration and Age of Patient

After analysing index group and age of patient using One way ANOVA, there is a relationship between three groups and age of patient with a p -value=0.024. Young patients are better integrated than older patient. (Table # 22).

Table # 22: Distribution of Patients by Level of CII and Age of Patient

Groups	Age Group					
	1		2		3	
	No	%	No.	%	No.	%
I	1	12.5	7	33.3	18	50.0
II	2	25.0	4	19.0	14	38.9
II	5	62.5	10	47.5	4	11.1
Total	8	100	21	100	36	100

Significance level: p value=0.024

Level of community integration and Functional level

One way ANOVA analysis of index group and functional level showed that the relationship was highly significant with p- value <0.001. Here functional level has been categorised into three levels, level 1 with FIM score less than 90, level 2 score between 91 and 107 and level 3 score between 108 and 126. Seventeen (65.4%) patients with level 3 fall into better-integrated group III in comparison with 18(69.2) patients of level 1 fall into lesser integrated group I. Patients with high functional independence level are well integrated into the community than those with a low functional level (Table # 23).

Table # 23: Distribution of Patients by Functional Level of the patient and

Groups	Level of CII					
	Functional Level					
	1		2		3	
	No	%	No.	%	No.	%
I	18	69.2	5	38.5	3	11.5
II	8	30.5	6	46.2	6	23.1
II	0	0	2	15.4	17	65.4
Total	26	100	13	100	26	100

Significance level: p value<0.001

Level of Community Integration and Depression Level

One way ANOVA analysis of index group and depression level showed significant relationship with p-value of 0.027. Level of depression among the three integrated groups, depression had a significant effect on Group I. Patients with higher depression score, tends to be less integrated than with lower score.

V. DISCUSSION, CONCLUSIONS AND RECOMMENDATIONS

Here awareness of preventive and rehabilitative aspect of stroke management, level of functional independence, level of community integration, levels of depression among patients and financial impact on patient and family members due to stroke and its management, are discussed based on relevant findings.

5.1 Awareness of the Preventive and Rehabilitative Aspect of Stroke Stroke Prevention:

Awareness of stroke prevention included both primary prevention and secondary prevention. Primary prevention of stroke included control of modifiable risk factors like hypertension, diabetes, smoking, sedentary lifestyle and intake of saturated fats. About 29(44.4%) of patients and their relatives were aware about primary prevention of stroke. Ways of prevention included mainly of changes in life style and regular medical check-up. Other ways were exercises, yoga, ayurvedic massage and engagement of self in some activities.

About 27(93.1%) were aware of the need for changes in life style. Regular medical check-up was seen as means by 3(10.3%) patients. Other ways were identified by 10(34.5%) patients.

Majority of patients (n = 55) were not aware that stroke could be prevented. There were 10(15.4%) patients who strongly thought that stroke could not be prevented. Reasons for inability to prevent were due to its sudden onset and lack of time to take immediate steps. Other reasons included "emotional shock" and "God's will."

Secondary Prevention included life style changes, which would reduce an incidence of a recurrent stroke, are smoking cessation, dietary control and physical activity.

About of 28(43.1%) were aware of secondary prevention of stroke. The important means of secondary prevention that were known were the administration of injection (anti-platelet treatment) in a medical facility to reduce severity of disability following a sudden attack. Important sources through which knowledge was obtained were medical professionals for 18(64.3%) patients and other sources such as mass media like newspaper and television for 11(39.3%) patients. About 10(35.7%) patients heard of it from interpersonal sources such as relatives and friends.

Stroke Management:

Out of 65 patients, three fourths (76.9%) were aware about some kind of facilities available for stroke management. This has affect on the way in which they avail various management for their rehabilitation and leading to total integration. Awareness of other important treatments, which were not common like Occupational Therapy, Speech Therapy were not brought out through this study. These treatments have very definite role to play for total rehabilitation of the patient.

Rehabilitation:

Under rehabilitation, aspects explored were awareness of rehabilitation of disabled, knowledge about rehabilitation, visit to physical medicine and rehabilitation department and knowledge about usefulness of rehabilitation for stroke management.

Almost two thirds of the patient (64.6%) were aware of rehabilitation for disabled people. The major sources of such information were mass media and medical personnel. The idea was that rehabilitation was a method of bringing a person back to normal life or independent. A few saw rehabilitation as a physical process of exercises etc. Very few (just less than a third) of the patient had visited any physical medicine and rehabilitation department.

The realisation that rehabilitation is a useful measure for long term management of stroke existed among just slightly over one thirds of the patient. In fact some even felt that it was not useful (9 out of 65). However, that almost half the patients (31 out of 65) were not even aware of the need for rehabilitation following stroke. This throws light upon on nature of post-stroke management practices that exist and problems that have to be faced in improving the state of knowledge.

5.2 Functional Independence Level

The next objective of this study was to estimate the level of functional independence of population. The level of functional independence was measured by Functional Independence Measure (FIM) Scale. According to the score by FIM, out of 65 patients, 22 were partially dependent in their functional activities, 26 were independent and 13 patients were between partial dependence and full independence. Whole sample had mean total FIM score of 93.8 which says that their functional independence lies between partially dependency to full independence.

5.3 Community Integration

Community Integration was categorised into three main aspects: 1) home integration 2) social integration 3) productivity and in addition few other factors have been included. They were transportation and accessibility, geographical orientation, leisure, community resources, community services, community facility and organisation for disabled.

Community Integration Index(CII):

The level of community integration attained was related to the age and sex of the patient. In addition it was also found the FIM was strongly associated with CII. It is possible that younger persons are better able to integrate because they stand to lose in terms of new experiences gained as opposed to other persons. Women also tended to be more often less integrated. However, since we have no measure of Community Integration pre-stroke to compare with, this assumption could be flawed. This is because in societies such as that found in Kerala, women's participation in the kind of community activities listed was always low.

Higher the level of functional independence higher the level of community integration. A person with a drive to regain as much of the pre-stroke independence as possible would seek out all possible resources to do so and it is possible that such a person's level of community integration would be high. The level of community integration was also related positively to the per capita household expenditure. A household with better economic status would be able to afford to make/provide the aids, facilitate the process of integration. On the other hand, a post-stroke person who resumed

participation in economic activities would also contribute to increasing the household expenditure and the relationship.

5.4 Depression Profile of Patients

Post-stroke depression can hamper integration of patient back into the community. So evaluating the level of depression among the patients should be given prime importance.

According to Beck's Depression Inventory, out of 65 patients, 25(38.4%) have moderate to severe depression, 13(20%) have extreme depression, 2 (3.1%) had a score of '0' and 6(12.3%) were not included in this evaluation for reasons of patient and their relative being illiterate. Mean depression level for this sample being 26.6 which is categorised under to have moderate depression. If not managed, it has possibility to become more severe which will affect on the process of integration.

Level of Community Integration and Depression Level

One way ANOVA analysis of index group and depression level showed significant relationship with p-value Of 0.027. This implies there was a significant difference of depression level among three-index group.

5.5 Financial Impact of Stroke and its Management on the Patients and their Families

An attempt is made to identify the caretaker of physical needs of the patient in the family and source of financial support to patient. Impact on patient and family was analysed in terms of burden of care due to stroke management in financial terms. Study also explores the source of financing expenditure due to stroke, current means of financing medical bills and future management of financial burden.

In majority (63.1%) of cases, spouses were taking care of physical needs of the patient, showing that there is greater physical strain on caretaker than the others like children, relatives, parents, attendant and home nurse.

More than half the patients (53.8%) had their own financial resources to support their family and the least other support comprised of spouse in 18(27.7%), children (male) in 22(33.8%), children (female) in 21(32.8%), parents in 3(4.6%) and others like friends, relatives, church and political party in 22(33.8%) patients.

General means of support consisted mainly of loans, employer paid, government schemes and sold property in 43(66.2%) patients. Pension was the important means of supporting the patient in 20(30.8%) patients, salary in 25(38.5%), daily wages of their spouses, relatives and children in 17(36.2%). None of the patients had any kind of disability benefits and insurance.

Forty (61.5%) patient's household had one to two earning members. There were 17(26.2 %) without any earning member in their household and 8(12.4%) with 3-4 members who can earn.

On expenditure for stroke management, mean percentage of expenditure on hospitalisation was about 47.3%(n=51) of total expenditure, followed by 34.22%(n=52) for medicines and least was 0.7 % for aids/equipment. The mean expenditure on hospitalisation was Rs. 20851.21(n=62), for that medicines was Rs. 7570.44(n=57) and for aids/equipment was Rs. 398.41(n=63). Here therapy included physiotherapy, ayurvedic, whereas attendant included home nurse. Mean

duration for medicines was 472 days (n=57), for therapy was 51 days (n=58) and for hospitalisation was 43(n=63).

While expenditure of family on various items for last month, showed that mean percentage on food & fuel was 62.8%(n=56) of the total monthly family expenditure, while least was for recreation about 1.1%(n=57). Here recreation included cable television, cinema and others were electricity bill, water bill and telephone bill.

About family illness and its effect on financial burden of family of the patient, 24(36.9%) patients have one of the family members affected by some chronic disease. Of the of 24 households who were badly affected, 9(13.8%) had diabetes, 5(7.7%) had asthma, 4(6.2) had cardiac disease and other disease found were back pain, mental retardation, psychiatric illness, rheumatoid arthritis, deep vein thrombosis, poliomyelitis in each of the patient. The mean duration of illness was 8.94 months. This aspect would have an added affect on their already financial resources of the family, especially if it is a chronic disease that requires a long-term medical management.

About source of financing expenditure at the time of onset due to disability, expenditure due to disability were categorised into self, loan, employer, government, sold property, charity, relatives and others. Out of 65 patients, 46(70.8%) have financed this expenditure by self, 25(38.5%) by loan, 18(27.7%) by relatives, 8(12.3%) by employer, 5(7.7%) by sold property, 4(6.2%) by charity, 2(3.1%) by government. This is an important because the sources of financing their expenditure were mainly through self and loan, and only least by the government.

Current means of financing medical bills were 32(49.2%) through relatives, 22(33.8%) by self, 15(23.1%) through loan, 4(6.2%) through employer, 2(3.1%) through charity, 1(1.5%) through government, 1(1.5%) through sold property) and 11(16.9%) through others [family business, pension]. Here current expenditure was mainly through relatives, followed by self and least by government.

Ways in which the patients were to manage the financial burden due to post-stroke care, were 26(40%) through relatives, 21(32.3%) through loan, 14(21.5%) through self, 5(7.7%) through employer, 1(1.5%) through charity and 28(43.1%) through others 9 [pension, salary, wages, family business].

Patients carry a high financial burden due to stroke and ways of management would be a complex issue in the absence of any social support system available for stroke affected person.

5.6 Conclusions

Study had made an attempt to highlight the importance of post-stroke management to enhance the quality of life with whatever abilities the person has now. It explored community integration, the level of functional independence, awareness of preventive and rehabilitative aspect of stroke management and psychological and financial impact on patient and his family due to stroke and its management of 65 persons with stroke. Community integration was related to various barriers to analyse its effects on integration of person back into his community.

During analysis of community integration aspect, a crude index was developed and the whole sample was categorised into three groups.

Significant relationship was found between index and age of person, sex, functional level, total monthly per-capita house hold expenditure.

Functional level of the sample showed that they vary between moderate to complete independence. This implies, there is need to improving the awareness regarding rehabilitation services among medical professional and lay public and to extend these services to larger section of the community through the primary health care as advocated through by WHO.

Awareness regarding preventive and rehabilitative aspect of stroke among patient and their family were limited and this needs more emphasis. It needs all round public health efforts from mass media, professionals, government, private establishment and lay public to highlight the urgency to prevent the occurrence stroke.

Finally this study attempts to highlight the psychological and financial impact due to stroke and its management on the person and his family. Moderate depression was found among these patients, this can bring down the level of community integration. It found a strong association between post-stroke community integration and the economic status of the patient. This clearly indicates the need for economic support services for stroke patients, especially those from the lower socio-economic status, if they are to become better integrated into society.

5.7 Recommendations

From a public health point of view, there is a need to facilitate the awareness of rehabilitation and preventive aspect of stroke among Physicians and lay public through continuing medical education and mass media. Also to

encourage the community oriented rehabilitation programs for stroke victims through primary health care.

Specialised training centres for rehabilitation health workers to impart skills of early identification and management of disability through involvement of local community can be set up. Also set up a Physical Medicine and Rehabilitation Department in every district of the state with services like Physiotherapy, Occupational Therapy, Prosthetist, Orthotist. etc.

Various legislation concerning construction of new buildings to reduce the effects of architectural barriers and enhancing the integration of disabled individuals back into the community have to be implemented promptly. Financial schemes or mechanisms to reduce the financial burden due to stroke and its management have to be floated.

5.8 Limitations

The sample size for the study is rather limited and therefore cannot be used to make generalisation

At times when the patient was not able to answer, the caretaker was consulted. In so far as such answers can be treated as proxies for the patient's attitudes, opinions and behaviour, they can be treated as valid.

Information about the mobility of the patient is based on reports and not always observation. If there were any reporting biases, these would affect the evaluations made.

The study does not take into consideration the loss of productivity for the patients and their caregivers. This limits the measures of community integration and understandings of the financial burden that accrues to the patients and their families.

REFERENCES

1. **Abraham J, Rao PSS, Imbraj SG, Shetty G.** An epidemiological study of hemiplegia due to stroke in South India. *Stroke*, 1970; 1:477-481.
2. **Aho K, Harmsen P, Hatano S, Marquarsden J, Smirnov VE, Strasser T.** Cerebrovascular disease in the community: results of a WHO collaborative study. *Bull WHO*, 1980; 58:113-30.
3. **Angeleri F, Angeleri A, Fosehi N, Giaquinto S, Nolfe G.** The influence of depression, social activity and family stress on functional outcome after stroke. *Stroke*, 1993; 24: 1478-1483.
4. **Awada A.** Stroke in Saudi Arabian young adults-a study of 120 cases. *Acta Neurol Scand*, 1989; 70:323-28.
5. **Balrajan R.** Ethnic differences in mortality from ischemic heart disease and cerebrovascular disease in England and Wales. *BMJ*, 1991; 302: 560-564.
6. **Bansal BC.** Recent concepts in stroke: Indian College of Physicians (Academic wing of Association of Physician of India).
7. **Bansal BC, Prakash C, Jain AL, Brahaman Adam KRV.** Cerebrovascular disease in young individuals below the age of 40 years. *Neurol India*, 1973; 21: 1-18.
8. **Beck AT, Ward CH, Mendelson M. Mock JE & Erabaugh.** An inventory for measuring depression. *Archives of General Psychiatry*, 1961; 33: 561-571.
9. **Burleigh SA, Farber RS & Gillard M.** Community integration and life satisfaction after traumatic brain injury: Long term findings. *Am j Occup Ther*, 1998 ; 52: 45-52.
10. **Chin L, Pai L, Shyu WC, Tayne Chen TR, Chang TP.** Analysis of costs borne by families of patient hospitalised for stroke. *Chung Hua I Hsuch Tsa Chin (Taipei)*, 61: 267-275, 1998.
11. **Chopra JS, Prabakar S.** Clinical features and risk factors in young. *Acta Neurol Scan*, 1979; 60: 289-300.
12. **David S, Phyllis A, Danny GK, Rubin B, Marvin.** Post-stroke depression: Relationships to functional impairment, coping strategies, and rehabilitation outcomes. *Stroke* 17: 1102-1107, 1986.
13. **Dalal PM.** *Japanese Circulation J*, 1981; 46:621-624.
14. **Drummond A.** Lesure activity stroke. *Int Disabil Studies*, 1991; 12: 157-160.

15. **Feibel JH, Berk S, Joynt RJ.** The unmet needs of stroke survivors. *Neurol*, 1979; 29: 592.
16. **Folstein J H, Maiberger P, McHugh PR.** Mood disorders as a specific complication of stroke. *J Neurol Neurosurg Psychiat*, 1977; 40: 1018-1020.
17. **Fugl Meyer AR, Eklund M, Fugl Meyer KS.** Vocational rehabilitation in northern Sweden, III: aspects of life satisfaction. *Scand J Rehabil Med*, 1991; 23: 83-97.
18. **Granger CV, Hamilton BB, Linacre JM, Heinemann AW, Wright BD.** Performance profiles of the Functional Independence Measure. *Arch Phys Med Rehabil*, 1993; 72 : 84-89.
19. **Guide for the Uniform Data Set for Medical Rehabilitation (Adult FIM), Version 4.0.** Buffalo, NY: State University of New York at Buffalo; 1993.
20. **Guidetti D, Baratti M, Zucco RG et al.** Incidence of stroke in young adults in Reggio Emilia area-northern Italy. *Neuroepidemiology*, 1993; 12: 82-7.
21. **Hatano S.** Experience from a multicentre stroke register: a preliminary report. *Bull WHO*, 1976; 54: 541-553.
22. **House A, Dennis M, Morige L, Warlow C, Hawton K and Jones L:** Mood disorders in the year after stroke: *British Journal of Psychiatry* 158: 83-93, 1991
23. **Jorgensen HS, Nakayama H, Raaschou HO, Vive-Larsen J, Stoier M, Olsen TS.** Outcome and time course of recovery in stroke, II: time course of recovery. The Copenhagen Stroke Study. *Arch Phys Med Rehabil*. 1995; 76:406-412.
24. **Jorgenson HS, Nakayama H, Raaschou HO, Olsen TS:** Acute stroke care and rehabilitation: An analysis of the direct cost and its clinical and social determinants. The Copenhagen stroke study. *Stroke*, 1997; 28: 1138-1141.
25. **Kerr LM, Anderson JM, Thompson JA et al.** Ischaemic stroke in young. Evaluation and age comparison of patients, six months to thirty-nine years. *J Child Nerol*, 1993; 8: 226-70.
26. **Krutzke JF.** Epidemiology of cerebrovascular disease. In: Dowell MC, Captain LR (eds.) *Cerebrovascular survey report for the National Institute of Neurological and Communicable Disorders and Stroke*. Bethesda National Institute of Communicable Disorders and Stroke, 1985.
27. **Labi MLC, Philips TF, Gresham GE.** Psychological disability in physically restored long-term stroke survivors. *Arch Phys Med Rehabil*, 1980; 61: 561-565

28. **Leno C, Bercaino J, Combarros O et al.** A prospective study of stroke in young adults in Cantabria, Spain. *Stroke*, 1993; 24:792-5.
29. **Mahoney FI, Barthel D.** Functional evaluation: the Barthel index. *Md State Med J*. 1965; 14:56-61.
30. **Murray CJL, Lopez AD.** Global comparative assessment in the health sector: Disease burden, expenditures and intervention packages. World Health Organisation, Geneva, 1994:1-192.
31. **National Institutes of health (1993).** Research plan for the National Centre for Medical Rehabilitation Research (NIH Publication No. 93-3509). Washington, DC: US. Government Printing Office.
32. **Ottenbacher KJ, Jannell S.** The results of clinical trials in stroke rehabilitation research. *Arch Neurol*. 1993; 50:37-44.
33. **Post-Stroke Rehabilitation Guideline Panel.** *Post-Stroke Rehabilitation*. Clinical practice guideline no. 16. Rockville, Md: US Department of Health and Human Services, Public Health Service, Agency for Health Care Policy and Research; 1995. AHCPR publication 95-0662.
34. **Prabhakar S. Chopra JS** (unpublished data 1999).
35. **Robinson RG, Price TR.** Post-stroke depressive disorders: A follow-up study of 103 patients. *Stroke*, 1982; 13: 635-64i.
36. **Robinson RG, Starr LB, Kubos KL, Price TR.** A two-year longitudinal study of post-stroke mood disorders: Findings during the initial evaluation. *Stroke*, 1983; 14: 736-741.
37. **Robinson RG, Szetela B.** Mood changes following left hemispheric brain injury. *Ann Neurol*, 1981; 9: 447-453.
38. **Robinson RG, Kubos KL, Starr LB, Rao K, Price TR.** Mood disorder in stroke patients: Importance of location of lesion. *Brain*, 1984; 107: 81-93.
39. **Robinson RG.** Neuropsychiatric consequences of stroke. *Annu Rev Med*. 1997; 48 : 217-229.
40. **Roth EJ.** Medical rehabilitation of the stroke patient. *Be Stroke Smart: National Stroke Association Newsletter*. 1992; 8:8.
41. **Sjogren K.** Leisure after stroke. *Int Rehabil Med*, 1982; 4: 80-87.
42. **Tatemichi TK, Desmond DW, Stern Y, Paik M, Sano M, Bagiella E.** Cognitive impairment after stroke: frequency, patterns, and relationship to functional abilities. *J Neurol Neurosurg Psychiatry*. 1994 ;57: 202-207.
43. **Wagenaar RC, Meijer OG.** Effects of stroke rehabilitation, I: a critical review of the literature. *Journal of Rehabilitation Sciences*. 1991; 4:61-73,97-109.

44. **Wester PO, Asplund K, Eriksson S, Holm J, Marke LA, Norving B, Normell L, Rehn Crona S**, eds. *Slaganfall (Stroke)*. Stockholm, Sweden: Nordstedtstrykkiri, 1992:96-104.
45. **Whiteneck GG**. Measuring what matters: Key rehabilitation outcomes. *Arch Phys Med Rehabil*, 1994; 73: 1073-1076.
46. **WHO** Regional office for Europe and the European stroke council report on Pan European Consensus Meeting on Stroke Management (Helsingborg Declaration), 1996: 1-29.
47. **WHO** Task force on stroke and other cerebrovascular disorders Recommendations on stroke prevention, diagnosis, and therapy. *Stroke*, 1989; 20; 1407-1431.
48. **WHO**. Techn. Rep. Ser., 1971, No.469.
49. **WHO**. Techn. Rep. Ser, 1986, No. 732.
50. **Willer B, Linn R & Allen K (1993)**. Community integration and barriers to integration for individuals with brain injury. In M. Alan, J. Finlayson & S.H Garner (Eds.), *Brain Injury Rehabilitation: Clinical consideration* (pp 355-375). Baltimore: Williams & Wilkins.
51. **Willer B, Rosenthal m, Kreutzer JS, Gordon WA, & Rempel R**. Assessment of community integration following rehabilitation for traumatic brain injury. *Journal of Head Trauma Rehabilitation*, 1993; 8: 75-87.
52. **Willer B, Ottenbacher KJ, & Coad ML**. The Community Integration Questionnaire: A comparative examination. *American Journal of Physical Medicine and Rehabilitation*, 1994; 73: 103-111.
53. **Wolf PA, D'Agostino RB, O'Neal MA, Sytkowski P, Kase CS, Belanger AJ, Kannel WB**. Secular trends in stroke incidence and mortality: the Framingham Study. *Stroke*.1992; 23:1551-1555.
54. **Wood-Dauphinee SL, Opzoomer MA, Williams JT, Marchand B & Sptizer WO**. Assessment of global function. The reintegration to normal living index. *Arch Phys Med Rehabil*, 1988; 69: 583-590.

Questionnaire

SERIAL #		DATE						
NAME		1.	AG		2.	SEX	M	F
ADDRESS:								

A. RESPONDENT:

3. Is the respondent able to communicate? YES NO

If no, name of the second respondent:
(If the patient is not able to communicate-then ask the care taker)

Relationship of the second respondent:

B. DIAGNOSIS : 4.(Type of Stroke)

C. DATE OF FIRST ATTACK: 5 (month/year)

D. RISK FACTORS:

Did you ever had/have?

6.	High Blood Pressure	Yes	No	7.	Diabetes Mellitus	Yes	No
8.	Cardiac Disease	Yes	No	9.	Transient Ischemic Attack	Yes	No
10.	Cigarette Smoking	Yes	No	11.	Others.....	Yes	No

E. PART OF BODY AFFECTED

12. Which side of your body is affected?

Left	1	Right	2	Both sides	3	Others(specify).....	4
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Does your affected side have?

13	Weakness (paresis)	YES	1	NO	2
14	Paralysis	YES	1	NO	2
15.	Others	YES	1	NO	2

F. DURATION:

16. Is this the first attack that you had? YES 1 NO 2

17. If no, how many times have you had an attack in the past?

18. How many months back did you have this attack?. Months

G. EDUCATION:

19. How far you been educated?.(Completed qualification)

Primary	1	Middle	2	High School	3	Higher Secondary	4
Graduate	5	Post graduate	6	Professional	7	Others.....	8

H. OCCUPATION:

20. What have you been working as prior to having the problem?.

Specify:

I. MARITAL STATUS:

21. Are you currently?.

Married	1	Never Married	2	Widowed	3	Divorced	4	Separated	5
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22. Who takes care of your physical needs? Specify the relationship

J. Support

23. In your family, who supports you financially?.

Self	1	Spouse	2	Children (male)	3	Children (female)	4	Parents	5	Others (specify).....	6
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24. If Self, How?

Salary	1	Wages	2	Pension	3	Disability Benefits	4	Insurance	5	Others (specify)	6
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K. Management and its Awareness

25. Which system of medicine did you use first?.

Allopathy	1	Ayurvedic	2	Homeopathy	3	Others	4
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26. Did you use more than one system of medicine?. YES NO

27. If yes, Type

28. Number of times:

29. Do you know about various facilities available for Stroke Management?. YES NO

30. If Yes, from where did you obtain this information

31. What are the types of facilities that a stroke patient needs:

Type of facility	Unaided Awareness	Aided Awareness
PMR		
Psychiatric		
Physiotherapy		
Ayurvedic		
Massage		
Specialized institutes		
Associations		
Others (specify)		

32. Can Stroke be prevented?. YES NO

33. If, Yes. How?.

34. If, No. Why Not?.

35. What are the complications of not preventing stroke ?.

36. Are you aware of primary prevention of stroke ?. YES NO

37. If yes, from where did you obtain your this information ?.

38. Have you heard about Rehabilitation of disabled people?. YES NO

39. If Yes, from where did you obtain this information:

40. What do you know about Rehabilitation?.

41. Did you ever visit any Physical Medicine and Rehabilitation Dept. of any hospital? YES

42. If Yes, where:

43. If within Kerala, Were you satisfied with the services provided there? YES NO

44. If no, Why?

45. Did you go out of Kerala for your rehabilitation?. YES NO

46. If Yes, where

47. Why did you go out of Kerala?

48. Do you think Rehabilitation is useful for long term management of post Stroke patients YES NO

49. If Yes / No, Why?

50. Have you heard about *OCCUPATIONAL THERAPY*?. YES NO

51. If Yes, from where did you obtain this source of information

52. Do you think *OCCUPATIONAL THERAPY* is useful for management of post-stroke? Y

53. If yes, in what way do you think Occupational Therapy can be useful for the management

L. LEVEL OF FUNCTIONAL INDEPENDENCE (BURDEN OF CARE)

Function	Score	Comments
A. Self Care		
1. Eating		
2. Grooming		
3. Bathing		
4. Upper Body Dressing		
5. Lower Body Dressing		
6. Toileting		
B. Sphincter Control		
7. Bladder		
8. Bowel		
C. Mobility		
9. Bed, Chair, Wheel		
10. Toilet		
11 Tub/Shower		
D. Locomotion		
12. Walk/ Wheel Chair		
13. Stairs Up and Down (12-14 stairs)		
E. Communication		
14. Comprehension		
15. Expression		
F. Social Cognition		
16. Social Interaction		
17. Problem Solving		
18. Memory		
TOTAL		

54. Functional Independence Measure Score is:

M. COMMUNITY RE-INTEGRATION

a. HOME: *accessibility and mobility* (within house and in the neighborhood)

55. How do you move around in your house? (Aids in mobility)

Wheel Chair	1	Walker	2	Walking Stick	3	Using Rails	4	Others
----------------	---	--------	---	------------------	---	----------------	---	-----------------

56. Do you find any difficulty to move within the house?.

YES	NO
-----	----

57. If yes, specify your difficulty.....

58. Do you find any difficulty in moving outside the house?(in the neighborhood) YES NO

59. If yes, specify your difficulty.....

--

60. How is your terrain around your neighborhood?

--

61. Is there curb-cut out in your neighborhood? YES NO

64. What is the condition of your approach road?. GOOD BAD

63. The condition of the road in which you live: KUCHA PUCCA POORLY MAINTAINED

64. Does it affect your mobility out side the house?. YES NO

65. If yes, how does it affect mobility?.

--

66. How far is the nearest shop nearest bus stop

67. Can you say which of these difficulties originating inside the house is the greatest and the least problematic?

Greatest Difficulty Least Difficulty

68. Can you say which aspect of these difficulties outside the house is the greatest and the least problematic?

Greatest Difficulty Least Difficulty

b. TRANSPORTATION AND ACCESSIBILITY

69. Do you use any kind of transport?. YES NO

70. If yes, do you use:

Public	1	Private	2	Others(specify)	3
				

71. If your using public transport, do you use:

Railways	1	Bus	2	Autorickshaw	3	Others(specify)	4
.....							

72. Are you aware of time schedule of above services ? YES NO

73. If yes, do you have any difficulty ? YES NO

74. If Yes, specify your difficulty:

--

75. If no, why?(give reasons)

--

76. Are you able to read the name boards on vehicles? YES NO

77. If no, why not?(give reasons)

--

78. Are you able to get in, take a seat and get out of the conveyance? YES NO

79. If no, specify your difficulty in each of these tasks:

--

80. If you are using private transport, what type of vehicle do you use:

Wheel Chair	1	Two Wheeler	2	Three Wheeler	3	Four Wheeler	4	Others(specify)	5
.....									
...									

81. Are you able to drive your vehicle? YES NO

82. If yes, is your vehicle modified or adapted for driving? YES NO

83. If yes , how is it modified or adapted?

--

84. How do you rate your difficulty in transportation?.

Greatest difficulty

Least difficulty

c. GEOGRAPHICAL ORIENTATION

85. Are you able to read name /sign boards in places?. YES NO

86. If no, why not ?. specify your difficulty:

87. Are you able to get direction?. YES NO

88. If no, specify your difficulty:

d. WORK

89. What kind of occupation were you in prior to stroke?. Specify

90. How long have you had this occupation?. Duration (Years/months).

91. Do you go to work now?. YES NO

92. If yes, do you have any difficulty?.

93. How long have you had been at work after the stroke?. Duration: (years/month)

94. If No, why?. (Give reasons)

95. Are you in the same occupation now?. YES NO

96. If No, why?. (Specify your difficulty)

97. How do you rate the difficulties in Work?

Greatest Difficulty Least Difficulty

e. COMMUNITY ACCESSIBILITY

98. Which of the following places do you go to now?

Bank	1	Post Office	2	Restaurant	3	Shoppin g	4	Ration Shop	5	Gas Agency	6	Bazaar
Pharm acy Shop	8	Coffee/ Tea Shop	9	Public Telephone Booth	10	Public Toilet	11	Cinema Theater s	12	Auditori um	1 3	Park
Others.....				15								

99. Do you have any difficulty in visiting / using these places? YES NO

100. If yes, specify the place/s:

101. Are you able to go alone to above places? YES NO

102. What were your difficulties?.

SL #	Place	Difficulties
1.		
2.		
3.		
4.		

103. Do you have any difficulties in moving in a crowded area?. YES NO

104. If yes, specify your problem area:

105. Do you use any aids/ equipment? YES NO

106. If yes, name of aids/Equipment:

107. Do you any difficulty in using it?. YES NO

108. If yes, specify your difficulty:

109. How do you rate your difficulty in Accessibility?

Greatest Difficulty Least Difficulty

f. LEISURE

110. Did you engage in any kind of Leisure activity prior to stroke? YES NO

111. If yes, what sorts of leisure activities did you engage in?

112. Do you engage in same leisure activity now? YES NO

113. If yes, do you have any difficulty?.

114. If No, why.....(give reasons)

115. How do you rate your difficulty in Leisure Activities?

Greatest Difficulty Least Difficulty

g. SOCIAL FUNCTIONS:

116. Have there been any changes in the different social activities that you participated in since you had the stroke? YES NO

117. If yes, what kind of change there has been in each of the following: -

Serial #	Activities	Pre-stroke	Post stroke	Reasons for change
1	Visits to religious Institutions			
2	Participate in/attend marriage functions			
3	Sports			
4	Picnics/excursions			
5	Social parties			
6	Theaters/Cinema/ Auditorium			
7	Walking/jogging for health reasons			
8	Meeting other for Discussion			
9	Visiting other places of recreation(specify)			
10	Watch T.V. / Listen to Radio			
11	Go to a fair			
12	Visit a friend or a relation			
13	Others			

118. How do you rate your difficulty in Social Functions?

Greatest Difficulty Least Difficulty

g. COMMUNITY RESOURCES

119. Are you aware of various community resources? YES NO

120. If yes, from where did you obtain this information?

121. What are they?

h. COMMUNITY SERVICES

122. Are you aware of any services given for physically disabled person?

YES	NO
-----	----

123. If yes, from where did you obtain this information?

124. What are these services?

i. COMMUNITY FACILITIES

125. Is there are any facility given by community for physically disabled person?. YES / NO

126. If yes, from where did you obtain this information?

127. What are these facilities?

j. COMMUNITY ORGANIZATIONS FOR DISABLED PEOPLE

128. Is there are any organizations for disabled people?.

YES	NO
-----	----

129. If yes, from did you obtain this information?

130. Who are these organizations?

N. Psychological Aspect

131. Score by Beck's Depression Scale is

O. COST (Patient's perspective)

132. Household Profile

SL #	Name	Relation to Patient	Sex	Age	Marital Status	Education	Earning: Yes/No
1.							
2.							
3.							
4.							
5.							

133. House hold size:

Senior Citizens (above 60 yrs)	Adults (59 - 16)	Children (<15 yrs)

34. How much do you spend on following inputs (expenditure) for management?.

SL	Inputs	Duration (months)	Value (Rs.)	Comments
1.	Hospitalization			
2.	Medicines			
3.	Diet			
4.	Transportation			
5.	Therapy (Specify.....)			
6.	Aids/Equipment			
7.	Attendant(If any, like Home nurse)			
8.	Others (Specify.....)			
9.				
	Total			

135. How much did your family spend on following items last month?.

SL #	Particulars	Duration (months)	Value (Rs.)	Comments
1.	Education			
2.	Health			
3.	Food & Fuel			
4.	Clothing			
5.	Transportation			
6.	Recreation			
7.	Others (.....)			
	Total			

136. Types and number of the houses the HH has:

Type	Kutchha	Kutchha Pucca	Pucca	Other (specify)	Total
Number					

137. Assets:

Car	1	Moto r cycle	2	Washing Machine	3	Col our t.v	4	A.C	5	Refri gerator	6	V C R	7	Ph o ne	8	Ga sto e.
Others.....							10									

138. In your family does anybody have / had any serious or chronic illness?.

YES	NO
-----	----

139. If yes, what was the illness ?

142. How long did he /she had/ having this illness ?

141. My observation on **SES** of the family: Poor Lower Middle Upper Middle

142. What were your source of financing your expenditure due to your disability?.

Self	1	Loan	2	Mortgage	3	Insurance	4	Emple e paid	5	Govt.	6	Sol d pro per ty
Others.....							8					

143. What are your current means of financing your medical bills?.

Source:

144. What changes have come about due to financial burden after having Stroke and

How do you think your family going to manage / have managed it?.

SL #	Events (Changes) w.r.t various inputs	Remedy (Management)
1.		
2.		
3.		
4.		
5.		

APPENDIX - II
Community Integration Index

S #	Items	Yes	No	N/A
I. HOME INTEGRATION				
1.1	Do you find any difficulty to move within the house?	1	0	
1.2	Do you find any difficulty in moving outside the house? (in the neighbourhood)	1	0	
1.3	The condition of the road in which you live	PUCCA	POOR/ MAINT	PUCCA
		2	1	0
1.4	Does the condition of the road in which you live it affects your mobility out side the house?	1	0	
II. SOCIAL INTEGRATION: SOCIAL FUNCTIONS				
2.0	Have there been any changes in the different social activities that you participated in since you had the stroke?	1	0	0
Pre-stroke				
2.1	Visits to religious Institutions	1	0	0
2.2	Participate in/attend marriage functions	1	0	0
2.3	Sports	1	0	0
2.4	Picnics/excursions	1	0	0
2.5	Social parties	1	0	0
2.6	Theatres/Cinema/ Auditorium	1	0	0
2.7	Walking/jogging for health reasons	1	0	0
2.8	Meeting other for Discussion	1	0	0
2.9	Visiting other places of recreation(specify)	1	0	0
2.10	Watch T.V. / Listen to Radio	1	0	0
2.11	Go to a fair	1	0	0
2.12	Visit a friend or a relation	1	0	0
Post stroke				
2.13	Visits to religious Institutions	1	0	0

2.14	Participate in/attend marriage functions	1	0	0
2.15	Sports	1	0	0
2.16	Picnics/excursions	1	0	0
2.17	Social parties	1	0	0
2.18	Theatres/Cinema/ Auditorium	1	0	0
2.19	Walking/jogging for health reasons	1	0	0
2.20	Meeting other for Discussion	1	0	0
2.21	Visiting other places of recreation(specify)	1	0	0
2.22	Watch T.V. / Listen to Radio	1	0	0
2.23	Go to a fair	1	0	0
2.24	Visit a friend or a relation	1	0	0
II. SOCIAL INTEGRATION: COMMUNITY ACCESSIBILITY				
	Do you go to places below?			
2.25	Bank	1	0	0
2.26	Post -Office	1	0	0
2.27	Restaurant	1	0	0
2.28	Shopping	1	0	0
2.29	Ration shop	1	0	0
2.30	Gas agency	1	0	0
2.31	Bazaar	1	0	0
2.32	Pharmacy shop	1	0	0
2.33	Coffee/tea shop	1	0	0
2.34	Public Telephone Booth	1	0	0
2.35	Public Toilet	1	0	0
2.36	Cinema Theatres	1	0	0
2.37	Auditorium	1	0	0
2.38	Park	1	0	0
2.39	Do you have any difficulty in visiting / using these places?	1	0	0
2.40	Are you able to go alone to above places?	1	0	0

2.41	Do you have any difficulties in moving in a crowded area?		1	0	0
2.42	Do you use any aids/ equipment?		1	0	0
2.43	Do you any difficulty in using it?		1	0	0
III. PRODUCTIVITY INTEGRATION					
3.0	Do you go to work now?		1	0	
3.1	How long have you had been at work after the stroke?	0-6	7-12	13-18	19-24
		1	2	3	4
3.2	Are you in the same occupation now?		1	0	
IV. TRANSPORTATION AND ACCESSIBILITY					
4.0	Do you use any kind of transport?		1	0	
4.1	Do you use?		Public	Pvt	
			2	1	
4.2	Are you able to get in, take a seat and get out of the conveyance?		1	0	
V. GEOGRAPHICAL ORIENTATION					
5.0	Are you able to read name /sign boards in places?		1	0	
5.1	Are you able to get direction?		1	0	
VI. LEISURE					
6.0	Did you engage in any kind of Leisure activity prior to stroke?		1	0	0
6.1	Do you engage in same leisure activity now?		1	0	0
VII. SUPPORTS: COMMUNITY RESOURCES					
7.0	Are your aware of various community resources?		1	0	0
COMMUNITY SERVICES					
7.1	Are you aware of any services given for physically disabled person?		1	0	0
COMMUNITY FACILITIES					
7.2	Is there are any facility given by community for physically disabled person?		1	0	0
COMMUNITY ORGANIZATIONS FOR DISABLED PEOPLE					
7.3	Is there are any organisations for disabled people?		1	0	0
			Maximum	Minimum	
TOTAL SCORE			67	2	