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Alterations of Intra and Extra Mitochondrial Enzyme in the Muscle Fibers of Rat Hind Limbs: Role of Exercise Training Under Age Induced Oxidative Stress Conditions

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ABSTRACT

Advancing age is associated with decline in physiological functions and cause oxidative stress. It is well documented that physical exercise training enhances the capacity to resist oxidative stress and is useful at every stage of life. Keeping in view of this, the present study was under taken to investigate the effect of endurance exercise training on the status of selected metabolic enzymes in aging rat skeletal muscle fibers. Wistar male albino rats of two different age groups i.e., young (3 months) and old/moderately aged (18 months) were divided in to two groups; sedentary control (SC) and exercise trained (ExT). Metabolic enzymes glucose-6-phosphate dehydrogenase (G-6-PDH), succinate dehydrogenase (SDH) and malate dehydrogenase (MDH) estimated in the hind limb muscle fibers of soleus (SOL), red gastrocnemius (RG) and white gastrocnemius WG) were decreased with advancement of age in all the muscle fibers; whereas, these enzymes were found to be significantly ($p < 0.01$) elevated in both the exercise trained groups. The decreased metabolic enzymes in old rats are indicative of low mitochondrial performance caused due to high levels of ROS during aging. Induction of the enzymes with exercise training was more in oxidative soleus muscles of young and old rats than the glycolytic

muscle fibers. It is envisaged that regular exercise training may enhance the metabolic enzyme activities and play a vital role in maintaining the mitochondrial functions at active state even in old animals.

Key words : Aging, Exercise, G-6-PDH, Mitochondrial enzymes, Skeletal muscle fibers.

Aging is an integral part of the process of growth and development that is terminated by death. In humans and animals, aging is associated with pronounced morphological and functional changes in skeletal musculature including loss of muscle mass, muscle strength and decreased speed of contraction (Fielding and Meydani, 1997; Song *et al.*, 2006). The loss of muscle mass is due to reduction in both the number and the size of muscle fibers. The muscle fibers of rat hind limb, soleus (SOL), red gastrocnemius (RG) and white gastrocnemius (WG) are also considered as Type-I (slow oxidative–SO), Type-IIa (fast oxidative glycolytic–FOG) and Type-IIb (fast glycolytic–FG) muscle fibers respectively (Armstrong and Phelps, 1984; Delp and Duan, 1996). There are greater losses of Type II fibers compared with Type I fibers with age and Type II fibers show more mitochondrial deletions and mitochondrial damage (Payne *et al.*, 2003). The decline in mitochondrial content and function impairs muscle oxidative and endurance capacity and is therefore, likely to contribute to the increase in muscle fatigue ability that occurs with aging (Rooyackers *et al.*, 1996).

Endurance exercise training has been shown to be very powerful stimulant of muscle growth and muscle protein synthesis. Strenuous physical exercise and sports are associated with a dramatic increase in oxygen uptake both at the whole-body level and in skeletal muscle. Evidences indicate the increase of oxygen flux in locomotor muscle during strenuous exercise results in the production of reactive oxygen species (ROS). Mitochondria are a major intracellular source for ROS production during oxidative phosphorylation not only in exercise but also in aging; and the increased production of ROS is implicated in the aging process (Bakala *et al.*, 2003). The resulting large increase in ROS may stimulate antioxidant enzyme synthesis; influence their degradation or both and can alter the structure and function of lipids, proteins and nucleic acids, leading to cellular injury and even cell death (Powers *et al.*, 2005; Lee and Wei, 2007). The changes that

occur in mitochondria during stress conditions reflect on mitochondrial enzymes and may lead to alter in the mitochondrial succinate and malate dehydrogenase activities. Hence, these enzymes (TCA cycle intermediates) considered as markers for mitochondria.

Although many investigators focused on metabolic differences and antioxidant enzymes alterations in young and old rats under stress conditions (Hammeren *et al.*, 1992; Jhansi Lakshmi, 1998; Mallikarjuna *et al.*, 2004), the specific effects of endurance exercise training on energy and mitochondrial enzymes in different muscle fibers during aging, have not been completely understood. Because of the importance of the specific muscle fibers involved in neuro muscular disease and in exercise, the present investigation was taken up to investigate the effect of treadmill exercise on extra mitochondrial G-6-PDH and intra mitochondrial SDH and MDH enzyme activities in different muscle fibers of aging rats. The soleus muscle was selected because it is predominantly made up of slow twitch and highly oxidative fibers, the red gastrocnemius muscles as representative of fast twitch and oxidative fibers whereas, the white gastrocnemius muscle consists mainly of fast twitch and glycolytic fibers.

MATERIAL AND METHODS

Animal care and treatment:

Pathogen free, Wistar strain male albino rats ($n=24$) of two different age groups i.e., young (3 months) weighing 170 ± 10 gm and moderately aged (18 months) weighing 240 ± 10 gm were used in the current investigation (Approved by the Institutional Animal Ethics Committee). We assumed such a division of the age groups according to the studies of Cao and Cutler (1995) and Koprowska *et al.* (2004). The skeletal muscle growth/maturity occurs in between 3-6 months and other physiological changes occur in the aging rats from 6 months onwards. The rats were housed in clean polypropylene cages, 6 rats per cage and maintained under temperature controlled room ($27 \pm 2^{\circ}\text{C}$) with a photoperiod of 12 hrs light and 12hrs dark cycle. The rats were fed with a standard rat pellet diet and water *ad libitum*.

Rats from each age (3-months and 18-months) were divided into two groups of six in each group. The first group of rats from each age (young $n=6$; old $n=6$) served as sedentary control (SC). The second

group of rats from each age (young $n=6$; old $n=6$) were considered as exercise trained (ExT) group and subjected to treadmill exercise training with medium uphill constant gradient of 7.5% at a running speed of 23m/min, 30min/day and 5 days/week for a period of 12 weeks. All exercised animals in both age groups completed 12 weeks period of exercise training protocol. The running program was scheduled between 6.00 and 8.00 A.M. The treadmill was custom built at the University Scientific Instrumentation Center (USIC), Sri Venkateswara University Campus, Tirupati.

Muscle Sampling Procedure

The animals were sacrificed after 24 hrs of the last training session along with sedentary control rats by cervical dislocation and selected muscle fibers of soleus (SOL), red gastrocnemius (RG) and white gastrocnemius (WG) were quickly removed from the hind limb by using dissecting microscope. The excised muscle fibers (SOL, RG and WG) were rapidly cleaned free of fat, tendon and surface fascia in ice-cold rat ringer solution, blotted and immediately frozen in liquid nitrogen. Tissues were stored at -80°C until biochemical analysis. Total time for muscle excision, dissection and freezing was < 5 min.

Biochemical Assays

Selected metabolic enzyme activities, such as glucose 6 phosphate dehydrogenase (G-6-PDH, EC:1.1.1.49), succinate dehydrogenase (SDH, EC:1.3.99.1) and malate dehydrogenase (MDH, EC: 1.1.1.37) were measured using the methods of Lohr and Waller (1965), Nachlas *et al.* (1960) and Prameelamma and Swami (1975) respectively.

Statistical Analysis

The ANOVA was carried out by using SPSS package and the data has been analyzed for the significance of the main effects i.e., age and exercise along with their interaction. Results were expressed as the mean $\pm$ SD of six observations and the values of significance were evaluated. The difference was considered significant at $p < 0.01$.

RESULTS

The specific activity of G-6-PDH remarkably decreased in the old rats compared to young ones. With endurance exercise training G-6-PDH activity was significantly elevated in both the age groups of rats

than that of their respective controls. Among muscle fibers, oxidative soleus muscles exhibited maximum percent elevation with exercise training in the young and also in moderately aged rats. Nevertheless, the elevation was more in young rats.

Table 1 : Changes in Glucose-6-Phosphate Dehydrogenase (G6-PDH) activity in selected skeletal muscle fibers of sedentary control and exercise trained male albino rats

Skeletal muscle fibers	Young rats (3 months)		Moderately aged rats (18 months)	
	Sedentary control	Exercise trained	Sedentary control	Exercise trained
Soleus	0.619 ±0.004	0.968±0.006* (+56.34)	0.576±0.005	0.781±0.003*(SOL) (+35.72)
Red Gastrocnemius (RG)	0.586±0.004	0.889±0.003* (+51.86)	0.484±0.003	0.326±0.004* (+29.52)
White Gastrocnemius (WG)	0.498±0.003	0.711±0.005* (+42.93)	0.405±0.004	0.513±0.004* (+26.89)

Values are expressed in units of superoxide anion reduced /mg protein/min.

Values are mean ± SD; * significant at $p < 0.001$.

Values in parentheses denote percent change.

Table 2 : Changes in Succinate Dehydrogenase (SDH) activity in selected skeletal muscle fibers of sedentary control and exercise trained

Skeletal muscle fibers	Young rats (3 months)		Moderately aged rats (18 months)	
	Sedentary control	Exercise trained	Sedentary control	Exercise trained
Soleus (SOL)	0.613±0.045	1.290±0.052* (+110.44)	0.549±0.023	0.917±0.039* (+67.03)
Red Gastrocnemius (RG)	0.415±0.025	0.661±0.064* (+60.24)	0.361±0.039	0.548±0.062* (+51.38)
White Gastrocnemius (WG)	0.397±0.059	0.726±0.061* (+82.66)	0.320±0.067	0.432±0.056* (+34.57)

Values are expressed in units of superoxide anion reduced /mg protein/min.

Values are mean ± SD; * significant at $p < 0.001$.

Values in parentheses denote percent change over sedentary control

As a function of age, the activities of SDH was remarkably decreased in aged rats. But endurance exercise training elevated the SDH activities in all muscle fibers of both the age groups. Drastic increase of SDH activity with exercise training was noticed in slow twitch oxidative muscle fibers. Moreover this elevation was more in young exercised rats than aged rats.

The specific activity of MDH decreased with advancement of age in all muscle fibers; but exercise training elevated the MDH activity in young and aged muscle fibers. MDH showed maximum percent elevation in highly oxidative soleus muscle than other muscle fibers in the young age group.

Table 3 : Changes in Malate Dehydrogenase (MDH) activity in selected skeletal muscle fibers of sedentary control and exercise trained

Skeletal muscle fibers	Young rats (3 months)		Moderately aged rats (18 months)	
	Sedentary control	Exercise trained	Sedentary control	Exercise trained
Soleus (SOL)	0.540 ± 0.036	1.006 ± 0.095*	0.414 ± 0.034 (+86.296)	0.595 ± 0.034* (+43.719)
Red Gastrocnemius (RG)	0.377 ± 0.038	0.568 ± 0.041* (+50.529)	0.315 ± 0.014	0.502 ± 0.022* (+59.365)
White Gastrocnemius (WG)	0.5345 ± 0.031	0.503 ± 0.028* (+45.797)	0.275 ± 0.036	0.404 ± 0.017* (+46.909)

Values are expressed in units of superoxide anion reduced /mg protein/min.

Values are mean ± SD; * significant at $p < 0.001$

Values in parentheses denote percent change over sedentary control

DISCUSSION

Glucose-6-phosphate dehydrogenase (G-6-PDH) enzyme is extra mitochondrial in location and highly specific for NADP as an electron acceptor. It has been traditionally thought that this is a typical “house keeping” enzyme that is regulated solely by the ratio of NADPH and NADP (Kletzien *et al.* 1994; Tian *et al.*, 1999). In the present investigation, the decline in the activity of G-6-PDH was noticed in all muscle fibers of aged animals. This decrease could be attributed to the reduced availability of NADP. Similar age related decrease in hepatic

G-6-PDH activity was reported by Gurumurthy (2001) in aged female rats. Aging is associated with the accumulation of inactive or less active forms of numerous enzymes and cause oxidative stress. Oxidative stress caused by aging, may result in the decrease of protein thiols, which may consequently impair many enzymes. In such a situation, G-6-PDH inhibition is closely associated with decreased protein thiols. A decrease in protein thiol content is a consequence of an increase in intracellular oxidants. The inhibition of G-6-PDH may decrease cellular reducing equivalents, thus limiting anti-oxidative defense mechanism (Tian *et al.*, 1999). Endurance exercise training significantly augmented the G-6-PDH activities in both age groups. Salvemini *et al.*(1999) reported that G-6-PDH induction served to maintain and regenerate the intracellular GSH pool. Several pieces of evidences indicate that the formation of GSH from its oxidized form GSSG, is dependent on NADPH produced by the pentose phosphate pathway and this pathway can be activated in response to GSH depletion. There is a correlation between GSH and G-6-PDH activity, when G-6-PDH activity reaches maximum induction, GSH pool is restored, suggesting that GSH equilibrium could be depend on G-6-PDH expression. The increased GSH content with exercise training is also an indicative of increased G-6-PDH activity in tissues (Mallikarjuna *et al.*, 2004). It is that G-6-PDH activity has a predominant role in the control of GSH output and is essential in maintaining an intracellular redox potential.

Succinate dehydrogenase (SDH) is a marker enzyme of mitochondria in the tissues. The activity of SDH in mitochondria is usually far greater than the other enzymes in both the developing and adult animals. Since the specific activity of SDH indicates the state of oxidative metabolism in mitochondria, any alterations in its activity under age induced oxidative stress conditions reflects the extent of derangement in mitochondrial metabolism. The present study illustrates that the specific activity of SDH was dramatically decreased with advancement of age. The decrease in the SDH activity of old rats reflects the general decline in oxidative potential of senescent tissues due to marked structural changes in the mitochondria such as enlargement, matrix vacuolation and shortened cristae with the advancement of age (Wardlaw *et al.*, 1986). The decrease in SDH activity was also reported by Jhansi Lakshmi (1998) and Mallikarjuna (2005) in senescent rats. This is may be due to diversion of TCA cycle

intermediates such as α -ketoglutarate, for its conversion into glutamate and glutamine to counter the toxic effects of ammonia produced during aging there by depleting TCA cycle intermediates. Aging may be considered as a type of stress, which leads to hypoxic condition in the tissues and consequent reduction in mitochondrial oxidoreductase activities (Mallikarjuna, 2005). The increased SDH activity during exercise training indicates increased aerobic efficiency of the skeletal muscle fibers. Previously, Hammeren *et al.* (1992) and Sullivan *et al.*, (1995) reported significant increase of SDH activity with exercise in different tissues of both young and old rats. Stuewe *et al.* (2000) reported that chronic exercise training induces many mitochondrial enzymes and enhanced mitochondrial proteins turnover which may also contribute to elevated SDH activity. Thus, the increased activity of SDH in young rats with endurance exercise training suggests increased mitochondrial oxidative potential and energy synthesis, utilization of carbohydrates and fats as substrates. During dynamic exercise at intensities more than 50% of peak oxygen uptake, there is a net increase in the total concentrations of TCA cycle intermediates in the tissues (Howarth *et al.* 2004). As an intermediate substance of TCA cycle, the increased SDH activity may be due to the increased availability of the substrate for SDH activity in the citric acid cycle.

Malate dehydrogenase (MDH) is a mitochondrial enzyme and plays an important role in TCA cycle. It has been demonstrated that several mitochondrial soluble NAD^+ dependant dehydrogenases including MDH are specifically associated with NADH: ubiquinone oxidoreductase (Kotlayar *et al.*, 2004). Mitochondrial MDH activity was remarkably decreased in older rats compared to the younger ones. Sailaja (1997) reported a decreased MDH activity in the skeletal muscles old albino rats. Ji *et al.* (1991) observed significant drop in MDH activity in the tissues of senile rats whereas training increased the enzyme activity levels. The decrease in MDH activity in senile rats suggests the lower utilization of malate in the Kreb's cycle. The drop in the MDH activity denotes fluctuations of oxidative metabolism and also reflects the turnover of carbohydrates and energy out put (Murray *et al.*, 2000).

It has been demonstrated that impairment in mitochondrial respiration and oxidative phosphorylation elicits an increase in oxidative stress (Yan and Sohal, 1998). Moreover, oxidative damage and large-scale depletion and duplication of mitochondrial DNA have been found to increase with age in various tissues of mammals. All these functional derangements occurring in mitochondria may lead to cause decrease mitochondrial enzymes including MDH during aging. Endurance exercise training significantly elevated the MDH activity in all muscle fibers in both age groups. Mallikarjuna (2005) and Gurumurthy (2001) reported increased hepatic and cardiac MDH activities with exercise training in albino rats. The increased MDH activity with response to exercise training suggests that higher utilization of malate in the tissues, which reflects the up-regulation of oxidative metabolism and the turnover of carbohydrates and energy output which is required during development and as well as exercise (Murray *et al.*, 2000). Previously, Stuewe *et al.* (2000) reported that NAD concentration is a key factor in the activation of mitochondrial MDH. It was reported that the activity of mitochondrial enzymes increased with endurance exercise training in animals (Powers *et al.*, 2005). Increased mitochondrial capacity also indicates the increased activity of MDH in the cell with endurance exercise training. The elevated mitochondrial activity also suggest a positive shift from anaerobic to aerobic utilization of energy substrates after continuous repetition of exercise regimen which could change or compensate physiological inefficiency that occur in aging phenomenon.

CONCLUSIONS

In the present study, the selected dehydrogenases such as extra mitochondrial G-6-PDH and intra mitochondrial SDH and MDH enzymes were drastically decreased in older rats and elevated with exercise training. These results suggest that mitochondrial enzymes in old animals are less able to meet energy demands. The increased mitochondrial enzymes with exercise training even in old animals suggest that mitochondrial work efficiency and oxidative phosphorylation was improved. From this results, one could infer that regular exercise training provide a favorable atmosphere to mitochondria to cope with oxidative stress which is caused by high amount of free radicals during aging. It also suggests that muscle

energy metabolism and TCA cycle intermediates are increased with exercise training even in aging rats.

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Home-Based Behavioural Family Intervention in Dementia : A Case Illustration

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ABSTRACT

The case presented here is a part of an intervention study carried out on patients with Dementia and their caregivers which illustrates the effectiveness of Home-based therapeutic program in management of behavioural problems in Dementia. The intervention consisted of 15 sessions spread over a period of 1 ½ months including assessments, which comprised of psychoeducation, problem solving strategies, reality orientation, differential reinforcement and time out. Results indicate clinically significant reduction in the patient's behavioural problems and dysphoric mood. Caregiver's distress also decreased significantly. Results are discussed along with implications and suggestions for future research

Key words: Dementia, Behaviour therapy, Caregiver burden, Clinical significance

Ageing leads to several biological changes that take place over time and results in progressive loss of functional capacity. Depression, Hypertension, Arthritis and Dementia are highly prevalent among the aged (Fisher, Carstensen, Turk & Noll, 1993). Current estimates reveal that there are about 24.3 million people with dementia in the world with 4.6 million new cases of dementia every year (one new case every 7 seconds). Most people with dementia live in developing countries (60% in 2001, rising to 71% by 2040). Numbers in developed countries are forecast to increase by 100% between 2001

and 2040, but by more than 300% in India, China, and their south Asian and western Pacific neighbors (Ferri, Prince, Brayne, Brodaty, Fratiglioni, Ganguli *et al.*, 2006). Approximately 83% of these patients show Behavioural and Psychological Symptoms of Dementia (BPSD) (Finkel, 2001). In course of time, the elderly with dementia manifests increasing difficulty in carrying out activities of daily living, impaired judgment and behavioural disturbances like hoarding, wandering, aggression and disinhibition.

Families are the first line of care for patients with dementia and often caregivers sacrifice their own health and well-being while providing extensive care. Research has shown evidence of considerable physical and psychological morbidity like fatigue, hypertension, anxiety and depression, greater burden (emotional, physical and financial), higher strain and impaired quality of life in caregivers of dementia patients (Knight, Lutzky & Macofsky-Urban, 1993; Dunkin & Anderson-Hanley, 1998; Aguglia, Onor, Trevisiol, Negro, Saina & Maso, 2004; Cooper, Balamurali & Livingston, 2007).

Considering the needs of caregivers of patients with dementia, several interventions have been developed such as support groups which aim to provide emotional support, psycho-education to families and enhance their coping skills. Studies provide evidence supporting the potential of family group intervention in improving psychological well-being, knowledge about dementia care and mastery among their caregivers (Faran & Keane Hagerty, 1994; Hosaka & Sugiyama, 1999; Hepburn, Tornatore, Center & Ostwald, 2001; Hepburn, Lewis, Tornatore, Sherman & Bremer, 2007).

Cognitive and behavioural approaches have been wide ranging, and have focused on teaching specific behavioural skills to the caregiver. Positive outcomes of studies using cognitive and behavioural approaches have been reported in most of the studies which include increased social support, decreased depression and burden and increased knowledge about dementia care (Brodaty & Gresham, 1989; Marriott, Donaldson, Tarrier & Burns, 2000). Gallagher-Thompson & Coon, (2007) in their recent review, identified evidence-based psychological treatments for reducing distress, and improving well-being of family members caring for an older relative with significant cognitive and/or physical impairment. Results indicated strong empirical support for cognitive-behavioral therapy.

Within the multi-component category, programs using a combination of at least two distinct theoretical approaches (e.g., individual counseling and support group attendance) were also found to be effective.

Psychological interventions with dementia patients and their caregivers in India are at the initial phase. Indian studies have reported high correlation between behavioural problems in patients with dementia and psychological distress and poor quality of life in their caregivers. There is a clear need for more education, advice and support for families affected by dementia (Chaturvedi, Tazaki, & Nakane, 1999; Sunanda, 2000; Srinivas 2002; Shaji, Smitha, Praveen Lal & Prince, 2002). Most intervention studies have been carried out with institutionalized patients. Few studies have examined the effectiveness of home-based programs. Evidence for the effectiveness of interventions is limited, mainly by methodological shortcomings. Considering caregiver distress in dementia and their role in patient care, an urgent attention to this aspect is needed.

CASE ILLUSTRATION

Mr. S.K, 84 year old married male, studied up to high school, retired officer in defense service from middle socio-economic status, urban background living in Bangalore, Southern India. He was hypertensive and had been operated for prostate enlargement in 1993. Family history indicated depression in patient's younger daughter, who committed suicide 6 years back by taking an overdose of tranquilizers. His spouse, 59 years old was the primary caregiver, educated upto high school who lived with the patient alone. The first daughter who stayed nearby helped them in household chores. Premorbidly, the patient was described as authoritative, strict and an autocratic decision maker. He presented with complaints of anger outbursts, forgetfulness, deficits in self-care skills and double incontinence since 5 years with insidious onset and progressive course. Patient was noticed to be forgetful and had difficulty remembering names of familiar people. He misplaced things like keys or personal belongings and assign blame to family members. He was unable to carry out simple calculations or handle money. He needed help in eating, dressing and bathing. He often became angry over trivial issues. *Mental Status Examination* (MSE) revealed irrelevant talk, euthymic mood and impaired cognitive functions with poor judgment.

Magnetic Resonance Imaging (MRI) revealed diffused cerebral atrophy. A diagnosis of Multi-infarct Dementia v/s Alzheimer's disease was made. Severity of dementia was measured using *Clinical Dementia Rating* (CDR) (Hughes, Berg, Danziger, Coben, & Martin, 1982) on which he obtained an overall score of 2 indicating moderate degree of dementia.

Behavioural Problem Checklist (BPC) (Niederehe & Fruge, 1984) was used to assess the range of behavioural problems of the patient and caregiver's emotional reactions to these behavioural problems. The checklist contains 52 items and the scale points expand from 0 to 4. Respondents (caregivers) rate the frequency and duration with which the dementia patient shows behaviour and how upsetting it is for them. The scale has 6 dimensions: Cognitive symptoms, Self care deficits, Instrumental Activities of Daily Living (IADL), Dysphoric mood, Acting-out behaviour, Inactivity/withdrawal. Relevant scores under each of the 6 dimensions are summed up and divided by the number of items to derive at patient's mean frequency of behavioural problems and caregivers mean distress per behavioural problem.

Zarit Burden Interview (ZBI) (Zarit, Reever & Bach-Peterson, 1980), a structured interview schedule was used to assess the overall subjective burden of the primary caregiver. Caregivers are asked to respond to the series of 22 questions about the impact of the patient's disabilities on their life. Estimates of the degree of burden can be made as little burden (scores 0-20), mild burden (scores 21-40), moderate burden (scores 41-60) and severe burden (scores 61-88). Internal reliability has been estimated using Chronbach's alpha at 0.91. Test retest reliability is reported at 0.71.

General Health Questionnaire (GHQ-28) (Goldberg & Williams, 1988) was used to assess the psychological morbidity in the primary caregiver.

Therapy: Home-based behavioural family intervention was provided consisting of 15 sessions spread over a period of one and half months including pre-therapy, post- therapy and follow up assessment. Detailed behavioural assessment was carried out. Patient's spouse was asked to maintain a 'problem diary' (with the help of her daughter) to help identify the antecedents and consequences of each target

behaviour. A therapeutic program was formulated consisting of psychoeducation to the family caregivers (Spouse and daughter) about the nature, course, prognosis and management of dementia. The information provided was based on the World Health Organization (1999) manual – *‘Alzheimer’s Disease - Help for Caregivers’*. Misconceptions of the spouse regarding the patient’s illness were clarified. She thought that he was capable of taking care of himself and troubled her intentionally. Information about dementia helped her understand his problem behaviours were not deliberate but occurred due to the disease. The caregivers were taught problem solving skills and the use of behavioural techniques like time out and differential reinforcement in dealing with the patients behavioural problems. Following are some examples of how the target behaviours were tackled using the aforementioned approaches.

Anger : Differential reinforcement and time out were employed to handle patient’s anger. He was uncooperative when carrying out activities like changing clothes and bathing and would get angry when he was forced to do so. The caregivers were advised to speak calmly with the patient and explain the reason why they wanted him to do that activity. When the patient would shout or get very angry, caregiver was asked to leave the room for 5 minutes after telling him that she will be back when he became calm (time out). They were asked to deliver positive statements after his anger subsided, such as, “I feel happy that you are keeping calm and listening to me”. If he got very angry, he was told “I feel unhappy when you shout at me, it hurts me”. These verbal messages were spoken slowly while maintaining eye contact and holding the patient’s hand. Caregivers were counseled to keep their remarks short and specific.

Repetitive questioning: The patient would ask questions repeatedly such as “When is the food getting ready?”, “Did I have lunch/dinner?” . Caregivers were asked to write the answer on a piece of paper and display it on such instances while communicating the following with a calm tone, maintaining eye contact and holding his hand, “I heard your question; this is my answer.... are you clear? Please repeat what I said”.

Deranging things: Whenever the patient disarranged things, he was asked to rearrange it for which he was positively reinforced by taking him out for an evening walk. If he refused to comply, the

caregiver was asked to express disappointment using differential reinforcement as mentioned above.

Difficulty in falling asleep : Mr. S.K also had sleep disturbances, such as getting up in the middle of the night, would start talking about past events and become restless. Sleep-hygiene schedule was introduced - he was not allowed to sleep in the afternoon and was engaged in some activity in the daytime such as reading, watching TV or listening to music. Fixed bed timings were scheduled at night and caffeinated beverages were restricted after 5 p.m.

Incontinence: Caregivers were asked to take the patient to the toilet every 1½ hours as urinary incontinence occurred every 2.5 hours. He was not able to indicate the need to urinate and did not have awareness about the soiling of his clothes. His clothes were arranged in such a way that it could be easily removed. The intake of water before bedtime was limited.

Cognitive deficits: Mr. S had difficulty locating toilet and bathroom. He also had difficulty wearing clothes as he was confused about the order in which the clothes were to be worn. He could not recollect the day, date and the year if asked. For these difficulties components of reality orientation was introduced wherein the caregiver was asked to assist the patient in maintaining a diary or calendar for remembering the day, date and year. Big labels were stuck on the wall to guide the patient the way to the toilet and bathroom. His clothes were arranged in a particular order such as placing undergarments and then pants and shirt on the bed from his left to the right so that he could wear them under supervision.

Externalization of interests was used for the spouse. She was suggested to involve herself in pleasurable activities that would help lift her mood. She was initially reluctant and had guilt feelings – “How can I think about myself when my husband is unwell”. The therapist explained that if she is maintained good health, she would be able to take care of the patient more efficiently. Later, she and the patient decided to go out to a temple and garden every day in the evening. Other activities such as listening to religious songs, visiting relatives’ place, writing letters to old friends were continued and alternated which brought relief to her distress. The patient’s daughter was given responsibility to handle those duties which he could no longer carry

out as a result of the disease such as shopping or handling money. Legal matters were settled like preparation of Will and transfer of bank accounts in view of the progressive nature of patient's illness.

RESULTS

Results were analyzed using clinically significant changes (50% and above, Blanchard & Schwarz, 1988) based on pre therapy, post therapy and follow-up assessment data.

Table 1 shows that the patient's overall behavioural problems were decreased by 36% (total pre mean = 2.13, total post mean = 3.34) indicating that the problem behaviours reduced from 3-6 times a week to 1-2 times a week at the end of therapy. At follow-up this improvement was maintained. Caregiver's distress related to overall behavioural problems of the patient decreased by 44% at post-assessment (pre mean distress = 3.16, post mean distress = 1.77) indicating that the patient's behavioural problems caused little to moderate stress as compared to pre intervention ("quite a lot"). The cognitive deficits of the patient reduced by 32% and self-care deficits by 27% at post assessment and these improvements were maintained at 6-week follow-up. Patient was able to locate toilet and bathroom on his own and wear clothes under supervision. He was partially able to bathe and use toilet as he became more co-operative. However the patient's IADL deficits, inactivity and withdrawal persisted. Clinically significant reduction was observed in patient's dysphoric mood and acting out behaviour at post-assessment (62% and 65% respectively). His restlessness, irritability and anxiety came down which reduced caregiver's distress significantly. Repetitive questioning, verbal threats and anger outbursts were no longer observed at the end of therapy as well as at follow-up assessment.

Table 1 : Pre-therapy, Post-therapy and Follow-up scores of problem behaviours in the patient and distress in primary caregiver on BPC

Domains	Frequency of problem behaviour				Distress in Primary Caregiver			
	Pre	Post	Follow-up	^a Clin Sig. Pre-post (%)	Pre	Post	Follow-up	Clin Sig. Pre-post (%)
Cognitive symptoms	3.14	2.14	2.14	31.85	3.33	1.83	1.67	45.04
Self- care deficits	3.67	2.67	2.67	27.25	3.33	2.00	2.00	39.94
Dysphoric mood	3.25	1.25	1.00	61.54	4.00	1.50	1.50	62.50
Inactivity / withdrawal	3.00	2.33	2.67	22.33	2.33	2.00	2.00	14.16
^b IADL	3.00	3.00	3.00	0.00	2.00	1.50	1.50	25.00
Acting-out behaviour	4.00	1.40	1.20	65.00	4.00	1.80	1.40	55.00
Mean	3.34	2.13	2.11	36.23	3.16	1.77	1.67	43.99

Frequency of problem behaviour

0 = never

1 = not in the past week

2 = 1-2 times last week

3 = 3-6 times last week

4 = daily

Distress of primary caregiver

0 = not at all

1 = a little

2 = moderate

3 = quite a lot

4 = extremely

a = Clinically Significant change

b = Instrumental Activities of Daily Living

In Table 2, scores of primary caregiver on ZBI and GHQ-28 are shown. Scores indicate 31% reduction in burden of the primary caregiver which was maintained at follow-up assessment (pre = 52, post and f-up = 36). She was able to carry out other activities along with patient's care and did not feel under strain all the time unlike before. Scores on GHQ-28 indicate that there was clinically significant reduction of 71% in psychological symptoms of the primary caregiver at post therapy assessment that was maintained at 6-week follow-up (pre = 7, post and f-up = 2). Initially her sleep was inadequate due to

excessive worry, which improved after intervention and maintained at 6-week follow-up.

Table 2 : Pre-therapy, Post-therapy and Follow-up assessment scores of Primary Caregiver on ZBI and GHQ-28

Sl. No.	Measure	Pre	Post	Follow-up	Clinical Significance (pre-post) %
1.	Zarit Burden Interview (ZBI)	52.00	36.00	36.00	30.76
2.	GHQ-28				
	a. Somatic symptoms	2.00	0.00	0.00	100.00
	b. Anxiety/ Insomnia	3.00	1.00	1.00	66.67
	c. Social dysfunction	2.00	1.00	1.00	50.00
	d. Severe depression	0.00	0.00	0.00	00.00
	Total Score GHQ-28	7.00	2.00	2.00	71.00

DISCUSSION

The present case illustration demonstrates the scope of behavioural intervention in management of dementia. Combining different techniques in intervention with patients and caregivers have been found to be effective (Qizilbash, Schneider, Chui, Tariot, Brodaty, Kaye & Erkinjuntti, 2002; Gallagher-Thompson & Coon, 2007). The therapeutic program in the present case was structured and home-based, spread over 15 sessions consisting of psychoeducation, providing written materials for education about dementia, teaching problem solving skills to the caregiver, use of behavioral techniques such as time out and differential reinforcement and reality orientation. The strengths of the intervention were that it directly targeted the patient's behavioural disturbances through the caregivers by empowering them to manage these behaviours and also helped in reducing their distress by empathic listening, ventilation and externalization of interests. Even after the intervention was terminated, caregiver could successfully manage the problem behaviours of the patient. The therapist demonstrated the behavioural skills to manage patient's problematic behaviours during the intervention which gave the caregiver a clear idea regarding its application.

While most of the studies have been carried out in groups and at institutionalized settings, in the present case, home-based intervention was chosen. It is a strenuous experience for the caregiver to bring the elderly with dementia to the clinic for the intervention on regular basis due to patient's cognitive deficits and behavioural symptoms. Home-based intervention occurred in a naturalistic setting, allowed direct monitoring of patient's symptoms and facilitated generalization of therapeutic gains. Brodaty, Gresham & Luscombe (1997) reported that a residential setting might be an advantage as it promotes more cohesive bonding and allows for observation of behaviours not easily accessible with a hospital-based program.

Although the effect of information and psychoeducation itself was not taken as an independent outcome measure, Caregiver reported that, "it helped us in changing our attitude towards the patient". "We know how to manage his problems now", "demonstration of techniques helped us in managing the patient".

In the present case, there was clinically significant reduction in caregiver's distress as the patient's dysphoric mood and acting out behaviour decreased. Although scores indicate marginal increase in these symptoms at 6-week follow-up, the caregiver's distress did not increase and she was more confident of handling problematic behaviours of the patient. Reasons for these positive findings could be that the intervention was individualized, home-based and incorporated different therapeutic strategies matching the needs of the caregivers. The presence of social support and the joint family system in Indian culture also helps in sharing the caregiving burden.

To the knowledge of the authors this is the first study of its kind in India. It provides new directions in the management of behavioural problems in dementia and in reducing caregivers' burden and psychological symptoms. Although, disabilities of patients with dementia may be irreversible, the present therapeutic intervention has the potential to empower the family members to manage different behavioural disturbances in the patients, which in turn can lower their stress. Each technique and method described in the therapeutic program provides a different resource for families, which can be incorporated in day-to-day clinical practice and assist them in providing care to their relative with dementia.

Future studies should include larger sample size to ensure generalizability of results. Researchers can begin to consistently implement this treatment framework by including control group to evaluate its efficacy. It would be additionally beneficial to have periodic follow-up assessments which would allow effective monitoring of patients' symptoms and caregivers' skills and distress in managing the patient with dementia.

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Benign Prostatic Hyperplasia, Prostatic Cancer and Penile Dysfunctions in Elderly : A Hospital Based Study

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ABSTRACT

Benign prostatic hyperplasia (BPH) is one of the most common diseases affecting the health of the aging male population. To study the clinical presentation of BPH, prostate cancer and penile dysfunction and to evaluate the urodynamic efficacy and safety of transurethral resection of prostate (TURP) in elderly patients having symptoms of obstructive benign prostatic hypertrophy, 335 elderly patients with various urogenital disorders were retrospectively studied. Prostate specific antigen was estimated for the purpose of prostate cancer along with other parameters. Odds ratio was used to compare categoric variables between groups where appropriate. Of the 335 patients with various urogenital disorders, BPH was predominant as compared to prostate cancer and penile dysfunction. Maximum number of patients belonged to 60-70 yrs age group. Most common symptom in BPH group was weak stream (54.66%). Main associated diseases were hypertension (31.68%), ischaemic heart disease (21.11%) and diabetes (21.11%). Complications were very few. Mortality (6.9%) was noted only in prostate cancer. Biochemical parameters were also normal in most of the patients in all the groups. Lower mortality may be due to active treatment for low and intermediate risk prostate cancer. Early detection / surgical intervention and intake of endogenous antioxidants (Vitamins A, C, E and Betacarotene) may be responsible for low incidence of prostate cancer in Indian elderly.

Keywords: Benign prostatic hyperplasia, Hospitalized elderly, Prostate cancer, Risk factors

Aging male reproductive system can give rise to clinically relevant manifestations, such as benign prostatic hyperplasia (BPH), prostate cancer (PCa) and erectile dysfunction (ED) (Cattolica *et al.*, 1997; Bobe *et al.*, 2006). Benign prostatic hyperplasia is one of the most common diseases affecting the health of the aging males (Doll *et al.*, 1994). Increasing life expectancy of men together with the introduction of prostate specific antigen (PSA) as a screening tool have both contributed to a rising number of elderly men with a diagnosis of prostate cancer (Waldert M. *et al.*, 2006).

To study the clinical presentation of BPK prostate cancer and penile dysfunction and to evaluate urodynamic efficacy and safety of transurethral resection of prostate (TURP) in elderly patients having symptoms of obstructive benign prostatic, hypertrophy

METHODS

335 elderly patients with various urogenital disorders were retrospectively studied. Diagnosis of BPH was established on the basis of uroflowmetry, ultrasonography to map out size of prostate, transition zone, amount of residual urine, and international prostate symptom score (IPSS). Prostate specific antigen was estimated for the purpose of prostate cancer along with the other parameters. Data was expressed as the mean $\pm$ SD for basic parameters. Odds ratio was used to compare categorical variables between groups where appropriate.

RESULTS

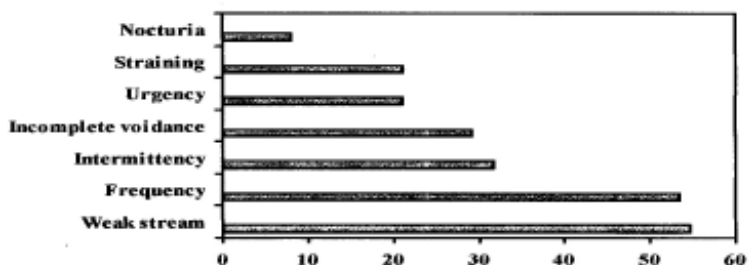
Out of a total of 335 elderly patients with various urogenital disorders, 161 patients were diagnosed as BPH, 29 as prostate cancer and 5 as penile dysfunction. Other dysfunctions included renal calculi, ureteric calculi, renal cancer and non functioning kidney. Maximum number of patients belonged to 60 70yrs age group (57.76%), followed by 71 80 (32.30%) while only 9.94% belonged to higher age group (81 to 90 years) (Table 1). Most common symptoms in BPH group were weak stream (54.66%), followed by frequency (53.52%), intermittency (31.68%), retention (31.68%), incomplete emptying (29.19/o), urgency (27.95%), straining (21.12%) nocturia (8.07%) and incontinence (4.97%) (fig 1). None had irritation. The obstructive symptoms were primary cause for referral to specialists including surgery. In our series, 103 (63.97%) patients had undergone transurethral prostate resection and 3 (1.86%) prostatectomy. Main

associated diseases were hypertension 31.68%, ischaemic heart disease 21.11%, and diabetes 21.11% (Table 2).

Table 1 : Demographic Data

Age groups	60-70	71-80	81-90	Total
BPH n	93	52	16	161
%	57.76	32.30	9.94	100
Cancer prostate n	10	12	7	29
%	34.48	41.38	24.14	100
Penile dysfunction n	4	1	-	5
%	75.0	25.0	-	100

Symptoms



Percentage

Fig. 1

Table 2 : Co-morbid conditions

	DM	HT	IHD	TUPR	Prostatectomy
BPH	33◇	51◇◇	34	103	3
n=161	20.50	31.68	21.11	63.97	1.86
Ca Prostate	5	8	2	7	2
n=29	17.24	27.58	6.89	24.14	6.90
Penile1	-	-	1	1	
dysfunction	20		-	20*	20**

◇OR = 1.24 ◇◇OR = 1.22

*Partial penectomy

**Penectomy

DM : Diabetes Mellitus

HT : Hypertension

IHD : Ischaemic heart disease

TUPR : transurethral resection of prostate

Complications of BPH: Stricture urethra in 5 cases, one had urinary incontinence and other hypotonic bladder.

Biochemical profile : Anemia in 12.42%, hyperglycemia in 5.59%, raised urea in 8.83%, Creatinine in 21.74% LDH (18%), and PSA (2.48%) (Table 3).

Table 3 : Changes in Biochemical Parameters

Disease		Low HB	↑ Blood Sugar	↑ Urea	↑ Creatin	↑ LDH	↑ PSA
BPH	n	20	9	11	35	29	4
	%	12.42	5.59	5.59	21.54	18.0	2.48
Prostate Cancer	n	2	1	2	2	2	9
	%	6.90	3.45	6.90	6.90	6.90	31.0
Penile Dysfunction	n	-	3	1	6	8	-
	%	-	8.33	2.78	16.66	22.22	-

Mortality None

Cancer prostate : In the present study, 29 cases of Ca prostate were hospitalized during one year and only 2 patients (6.9%) died during hospitalization. Diabetes was detected in 17.24%, hypertension in 27.58% and IHD in 6.89% (Table 2).

Biochemical profile: Anemia in 6.90%, hyperglycemia in 3.45%, raised urea in 6.90%, Creatinine in 6.90%, LDH 6.908%), and PSA (9.3 1%) (Table 3).

Mortality 6.90%

Penile dysfunctions : There were 6 patients admitted with Cancer of penis and 2 had erectile dysfunction. Diabetes was associated in 20% patients (Table 2).

Biochemical Profile : Twenty percent subjects showed raised urea, creatinine and LDH levels however, none of them had anemia or hyperglycemia (Table 3)

Mortality : None

DISCUSSION

The age specific prevalence of BPH was maximum in the 60-69 year age group. Similar findings were reported earlier (Ozturk A. *et al.*, 2000). Although malignant tumours occur at all ages, cancer disproportionately strikes individuals in the age group of 65 years and above.

High incidence of prostate cancer has been reported from western countries (Wong YN *et al.*, 2006). However, only 29 patients with cancer prostate were admitted during one year in our hospital and incidence was the highest (65.51%) in late seventies. Findings are similar to other study (7) Most common symptoms in BPH group was weak stream (54.661/6), compared to 33% reported by Garraway *et al* (8) while other symptoms viz intermittency (31.68%), incomplete emptying (29.19%), were low. Straining (21.12%) was also similar to those reported by Garraway *et al* series (8) however, symptoms like urgency (27.95%), incontinence (4.97%) were less in our series compared to Garraway *et al.*, (1991).

None had irritation although Bobe *et al.* (2006) reported irritation as main clinical symptom, along with obstruction. (52.2%). On analysing repercussions on quality of life, that obstructive symptoms were found to be less tolerated: 65.7% compared to 9.41/6 of the group with irritation. Our results showed very low incidence of nocturia (8.07%) compared to 88. 1% in series of Bobe *et al.* (2006).

In treating BPH, we must bear in mind preferences of patients. They tolerate obstructive symptoms less, resulting in consultations of specialists and even opt for surgery (*ibid*).

Operative procedure was mainly Trans urethral resection of prostate in our study though laparoscopic radical prostatectomy and photoselective vaporization of the prostate for benign prostatic hyperplasia (BP14) were commonly quoted by other authors (Poulakos *et al.*, 2006 and Murtagh J. *et al.*, 2006).

In our series, diabetes was associated with prostate cancer in 17. 24%. However, diabetics appear to have a lower risk of prostate cancer in whites (Rosenberg DJ, 2002).

Hypertension (31.68%) and BPH coexisted however, higher incidence (46%) was documented in literature (Nicolas Torralba IA *et al.*, 2003). Lower urinary tract infection (66.37%) was shown to be

associated with BPH (ibid) but, the incidence was low (9.94%) in BPH and 13.79% in prostate cancer in our series.

Hypertensives (OR 1.22) and diabetics (OR 1.24) appear to have higher risk of BPH than prostate cancer Rosenberg in his study of Whites documented similar finding (Rosenberg DJ, 2002) showing Incontinence after surgery for BPH represents a condition that requires careful evaluation. In our series, 4.97% was found to have incontinence values were significantly low compared to 42.8% reported by Theodorou *et al.* (1998) showing 41.1% had a simple type of incontinence and 16.1% remained unclassified.

None of the patients in our series were on statin drugs and were not associated with risk of prostate cancer overall but was associated with a reduced risk of advanced (especially metastatic or fatal) prostate cancer (Platz EA *et al.*, 2006).

TURP in relieving urinary obstruction due to BPH, offers some advantages in terms of catheterization and hospital stay (Gallucci M. *et al.*, 1998) Our results shows that TURP is the safest procedure (Cattolica EV *et al.*, 1997 and Doll HA *et al.*, 1994) with no deaths in BPH group. Hargreave *et al.* (1996) reported the relative risk of late mortality after TURP compared with open prostatectomy was 1.13 after controlling for age and the presence of a diagnosis of cancer.

Penile dysfunctions is a part of aging male reproductive system (Sampson N. and Schulman CC, 2000) however, only 5 patients had penile dysfunction in our series and no association between diabetes and hypertension was noticed.

During hospitalization, mortality was found to be 6.90% amongst prostate cancer while none in BPH and penile dysfunction group. PSA levels were significantly higher in prostate cancer group compared to BPH. Age is generally considered to be a key prognostic factor in terms of therapeutic decision making, perhaps as important as PSA level and Gleason score. Even in men over 70 years, treatment without curative intent may deprive frail patients of years of life (Waldert M. *et al.*, 2006).

Lower mortality may be due to active treatment for low and intermediate risk prostate cancer in elderly men aged 65 to 80 years. (Wong *et al.*, 2006). Early detection by PSA and early surgical intervention and intake of endogenous antioxidants (Vitamins A, C, E

and Beta carotene) might be responsible for low incidence of prostate cancer in Indian elderly (McHedlidze M. *et al.*, 2006).

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Epidemiology of Disability Among Geriatric Population in the Semi Urban Area of Mangalore City, Karnataka

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ABSTRACT

The paper aims to determine the prevalence and socio demographic correlates of disability, associated co-morbid chronic conditions and needs assessment of the disabled among geriatric population. A cross sectional study was carried out from July to October 2006. 120 subjects in geriatric age group were randomly selected from Boloor, Mangalore city, Karnataka. All the individuals aged 60 years and above in the selected houses were interviewed and examined. The data was analysed statistically. Prevalence of disability was found to be 65.8%. Speech and loco motor disability were more common. Prevalence of disability was found to be 90.9% among 80 years and above age group. Around 1/3 of the disabled had chronic co morbid conditions. None of the disabled received Speech therapy, Vocational training and Job placement. Disability in this area is an important public health problem among geriatric population. There is an ample scope for community based rehabilitation of the disabled also.

Key words : Epidemiology, Disability, Geriatric population

Disabled individuals in the community face many social problems. They are perceived only in the light of their infirmities. The incidence of disabilities is higher in developing countries than in the industrialized ones. However, in developing countries, people with disabilities have a shorter life span. As health services in developing countries improve, survival rates will increase. When infant and child

mortality rates diminish, the overall survival shows an upward trend and the proportion of elderly people in the population increases (WHO, 1989).

In India around 10% of the population is affected with some disabilities (Barbotte E. *et al.*, 2001; Sharma, A.K. and Praveen, V. 2002). Expectation of life at birth for males and females has increased considerably in recent years. In India it is projected to be 67 years for males and 69 years for females in 2011-2016. Projections beyond 2016 made by United Nations has indicated that 21% of the Indian population will be above 60 years of age by 2050 which was 6.8% in 1991. The contribution of elderly populations to demographic figures is increasing day by day. Increasing problems of health care, psycho-social, personal and socio-economic factors associated with the elderly further overwhelms this (Prakash, R. *et al.*, 2004).

Disability among the elderly certainly is not a new problem. The high prevalence of chronic conditions in the elderly, coupled with the dramatic shift occurring in the age structure accounts for increasing concern about disability among the elderly as a public health problem. Knowledge of chronic diseases or conditions in and of itself, however, does not directly inform us about level of disability. Direct information is still needed on the nature and extent of disability in the elderly population (Alan M.J. *et al.*, 1981)..

Though disability is the commonest problem, very few community based studies had been conducted in India to understand the problem. No similar study had been conducted in the past among geriatric population in Mangalore city of Karnataka. Considering this background, the present study was conducted in order to determine the prevalence of disability among geriatric population in Mangalore city, Karnataka.

METHODS

This was a community-based cross sectional study carried out over a period of 4 months from July to October 2006. The study was conducted at the semi urban area of Mangalore Municipal Corporation, which consists of 60 wards and population of 3,99,565 according to 2001 census. Boloor, a semi urban area which covers a population of 12,880 spread over 2 wards were covered. Sample size was estimated for infinite population by using the formula $4pq/d^2$,

where prevalence was taken as 20%. Required precision of the estimate (d) was set at 10%. Using the above formula, the sample size was estimated for all the age groups to be 1600. After adding non response error of 10%, an additional 178 subjects were included. Thus the sample size for all the age groups became 1778. Taking proportion of geriatric population as 6.8%, the sample size of geriatric population in our study was found to be 120. The study population comprised individuals in the geriatric age group, which included 60 years and above age group.

The study was conducted by making house to house visits selected with simple random technique, interviewing and examining all the eligible subjects. A prerequisite for the eligibility was membership in the household, defined as all persons who are biologically related with the other members and eating from a common kitchen. If a designated person could not be contacted or not cooperative during three separate visits, then the subject was considered as non-respondent.

Socioeconomic status was assessed by modified Uday Parik Scale. Disability was assessed as per the criteria laid down by WHO (Dey, A.B., 1999). Mental disability was assessed by Indian Disability Evaluation and Assessment Scale (IDEAS) developed by the Rehabilitation Committee of Indian Psychiatric Society (Report, 2002). Needs assessment of the disabled was assessed based on the instrument designed on the lines of questionnaire taken from Action Aid India (Thomas, M. and Pruthvish, S. 1993).

The data collected was tabulated and analyzed by using the Statistical Package for Social Sciences (SPSS) version 11.5 for windows. Findings were described in terms of proportions and percentages. Univariate analysis was carried out separately for each factor. Chi square test was carried out to test the differences between proportions. The probability level of less than 0.05 was considered as significant.

RESULTS

All the 120 subjects were available for the final analysis (response rate, 100%). The overall prevalence of disability was found to be 65.8% (79). The most common type of disability was speech (45, 57%), followed by Loco motor (39, 49.4%), Hearing (17, 21.5%), Mental and Visual (14 each, 17.7%) disability.

The prevalence of disability was marginally higher among males (66.7%) than that of females (64.1%). It was comparatively less among (60-69) years age group (54%). This was followed by (70-79) years age group (76.1%) and 80 years and above age group (90.9%) and it was found to be significant ($\chi^2=9.2$, $p=0.01$). The prevalence of disability among subjects of nuclear family was marginally less (64.4%) than that of Joint/Extended family (66.7%), but majority of the disabled (50) belonged to latter category. The difference was not found to be significant with family type, socioeconomic status and marital status (Table 1).

Table 1 : Prevalence of disability according to socio demographic variables (N=120)

Socio demographic		Subjects variables	Number examined	Prevalence of disabled	χ^2 , p (%)
Gender	Male	81	81	66.7	0.1,
	Female	39	25	64.1	0.8
Age group (years)	60 -69	63	34	54.0	9.2,
	70-79	46	35	76.1	0.01*
	80 and above	11	10	90.9	
Family	Nuclear	45	29	64.4	0.1,
	Joint/Extended	75	50	66.7	0.8
Socio economic status	Low	48	32	66.7	2.9,
	Middle	52	37	71.2	0.2
	High	20	10	50.0	
Marital Status	Ever Married	117	76	65.0	1.6,
	Never married	3	3	100.0	0.2

* P value less than 0.05 is considered as significant.

Majority of the disabled had Hypertension (34) followed by joint pain (32), Diabetes (25), Backache(16) and others like Asthma/COPD, Fits, Heart Problems (Table 2). Around 1/3 of the disabled (36.7%)

were assessed, while 27.8% of them got medical/surgical treatment. Even though majority (78.5%) of the disabled felt that they required Aid/appliance, only 17.7% of them received them. None of the disabled received Speech therapy, Vocational training and Job placement (Table 2).

Table 2 : Needs of disabled (N= 79)

Types of needs	Felt (%)		Received (%)	
Assessment	69	(87.3)	29	(36.7)
Medical/surgical treatment	70	(88.6)	22	(27.8)
Physiotherapy	25	(31.6)	11	(13.9)
Speech therapy	12	(15)	0	(0)
Aid/appliance	62	(78.5)	14	(17.7)
Vocational training	3	(3.8)	0	(0)
Job placement	0	(0)	0	(0)

DISCUSSION

Consistent with the economic and social changes in the country, geriatric population in India are increasing with a subsequent increase in chronic co morbid conditions. This has enhanced the risk of developing disability among geriatric population. Well documented studies to determine the prevalence and its epidemiological features are few. Some studies had taken only the physical disability and some others mental disability. Also, the data collected by health workers could not detect mild degrees of disability because of their limited knowledge and lack of training. As our study illustrates, both physical and mental disabilities are of great concern in this area. Age place a major role as determinant of disability. Chronic medical conditions are also more common among disabled.

The present study showed a higher prevalence of disability among geriatric population in comparison to prevalence in general (NSSO, 2003, Census 2001). This was because of detection of even mild degrees of disability in our study. Recent National Sample Survey Organization report in India showed the prevalence of disability among geriatric population as little as 6.4%. The widely differing prevalence of disability found in these studies was due to wide difference in the samples and definitions used for disability.

Higher prevalence of speech disability was observed in our study in contrast to other studies (NSSO, 2003, Census, 2001). This is mainly because even mild degrees of speech impairment such as stammering, speaking with abnormal voice like nasal voice, hoarse voice and discordant voice is taken into consideration while assessing speech disability. Prevalence of loco motor disability was also higher in comparison to other studies. This is again because of inclusion of even mild loco motor disability in our study.

As the age advances, the prevalence increased significantly. Our study is consistent with the findings of other similar studies (Alan, M.J. *et al.*, 1981). Marginally higher prevalence of disability among males is observed in comparison to other studies (Noveymony, M.A. and Raj J.S. 2003). The present study showed that 95% of the disabled were married and only 5% of them were unmarried in contradiction to other studies. In India, about 92% of the disabled lived with their spouse and/or other members in the family. But in the present study, 37% (29) of the disabled belonged to nuclear family. Others (50, 63%) belonged to Joint/Extended family. In view of the above, the aged disabled in this part of the country are well placed as far as the family life is concerned.

Various studies have shown that the prevalence of disabilities is found to be significantly high among the individuals suffering from chronic medical conditions (Dey, A.B. *et al.*, 2001; Joshi, K. *et al.*, 2003; Khan, J.A. and Khan Z, 2001). Even though majority of the disabled felt that they required Aid/appliance, only minority of them received them in contrast to other studies (Pal H.R. *et al.*, 2000). None of the disabled received Speech therapy, Vocational training and Job placement. That shows that there is a large scope for community based rehabilitation for the disabled.

The present study can not depict the true picture of disability among geriatric population in the community as because of inherent limitations of cross sectional study. Besides, variation in the prevalence may occur due to the location of the area and other factors. There is also possibility of underestimation of mental disability because of inability of subjects to express their mental abilities such as self care, interpersonal activities, communication and understanding. There also may have been recall bias. Pure tone audiometry was not used while assessing hearing disability due to feasibility constraints. In

spite of all these, one of the important strength of the study was that the data was gathered through a population based survey by community based clinicians, which gives more reliability of information than self reported information or lay reporting.

Disability among geriatric population in this area is an important public health problem. Speech and loco motor disabilities are the commonest types of disabilities. Effort should be made to start the Community Based Rehabilitation Programme for aged disabled among geriatric population in Bolor, a semi urban area of Mangalore city. This will require coordinated efforts by local, district and provincial authorities. Political will, public sector cooperation and assistance, financial support from nongovernmental and international organizations involved in rehabilitation is also essential. Special emphasis should be laid on care of aged disabled in our health care system. It should be incorporated to the general health services and training facilities for health workers should be made available.

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Future Implications of the Dwindling Culture of Vertical Support for Retirees in Southwestern Nigeria

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ABSTRACT

This study examined, working with the philosophy of care among the Yoruba people of Southwestern Nigeria, the extent of care from the desired source(s) by 954 retirees in the said location between October 2005 and March 2006. Since the study was both reactionary and retroactive in nature, it did not limit focus to the immediate problems of care for the retirees but extended concern to possible accompanying problems of inadequate care of the retirees by children in the future. The study concluded that parochial but macro and Europocentric nature of past studies account for the persistence of retirees' problem in Nigeria.

Key words : Social support, Support bank, Retirees.

The culture of social support describes a way of life involving a network of assistance among relatives, friends and organizations. Social support refers to the exchange of resources, material or nonmaterial, between at least two persons perceived by the provider or recipient to be intended to enhance the well-being of the recipient.

We can describe human beings as surviving on the culture of social support; and it is pronounced in modern societies which Emile Durkheim (1893) describes as bound and united by organic solidarity. He believes that heterogeneity and division of labour bring about interdependence and interdependence ensures harmony in modern

societies. This is, however, not to construe an erroneous belief that it is only in modern societies where dependence, needs and a culture of assistance can be found. Every form or stage of living, from infancy to retirement and/or old age, is marked by a peculiarity of needs; and there is no stage in which self-sufficiency is attained for most members of the society. In another form, it can be concluded that needs, either in the economic, physical, social or psychological sense, characterize living. The needs of the individuals differ, however, either as a result of varied demands of stages of living, socio-demographic and economic characteristics of each person, among others.

Social support is also observable in all the four dimensions of human interaction; namely: cooperation, competition, exchange and conflict. For instance, Coser (1956) submits that even in conflict situation, cohesiveness, love and support are promoted within a group any time such a group is involved in a conflictual relationship with another group. That is, inter-group conflict promotes intra-group solidarity. Reference is usually made to the public plea by the traditional ruler of a warring community in Osun State that because of the disruptions of war, creditors should extend the periods of grace given their debtors. Additionally, they also appealed to those who had enough to lend fresh financial support during the period of war. It was a clear demonstration of support in the face of conflict.

As expressed earlier, social support can come in different dimensions but its flow is either vertical or horizontal in nature. Support may be expressed structurally (marital status, size of support network or frequency of social interactions) and/or functionally (offering emotional, informational or tangible support).

On the network of support, Quadagno (1999) points out that support networks can be described by the characteristics of the people with whom an individual has ties. Such characteristics may include age, sex, number of years of relationships involved and geographical proximity. She also stresses that networks of support involve exchanges over a life time. The simplest way to understand this is to

think of a support bank; in which deposits are made early in the life course in anticipation of future needs, or withdrawals (Antonovsky, 1974).

The concept of support bank points to the fact that support systems are never one-sided; but reciprocal. And as people can gain or lose in their transactions with banks in the economic world, the same is applicable to an individual in the social support banks of life. There can be an instance where vertically, parents might have deposited greatly into the nurture and education of children only to be repaid by neglect or desertion from such children or, some of them in later life. This is an instance of loss in the support bank of the parents. At another time, help or assistance rendered to friends, workmates, members of the same religious association, and so on, may not be reciprocated by the beneficiaries and in this instance, one is losing out horizontally from the support bank of life. For clarification, support is horizontal when it flows from people of equal or almost of similar status such as age, educational attainments, among others. But, when it is between or among people of different statuses, especially age, such as parents to children, it is vertical; and this forms the core of the different foci of gerontologists on the issues of social support.

In the study, attempts were made to examine the relevance of children in helping needy, retired parents in Southwestern Nigeria; to project into the future relations of care between children and parents and to draw attention to likely accompanying problems of poor attention of care.

Review of Literature

In a pilot study on the possibilities and limits of care in seven European countries, Amann (1980) reported that open, and not institutional care was prevalent for the needy elderly in most parts of Austria, Denmark, Greece, Hungary, The Netherlands, Poland and Yugoslavia. Care giving in homes was also very common in Nigeria and other non-Western societies in the past. This was sustained for a long time by some traditional beliefs, resulting in promotion of care.

In the past, Nigerian elders were held in high esteem and were not allowed to suffer any neglect. This was also obtainable among the Chinese and the Kirghiz, a small community of 2000 people who lived in the high valleys of Afghanistan. Among the Kirghiz, the household head, called *oey bashi*, (the most senior male or, in the absence of a male, the most senior female), exercised complete authority over the household (Shahrani, 1981). Traditional Chinese culture also placed a high value on old age. The veneration of the old is always linked to values of Confucian religion, which emphasizes that parents should treat their children with *zi*, or nurturance, and that children should treat their parents with *xiao*, meaning filial piety or absolute obedience. To be *xiao* means showing one's parents respect at all times, performing acts of ancestral worship when they die, and generating grand children to carry on the family name. *Xiao* extends beyond respect for one's parents alone but includes deference to all elderly people. It is accompanied by many symbolic and conventional gestures such as speaking politely, deferring in conversation to those older than oneself, and never ridiculing or insulting the aged. It would be a shameful breach of *xiao* to neglect the needs of clothing, food, medical care of the elderly or to put them in a nursing home (Amoss and Harrel, 1981).

The Yoruba people, inhabiting the Southwestern Nigeria also had similar culture. They too had similar names/labels for individuals who met up or otherwise on the nurture and care of needy members of the family. Parents who shirk in the responsibility of nurture and care for the children are called *abímáwò*, that is, they can only bear children without giving attention of care. Children who abandon their parents in periods of needs too can be labeled *ò?sánjù-o?mo?*, that is, a wicked child; not holding any kind of love or pity for the parents or *o?mo?-pò?-bí-o?sàn-bó?* which likens such a child to an orange which drops from a tree top and bursts, thereby rendering itself useless.

In the past, the belief in ancestral worship ensured that elders were taken care of so that the living child would not suffer their wrath when the old died and were transformed into gods (Bussia, 1965 and

Adisa, 2000). The extended living, premarital investigations, among others, created love towards the elders.

Generally, the care of the elders is dwindling as a result of many factors, some of which are examined in the next discussions.

There is a negative effect of poor political economy and modernization on the attention that the elderly receive in the contemporary times. Adisa (*Ibid.*) observed that there have been changes in the compositions and functions of families in Nigeria. It is not the importance of the values attached to rendering help to the needy members of the family that has gone down but also incapacities and variations in mode of living. For instance, the Yoruba adage that: *bí òkété bá dàgbà tán, o?mún o?mo? rẹ? ni ó n?* mún, meaning, an old rodent feeds on the teats of the children, has become a niche. The political economy, which has made it difficult or impossible for the children themselves to be in dependent, has made the moral philosophy of living outdated. There are problems associated with unemployment, under-payment at work, and job insecurity which may make both the parent and the child double victims of retrenchment.

This study was carried out on the presumption that the retirees were receiving attention from younger members of their families just as their plight has been focused by the media in the recent times.

METHOD

The study was carried out in Osun State in the Southwestern Nigeria. The respondents were former workers in the private sector, the Military and the para-Military, such as the Police and the Customs Services, Research Institutes, Federal Ministries and Parastatals, Teaching, Local Government and the Civil Services of Osun, Ondo, Ogun and Lagos States (four of six states in the region).

The 954 retirees were selected purposively and through systematic sampling techniques because of the following reasons:

The retirees were heterogeneous and were spread all over the state, thereby necessitating the use of the techniques. There was also no reliable sampling frame; offices worked on estimates because of inaccurate data of the actual population of the pensioners. The pensioners were lumped together irrespective of their cadres, thereby

making stratification difficult. The study only covered retirees with associations, which could provide information on members.

Structured questionnaire was used in eliciting information from the respondents and the analysis was largely descriptive.

The culture of the people calls for an investigation into whether the actual sources of assistance to the retirees were really their desired sources of help. If not, how does the network of support affect morale?

FINDINGS

The study found a preponderance of male retirees over the female retirees. Male retirees constituted 80.2 percent of the retirees and this might be a result of unwillingness of parents in the past to educate a girl-child.

The majority of the retirees were also Christians accounting for 81.2 percent and others were Muslims. This was probably responsible for the majority being monogamists, 79.5 percent.

Even as the retirees who could be described as young and middle-aged retirees, 40-59 years, constituted 49.1 percent, they were still considered relevant because, age notwithstanding, retirement is always a period of increased disabilities. Their inclusion also allowed for variations in needs and adjustment capabilities.

In all, 49.7 percent had children who have been working, ranging from one to ten; hence the question on whether children assisted them could be asked. Even as retirees, a little below 40 percent still had children in schools and among the retirees themselves, only 7 percent did not have formal education. The illiteracy level would have been higher if the study were to be conducted either in the North or the East of the country. More so, the Fredman test to evaluate the need preferences of the retirees revealed that the retirees preferred economic independence of children to adequate retirement income. This definitely portrays how important children's education and economic independence were to the retirees and the importance of assessing return of support to needy parents.

Table 1 : Table showing the coping mechanisms of the respondents

Coping mechanisms	Percentages
Reliance on proceeds from personal trading	33.1
Assistance from appeals made to friends	16.0
Assistance from appeals to children and/or other relations	7.2
Reliance on farm proceeds	6.6
Assistance from spouse	0.6
Reliance on retirement entitlement	37.5
Total	100.0

Source: Author's fieldwork October 2005 – March 2006

The table presented first the order of dependence on sources of aid for the retirees about whom retirement entitlements could be said to be inadequate. It reveals that personal trading was of assistance to greater percentage of the retirees who supplemented retirement incomes with other things. If personal efforts would be considered altogether, yields from farming and trading constituted 39.7 percent.

Future Implications of Findings

Lessons to be drawn from the findings are many; but the earlier discussions have highlighted reasons for the incapability of children, or other family members to be atop the sources of assistance for the retirees.

The findings have revealed a shift from one principle of living among the Yorubas to another. In the earlier times, children were not allowing their aged, needy parents to suffer hunger or any form of neglect such that the expression: *bí òkété bá dàgbà tán, o?mún o?mo? rẹ? ni ó n?* mún, that literally means that: rodents feed on the teat of the children in old age became a popular saying. This has become cliché and changing to: *àtẹ?le?wó? e?ni nìkan ni kì í tan ni je?*, meaning: only the reliance on personal handiwork/efforts does not fail. The greater reliance on personal trading and farming can then be explained by the latter guiding principle of living.

Another implication is that if children are not forthcoming in times of help, parents may want to de-emphasise great investment in

them so as not to have vain hope of security in times of needs. Instead, they will prefer to invest in friends, religious associations and other outside associations, where assistance will seem forthcoming.

This inference is made drawing from one of the assumptions of Homans (1974), the first proponent of exchange theory. The first of Homans' Aggression – Approval propositions states that:

when a person's action does not receive the reward he expected, he will be angry; he becomes more likely to perform aggressive behaviour, and the results of such behaviour become more valuable to him.

Since the concept of reciprocity is so vital in explaining networks of care and support relationship, how much encouragement will the retirees with probable records of losses in their ventures on children, give to other parents to give good nurture and education to children? Even, if the retirees are admitting fate, there is a popular Yoruba adage that *Eni tí ó jìn sí kòtò máa n' kó ará yòókù lógbón*, meaning, the mistakes of some teach others some good lessons; when a person falls into a ditch, others learn to open their eyes well as they walk.

George Homans' proposition helps to infer a possibility that if it were to be a longitudinal study where the retirees could still be asked whether they would be prepared to spend so much money on the education of their children, there would definitely be a drop. When the love for education of children wanes, it portends great danger not only for the direct would be children but for the region of southwestern Nigeria, the entire country and possibly, the whole world.

There will be an increase in the rate of drop-outs from schools, juvenile delinquencies and alcoholism. Child labour, teenage pregnancies, pilfering trafficking in girls, prostitution, among others will also be accompanying problems of disinterest in the education of children in Southwestern Nigeria.

The region will also be losing out on its regional identity. The Southwestern part of Nigeria is one of the old three regions Nigeria was comprised of. And in the national relation and politics, the East is prominent for commerce, creativity and invention, the North, for extensive agriculture and the southwest, education. Each region is respected for what it is noted for in the politics of the country and if a

region loses its relevance through loss of regional identity, its lots in politics will just be shared out.

This clearly shows that the relations of care, love and affection between parents and children are beyond moral issues but also developmental ones. Even in the absence of any statistical data, the Southwest can boast of accounting for fifty percent of literacy level in Nigeria; and when the region is affected, the pivotal roles of education will make the country's developmental efforts a ruse. The following conclusions and recommendations are made to avert the possible danger.

Conclusions and Recommendations

Many studies in the past were parochial in nature focusing only on present situations without projecting into the future. The dearth of indigenous literature has also made reliance on foreign literatures inevitable. This usually has its weakness, as recommendations will be based, not on the peculiarity of home situation but on foreign realities.

The study recommended that the government can either enhance the saving capacity of workers through increased pay or empower children by reducing unemployment rate and this would improve upon the lot of retirees.

If possible also, the suggestion by justice Karibi-Whyte that property right be conferred on job holders to enjoy recourse to law if unlawfully deprived of job, or retrenched, should be given a trial to replace master – slave relations between job holders and employers.

Since begging for alms is a distasteful act in the Southwestern region, it is imperative, that the government and policy makers attend to the recommendations.

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Age Related Loss of Hand Grip Strength Among Rural and Urban Brahmin Females

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ABSTRACT

The purpose of this cross-sectional study is to examine age related loss of hand grip strength among rural and urban females, ranging in age from 40 to 70 years. Both the rural as well as urban Brahmin females show a decline in the mean values of grip strength (both right and left hand) with increasing age. Urban Brahmin females show statistically non-significant higher mean values of grip strength than their rural counterparts. Percentage magnitude of loss of hand grip strength (both right and left hand) is more among rural females than the urban Brahmin females. Right hand grip strength of rural and urban Brahmin females exhibit greater mean value than left hand grip strength.

Key Words: Hand grip strength, Rural–urban brahmin females, Muscle strength, Aging

Aging has a degenerative effect on hand function, including declines in hand and finger strength and ability to control submaximal pinch force and maintain a steady precision pinch posture, manual speed, and hand sensation. Hand grip strength is an important predictor of disability and mortality among elder people. The proportion of elder people in the world is growing. According to the official projections of the Registrar General, India in 2016 the elderly population is estimated to be 14 million, which will be approximately 8.9 percent of the total Indian population. Unfortunately there is still a

paucity of studies that include older people in developing countries (WHO, 1995).

Numerous studies on grip strength with regard to post-operative complications and deaths (Klidjian *et al.*, 1980; Guo *et al.*, 1996), nutritional status (Vaz *et al.*, 1996; Chilima and Ismail, 2001; Pieterse *et al.*, 2002), functional ability (Jette *et al.*, 1990; Hyatt *et al.*, 1990; Proctor *et al.*, 2006), physical performance (Samson *et al.*, 2000; Onder *et al.*, 2002), effect of hand dominance (Incel *et al.*, 2002; Kamarul *et al.*, 2006) have appeared, but there is a limited information regarding the rural and urban differences of this aspect among aged females. Hence, the primary goal of this study is to gauge the loss of hand grip strength among rural and urban Brahmin females.

METHODS

The present cross-sectional study are based on a sample of 870 Brahmin females (rural = 450, urban = 420), ranging in age from 40 to 70 years. The data were collected in two phases from the year 1999 to 2001 from rural and urban areas of district Roop Nagar (Punjab). The subjects were selected at random. All the subjects were physically and mentally normal and were not suffering from any chronic disease at the time of data collection. Subjects with history of upper limb injury or deformity were excluded.

The data were arranged in six age groups, each of five years duration except the first age group, which is of six years duration for both rural and urban Brahmin females. Age in years had been obtained from the date of birth, which most of the urban females could recall; whereas in majority of rural females and some aged urban females age had to be ascertained by association with some important events like age at marriage, age of the first child, any important festival etc. With this cross-questioning, it was possible to ascertain nearly the correct age of the subject.

Hand grip strength (kg) was measured with Dynamometer. Subjects were encouraged to exert their maximal grip. They performed three grip tests with each hand. The best result was chosen for analysis. Student's t-test was used to find out the magnitude of rural and urban differences at all ages.

RESULTS

Table 1 shows mean and s.d. values of grip strength for right hand. In rural females, mean values of grip strength of right hand at 40-45 years is 20.92 kg, with a net decline of 10.84 kg, when they reach the age of 66-70. In urban Brahmin females highest mean value of grip strength was observed at 40-45 years (21.20 kg) and minimum value was registered at 66-70 years (11.08 kg). Urban females reveal higher mean values of right hand grip strength than their rural counterparts at all age groups, but it was statistically significant only at 51-55 years group. Percentage of loss was more among rural females (51.81%) as compared to the urban females (47.73 %).

Table 1: Grip strength (kg) of right hand against different age groups in rural and urban brahmin females.

Age Group (in years)	Rural Brahmin Females		t value	Urban Brahmin Females	
	N	Mean±S.D		N	Mean±S.D
40-45	75	20.92±4.56	0.33	70	21.20±5.60
46-50	75	19.26±4.22	1.05	70	20.08±5.06
51-55	75	16.33±4.03	2.39**	70	16.82±4.88
56-60	75	13.54±5.01	0.34	70	14.74±3.04
61-65	75	12.84±5.48	1.59	70	13.45±3.54
66-70	75	10.08±4.42	0.23	70	11.08±3.83

Table 2 shows mean and s.d. values of grip strength for left hand. The value for left hand rural females dropped from 18.13 kg at age group 40-45 to 9.00 kg at age group 66-70, resulting in the net loss of 9.13 kg over 20 years, whereas for urban females it was 18.67 kg at age group 40-45 and show a decline by 8.76 kg to reach the minimum value of 9.91 kg at the age group 66-70. Mean values for left hand have been found to be statistically non-significantly higher in urban females than their rural counterparts. Magnitude of loss for left hand was more among rural females (50.35 %) than urban females (46.92%).

Table 2 : Grip strength (kg) of left hand against different age groups in rural and urban Brahmin females.

Age Group (in years)	Rural Brahmin Females		<i>t</i> value	Urban Brahmin Females	
	N	Mean $\pm$ S.D		N	Mean $\pm$ S.D
40-45	75	18.13 $\pm$ 4.90	0.66	70	18.67 $\pm$ 4.85
46-50	75	17.14 $\pm$ 4.65	0.29	70	17.38 $\pm$ 5.35
51-55	75	13.00 $\pm$ 3.87	1.64	70	15.05 $\pm$ 3.92
56-60	75	10.22 $\pm$ 3.56	0.78	70	12.65 $\pm$ 3.15
61-65	75	9.65 $\pm$ 4.17	1.26	70	10.85 $\pm$ 4.11
66-70	75	9.00 $\pm$ 4.68	1.24	70	9.91 $\pm$ 3.90

DISCUSSION

Grip strength is measured as an indicator of muscular strength in the upper limb. In the present study, both the rural as well as urban Brahmin females show an age related decline in grip strength. This is in accordance with the findings of previous studies, reporting a trend of decline in grip strength with advancing age (Rantanen *et al.*, 1994; Joycee and Kapoor, 1995; Singal *et al.*, 1999; Samson *et al.*, 2000; Chilima and Ismail, 2001; Frederiksen *et al.*, 2005; Forrest *et al.*, 2007). Rantanen *et al.* (1994) and Brown *et al.* (1995) noticed that the diminished functioning in sensorimotor system in old people can be a limiting factor in the maintenance of an independent life style and can increase the risk of fall and fracture. These findings clearly depict that the aging process is associated with progressive declines in muscle strength, resulting in functional disability and reduces quality of life (Forrest *et al.*, 2007).

Rural and urban Brahmin females in the present study shows that grip strength of right hand is greater than left hand, which is also supported by earlier studies (Bagga, 1997). This may probably be because the right hand is more active over left hand. Kamarul *et al.* (2006) also reported that hand grip strength is significantly correlated with hand dominance. Urban Brahmin females exhibit higher mean values of grip strength (both right and left hand) than rural Brahmin females. Similar findings are reported by Hussain (1997) showing greater grip strength of urban Kunbi females than their rural counterparts. This is contrary to the findings of Singal *et al.* (1999)

who reported rural Jat Sikh females have more grip strength than urban Jat sikh females at most of the age groups. So the lower grip strength (both right and left hand) of rural females than their urban counterparts may be attributed to poor nutrition leading to the decline in muscular strength. This is in an agreement with the findings that poor nutritional status is associated with poor hand grip strength (Guo *et al.*, 1996 and Chilima and Ismail, 2001). Cauley *et al.* (1987) found that the reduction in physical activity with age may contribute to strength decline .

Table 3 reveals the comparison of Brahmin females (present study) for grip strength with maharashtrian Brahmin and migrant (Punjabi & Sindhi) women (Bagga, 1997) and rural and urban Kunbi females (Hussain 1997). Rural and urban Brahmin females show lower grip strength (right and left hand) than the rural and urban Kunbi females at all ages except at age group 40-50 years (Fig. 1 & 2). Rural and urban Brahmin females when compared with maharashtrian Brahmin females and migrant (Punjabi & Sindhi) women show higher value (right & left hand) at all ages except at 40-50 years. Table 4 shows t-values.

The results calculated from table 3 confirm the previously reported grip strength loss with increasing age. Carmeli *et al.* (2003) observed that deterioration of hand function in elderly adults is a combination of local structural changes (joints , muscle, tendon, bone, nerve and receptors, blood supply, skin and fingernails) and more distant changes in neural control. These changes are often accompanied by underlying pathological conditions (osteoporosis, osteoarthritis, rheumatic arthritis, and Parkinson's disease) that are common in elderly population. Hence, understanding these change in muscle strength and functional mobility with age is becoming more important because of longer life expectancy and an increasing elderly population (Wolfson *et al.*, 1993).

Table 3 : Comparison of right and left hand grip strength of rural and urban Brahmin females with rural and urban Kunbi, Maharashtra Brahmin and migrants.

Age Group (in years)		Rural Brahmin	Urban Brahmin	Rural Kunbi	Urban Kunbi	Maharashtrian Brahmin	Migrant (Punjabi & Sindhi)
40-50	Right	20.09±4.49	20.64±5.39	19.84±4.09	20.24±5.19	18.33±4.62	18.00±3.39
	Left	17.63±4.82	18.02±5.17	20.61±3.79	19.96±5.16	17.63±4.35	15.80±3.19
51-60	Right	14.93±4.77	15.78±4.21	16.93±4.02	17.21±4.45	17.43±4.57	18.33±1.15
	Left	11.61±3.98	13.85±3.77	17.04±3.72	17.07±4.31	16.23±4.81	15.00±5.00
61-70	Right	11.46±5.18	12.26±3.89	13.56±3.47	14.79±3.47	16.14±4.45	12.57±1.90
	Left	9.32±4.46	10.38±4.05	13.73±2.73	13.97±3.45	14.97±4.31	10.71±4.46

Table 4 : t-values for the right and left hand grip strength of rural and urban Brahmin females with rural and urban Kunbi, Maharashtra Brahmin and migrants.

Age Group (in years)		Rural vs Rural Kunbi	Urban vs Rural Kunbi	Rural vs Urban Kunbi	Urban vs Urban Kunbi	Rural vs Maharashtra Brahmin	Urban vs Maharashtra Brahmin	Rural vs Migrant	Urban vs Migrant
40-50	Right	0.39	1.08	-0.21	0.51	1.93	2.16*	2.40**	2.56**
	Left	-4.53***	-1.88	-3.35***	-2.26*	-2.62**	-1.90	-4.16***	-3.52***
51-60	Right	-3.02***	-2.27**	-4.77***	-4.50***	-4.90***	-5.09***	-1.15	-0.42
	Left	-9.56***	-3.70***	-3.24***	-2.55**	0	0.38	1.98*	2.24*
61-70	Right	-2.95***	-5.77***	-9.17***	-5.52***	-5.56***	-2.95***	-4.27***	-1.49
	Left	-7.30***	-5.98***	-7.53***	-6.21***	-6.74***	-5.88***	-1.55	-0.39

p<0.05*; p<0.02**; p<0.01, .001***

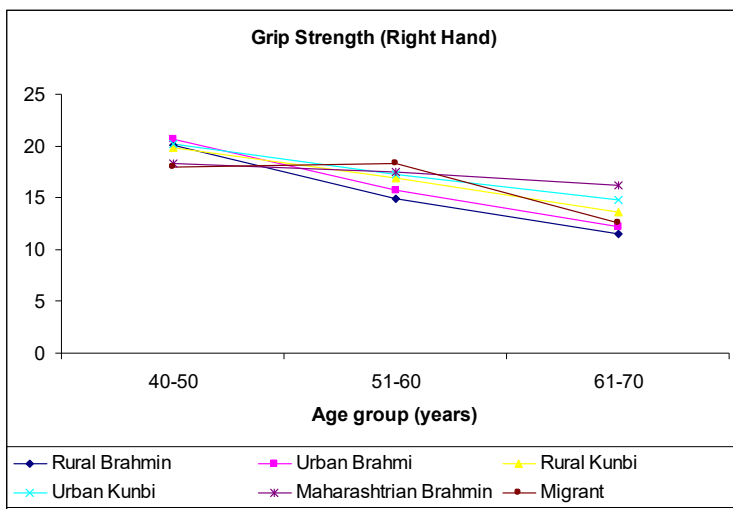


Figure 1 : Comparison of grip strength (right hand) of rural and urban Brahmin females with rural urban Kunbi, Maharashtrian Brahmin and Migrant females.

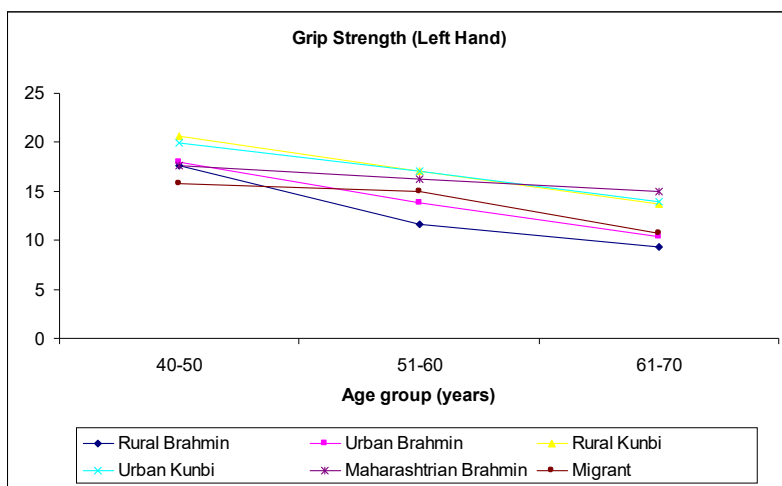


Figure 2 : Comparison of grip strength (left hand) of rural and urban Brahmin females with rural and urban Kunbi, Maharashtrian Brahmin and Migrant females

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Case Study of Productive Ageing among the Rural Women

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ABSTRACT

It is usually held that ageing for women in rural areas brings with it insecurity and utmost dependency. Gerontological literature replete with the evidence that elderly women are the most vulnerable group among the aged. More often than not they are subject to different kinds of elder abuse mainly because of their relatively less involvement in-productive process. This seems to be an erroneous notion for, it is widely known that women never retire. In rural areas they are regarded as an asset to the family as a productive group. This paper makes a case study of some elderly women belonging to several villages of the districts of 24 Parganas(s), Hooghly, Howrah and Purulia in West Bengal to examine the role these women play in productive processes in their respective households and society. The study further examines the variation, if any, in the nature of involvement in productive activities by age and seeks to find out the reasons behind differential participations. The study revealed that ageing for many a rural woman is neither a curse nor a blessing. It hardly frightens them for, some women earnestly desire to undertake role reversal. They are not a liability to the family but certainly a human assets who also help ushering social change.

Key words : Productive ageing, Elder abuse, Human asset, Social change, Role reversal

The “grey cloud” on the horizon to-day – the rapidly ageing population feared by the “doom and gloom” – has several linings that have too long gone unnoticed, under appreciated and under utilized. One of these is the contribution of voluntary work by older persons, those who choose and who are able to remain active and productive member of society. Volunteering by older persons is a singular and particularly valuable mode of “productive ageing”, because their contribution is the gift of life experience, skill, wisdom and human warmth to other generation.

There is a great deal of literature on the subject of ageing but much of it does a disservice to older persons and to their societies ; it neglects or addresses only in passing, the changing ways that older people engage in society. Short shrift is given to the wealth of knowledge, expertise, skill and wisdom that is available to educate and inform younger generation. And this lack of attention does nothing to support the development of policies that would encourage and facilitate the fullest participation of older people in family, neighborhood and society.

One of the most crucial issues that social planners and policy makers are confronted with is their inadequate knowledge about what to do with our first growing elderly persons who are having much higher longevity now than ever before. The joint family, long thought of answering to this question is neither as held out to be widespread, nor does it seem capable enough to accommodate the pressures exerted by the demands of a modern industrialized, westernized and globalized life style. We know that far worse is the expression of social neglect, abuse and societal carelessness giving rise to the feeling of emotional isolation, loneliness, depression and a sense of alienation among the aged. Even at the risk of repetition it can be mentioned that how the rural aged women living in both economically backward region as well as relatively advanced areas are facing the brunt of enormous socio-economic and psychological stress.

Ageing for women in rural areas, brings with it dependence, insecurity, failing health, and loss of control over one’s life. In an inadequate social security system of rural India, where poverty, unemployment, decreasing land-man ratio, malnutrition and population explosion are quite rampant, aged women constitute a vulnerable group which is often subjected to insult, injury,

exploitation, inequality, injustice and multiple morbidity. In a socio-cultural milieu, which is, by and large, hierarchical and strictly patriarchal, majority of women are rarely educated, victims of child marriage, not encouraged to take up employment and their public participation is strictly limited, there is a growing number who face a situation of “triple jeopardy” that of being old, female and poor” (Prakash, 1996).

Majority of the older women are dependent on others economically as they are not gainfully employed. We are yet to have a comprehensive social security system to cover all the needy women in rural area. “For, 74% women spend their lives without a spouse, 75% older women suffer from at least one chronic disease. Majority of them live with children and the quality of their life solely depends on the sentiments, resources and inclination of their careers” (Kumar, 1996). The inter-personal relationships with their sons and daughters-in-law also are becoming increasingly brittle (Chakrabarti, 1995). It is against this background that this present exercise has been made to know how far promoting methods of productive ageing can be of any help for the rural elderly women in gaining a sense of self-worth, social respectability, economic security and a sense of holistic well being. The term “Productive ageing” covers three major aspects : Physical, Economic and Social. The physical aspect focuses on healthy mind and healthy body, emotional and spiritual well-being. The economic aspect deals with commercial, business, monetary benefits, gainful employment suitable to age, health and local habitat. The social aspect involves participation in family’s and community’s, activities – to the satisfaction and advantage for herself and society (Kumar, 1996). This paper makes an attempt to present five case studies of elderly women living in different villages in 24 Parganas (S), Hooghly, Howrah and Purulia districts for examining their involvement in productive processes.

The study has the following objectives :

1. To examine the variation, if any, in the nature of involvement in productive ageing by age of the selected women belonging to different socio-economic backgrounds of the 5 villages in different districts of West Bengal.

2. To extract the reasons for differences, if any, in the extent of participation in productive ageing by the rural elderly women under examination, and
3. To analyze the role played by family, neighborhood and community in motivating the elderly women to take part in physical economic and socio-cultural aspects of productive ageing.

METHODS

The study is based on case-study materials collected from purposively selected five women elderly belonging to the village named Majilpur and Taldih in 24 Parganas (S), Lokenath in Hooghly, Haturaia in Howrah and Sankra in Purulia. The case-studies were verified with the help of neighbors. Interview and observation methods were also followed. While the principal investigator supervised the collection of case-studies through tape-recorder by a trained lady field investigator, the male investigator remained busy in interviewing the heads of the household with a questionnaire-schedule. The B. Stat (Hons.) students of the Indian Statistical Institute were also interested to take case-history and other relevant data from the Jainagar village. One girl-student was so much excited that she applied life-history technique to extract live data.

Incidentally, the principal investigator was entrusted upon to conduct a survey among the rural people belonging to different West Bengal districts in 1994. Moreover, he was commissioned to organize a 3-day workshop along with a senior psychologists at the Haturia-2 Gram Panchayat to explore local resources for rural development. In this way, rapport was built in the village in advance. For the selection of Loknath case in Hooghly and Sankra case in Purulia, prior experiences of the team members helped a lot to obtain case study and other data.

CASE STUDIES

Case # 1

Manoda Mondol (68) was a widow living at Majilpur Village, 24 Parganas (South) with her son, Badol, daughter-in-law, (Moyna) and ground children.

She belonged to small peasant household. She lost her husband 5 years ago. The family owned 8 bighas of land, a pond, kitchen, garden and two coconut trees. Besides, there were a pair of bullocks, one milched cow and a calf, and three goats. Manoda kept herself busy in supervising the household work, looked after the kitchen garden, milked the cow, and took care of the cow-boy who tender the cattle and goats and fetch the fodder. Manoda earned money by selling green coconuts, and excess products of the kitchen garden. She spends her leisure times by listening to the religious discourse at the village community center. She would take important family decision like when the rice-taking ceremony of the youngest grand child would be held, whom to be invited, selection of mate for the grand daughter, when the annual household worship to be performed and so on. Manoda was a good story-teller. She took the role of a fun-seeker, playmate and story-teller. The grand children often make fight among themselves over their sleeping arrangement with the grandmother. In fact, Manoda seemed to be the most dominant at the same time cordial member of the Mandol family.

Case # 2 :

Lakkhi Bala (69) a married woman lived with her husband Haran Naskar (80) in the Bangal Para of Taldih village, South 24 Parganas in an empty nest. Her husband is seriously ill and also having a sight problem she herself is having chronic pain in the knees Lakkhi Bala's two sons and two daughters lived elsewhere. The eldest son, being stayed in the same village but at different hamlet named Ghosh Para, occasionally visits his parents and help them with money. The old couple were not completely denied of the filial care. For, from time to time, the parents used to enjoy the company of their grandchildren and also the taste of good food items from them. Lakkhi had to keep herself busy in doing household chores, nursing Haran, and frequently visited the Gram Panchayat office to enquire about the status of her husband's old age pension. In the afternoon, she would make broom sticks from the coconut leaves to supplement family income and produce fueling materials out of dried coconut leaves. She was a god fearing woman. Everyday she would worship household deities with flower, *nakuldana* and water. Her daily domestic chores include sweeping the *uthon* (court yard), cleaning the goatary shed, feeding

the goats with jack-fruit leaves, tending them by a cow-boy, ship-shape the bed, prepare breakfast for her husband, attend to her husband's various needs, cook meals, goes to the groceries, and *haat* (village market) for buying vegetables, spices and fish. From her activities of daily life it appears that inactiveness is a concept unknown to her.

Case # 3

Tulshibala Giri (75) was an widowed woman whom the investigator met at her daughter's house at Haturia in the district of Howrah. She was a wretched woman compelled to lead a life of a *bhager ma* (shared mother) moving from one family to another of her two sons and a daughter under a system locally named as *pala* (rotatory) for 4 months in a family. The investigator got interested in her case to explore how far she was dependent upon her children for sustenance and care and the nature of voluntary services contributed to the family. From a priori information from the Panchayat member the lady investigator gathered that Tulshi's husband was small peasant owning 6 bighas of cultivable land and also worked as tenant cultivator. When he was terminally ill, the eldest son persuaded him to transfer the land to him and his brother which Tulshi's husband did with the hope that they would look after their. But the commitment was not honored. Ultimately, the Panchayat had to intervene for settling the disputes concerning Tulshi's sustenance and care. The settlement was that each of the two sons and the daughter would look after their mother rotationally for four months in a year. Thus, Tulshi had to move from one family to another with utter disgrace.

As Tulshi was quite fit to render her services to the family of her daughters-in-law and daughter by way of performing domestic works such as sweeping the floor, helping as a baby sitter, acting as an ayah to perform pre-natal and post-natal care, and so on. She used to enjoy ample freedom at her daughter's place to spend times with the company of other older women nearby and would stand by them during crisis.

But the situation was not so congenial at her sons' family. Besides rendering help in domestic chores, she had to make cow dung cakes, prepare prickles, *aam sattva* (a kind of thin cake made of the

sweet juice of ripe mango drying it in the sun), *aam-chur* (dried slices of green mango preserved in salt) and *bori* (a small conical ball made of the paste of pigeon pea and dried in the sun) etc. During the rainy season she used to make paper packet known as *thonga* for supplementing her son's family income. However, neglect, abuse and compel to face filthy words from her daughters'-in-law were the usual treatment which she had to suffer. Tulshibala's case may not reveal much of her involvement in productive ageing because of her loss of family status, utmost dependence on children and advanced age.

Case # 4

Safiunnisha Begum (64) was an educated married woman lived at Bahirkhand village, Hooghly in a joint family. She was a retired primary school teacher and actively involved in the movement of women's upliftment. Her husband was a bed-ridden paralytic patient. Safiunnisha's two sons, Helal (35) a married son having three girls, and Kamal (20) was a Higher Secondary student, and two daughters, Ayesha and Tuktuki. Her husband's younger brother, Sirajul (68) also lived in the same family with his married and unmarried children. Cultivation, service and wholesale dealer of clothes and owning a ration shop were the sources of family income of Safiunnisha Begum. Although Safiunnisha had mother-in-law aged about 90 yet the entire family reported to have under her own control. She got pension, invested her terminal benefits into the small saving schemes and Govt. bonds but allowed their earning sons and other member of the family to spend as per their respective will, of course, after contributing a portion of their income for household expenditure. Although the head of the family was her mother-in-law, yet actually her husband's brother Sirajul functioned as a de-facto head.

Safiunnisha engaged herself in full-time community welfare work holding the position of a member of the panchayat. However, she would pay whole hearted attention to her ailing husband and also took part in important family decisions like education of grand children daughter's marriage, transaction of property and so on. Being a religious minded lady, she performed the *namaaz* (prayer) daily before sun-rise.

Case # 5

Parul Badyokar (66) belonged to the poorest of the poor family at the Sankra village of Para block in Purulia. Signs of under-nutrition were traced in every member of her family. She lived with her only son, Tarak (42) who was married and having his family. Her husband died in a car accident some 20 years ago while returning from the market in the evening in a drunken state. It was by dint of Parul's relentless fight against the poverty that her family could survive and eke out its living. She used to engaged in her family's traditional occupation in basketry like many other Badyakars in the locality. Her son, Tarak (40) read up to primary level and worked as an agricultural labour. Tarak's wife was a domestic maid in a Mahato family. But whenever they had leisure lines, joined Parul in making basketry, winnowing fan, broom sticks, small fish basket etc. Tarak used to buy bamboo from the neighboring Mahato families and his wife, Kushum (30) would accompany her mother-in-law for disposing of the products to their fixed customers in and around the village in exchange of crop and cereals. Parul's eldest grandson (12) worked as a *bagal* (cattle grazer) to graze the cattle of the Sarak families, while the next one (10) collected cow-dung with which Parul and Kushum would make cakes. Besides contributing family income, Parul had to look after the children, feed them, send the youngest one to school and participate in other domestic activities. The only recreation which she could afford to have was casual attendance to the religious discourse that held in the *Horibol* (village community center) in the evening.

DISCUSSION

It is usually held that ageing for women in rural areas brings with it insecurity and utmost economic dependency. Aged women, constitute a vulnerable group which is often subject to physical and mental abuse. Women are undoubtedly the most productive group in rural areas and they occupy a unique position by virtue of their productive power. The older population continues to be dominated by women who are widows. A majority of them are being forced to live at the margin of survivality and work in an unorganized sector. Recently, "the introduction of modern farming methods and mechanization in the industrial sectors had have an adverse affect reducing the elderly in work participation. Due to decreased activity

in work place during old age more and more elderly persons have to stay back home by engaging themselves in household chores. The economic value of the women are mostly invisible in the sense that it is neither remunerated nor acknowledged.

From the case studies of five elderly women from the villages of South 24 Parganas, Hooghly and Purulia districts, it revealed that the contribution of these women in the economic sphere cannot be overlooked. Although the rate of participation and extent of supplement to the family income tend to vary from case to case yet not an elderly women could be found to remain idle at home by becoming fully dependent on other members, if of course, they are not physical unfit. So far as physical aspects of productivity is concerned, two out of five cases seem to suffer from gout and debility. Mentally also. Cases # 3 suffers from emotional isolation, loneliness and inferiority complex because her social status has gone down because of the demise of husband. She led the life of a *bhager ma* (shared mother). Poverty, lack of compromising attitude and frequent quarrels with her own people made her a psychic patient. Affluency, economic solvency and higher education make a rural elderly woman productive in economic physical and social aspects as the revealed in Case No. 4. The social as well as family status of the elderly woman seemed to have enhanced much because of her involvement in both private and public welfare programs. Abject poverty and lack of landed property and other asset force an elderly women to get involve in income generating process. Poor illiterate elderly women in rural areas can hardly think of empowerment of woman – which is why except in a solitary case none could be found interested in active participation in women's organization. Perhaps, the wide-spread negative attitude towards old age such as feeling of low self-worth, self-esteem, helplessness, and above all patriarchal social system which are ingrained among the elderly women in rural areas make them apathetic towards active participation in politics. “Bringing attitudinal changes among the rural women in particular, and society in general, is imperative for them to be considered as a special persons and inspire them leading meaningful lives” (Chowdhary, 2001).

It is of urgent necessity to make an intervention plan for the rural aged women in every village in the form of “initiating a set of co-

ordinate activities so that the disadvantageous conditions which surround the older women and which hamper their fuller participation in family and community life are reduced, paving the way for psycho-social upliftment, economic and holistic security (Chowdhary, 2001). However, during the period of rapid rural appraisal by a team of anthropologists, demographer, statistician, and physician throughout the length and breadth of Purulia district in 1990s, all the members were unanimous in one respect that ageing was not a liability for rural elderly women. For, barring those who are permanently disabled and incapacitated, not many women elderly could be seen sitting idly by withdrawing themselves from productive process or abstain from taking care of the members of the family in crisis.

CONCLUSION

Ageing for many a rural elderly women is neither a curse nor a blessing. It hardly frightens them. Rather, some women earnestly desire to undertake the role reversal. Traditional values are still rampant in Indian rural areas. It is the elderly women who continue to sustain Indian culture. They act as a buffer to promote natural acceptance of the ageing process. "Religious and cultural ideas about birth and cycle as ever recurring, tradition of respect for the aged mitigates the socio-psychological problems associated with the ageing to some extent (Prakash, 1996). Rural elderly women are still not a liability unlike that of their urban counterparts. But that does not make us complacent because prevention is better than cure. Field experience indicates that women do not lack ability to improve their lot if the gender discrimination in decision-making process is minimized.

The traditional notion that women's actual place is confined to hearth and home, especially for those who are older in age, needs to be given a second thought. There are many elderly women all over the world who excelled in the later part of their life. The only point is that elderly women – be they in rural or urban areas should be given equal opportunities, access to education, employment and alternative role instead of home maker (Prakash, 1996). More than anything else, finding ways in which older women can feel in control in their lives (like for instance, Safiunnisha Begum of case no. 4) will go a long way in reducing the helplessness that older women face.

The process of empowerment for the “productive” aged womenfolk in rural Bengal can go a long way to not only generate innovative ideas for improving their quality of life but also act as a catalyst for social change. Thus by utilizing their time, knowledge, skills, experience and wisdom the elderly women can make individual benefit and contribute to social development. Productive ageing is not a utopian concept for the elderly especially for the women in rural area. The need of the hour is to undertake intervention program by the N.G.O.s or Mahila Panchayat for generating awareness among the elderly women about the widening scope of productive ageing.

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The Morbidity Profile of the Aged in Surat City

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ABSTRACT

This study explores the morbidity profile among 68 residents of four old age homes run in Surat city through interview technique. Unwillingness of family members to take care of the elderly emerges as the main reason of their stay at these homes. The person prevalence of diagnosed physical ailments was 80.9% with an average prevalence of 1.3. The study also describes their complaints and feelings relating to mental health and the perceived wishes of the respondents. The study discusses their patterns of seeking of internal and external medical care and the hindrances that resulted into unmet health needs. The study gives appropriate recommendations for the appropriate health care provision of the elderly.

Key Words: Aged, Morbidity profile, Unmet needs,

According to the 2001 census, India is home to more than 76 million people aged 60 years and over. This age group, currently 7.4% of the population, is expected to grow dramatically in the coming decades. This aging and also the demand for specialist services should be more evident in regions with favourable health indicators (Sathyanarayana & Shaji, 2007). Presently, limited studies have been carried out and also due to the absence of a nation wide registry of older people comprehensive community-based data on morbidity and disability is unavailable (Dhar, 2005). There is a strong need for making available information on the health needs of this rapidly greying population, especially those disabled, as this would be one of

the most important challenges, which the community will face in view of the rise in life expectancy (Grover *et al.*, 2000; Khan and Khan, 2001).

In India and Asia traditionally there are culturally imbedded norms about respect for elderly and the responsibility of the young to care for old. The NFHS surveys of 1992-93 and 1998-99 document that still traditional familial support, especially through son, is available to around 88 percent of elderly in India. However, the demographic ageing coupled with fertility reductions implies fewer children to support the aged and the social structures at large (Reddy, 1996).

Dr. Uton Muchtar Rafei, Regional Director of the WHO- SEARO office had surmised that unfortunately the contemporary milieu has witnessed the inopportune erosion and the gradual phasing of joint family system in India with around 12 per cent rural living alone and increasing. These findings suggest that further erosions in traditional family values are inevitable. In absence of well organized social networks and universal access to social security, the scenario for the aged in India, more so the abandoned, remains grim and it is likely that in the not so distant future many of the elderly would be compelled for making their own living arrangements in senior citizens homes. Such a scenario would eventually culminate into greater governmental responsibilities for the care of the aged. It is in this context that this study attempts to explore the morbidity profile of the aged and some important variables affecting the same among elderly people residing in old age homes in the city of Surat.

METHODS

This study explores the health and morbidity profile and important variables affecting the same among 68 residents, aged 60 years and above, of four old age homes run by various trusts located in the city of Surat, through the interview technique, from Oct. 2006 to Jan. 2007, spanning a period of four months after obtaining consent from the organizers and the residents of these old age homes. Out of these four homes two were paid homes, one was a free home for a select religion and the remaining was a free home open to all.

A semi-structured discussion schedule was employed containing variables on socio-economic aspects, diseases and disability profile, health care seeking behaviour, dietary patterns, physical and leisure activities, variables regarding homes for the elderly; dignity. Revisits were made in case we wanted to gather further information or for any clarification or for providing medical care to them. The information collected and other additional information that we judged as important to us was noted in individual interview forms. The collected information was entered in Microsoft EXCEL and subsequently analysed using SPSS package supplemented by manual analysis of the qualitative data.

The intention behind this project were to explore the problems faced by this highly vulnerable group which has been largely discarded by their kith and kin and left to fend for themselves at the end of their life on order to provide medical care to them in the aftermath of the devastating floods of August 2006 which inundated the entire city and decrease their unmet needs.

RESULTS AND DISCUSSION

Their general profile reveals that majority of the respondents were males (54.4%); aged 71 years and above (63.2%); had received primary education (48.5%); were employed in the past (45.6%) or were housewives (39.7%); ever married (69.1%); spouse was alive (29.8%); had children (47.1%); had been staying at the old age home for more than 3 years (58.8%).

Inability of the aged to live alone and the unwillingness of family members to take care of them emerged as the main reason behind their stay at the home. The family members had expressed this in the form of abuse, neglect and refusal to live with them and care for them. The finding of abuse is similar to that reported by other studies (Chokkanathan and Lee, 2005) using logistic regression techniques of 1993 survey data from three states of South India: Kerala, Tamil Nadu and Karnataka had reported that negative self rated health is associated with death of spouse and familial social support ties as the presence of specific kin.

The reluctance or stoppage of the inter-generational family system to take care of the elderly is a matter for serious concern as there is no doubt that if these stop caring for the aged then our

infrastructure is simply not in a position to even take care of a fraction of them. This finding documents the strong need to check the erosion of the entrenched family values and ensure that our traditional age and kinship roles are preserved. Otherwise those elderly who are marginalised and economically deprived would be the first to suffer.

Table 1 : Distribution of the physical health problems of the respondents

Health problems	Frequency (Percentage)
Joint pains & partial immobility	17 (25)
Diabetes	13 (19.1)
Hypertension	19 (27.9)
Total physical immobility	9 (13.2)
Varicose veins	1 (1.5)
Mouth ulcers	1 (1.5)
Asthma	2 (2.9)
Neurological disorders	1 (1.5)
Prolapsed vertebral disc	1 (1.5)
Back pain	6 (8.8)
Severe dental problems	9 (13.2)
Chronic cough	3 (4.4)
Totally blind	1 (1.5)
Partially blind	1 (1.5)
Hearing loss	6 (8.8)
Total	90 (Multiple response)

The diagnosed physical morbidity of the elderly is as shown in Table 1. What is particularly worrisome is the observation that 80.9 percent are suffering from a diagnosed health problem and the average prevalence per aged person is 1.3. Such a prevalence of diagnosed health disorders is indeed high. It can be seen that the majority were suffering from chronic and degenerative diseases and non-communicable diseases. This pattern is similar to that reported by

Reddy based on the 42nd Round of the National Sample Survey, though our prevalence is double that reported by the NSS, as the letter had collected information on seven chronic diseases selective (Reddy, 1996). The pattern of our disease profile reflects the common diseases affecting the elderly as reported by Dhar (2002).

Limited in house health care facilities were available in three of these homes in the form of daily free OPD services by a non-resident MBBS doctor; panel of doctors which can be consulted for routine free treatment and on call for serious patients; hospital of same community located adjacently. However, these three homes did not have any arrangements for free or subsidized referral and treatment of patients requiring specialised medical care, from any external facility. Whereas a well developed hospital was located in the premises of the fourth home. The elderly did not report of having any major problems with their in-house health care facilities. The elderly residing in the paid homes had reported of better quality and user friendliness of the in-house health care facilities as compared to the free homes.

The majority of these elderly frequented the public sector or the government health care facilities for seeking of medical care. They were excluded from the ambit of private providers due to high usage costs. The problems of this category of residents were predominantly related with difficulty to reach these centres and with the out of pocket expenses that had to be borne by them while seeking of care.

Our findings are in line with other Indian studies that have identified distant government health facilities, lack of economic independence and lack of awareness and utilization of geriatric welfare services as among the major needs of the elderly (Goel *et al.*, 2003). Our finding also point to the need for investing in the quality of public services as argued by others (Levesque *et al.*, 2007; Medhi, 2006). Rectification of poor health status through affordable health services and better management of illness and certain low cost interventions (Medhi *et al.*, 2006) are essential to ensure that the elderly, who are often a marginalised lot, can receive a semblance of some equity in access, if not the ideals of essential health care as envisaged in the Alma Ata declaration.

The elderly had also reported on the absence of any routine screening for diseases. They were examined whenever they reported of

any complaints. Screening for diseases and subsequent treatment has been identified as an important tool for improving health status (Medhi *et al.*, 2006; Mohan *et al.*, 2007).

Another important factor that merits attention is the reporting by these elderly of levying of user charges with significant out of pocket expenditures by the public and the government health care facilities. They had also reported that in addition to these user charges, the hospitals hardly dispense medicines etc. and prescribe these from outside, which they cannot afford. The levying of user charges and the unavailability of medicines in government and public hospitals is a very significant factor limiting seeking of health care, as many of these elderly, especially those residing among the free homes, had reported of facing severe budgetary constraints and with their priorities on spending. Therefore this tragically culminated into their forgoing of some treatments, which they perceived as too costly, thereby increasing their unmet needs.

This finding is in line with the conclusion of Gupta *et al.* (2001) who had used the Human Development Indicator Survey of 1994-95 to analyze the health-seeking behaviour of the elderly and had concluded that income was among the two key determinants in deciding who could seek care. Similarly studies from India have reported that, both, urban and rural, diabetic subjects spend a large percentage of income on diabetes management. The economic burden on urban families is rising and the total direct cost has doubled from 1998 to 2005 (Ramachandran *et al.*, 2007). Another important problems associated with management of diabetes is the wide gap between practice recommendations and actual delivery of diabetes care in India (Nagpal and Bhartia, 2007). Similar is the case with hypertension, wherein the majority of hypertensives remain undetected. Among those detected, for the majority, the control of hypertension is inadequate or left untreated (Mohan *et al.*, 2007). Palatty *et al.* (2003) while studying the drug utilisation patterns in geriatric patients with diabetes and hypertension, attending a tertiary care centre, had reported that the drugs used currently in elderly precludes drug safety, compromises quality of life and increased healthcare costs unnecessarily.

The elderly had reported about the conspicuous absence of any charitable trusts, financially or otherwise, to assist them with seeking of external care. Often these residents had to forgo expensive

treatments and face an irregular supply of medications for chronic diseases as diabetes.

The experiences of the miniscule (16%) who could afford care from private providers were good, however such services were being utilised only by those better off and these were all residing in the paid homes. These observations are in line with the reports that the private sector is indeed the predominant source of inpatient care and the public sector has an important role in providing access to care for the poor. (Levesque *et al.*, 2007).

The issues of high prevalence of physical immobility among the elderly as observed in our study merits particular attention as these are unable to perform even their basic functions without external support and their health care seeking behaviour is also very poor. In our study such an external support was fully available to the elderly without any restriction only in the paid homes. This support was available only in context of the services available in the home and not for external services. Further even among the paid homes, the service providers were far more courteous to those elderly who tipped them. Whereas, in the free homes, the intimates themselves had to make self-help through mutual internal arrangements for any assistance with bringing meals etc. to the invalid, whether temporarily or permanently. In the free home for the select religion these services ranged between the other two categories and were variable depending upon the directives of the elected community leaders.

Audinarayana and Sheela, (2002) had also reported of physical disabilities among half of the studied elderly population. Logistic regression analysis had shown that likelihood of physical disabilities increases significantly with age and decreases in higher socioeconomic class. Thus these immobile elderly suffer from the combined disadvantages of poor health status due to their increased age, low socioeconomic class and as well as poor care seeking behaviour due to immobility.

The unmet health care needs for diagnosed ailments were higher in the free homes (47.1%) as compared to the paid homes (32.3%). On the overall, the immobile and single elderly had harboured greater wishes of an early death; lower self esteem and were angry towards their children for reneging their kinship duties at their vulnerable age.

These feelings were mainly a consequence of their sense of dependency and loss of privacy.

The respondents had reported of absence of any advices given to them in the context of vitamin and mineral supplementation or dietary advices or exercises. This assumes significant importance as osteoporosis is common among the elderly due either to excessive bone resorption or diminished new bone formation or both (Arya, 2000). Also numerous studies have brought out the benefits of adoption of healthy lifestyle and regular exercises, yoga and meditation.

Table 2: Distribution of complains/ feelings relating to mental health

Complains	Frequency (Percentage)	
Pervasive feelings of loneliness	42	(23.2)
Feelings of failure	32	(17.6)
Feelings of betrayal	34	(18.7)
Feelings of anger	37	(20.4)
Loss of self esteem	36	(19.8)
Total	181 (Multiple Response)	

Complaints relating to mental health constituted a major chunk of the problems of the elderly, averaging 2.6 complaints per individual. Our discussions with them revealed that the majority (70.6%) of these elderly were deeply affected by the rejection by their family and infrequent visits by their relatives, friends or children, which probably found expression through their feelings of loneliness, failure, betrayal and anger.

It was observed that the feelings of loneliness to be all pervasive and discussions with the subjects revealed that there was not even a single resident who had not harboured such feeling at numerous occasions. Greater satisfaction was observable among those elderly cohabiting with their spouse and those residing in paid homes alike that observed for physical complaints. This finding assumes great importance as studies have shown that mental health conditions are important causes of morbidity and premature mortality for the older people (Sathyanarayana & Shaji, 2007) and account for over one quarter of all disability-adjusted life years (DALYs) in this group. It has been stated that the current prevalence of dementia was around

60% in 2001 and could increase from 71% to 300% by 2040 in India coupled with problems as depression and other mental health problems and will emerge as a major public health problem. Goel *et al.* (2003) had reported that sad attitude towards life, loneliness and ignorance to their advice by family members as among the major needs of elderly.

Typically, the mental problems remain hidden and evade seeking of care due to their low perceived priority (Sathyanarayana & Shaji, 2007) and the usual primary care physicians are often not likely to be involved in such medical care provision. Similarly informal screening by community health workers is likely to result in low sensitivity and positive predictive values.

Table 3: Distribution of the wishes of the respondents

Wishes	Frequency (Percentage)	
Death	26	(38.2)
Good health	30	(44.1)
Relaxed life	18	(26.5)
Money	5	(7.4)
Rebirth as human being	3	(4.4)
Happiness	15	(22.1)
Total	(Multiple Responses)	

The wishes of the elderly, as seen in Table 3, portray their needs and mirror their physical and mental health and their desire for good health tops this list. Their desires reflect their perception to be able to lead a normal, happy and a healthy life as brought out in our discussions. In their desires they aspired for a better health as was realistic at their age and not for the idealistic norms. Their desire for death as observed among 38.2% is disturbing and reflects their mental health. The discussions with respondents revealed various reasons suggestive of this desire such as those listed earlier among mental health complaints; isolation from their family members; physical immobility and disabilities. The desire for death was strikingly absent among elderly cohabiting with their spouse.

Only 47.1% and 27.9% of these residents were supportive of the concept of regular medical assistance or with provision of free medicines through our departmental facilities as their present in-house

OPD services were of a better quality as compared with our limited services. However, they were appreciative of the help that we could provide to them for meeting their specialised and referral needs and call us for advice and remedy whenever they are unable to meet some pressing health need, bringing out the vital need for free specialised care provision to elderly.

The study also brings out the need to train our primary care physicians to deliver comprehensive health services to elderly, encompassing curative interventions for physical and mental illnesses for long-term support and with chronic disease management. This would necessitate a major paradigm stemming from these evolving needs. It is practically infeasible to conjecture that elderly would actually be able to utilise services which involve long waits in crowded clinics for brief consultations with insensitive staff.

We need to ensure that advances in mental health are eventually actualised by incorporating our socio-cultural values and structures and macro-economic factors in existing health policies and programmes to culminate into user-friendly mental health services (Prince *et al.*, 2007; Sathyanarayana & Shaji, 2007), which appears improbable in context of our prevailing health infrastructural capabilities and strengths. This would imply the need for extensive training and empowering of health care personnel and their sensitization to the needs of the elderly.

While surmising based on the present findings, this study would like to point out the fact that our health services would need major paradigm shift in our attempts to ensure that the health care needs of our aged are met and that they are able to live their remaining life with minimum disabilities and with dignity.

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Socio-economic and Health Implications of Population Ageing in India

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ABSTRACT

Population ageing is one of the major challenges of the 21st century. This demographic shift has immensely affected the social fabric, cultural values and economic structure of the society to a great extent. India being an important member of the developing countries will have to bear its share more in the coming decades. This backdrop gives an immense scope to study socio-economic and health implications of population ageing in this context. The present paper makes an attempt to examine (i) demographic, (ii) health and (iii) psycho-social implications of population ageing in the Indian context. It also raises some important policy issues, which will create newer problems to the aged during the immediate as well as in distant future. Finally it has been found that the ageing process has been influenced by the socio-economic development of the society. So, if we are late in thinking about socio-economic implications of population ageing, there will be more issues and questions than answers. It is proper time to seek appropriate and positive solutions to meet the challenges of ageing for the next millennium.

Key Words: Socio-economic, Health, Population ageing

Population ageing is one of humanity's greatest triumphs (WHO, 2002). It is also one of greatest challenges of the 21st century. It is a phenomenon characterized by the decline in fertility and continued

increase in the levels of life expectancy. These two variables are producing fundamental changes in the age structure of the population and are a hallmark of the demographic transition. This transition outlines shift from high levels of mortality and fertility to low levels and is subsequently characterized by a rapid drop in mortality followed by somewhat slower decline in fertility.

However, social scenario of the world is changing rapidly and this change is going to drastically alter the face of the world in the next millennium. This alteration will be manifested with many societal problems in the global context. The steady and sustained growth of sixty plus population is one such global phenomenon. This demographic shift will affect the social and economic lives of human beings to a great extent. However, this alteration is not uniform. Within the same region demographic transition may vary from one country to another. Furthermore, the impact of this ageing process on social and economic lives of older peoples of different countries will be varied in nature, depending on their social fabric, cultural values and economic structure of the society. India being an important member of the developing nations will bear its share more in the coming decades.

The present paper attempts to probe the implications of the ageing process for the social and economic lives of human beings in the 21st century. Broadly the paper will highlight some implications of population ageing which will intensify and create newer problems to the aged vis-à-vis society during the immediate as well as distant future.

In India, studies on demographic aspects of ageing are not too few. Overall these demographic studies especially in the context of population ageing in India can be broadly grouped into a number of categories which are as follows – several indicators of population ageing (Guha Roy, 1985; Bose, 1988; Guha Roy 1999; Biswas, 1994; Vijaya Kumar, 1999; Bhaswar, 1999); population ageing in developed and developing countries (Bose and Gangrade, 1988); historical pattern of mortality and fertility declination in India (Goyal, 1997); comprehensive demographic account of the elderly in India (Rajan, Mishra and Sharma, 1999; Karkal, 1998); gender differentials in ageing and widowhood (Gulati and Rajan, 1999); demographic determinants of ageing process (Gulati, 1989); socio-demographic dimensions of

population ageing in India (Pati and Jena,1989); demographic trends and socio-economic implications (surpal,1986); population ageing in the context of Asia (Dhar Chakraborty,2004) etc. These are a cross section of the literatures on population ageing, which have been mentioned here. However omission is unintentional.

OBJECTIVES

The present paper makes an attempt to examine (i) demographic, (ii) economic, (iii) health and (iv) psycho-social implications of population ageing in India. Along with this, the paper also highlights some important policy issues, which may create newer problems to the aged during the immediate as well as in distant future. The secondary data sources have been used for understanding the present problem.

Population Ageing in India

The world's elderly population has been growing for centuries. What is new is the rapid pace of ageing. The Indian situation can be better understood in the context of worldwide trends in population ageing. The trend is built up on the basis of UN Population Projections (UN, 1988) (Table.1). The size of the elderly population of age 60 years and above will cross one billion mark in 2020. Share of the less developed countries will be more than 0.7 billion, which is 69.5 per cent. Out of the total share of the developing region, Asia (excluding Japan) will contribute 77 percent of the aged population; where as about 72 percent of the sub population of elderly in Asia will be contributed by China and India. A new kind of population problem, hitherto known only in developing countries, is thus imminent in these two most populous countries of the world (Guha Roy, 1985).

In India, since 1961 sharp decline in the overall death rate and also in mortality levels in the older age groups initiated a process of ageing. This has accelerated after 1971 when the fertility level also started declining. The elderly population from 12.06 million in 1901 to 19.61 million in 1951, an increase of about 63 percent. Between 1951 and 1971 the number of elderly increased by about 67 percent, reaching 32.70 million by 1971. During 1971-81, the increase in the aged population was about 32 percent as against the increase of 24.7 percent recorded for the total population during this period. During the decade 1981-91 the old age population increased by 13.5 million with a decadal growth rate of 31 percent. According to estimates made by

the Technical Group on Population Projections, the likely number of the elderly by the year 2016 will be around 113 millions (Census of India, 1999). The data clearly reveal that the absolute number of elderly population (60 years and above) is increasing rapidly, and the population is beginning to age (Table.2). This consequence is also reflected in the age structure of aged population, which suggest an increasing trend in the proportion of old. The growth of old-old and very-old more or less remains same over time, but other age groups between 69 to 80 years shows an increasing trend over the decades (Table.3). In Indian context, men outnumber women. This phenomenon is also true in the young-old (60-70 years) age groups. But as age increases, the sex ratio is in favour of women in the old-old and very-old age groups (sex ratio is defined as the number of females per 1000 males) (Table 4). Practically all section of the world has experienced continuous improvements in life expectancy and India is not exception to this phenomenon. Another important feature that can be mentioned here is the men's life expectancy, which is uniformly, lower than women's (Table.5). The other consequence of such phenomenon is reflected in rural-urban living. India being an agrarian country, more than three fourth of the aged person are residents of rural areas (Table.6). As a consequence of which the effect of population ageing is more severe in the countryside than it is in the urban area. In the following section we discuss the perceptible changes.

Table 1 : Worldwide Trend of Population of 60 Years and Above : 1980-2020

Region / Country	1980	1990	2000	2010	2020
A. Population Aged 60 and Over (in Million)					
World	381.2	484.7	608.7	754.2	1011.6
Developed	173.3	203.6	234.6	232.4	308.2
Developing	207.9	281.8	374.1	491.8	703.4
Africa	23.4	30.9	41.8	57.0	82.0
Latin America	23.4	31.7	41.9	56.4	80.7
Asia(excluding Japan)	160.0	218.2	290.0	377.7	539.9
China	73.6	101.2	131.7	167.9	238.9
India	44.6	60.2	81.4	107.0	149.7

B. Proportion of Aged 60 and Over Population (in Per cent)

World	8.6	9.2	9.9	10.8	12.9
Developed	15.2	16.8	18.4	19.7	22.4
Developing	6.3	7.0	7.7	8.7	10.9
Africa	4.9	4.8	4.8	4.9	5.6
Latin America	6.5	7.0	7.7	8.8	11.0
Asia(excluding Japan)	6.5	7.4	8.5	9.8	12.8
China	7.4	9.0	10.5	12.4	16.6
India	6.5	7.3	8.4	9.9	12.6

Source : United Nations, World Demographic Estimate and Projections, 1950-2025 United Nations, New York Population Aged 60 and Over (in Million)

Table 2: Increasing Trend in the Proportion of Aged (60 Years and Above) in India, 1961-2021

State / Union Territory	Year						
	1961	1971	1981	1991	2001	2011	2021
India	5.63	5.97	6.28	6.58	7.08	8.18	9.87

Source : Census of India , 2001

Table 3 : Growth of Older Population in India, 1961-2001

Age Group	Year				
	1961	1971	1981	1991	2001
60 - 69	65.12	65.37	64.13	62.82	63.58
70 - 79	24.83	24.85	26.31	25.93	26.31
80 - 89	7.92	7.68	7.86	9.06	9.15
90 - 99	1.74	1.71	1.39	1.92	1.97
100+	0.40	0.4	0.31	0.27	0.29

Source : Census of India, 2001

Table 4 : Sex Ratio for the Elderly in India, 1961-2001

State/Union Territory	Age Group	Year				
		1961	1971	1981	1991	2001
India	60-64	77	92	94	94	91
	65-69	96	92	96	94	97
	70+	106	97	98	93	102

Source : Census of India, 2001

Table 5 : Life Expectancy at 60 + : India

Period	60 years		65 years		70 years	
	Male	Female	Male	Female	Male	Female
1901-11	9.0	9.3	7.3	7.6	5.8	6.0
1911-21	9.0	9.5	7.3	7.7	5.8	6.2
1921-31	9.3	9.9	7.5	8.0	6.0	6.4
1931-41	10.0	10.6	8.0	8.6	6.3	6.8
1941-51	10.9	11.4	8.8	9.2	6.8	7.3
1951-61	12.3	12.8	9.8	10.3	7.6	8.0
1961-71	14.0	14.3	11.1	11.5	8.6	8.9
1971-81	16.1	16.1	12.8	13.0	9.7	9.9
1981-91	17.3	18.0	13.7	14.5	10.4	11.0
1991-2001	18.1	20.0	14.6	15.9	11.0	12.1

Source : Malaker and Guha Roy , 1986

Table 6: Trends in the Proportion of Aged in Urban and Rural Areas, India

State/Union Territory	Year				
	1961	1971	1981	1991	2001
India					
Rural	5.83	6.21	7.21	7.15	7.10
Urban	4.74	4.98	5.37	5.79	5.95

Source : Census of India, 2001

Perceptible Changes

Economic Aspect

As the demographic transformation takes place in the new millennium, the impact on country's economy will not be a one-way process. On the one hand it is likely that such a large number of aged population cannot be fruitfully accommodated within the present framework of the economy. But the services of such large number of aged population can also be channelized in the manner that will be beneficial to the economy. A nation wide survey reveals that as many as 70 percent of the aged had to depend on others for their daily maintenance. The situation is worse for elderly females (Table.7). In this context it is very much pertinent to know the economic support providers to those elderlies. About 75 percent is provided by their own children, a sizeable portion (14 to 16 percent) by spouse, 5 to 6 percent by grandchildren and the rest by the relatives or non- relations (Table.8). But for economically independent ones, about 95 percent have one or more dependents (Table.9). The analysis shows that the situation in so far as the elderlies are concerned has become a complicated system where care providing requires a closer look in relation with the economic situation.

Being an agrarian country, Census data reveal that out of the productive workers in the 60 years and above age group, about 80 percent of the males and 85 percent of the females are in agricultural sector, where as very few percentages are involved in household industry sector (Census, 2001). In both these categories females outnumber the males. In organized sector like service, manufacturing including professional and technical jobs, participation of elderly males and females are poor. The reason for such a differential phenomenon in rural and urban India could partly be explained by the sector and states of employment. In urban areas, a significant proportion of the working population is engaged in regular wage employment and in this category there is a fixed age of mandatory superannuation. People are provided with retirement benefits. On the other hand in rural areas, the scope of regular wage employment is limited. The rural people mainly engage themselves in the agriculture sector as self-employed. As there is no age limit for superannuation, people continue to work even after the age of 60 years (Table.10).

Table 7 : Per 1000 Distribution of Aged Persons by State of Economic Dependence for each Sex

India Gender	State of Economic Dependence				Total
	Not Dependent on Others	Partially Dependent on Others	Fully Dependent	No Response	
Rural					
Male	485	180	313	22	1000
Female	121	146	706	27	1000
Person	301	163	511	25	1000
Urban					
Male	515	169	297	19	1000
Female	115	110	757	18	1000
Person	311	139	532	18	1000

Source : National Sample Survey 52nd Round Survey

Table 8 : Per 1000 Distribution of Care Provider of Economically Dependent Aged

India Gender	Spouse Children	Economic Care Provider			Total
		Own Children	Grand	Others	
Rural					
Male	113	766	50	71	1000
Female	159	717	52	72	1000
Person	142	735	52	71	1000
Urban					
Male	105	792	54	49	1000
Female	182	695	56	67	1000
Person	156	728	55	61	1000

Source : National Sample Survey 52nd Round Survey, 1995-96

Table 9 : Per 1000 Distribution of Economically Independent Aged Persons by their Dependents

Aged Persons by their Dependents						
India	Number of Dependents					Total
Gender	Nil	1	2	3 - 5	6 or above	
Rural						
Male	35	348	150	266	201	1000
Female	157	242	102	162	337	1000
Person	52	332	144	251	221	1000
Urban						
Male	32	434	181	218	135	1000
Female	175	303	101	91	330	1000
Person	51	416	170	201	162	1000

Source : National Sample Survey 52nd Round Survey, 1995-96.

Table 10: Per 1000 Distribution of Usual (Principal) Activity Status of Aged

India Sex	Usual Activity Status				Total
	Self employed in Agri- culture	Non- agriculture	Regular Employees	Casual Labour	
Rural					
Male	662	111	12	215	1000
Female	509	92	29	370	1000
Person	627	106	16	251	1000
Urban					
Male	176	567	147	110	1000
Female	203	354	152	291	1000
Person	182	523	150	145	1000

Source : National Sample Survey 52nd Round Survey

A comparative outlook of young (15-59 years) and 60+ workforce participation reveals that the proportion of the elderly in service sector has almost reduced by half from 39 percent to 20 percent among elderly males and one third from 18 percent to 12 percent among the females. Surprisingly, those employed in agriculture goes up substantially higher among the 60+ age groups as compared to young age group; the rise is 59 percent to 78 percent for males and from 78 percent to 84 percent for females. Increasing participation of females in the workforce is the result of changing trends in value system. Moreover, the out migration of younger generation compelled the aged to work for self-maintenance (Vijayanunni, 1997).

A common but useful way of assessing the impact of age structure on economic well being can be better judged through dependency ratio (Kinsella, 1994). The elderly population in India is diverse in terms of their needs and abilities. As a consequence of this phenomenon, elderly will form a highly dependent group that could have an adverse effect on the economy at the national as well as at the State level. Generally, child, elderly and the total dependency ratio, are the three markers that leads to understand the overall dependency on bread earning groups.

Over the decades, the old age dependency is gradually increasing and the fall out is seen more in females (Table.11). This is due to less workforce participation of females. On the other hand, from a comparative outlook it is evident that child dependency is gradually decreasing, whereas elderly dependency is gradually increasing (Table.12). This has happened because of a continuous proportional decline in the population aged 0-14 years due to decline in fertility rates. Another important observation from demographic projection indicates that gradual decline in the birth rates will decrease the load of child rearing cost. Where as, increasing trend of life expectancy will increase the huge dependency load of elderly. This is an alarming demographic trend that requires a substantive adjustment in the economic sphere of the government. In other words the productivity of the elderlies (60-70 years) need to be reassessed and as far as applicable the varied experience of the group should be reemployed for the overall benefit of the society and thus may minimized the adverse effect of such dependency syndrome.

Health Aspect

With the growing elderly population in this country, their health status is becoming a great concern. Geriatric treatments are not yet in the state of formative structure in India. The supply of health manpower and arrangement for basic medical infrastructure are utterly inadequate to cope with this growing population. With advancing years the elderly have a number of health problems; most of them are chronic in nature. However elderlies suffer not only from chronic ailment specific to old age, but also from ill-health accumulated over the life span that may manifest itself in old age in an aggravated form.

Table 11 : Old Age Dependency Ratio by Sex, India, 1961- 2001

Year	Total	Male	Female
1961	10.93	10.91	10.94
1971	11.47	11.39	11.57
1981	12.04	11.84	12.24
1991	12.26	12.16	12.23
2001	12.59	11.72	12.05

Source : Census of India, 2001

Old Age Dependency Ratio = Number of Persons 60

Persons in the Age Group 15-59

Table 12: Dependency Ratio and Indices of Ageing, India, 1951-2001

Year	Dependency Ratio			
	Child	Elderly	Total	Index of Ageing
1951	68.49	9.8	78.29	14.31
1961	76.97	10.93	87.90	13.72
1971	80.82	11.47	92.29	14.2
1981	73.64	12.04	85.68	16.18
1991	61.43	12.26	73.69	18.42
2001	50.94	12.59	63.53	24.72

Source : Census of India , 2001

On the basis of existing evidences from causes of death in India, it appears that for the age group 65-69 years about 38 percent of the deaths in urban areas occur due to disease of the circulatory system followed by 20-22 percent of these by symptom, signs and ill-defined conditions where as about 8 to 10 percent of the deaths occur due to infectious and parasitic diseases. For the age group 70 years and above those three groups of diseases are the major causes of deaths. Next comes nutritional, metabolic, gastro-intestinal and genitor-urinary disorders (Table.13). The prevalence of chronic diseases among the aged in general seem to be very high. It is higher in urban areas (55 percent) than in the rural areas (52 percent). Elderly peoples are suffering from chronic disorders, joint problems, cough and cold, hypertension, diabetes and heart diseases. 'Problem of joint' and 'cough' happened to be the most severe chronic diseases for the aged. Greater prevalence of blood pressure, heart disease and diabetes in the urban areas compared to that in rural areas reflects the disparity in development (Table.14). Thus the health experiences of the aged population in India are consistent with the *Theory of Epidemiologic Transition*, which suggests that health problems shift from communicable and infectious diseases to chronic and degenerative diseases with improvement in socio-economic level (Omran, 1971).

Disability is viewed as largely the result of cumulative experience over life cycle with disease and injury. With the advancement of chronological age, elderly peoples are suffering from four major components of impairments, such as hearing, loss of vision, locomotors problem and loss of memory. The age of onset of impairment, according to the National Sample Survey Organization (NSSO of 1991) was 60 years or above for 54 percent (locomotors disability) to 69 percent (visual impairment) of the elderly persons. Visual impairment is one of the most common non-lethal conditions among the elderly. Elderly women suffer more than men in the impairment of vision probably due to more nutritional deficiency (restrictions to dietary intake due to widowhood) and Vitamin A deficiency in particular. Besides, it is evident that elderly females suffer more from locomotors problems, which is an obvious consequence after menopause. Loss of hearing appears at later old age. The major contributing factors in urban areas being the noises created above the permissible limit by vehicular traffic, factories and excessive use of electronic gadgets (Table.15).

Table 13 : Percentage Distribution of Medically Certified Death for Aged Persons by Sex according to the Major Cause Groups for Urban Areas, 1993

Cause of Death	65 - 69		70+	
	Male	Female	Male	Female
Infectious and Parasitic Diseases	13.2	9.6	9.3	6.5
Neoplasms	5.3	6.9	4.1	3.8
Endocrine Nutritional and Metabolic Diseases and Immunity Disorders	4.9	6.5	4.1	4.5
Diseases of Blood and Blood Forming Organs	1.5	1.8	1.4	1.9
Mental Disorders	0.2	0.1	0.1	0.1
Diseases of the Nervous System and Sense Organs	1.9	2.3	1.9	1.9
Disease of the Circulatory System	38.3	36.6	36.9	36.9
Disease of the Respiratory System	8.2	7.1	9.7	10.2
Disease of the Digestive System	5.1	3.5	3.2	2.4
Disease of the Genito-Urinary System	1.8	1.7	1.7	1.2
Disease of the Skin and Subcutaneous Tissue	0.2	0.3	0.2	0.2
Disease of the Musculo-Skeletal System and Connective Tissue	0.1	0.3	0.1	0.1
Symptoms Signs and Ill-defined Conditions	15.7	19.5	24.1	27.3
Injury and Poisoning	3.5	3.3	2.9	2.6
Other Causes	0.1	0.5	0.3	0.4
All Causes	100.0	100.0	100.0	100.0

Source : Census of India, 2001

Table 14: Per 1000 Distribution of Aged Persons having Chronic Diseases by Gender

India Type of Chronic Disease	Rural		Urban	
	Male	Female	Male	Female
Cough	250	1958	179	142
Piles	33	16	32	18
Problems of Joints	363	404	285	393
High / Low Blood Pressure	108	105	200	251
HeartDisease	34	27	68	53
Urinary Problem	38	23	49	24
Diabetes	36	28	85	66
Cancer	2	3	2	4
Any of the Above	527	514	528	560

Source : National Sample Survey 52nd Round Survey, 1995-96

Note : Multiple Responses Occurred

Table 15 : Per 1000 Distribution of Aged Persons having Type of Physical Disability by Sex

India Type of Physical Disability	Rural		Urban	
	Male	Female	Male	Female
Visual	249	291	225	260
Hearing	139	156	111	132
Speech	32	38	29	3
Locomotor	107	115	80	94
Amnesia / Senility	96	113	61	80
Any Disability	380	425	333	367

Source : National Sample Survey 52nd Round Survey

Note : Multiple Responses Occurred

Social Aspect

The family is the key unit that provides social and economic support to the individual at different stages of life. In India, still now the family structure is horizontal with children and fewer generations above. The extended family system is the dominant form of family. Very high percentages of the aged person are still living in family with spouse and sons or kin. In such a system, the aged who have lost their spouses, depend on their children for living, a true reflection of Indian tradition. The rural-urban difference is negligible in this respect. Very few percentage of the aged have no surviving children (Table.16). Regarding living arrangement, one distressing observation is that while majority of the aged males are living with their spouses, majority of their counterparts are living either alone or with their surviving children or live with other relations and non-relations. This pattern is observable due to the impact of the higher incidence of widowhood generated by difference in age at marriage and longer life expectancy of elderly females (Table.17). The other important phenomenon is the care-giving role of the family. But this role also has undergone many a changes due to the impact of urbanization, industrialization, modernization and even globalization. The consequence of which is the relinquishment of traditional role and status by the elderlies. Thus the family can neither fulfill their needs nor is to give them physical, material and emotional supports. But still then aged prefer to secure a tender healing touch from the member of the family particularly in their twilight years.

Table 16 : Per 1000 Distribution of Aged Persons by Type of Living Arrangement by Gender, India

Living Arrangement	Rural		Urban	
	Male	Female	Male	Female
Alone	25	61	30	60
With Spouse Only	137	77	103	57
With Spouse & Other Members	613	313	648	297
With Children	179	481	178	512
With Other Relations & Non-relations	38	59	35	65
No Response	8	9	6	9
Total	1000	1000	1000	1000

Source : National Sample Survey 52nd Round Survey

Table 17 : Percentage Distribution of Aged 60+ by Marital Satus, Sex, India 1961-2001

Year	Never Married		Married		Widowed		Divorced Seperated	
	Male	Female	Male	Female	Male	Female	Male	Female
1961	2.86	0.41	69.06	23.72	27.47	75.36	0.57	0.45
1971	2.43	0.37	74.67	30.04	22.37	69.17	0.46	0.37
1981	1.95	0.36	78.19	34.89	19.4	64.33	0.39	0.40
1991	3.45	1.39	80.7	44.16	15.47	54.04	0.32	0.40
2001	NA	NA	NA	NA	NA	NA	NA	NA

Source : Census of India, 2001

Implications and Consequences of Transition

The ageing process has already begun in India. The above discussion clearly depicts that in India, population ageing and its character are undergoing a significant change. In this section, the paper will highlight some aspects of implications and consequences of gradual demographic and subsequent transitions in India.

Demography

- The process of population ageing is a by-product of fertility and mortality declines. It is neither amenable to change nor it can be modified or altered and hence ageing of population will continue in future years to come.
- Number of aged persons will increase in a rapid manner, which will encompass a larger proportion of the total population. As a result they will survive in an ageing society.
- In the near future, their percentage will be more in the age group of 60-80 years of age.
- The index of ageing which is another indicator of population ageing is expected to pick up faster within the next thirty years.
- Sex ratio will increase over the decades, which makes an imbalance among the old. There is likely to be a preponderance of females in the old-old age group.
- Increased trend of urbanization will compel the elderly population to concentrate more in urban areas.

- Literacy rate of the elderly population will increase. The rate will increase more within urban elderly females.
- Increasing trend of life expectancy of females will compel them to spend their twilight years of life in bitter ashes of widowhood.
- In India, the regional and cultural difference of population ageing is to be reckoned.

Economy

- The strength of an economy lies in its productive forces, which is based on youth of the country. Due to population ageing country's economy will suffer in the next millennium.
- A large proportion of the labour force will cease to work due to retirement. There will be inadequate replacement by the youth due to low fertility rate in ageing societies. Country will become a pensioner's paradise.
- More rural elderly will contribute to their higher labour force participation mainly in agricultural sector. In urban areas, there will be much unorganized labour in the service and manufacturing sectors.
- The burden of dependents of the aged will increase.
- Old age dependency will increase and economic care provider will be less in the family.
- The aged will face economic hardship more and this hardship will be more among the rural aged.
- Large number of women will not be engaged in gainful occupations.
- Non-working women will always be grater, and their economic dependence will increase.

Health

- Elderly will suffer more from a variety of ailments.
- Mortality rate will further decline and life expectancy will also increase both at birth and at the age of 60 years.
- In comparison to earlier ages mortality rate of elderly females will continue to be lower.
- Increased environmental pollution along with hazards will continue to contribute to much physical impairment to the urban aged than rural aged.

- To provide better health care services to the rapidly increasing number of elderly, geriatric health care services are positively required.
- Geriatric care arrangement will suffer due to inadequate geriatric care education, management and infrastructure.
- Elderly women will suffer more from nutritional deficiencies, chronic diseases and disabilities.
- Cost effectiveness and quick recovery of allopathic medicine will be considered more effective.

Psychosocial

- Elderly women will suffer more from widowhood. In a male dominated society , mostly dependent elderly females will have unhappy family relationship.
- Widowhood along with lower status of elderly women will lead to the difference in their living arrangements.
- Rapid urbanization along with globalization will create more stress and strain to maintain co-living with aged parents.
- Instead of extended family structure, a trend will be more towards tiny atomic nuclear family where the intra-family role and status of the elderly persons will be devalued.
- Individualistic and self-achievement oriented outlook of the youth will increase more.
- Work participation rate of younger women will increase more. They will be unable to play dual role of earner and care giver.
- Instead of informal family support, institutional support will be required more.
- Career aspirations will lead the younger generation live away from their aged relatives. Modern communication and technologies will play an important role in fulfilling their responsibilities.
- Many emotional problems will crop up due to estrange relationships of household members.
- Aged will face newer problems and challenges of adjustment (social, behavioural and attitudinal) in an emerging industrial culture.

- Aged couple or lonely aged will be more exposed to the hazards of ageing, isolation and loneliness.

Issues and Policy Guidelines

Issues

The above discussions on population ageing and its obvious consequences on demographic, economic, health and psychosocial aspect have raised some emerging issues which are extremely important for government (central, state and local), policy makers, social workers and non-governmental organizations about the present and future of graying population. These are –

- Due to rapid urbanization, extended family structure is changing drastically. In this transition, how far the informal support system can be sustained? If it is not sustained what will be the alternative support system for the aged in future?
- Informal family support system will be weakening more due to economic crisis in family. How this support can be strengthened?
- In urban areas more elderly labour force will be in unorganized sector, which does not provide any old age benefits. So how does the scope for this population can be developed in the unorganized sector?
- Being a developing country India is restructuring its economy in the light of globalization. How it can safeguard the interest of the aged population?
- Demographic transition, gradual disappearance of informal family support, changing priorities of younger generation, increasing trend of women's workforce participation have raised the fundamental issues of social security of graying population in today and tomorrow. Who will bear the responsibility, family or community or the state?

Policy Guidelines

In the light of the above issues some policy guidelines have been identified for better living of our parental generation.

- Problems of ageing should require a holistic approach for solution.
- Aged are a class, which is not homogenous. So, plan, priority should be worked out considering of age, gender, marital status,

religion, language, economic, social categories and cultural tradition.

- Regarding planning, priority should be given on education, economy, health and psychosocial aspects.
- Viable social security system for elderly women that will meet their health and other needs.
- Government has to reconsider their retirement policies keeping in mind the demographic transition.
- Geriatric assessment and health services needed.
- Agreement of health education for preventive geriatrics is of utmost importance.
- Effective implementation of the 'Maintenance-Care and Protection' law.
- Policies should emphasize social security (particularly in unorganized sector), health care, living arrangement, housing and other life satisfaction.
- G.I.S (Geographical Information System) should be implemented for aged data base, which will help in information updating, monitoring, and dissemination for researchers, academic courses and policy formulations.
- To support policy and development programs the exchange of researchers and research findings between national and international agencies should be privileged for international co-operation on ageing.
- Courses should be included on ageing issues in the university, college and school curriculum focusing the importance of aged persons in the society with a backdrop of Indian tradition.

In conclusion, it appears that population ageing is one of the most important and challenging issues in this millennium. It may be inferred that in this country, the ageing process has been largely influenced by the socio-economic development of the society. But the problems require serious thinking on the part of the government and the civil society. Unless we find proper answers and solutions to mitigate such problems like population ageing, the large sections of the aged population in this country will face more hardships both economically and socially. To address this problem we will expect the government to rise and mould its economic policies in a more planned manner and

offer enough relief and social security to the aged population in India. On the part of the civil society it is expected that more awareness will be generated with regards to the problems of the gerons and a special emphasis need to be stressed upon to address the adverse gender inequality in terms of the female aged.

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Working and Non-working Rural and Urban Elderly: Subjective Well being and Quality of Life

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ABSTRACT

The present study is an attempt to explore the experience of subjective well being and quality of life among working and Non-working elderly across rural and urban settings. The measures used in this study were P.G.I. health questionnaire, Satisfaction with life scale and Quality of life scale. Results show that elderly of this study have low levels of health problems. Elderly are more satisfied with future and experience better quality of life. Rural elderly showed more physical health problems compared to urban elderly. On the other hand urban elderly were more satisfied with past. Rural elderly showed more satisfaction with future. Urban elderly experience more independence, better social relations, environment and total quality of life in comparison to rural elderly. No significant differences were, however, found for working and Non-working elderly.

Keywords : Subjective well-being, Quality of life, Working, Non-working, Rural, Urban elderly.

Elderly is a term that has a relative meaning. It varies from society to society and culture to culture. It can be thought in terms of biological, sociological and psychological aging (Mukherji, 1972). If a person is biologically old but possesses a youthful temperament, then sociologically and psychologically he is younger than his biological age.

India ranks second among countries of the world having large number of elderly population. Old age in India begins at 60 years of

age (Mahadaven, 1986). This is the age when a working individual generally retires and finds him/her self in a workless position. This major change in life results in various physical, financial and psychological problems (Batra, 2004). Retirement, for most of the employees, is traumatic and degrading experience. Firstly because the status which they achieved during their entire past life is taken away over night and secondly, there is a deterioration in monthly salary. The pinch of these changes is felt more by people who still have a good health and feel that they can contribute more to the society because of their expertise and knowledge. Miller (1965) has pointed out that the loss of occupational identity and the associated feeling of inadequacy leads to low morale, decreased level of satisfaction, embarrassment, feeling of inferiority in social interaction and poor health. There are several studies showing retirement is closely related to poor health (Batcheler and Nepier, 1953; and Johnson 1958) and deterioration in mental health (Towsend, 1955; Tunstal, 1966). It also results in poor economic condition that emerges as a major factor affecting retirees' adjustment to a new way of life (Cox and Bhak, 1979). People who have no accumulated saving prior to the retirement and not getting pension feel permanent disempowerment.

Retirement always does not mean real economic deprivation, but it does require learning to live with meager resources. In a study of retired person in greater Bombay, Desai and Naik (1974) found that one third of the retired persons had no savings, two third of them had no social liability, nearly 65% of them had good relationship with other family members both prior and after the retirement. It has been observed that some people have improved health after retirement show high life satisfaction and continue to do many of their former work related roles.

In the light of above contradictory findings it may be said that the life after retirement in many cases become problematic. One positive feature concerning the elderly population is that most of the 60 years old, today, are engaged in jobs for which no specific age is set for retirement. Also many elderly are re-engaged in areas of their interest after retirement. This leads to better social adjustment (Jayshree and Rao, 1991), emotional security (Batra, 2004), close relationship,

physical well-being and involvement in social activities (Bhatia, 2002).

The present study focused on the subjective experiences of working and non-working elderly and their quality of life. It was assumed that working elderly are economically independent and have respect in their family and social life, enjoy positive experiences resulting in better quality of life. In contrast, elderly who are not engaged in any work are entirely, or in some degree, dependent for their livelihood on their children, experience problems in interpersonal relationship, emotional insecurity and loss of power and leading a low quality of life (Batra, 2004).

Another focus of this study was on rural and urban differences. With the onset of modernization and industrialization there is a greater migration of the population from rural to urban areas and also shift from the traditional occupation (agriculture) to modern trade (finance and service). This change has greater input on personal experience of well-being. In traditional occupation people used to engage in work till their physical capability allowed they used to experience power, prestige in family and social life and economic independence. But with the change of traditional occupation, there is a shift in elderly life experience. In service, there are age limits to engage in a job and after that person has to live on pension or savings. This differences is obvious in terms of urban and rural elderly, most of rural elderly are still engaged in agriculture work. As compared to urban elderly, rural elderly may have more positive experiences and better quality of life.

METHOD

Sample : The sample consisted of 60 elderly with equal number (30 each) from rural and urban areas. The sample was further divided amongst engaged and non-engaged in work groups, where the former constituted those who were still involved in some work for their livelihood, the latter were not engaged in any job for their livelihood.

Measures:

P.G.I.Health Questionnaire : It is a self-report measure of thirty-eight items developed by Verma, Wig and Prasad (1986).The scale consisted of two dimensions of physical health with a range of 0-16

and Psychological health with a range of 0-22. The total scale score ranges between 0-38. High score indicates experiencing more health problem (propensity to develop neurotic system under stress). This scale has internal reliability of 0.86 and test retest reliability was found to be the 0.88.

Temporal Satisfaction with Life (TSWL) : Diener, Emmons, Larsen and Griffin (1985) developed this scale. It has 15 items, out of this equal number of items were related to past, present and future satisfaction. The items were scored on a 7 point scale ranging from strongly disagree (1) to strongly agree (7). This possible score could range from 15 to 105 and for each dimension Satisfaction with Past, Present and Future, the range of scores was 5-35. The alpha reliability was 0.92 and retest reliability was 0.83. The Hindi version of this scale was significantly and positively correlated ($r = 0.79$) with original English version. High score indicate high life satisfaction.

Quality Of Life (QOL) : This scale was developed by W.H.O. (1995). This scale consists of 100 items with a range of 100-500, based on 7 dimensions i.e. score for General Health, range is (4-20); for Physical domain, range is (12-60); for Level of Independence, range is (16-80); for Social relationship, range is (12-60); for Environment, range is (32-160); for Spirituality, religiosity and personal beliefs, range is (4-20). The items were on 5 point scale ranging from strongly disagree (1) to strongly agree (5) and high score indicates high quality of life.

Procedure: The investigator approached the sixty five elderly at their residences and rapport was developed. Possibility was explored for participation in the study and they were explained the purpose of the research and asked to cooperate in the study. After understanding the purpose of research and measures, subjects felt interested and agreed to participate in the present study. Doubts and enquires by the respondents were clarified. Out of sixty-five individuals sixty completed the questionnaire and five of them did not complete the entire questionnaire. Hence, five individuals were excluded from the study and thus the final sample consisted of 60 participants.

RESULTS

Table 1 : Mean Score of Health & Subjective Well-being (satisfaction with life)

Variable	Health			Satisfaction With Life		
	Psycho	Physical	Total	Past	Present	Future
Score						
Mean	7.1	8.08	15.18	20.25	20.80	24.82
Sd	4.59	5.12	9.71	5.95	6.50	6.59

Table 1 shows the mean scores of health & subjective well-being (satisfaction with life). Scores indicate that elderly experience lower level of health problem and optimism and in case of Satisfaction with Life, they are satisfied with the past, present and future. The degree of satisfaction was more for future than the past and present.

Table 2 : Mean Score of Quality of Life

Variable Score	Quality of Life						
	Health	Physical	Psycho	Indep- endence	Social Relation	Environ- ment	Spiritua- lity & belief
Mean	13.82	35.17	60.57	46.93	38.63	100.70	12.77
Sd	3.06	8.88	9.70	7.89	7.73	13.90	2.68
							306.73
							37.18

The mean score of variables of Quality of Life show that elderly did not experience better in context of two variable of Quality of Life (i.e. Physical and independence) and on the other variables they experienced better Quality of Life and also on over all Quality of Life.

Table 3 : 2x2 ANOVA for mean difference between rural and urban and working and non-working.

Variable	Dimensions	Rural	Urban	F value
Health	Physical Health	9.87	6.30	8.04**
Satisfaction with life	Satisfaction with Past	18.57	21.93	5.11*
	Satisfaction with Future	26.70	22.93	5.21*
	Independence	44.97	48.90	3.86*
Quality of Life	Social relations	36.37	40.90	5.62*
	Environment	96.20	105.20	6.70*
	Total Quality of Life	294.70	318.77	6.92**

**p<.01, *p<.05

(No differences were found between working or non -working and for the interaction effect.)

Table 3 shows that the rural and urban elderly significantly differ on the following dimensions of (Physical health, Satisfaction with life: past and future, and quality of life: Independence, social relations, environment, total quality of life) and apart from this the other variables of other dimensions like (Psychological health, Satisfaction with present, Quality of life: Health, Physical, Psychological and Spirituality and beliefs), also, did not differ significantly.

DISCUSSION

The focus of the present study was to explore subjective experiences of working and non-working elderly and to understand their quality of life. It was assumed that since working elderly are economically independent and have respect in their family and social life, they enjoy positive experiences which result in better quality of life but those elderly who are not engaged in any work are entirely, or in some degree, dependent for their livelihood on their children, experience problems in interpersonal relationship, emotional insecurity and loss of power which leads to low quality of life.

Another focus of this study was on exploring rural and urban differences. It was assumed that since in urban life elder persons live on pension or savings whereas most of rural elderly are engaged in agriculture work. Rural elderly may have more positive experiences and better quality of life than the urban elderly. The main findings of the study are as follow:-

1. Elderly showed low level of health problems but they showed less psychological problems as compared to physical problems.
2. Satisfaction with life is more in future than in past and present but they are also satisfied with past and present.
3. In Quality of life elderly did not show good scores on variables (Physical & Independence) but they experience better quality of life on such variables : health, psychological, social relation, environment, spiritual /religion.
4. Rural elderly face more health problems (physical) compared to urban elderly.

5. Urban elderly are more satisfied with past and rural elderly showed more satisfaction with future.
6. In Quality of life urban elderly experience more independence and better social relations, environment and total quality of life compared to rural elderly.
7. Working and non working elderly did not show any significant difference on the all above variable.

Table 1 shows the mean score of overall health (15.18) and shows low level of health problem, mean of Physical health (8.08) & Psychological health (7.10) shows that elderly face more physical problem than the psychological problem. So it is obvious that disease and infection are common features of aging. Many elderly are inadequately aware of health and hygiene practices and this is apart from the fact that many elderly do not give adequate attention to health due to various reasons (Rammurti, 2003).

The W.H.O. defines psychological health as “comprising good self-esteem, enjoying a general feeling of well-being, creativity, problem solving skills and emotional stability” whereas Naqvi (2006) argued that internal belief characterizes one’s positive health condition, and as the elderly are mature (emotional stability & creativity), in Indian family they still have authority and power (Self-esteem) and house hold decision making (problem solving) which leads to increase in internal belief of the elderly and enhance their internal locus of control, which accounts for the low level of psychological health problem.

Table 1 also shows that the overall mean score of satisfaction with life: past (20.25), present (20.80) and future (24.82) of elderly person. They are satisfied with past present & future. But they are more satisfied for future in compare to past. It may be attributed to the reason that they enjoy old age and liabilities because Indian society is a traditional society, and even in recent time they accept the old values and rituals. Generally, older people spend their time in family and enjoy with their kinship and grand children, they play with them, and teach them, and believe that ***“Beta to mera mool dhan hai aur pota mera sood hai.”*** (The son is my principle amount and the grandson is my interest). They perceive their future in grandsons and they are satisfied with future life. On the other hand, the possibility of

developing technologies which will slow down the process of biological aging and society such as ours in which consumerism and material values are regarded as absolutely central image of youthful beauty and energy will continue to dominate the media, also plays an important role. The emphasis upon flexibility, adaptability and self expression long associated with youth is now being extended for forth coming generation in old age. Here we can refer to the whole paraphernalia of consumer cultural artifacts and services such as jogging, exercise, routines, cosmetics, healthy food & fashionable leisure wear are now marketed to elderly people to sustain health, youthful energy and spirit of self improvement deep in old age. The consequences for the relationship between the generations are momentous (Featherstone and Hepworth, 1999) and in a way the level of satisfaction is the yardstick of the well-being of the aged individual (Chaddha and Willigen, 1995) reflecting their psychological, physical, social & financial adjustment (Chaddha, Agrawal and Mangal, 1992).

Table 2 shows the mean score of quality of life (306.73), health QOL (13.82), physical QOL (35.17), psychological QOL (60.57), independence (46.93), social relation (38.63), environment (100.70), spirituality & belief (12.77). Mean score shows that the elderly experience better quality of life on the variable (health, psychological, independence, social relations, environment, spiritual and belief). Reason for expressing better quality of life can be seen in the number of fundamental changes in the ways that societies perceive and respond to human aging like increasing life expectancy, psychological changes, social change, social jeopardy, political action, social policy, education, income and resources, housing, institutionalized ageism and intergenerational relations (Bond and Coleman, 1999).

Table 3 shows the mean differences of urban and rural elderly people. Mean score of the urban elderly (6.30) and rural elderly (9.87) and the F value is 8.04**. On physical health it shows significant differences between rural and urban elderly. Rural elderly face more psychological health problems. The reasons for rural elderly experiencing more physical health problem can be attributed to their lack of health awareness and facility in rural area's and also poor economic status, inappropriate diet often resulting from poor physical health, social deprivation, lack of attention by family members (Venkateswarlu, Iyer and Rao, 2003).

Table 3 also shows the mean score of satisfaction with life of rural elderly people respectively for past (18.57) and future (26.70) and urban elderly score respectively for past (21.93) and future (22.93) and the F value of the past (5.11*) and future (5.21*). Scores show that urban elderly are more satisfied with past and rural elderly are more satisfied with future. Satisfaction with life is related with successful meeting the development and change of individual in urban condition elderly people think that the changing is fast and they are not able to cope with the environmental/situation, as well as they used to do earlier because they are getting old (physically, psychologically) and their source of income is also decreasing. So they are satisfied with their past and anxious and worried about the future where as rural elderly have some social norms for them, like they get themselves busy in religious activities, get attached to family life and teach their grand children and socialize them. So, they are satisfied with present rather than past, and they tend to be more satisfied toward future.

Table 3 also shows the mean difference of quality of life and their variables (independence, social relations, environment and total quality of life). Mean scores of urban elderly, total quality of life (318.77), independence (48.90), social relations (40.90), environment (105.20) and rural elderly total quality of life (294.70), independence (44.97), social relations (36.37), environment (96.20) and the F value of these mean differences respectively are total quality of life (6.92**), Independence (3.86*), social relations (5.62*), environment (6.70*). These differences show that the urban elderly experience better quality of life.

Urban elderly show high independence due to mobility, activities of daily life, dependence on medication, and working capacity is much better in urban areas.

Physical safety and security, home environment, financial resources, health and availability and quality of social care are very high in urban areas. So they report high on environment. The aforesaid dimension of quality of life reported high for urban in comparison to rural.

In context of working and non-working elderly, there is no significant difference between working and non-working. The sample of this study is considering disengaged people as retired serviceman.

They are also getting pension, so they are economically independent. They spend more time in family, and are engaged as a businessman that involves business with long time so that they have a large social network and independency, so they are reporting same kind of well being and quality of life as disengaged. According to activity theory, happiness comes about through virtuous activity that is from activity that is performed well (Diener, 1984) and also it may be because the engaged older are active in economic productivity and the disengaged are active in family life so both dose not have any difference between experience of well-being.

CONCLUSION

The study made an effort to understand subjective well-being and quality of life among rural urban and working and non-working elderly. Elderly show low psychological problems as compared to physical problem and they show more satisfaction with life in future. Urban elders found more satisfaction with past whereas rural elderly found more satisfaction with future. Health problems are more in rural elderly. Independency, social relations, environment and total quality of life are more in urban elderly. No significant differences are found for working and non-working elderly.

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Bangladesh Population Ageing and Life Expectancies : 1950 - 2050

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ABSTRACT

Bangladesh has experienced a steady decline in mortality accompanied by modest decline in fertility. The outcome of these decrease constitute the framework within which the implication of population ageing and the extension of life are required to be considered. Since the older population is growing at a considerably faster rate and the life expectancy is also increasing with the advancement of time. The elderly should not be considered as a burden to the society. Their valuable experiences should be utilized fruitfully. Both government and society should take the responsibility of elderly.

Key words: Population ageing, Life expectancy, Social security, Long term care.

For the near future, virtually all countries will face population ageing, although at varying levels of intensity and in different time frames. The shift in age structure associated with population ageing has a profound impact on a broad range of economic, political and social conditions. For example, concerns are growing about the long-term viability of intergenerational social support systems, which are crucial for the well-being of both the older and younger generations (Cliquet and Nizamuddin, 1999). Like so many countries of the Asia-Pacific region, Bangladesh has experienced a steady decline in mortality accompanied by modest decline in fertility (NAS, 1981, ESCAP, 1981; Mabud, 1987; Kabir and Uddin, 1987). The outcome of

these decrease constitute the framework within which the implication of population ageing and the extension of life are required to be considered (Tareque, 2007).

Old age is a product of history, individual experiences and social forces (Morgan and Kunkel, 2001). It is not a separate issue from social integration, gender advancement, economic stability or poverty. The elderly comprise a much larger proportion of the population today than ever before. When the medical science was in its infant stage fertility and mortality rates were high, the relative size of an aged population was small. The rapid and faster technological progresses in medical science control the fertility and mortality rates considerably, and the average composition exhibits a relatively larger proportion of the elderly persons. Increased age normally brings considerable change in individual needs. For instance, health conditions typically decline with advancing age, and this suggests an escalation in the demand for long-term care (Pollard, 1995; Crimmins, 1997). As more people live longer, retirement, pensions and other social benefits tend to extend over longer periods of time. This makes it necessary for social security systems to change substantially in order to remain effective (Creedy, 1998; Bravo, 1999). Increasing longevity can also result in rising medical costs and increasing demands for health services, since older people are typically more vulnerable to chronic diseases (de Jong-Gierveld and van Solinge, 1995; Holliday, 1999). That is why this article tries to analyze the present situation of the aged and its future relevance. On the basis of life expectancies for all ages it is suggested that the government as well as the general community change their attitudes towards the aged in Bangladesh.

DATA SOURCE AND METHODS

The study is based on the data of United Nations, mainly a World Population Ageing : 1950–2050 (UN, 2001) and World Population Prospectus 2006 data.

Life expectancies are estimated using age distributions produced by two consecutive censuses based on Preston and Bennett, 1983 method. The application of this method is not very sensitive to certain

types of age-misreporting, particularly heaping and this method is innovative (UN, 1983).

Ageing Indicators

Table 1 shows the increasing trend in median age and ageing index but declining trend in potential support ratio over the next half century i.e. 2000 to 2050. During the last 50 years, the median age of the Bangladeshi population decreased by about 2 years from nearly 22 years in 1950 to nearly 20 years in 2000. But it is projected to increase by about 15 years over the next half century. The ageing index i.e. the ratio of the people aged 60 or over to children younger than 15 will be about 5.7 times over the next half century. The potential support ratio (PSR) i.e. the number of persons aged 15 – 64 years per one older person aged 65 years or older indicates the dependency burden on potential workers. It has important implications for social security schemes, particularly traditional systems in which current workers pay for the benefits of the current retirees. This ratio is expected to drop more than 66 percent over the next 50 years.

Table 1 : Ageing Indicators

Indicators	1950	1975	2000	2025	2050
Median Age	21.6	17.2	20.2	26.9	34.8
Ageing Index	16.4	12.2	12.8	29.8	72.9
Potential Support Ratio	16.2	14.8	18.6	12.9	6.2

Speed of Population Ageing and Age Structure

Table 2 presents the increasing trend in percentage for 60+, 65+ and 80+ aged population for the next 50 years. It has also been observed that the older population is growing faster than the total population and the highest growth rate will be for 80+ population in 2050.

The survival rate to a specific age X is the proportion of newborns in a given year who would be expected to survive at age X if

current mortality trends were to continue for at least the next X years. Table 2 shows a good sign that the survival rates for 60+, 65+ and 80+ is increasing with the advancement of time. This may be a reflection of advancement in medical technologies, health facilities etc.

Table 2 : Size, growth and survival

Indicators	1950	1975	2000	2025	2050
Percentage					
60+	6.9	4.8	5.2	9.2	17.0
65+	5.1	2.9	3.3	5.8	11.7
80+	0.6	0.3	0.4	0.7	1.9
	1950-55	1975-80	2000-05	2025-30	2045-50
Growth Rate (Percentage)					
Total	2.0	2.4	2.1	1.1	0.7
60+	1.6	1.0	2.9	4.1	3.1
65+	1.9	2.0	3.0	4.7	3.5
80+	4.1	3.0	3.0	3.7	4.8
Survival Rate (Percentage)					
60+	-	-	66.2	82.1	88.7
65+	-	-	58.4	75.0	82.9
80+	-	-	21.7	33.9	43.4

From table 2 it may be inferred that the growth and survival rates for the older persons are increasing, i.e. ageing which has been taking place at a modest rate until now will accelerate in the near future.

Thus, to know the situation, age pyramids of Bangladesh are presented in figure 1 over three points of time – i.e. 1950, 2000 and 2050. There is a gradual rise in the 60+ portions which is a contribution of increase in life expectancy. So, what will be the life expectancy in 2050? This question is solved in the next section.

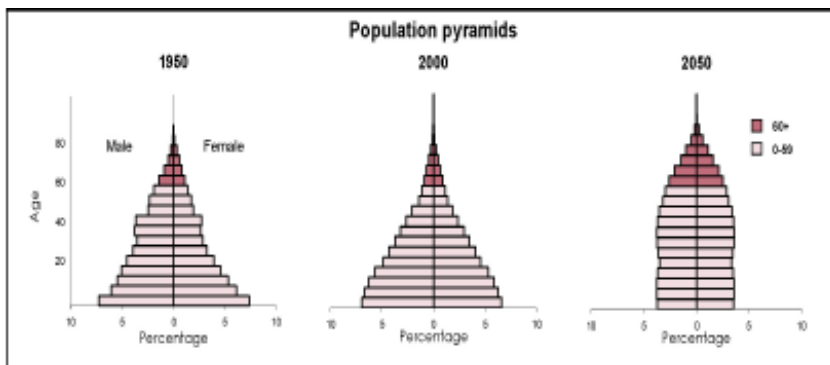


Fig 1: Age Pyramids of Bangladesh

Source: World Population Ageing: 1950 - 2050

Life Expectancy

Table 3 shows the increasing trend in life expectancies at birth and at age 60+, 65+ and 80+ which indicates the reduction in mortality. From an average life about 62 years in 2000 – 2005, the people will live up to an average of about 76 years in 20045 – 2050.

Table 3 : Life Expectancy*

Indicators	1950-55	1975-80	2000-05	2025-30	2045-50
Life Expectancy (Years)					
Birth	-	-	62.0	71.2	75.5
60+	-	-	15.8	17.6	19.2
65+	-	-	12.6	14.0	15.4
80+	-	-	5.4	5.9	6.5

* Data comes from World Population Prospectus, 2006 and UN, 2001

But to know the life expectancies at different ages, indirect technique is used and the results have been shown in table 4. Using table 4 and 3, one can get the life expectancies at different age groups except 5-9 and 55-59 years.

Table 4 : Life Expectancy**

Indicators	1950-60	1975-85	2000-10	2025-35	2040-50
Life Expectancy (Years)					
10-14	45.3	50.9	57.3	62.2	64.3
15-19	42.3	46.9	53.2	57.5	59.5
20-24	38.0	42.6	48.7	52.6	54.8
25-29	34.9	38.8	44.2	48.3	50.2
30-34	31.9	34.6	39.7	43.7	45.6
35-39	28.7	31.0	35.9	38.9	40.8
40-44	25.6	27.9	31.9	34.8	36.3
45-49	22.5	23.8	27.5	30.1	31.6
50-54	19.4	20.5	23.5	25.5	26.9

** Life expectancies are estimated using World Population Prospectus 2006 data

From table 4 it may be observed that the life expectancies have increased with the advancement of time. One important reason for the rise in life expectancy the transfer of medical technologies from the western countries. The persistent improvement in public health facilities over the years have mainly contributed to the population ageing in Bangladesh.

CONCLUSION

Population ageing is profound, having major consequences and implications for all facets of human life. In the economic area, population ageing will have an impact on economic growth, savings, investment and consumption, labour markets, pensions, taxation and intergenerational transfers. In the social sphere, population ageing affects health and health care, family composition and living arrangements, housing and migration. In the political arena, population ageing can influence voting patterns and representation (UN, 2001). Since the older population is growing at a considerably faster rate, there is need for change in the attitude of not only community and the government but also the people. The elderly should be considered not as a burden to the society but their valuable experience should be utilized fruitfully and it should be the responsibility of the society and the government to impart an improved and effective quality of life to

them in return to their lifelong dedicated services towards their children and the nation. It is high time that the Bangladeshi policy makers give due importance to the forthcoming age wave. There are many lessons that can be learnt from the experiences of industrial societies who are facing the problems associated with an increase in their ageing population. Careful planning should make it possible for Bangladesh to take the best from the developed world's experience while avoiding negative features.

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