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Effect of *Celastrus paniculatus* on Learning, Memory and Serum Biochemistry of Aging Albino Rats

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Saproon, Solan (H.P.) - 173 211

ABSTRACT

Ethanol extract of Celastrus paniculatus was administered at the rate of 2 g/kg body weight orally 16 days before trial experiment in male Wister albino rats of 3, 12 and 20 months old animals. They were studied for learning and memory process as well as for any change in the serum biochemistry. All animals were trained on Y-maze. Each animal received a daily session of 10 trials for 5 days i.e. a maximum of 50 trials. Increase in response of 5th session as compared to 1st session was taken as criteria of learning and memory. There was a significant increase in learning and memory in the treated group with respect to its control. Results show that Celastrus paniculatus preferentially affects learning and recall of memory and also regulate the serum biochemistry.

Key words : Learning, Memory, Serum and Y-maze

Exercise increases neurogenesis in the dentate gyrus of the brain, which is important for memory function. New neurons are added continuously to certain area of the adult brain, such as hippocampus and olfactory bulb (Ahmadiasl *et al.*, 2003). In mice, neurogenesis in the dentate gyrus increases with exposure to an enriched environment, and it is associated with improved learning (Kempermann *et al.*,

1997). The effect of drugs on learning and memory can be tested by the various behavioral studies e.g. passive and active avoidance test, radial arm maze, water maze, Y and T maze etc. (He *et al.*, 2000). Each of these methods has its own characteristics and thus using more than one method for the same animal usually broadens our knowledge of its effects. The oil extracted from the seed of *Celastrus paniculatus* is known to have effects on the central nervous system (Joglekar and Balwani, 1967), beneficial effects in psychiatric patients (Hakim, 1964), stimulatory effects on intellect (Nadkarni, 1976), improvement in I.Q. of mentally retarded children (Nalini *et al.*, 1986). Preliminary studies have shown that *Celastrus paniculatus* improves the memory process in rats (Karanth *et al.*, 1980). The present study was carried out to evaluate the effect of seed extract of *Celastrus paniculatus* on learning and memory process as well as on serum biochemistry. The study also attempts to correlate serum biochemistry with cognitive functions.

Materials and Methods

Male Wister albino rats were procured from the Disease-Free Small Animal House of Haryana Agricultural University, Hisar. They were housed in the Animal House of the Department of Zoology, Kurukshetra University, Kurukshetra, in groups of three in polypropylene cages, each measuring $40 \times 25 \times 15$ cm. The animals were provided with standard rat feed and water *ad libitum*. Optimum light and temperature conditions were maintained throughout the experiment. Before starting the experiment, the animals were maintained under these conditions for two weeks to acclimatize them in the laboratory environment. Prior to starting the experiment, animals were divided into different control and treated groups. In each group, three rats were used.

Drug Preparation

Seeds of *Celastrus paniculatus* were procured from an Ayurvedic medical practitioner at Kurukshetra in a single lot and sent to the Ayurvedic Department, Kurukshetra and Department of Botany, Kurukshetra University, Kurukshetra for their verification and Botanical identification. The seeds were crushed and extracted with

ethyl alcohol in 1:3 ratio for 30 days. The extract thus obtained was then distilled under vacuum to remove all traces of the solvent. Thick brown oil was obtained in the trough. This was subsequently used for treatment of experimental rats.

Drug Schedule

Ethanol extract of *Celastrus paniculatus* was given to experimental group orally at a dose of 2g/kg body weight daily at 10 A.M. for 16 days and control animal was given the equal amount of distilled water.

Spatial Learning

All groups of animals were familiarized to Y maze apparatus in order to eliminate stress of exercise. Prior to spatial learning, control and treated groups were trained on a Y maze for one hour for five days (Dellu *et al.*, 1992). All animals completed the training session successfully .

Recognition Memory

Testing of cognitive functions was carried out using the Y maze evaluating spatial learning and recognition memory. The correct aversive behavior of control and treated rats in the Y maze was tested with ten trial per day for five days. At the start of testing, rat were placed in the start arm to explore the food pallets. The time taken to trace the pallets is recorded by digital timer (Conrad *et al.*, 1997).

Serum analysis

After this completion of tests, animals were slightly anesthetised with diethyl ether and blood was collected for serum analysis using at Standard thyrocare kit of digital blood analyzer.

Statistical analysis

The significance of difference between the avoid responses of the control and treated value was determined by Student 't' test.

Results

The mean time (in second) required to trace the food pallets by young; aged and treated animals in Y-maze are shown (table 1) and serum biochemistry is presented separately (Fig. 1).

Table-1 : Performance of rats in Y maze (mean $\pm$ SD) of 10 trials per day for 5 days.

Age (in months)	Performance (in second)
3	7.4 $\pm$ 0.3
12	7.8 $\pm$ 0.5
20	11.4 $\pm$ 0.5
20 (treated)	9.2* $\pm$ 0.6

*P<0.05

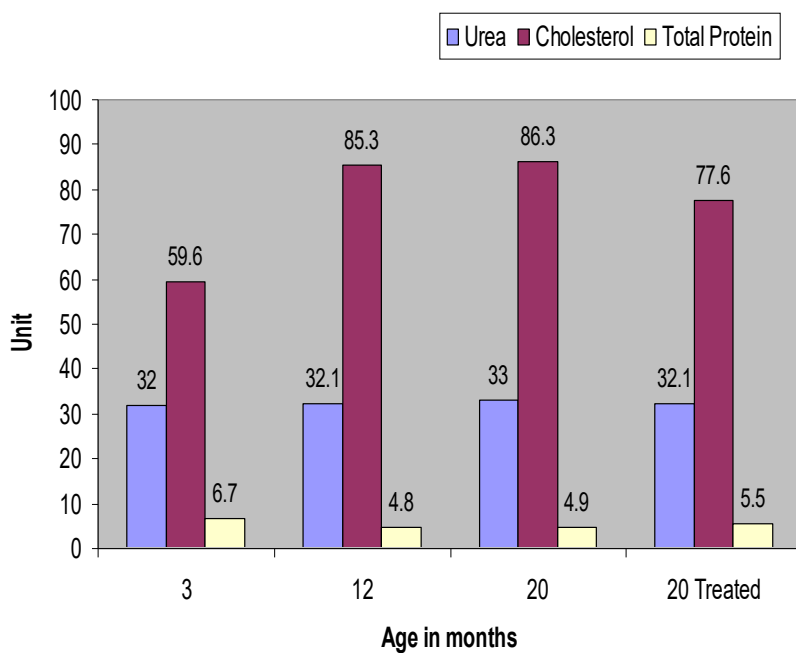


Fig. 1 Values of serum analysis (Mean $\pm$ SD)

Discussion

The result of the present study revealed that there was a significant decline in learning and memory with age. Avoidance response has been suggested to reflect cognitive function (Reddy, 1997). The treatment of *Celastrus paniculatus* has significantly increased learning and memory in the aged group with *Celastrus* extract. The study support the earlier finding of Levin (1999), who reported memory deterioration and other dementia with advancing age. Das *et al.*, (2003) also reported that scopolamine treatment in rat improved the acquisition and consolidation of learning process. Clinical evidences indicate that muscarinic receptor blockade results in disruptions of behavioral inhibition, working memory, retrieval from long term memory, attention, decisional processes, movement strategy selection and alter sensory processing (Fibiger, 1990). He suggested importance of central cholinergic neurons in the acquisition and post acquisition (consolidation) performance of variety of learned behaviors. No significant alteration was observed in urea, cholesterol and protein profile in treated aged rats suggesting that *Celastrus paniculatus* extract may not largely impair the blood biochemistry / physiology of experimental rats. Chaudhary (2001) earlier documented that *Centella asiatica* extract did not affect the blood biochemistry. Extract of *Celastrus* may be a potential candidate.

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Age Consistent Cognitive Decline - An Ayurvedic Pharmacological Management

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ABSTRACT

*Impairment of memory and learning need not accompanying normal ageing. Susceptibility to age - related cognitive decline varies widely among individuals, suggesting that suitable interventions may be helpful in preventing its occurrence. A large number of references indicates that age related cognitive decline may be controlled or prevented by suitable pharmacologic and non-pharmacologic methods to a significant extent. There is a global demand towards the utilisation of plant based products to meet out health care need of the population world wide. Indian subcontinent rely on traditional medicine mainly Ayurvedic drugs. Traditional medicine could not get recognition in the absence of scientific evidences. Keeping the facts in view 61 aged subjects of both sex with an age range of 62-75 years were selected. 28 aged had cognitive deficits particularly the memory loss. Whereas 33 were normal aged. The subject of both group were treated with organic extract of *Bacopa monnieri* in effective doses continuously for six months and evaluated on various neuropsychological parameters. The results obtained at the end of six months revealed beneficial effect in improving memory and attention span and also associated behavioural problems among demented elderly people. The neuro-chemical loss was checked and enhanced in senile dementia cases. The test drug has potentiality to improve memory and other cognitive deficits among the aged suffering from dementia and associated behavioural problems.*

Key words : Ageds, Dementia, Cognitive deficits, ChAT, Nor-adrenaline, Bacopa monnieri

Dementia is defined as the loss of cognitive or intellectual functions. Unlike occasional forgetfulness, dementia is marked by a profound impairment of memory as well as the loss of additional, complex abilities required for problem-solving, decision making, spatial orientation, and even the ability to put simple words together to communicate. Dementia is permanent, progressive disease that mostly affects the elderly, who over time may lose the ability to function normally and require round-the clock care. Reduced blood flow, aside from starving brain cells of needed fuel, also increases the production of free radicals that further damage cell membranes and accelerate brain cell death. As the number of lost brain cells grows -from the ravages of age or the debilitating effects of degenerative diseases such as Alzheimer's -mental deterioration continues. Memories begin to fade and the ability to form new thoughts and solve problems is further reduced.

This continuous loss of brain cells is further aggravated by damage from other age-related conditions, such as hypertension, arterio-sclerosis, diabetes and cerebrovascular disease such as cerebrovascular insufficiency, strokes and multi-infarct dementia. According to the US Congress Office of Technology Assessment 1.8 million Americans have severe dementia and another one million to five million have mild to moderate dementia.

They further reported that approximately four million of these people suffer from dementia due to Alzheimer's disease, which is expected to affect more than six million by the year 2040.

A decline in memory and cognitive (thinking) function is considered by many authorities as a normal consequence of aging (Craik FIM *et al.*, 1992, Smith GE *et al.*, 1996). Environmental toxins, vitamins deficiencies and the process of ageing can alter cognition. The aging process generally leads to difficulties with memory (Danninen T 1996, Levy R 1994). Risk factors for age related cognitive decline include advancing age, female gender, prior heart attack and heart, failure. People with age related cognitive decline

experience deterioration in memory, learning, attention, concentration, thinking use of language including neurological disorder (Alzheimer's disease), vascular disorder (multi-infract disease), inherited disorders (Huntington's disease) and infection (viruses such as HIV).

Age related cognitive decline occurs gradually, sudden cognitive decline is not a part of normal aging. When people develop an illness such as Alzheimer's disease, mental deterioration usually happens quickly. In contrast, cognitive performance in elderly normally remains stable over many years, with only slight declines in short-term memory and reaction times (Rubin ED *et al.*, 1998, Nussbaum PD 1997, Ferris SD *et al.*, 1996). To perform its complex function, the brain requires a continuous high-energy level. Aging brain cells are inefficient at glucose intake and mitochondrial energy production. This allows for the build-up of cellular debris, eventually destroying brain cells and causing age related cognitive decline. Nutrients that can help restore energy production may therefore, help to prevent or control brain aging.

By transporting fatty acids into the mitochondria, the amino acid acetyl-L-carnitine with the antioxidant lipoic acid help reverse mitochondrial breakdown, oxidative damage and memory loss in old rats (Hagen TM *et al.*, 2002, Aureli T *et al.*, 2000, Liu J *et al.*, 2002). Several clinical trials suggest that acetyl-L-carnitine and phosphatidylserine delays the onset of age related cognitive decline and improve overall cognitive function in the elderly subjects (Salvioli G *et al.*, 1994, Maggioni M *et al.*, 1990).

By controlling chronic inflammation, Omega-3 fatty acids may help reverse brain damage associated with aging and degenerative diseases. Population studies have investigated the link between antioxidant intake and age related cognitive decline. Higher blood level of Vitamin -C, beta carotene (Miyamoto M *et al.*, 1989) and vitamin- E supplementation accelerated learning and prevent the memory deficits associated with oxidative stress (Fukui K *et al.*, 2002, Masaki KH *et al.*, 2000, Joseph JA *et al.*, 1998). Similarly high intake of mono-unsaturated fatty acids and caffeine has been associated with protection against age related cognitive decline (Solfrizzi V *et al.*, 1999, Jarvis MJ 1993). Cigarette smokers, people with high level of education and exercise have beneficial effect on physiological well

being and cognitive functioning in elderly people (Williams P *et al.*, 1997).

Various studies have demonstrated that patients suffering from age related cognitive decline gain significant benefit from Brahmi, both in terms of memory and life quality. Brahmi belongs to the family Scrophulariaceae. Charak describes Brahmi as a major component which prevents early ageing and disease, improves the memory and intelligence, prolong life, nourish body and improves general health. Brahmi is one of the most popular medhya drug (Noo-tropic agent) of Indian medicine. The whole plant of this herb is advocated as a nervine and mental tonic and for the treatment of different mental and nervous disorders (Chopra *et al.*, 1958, Satyavati *et al.*, 1976, Khory RN *et al.*, 1981, Asolkar L Vet al 1992). Brahmi has been observed influencing learning and memory process in different experimental evaluation (Prakash and Sirsi 1962, Singh and Sinha 1971, Sharma 1978, Singh and Dhawan 1978, 1982).

Keeping the facts in view a group of aged people with cognitive impairment were treated with hydro-alcoholic extract of *Bacopa monnieri* and evaluated on various Neuropsychophysiological parameters for its beneficial effects.

Material and Method

61 ageds of both sex with age range of 62- 75 years were selected under field survey programme within Varanasi city. 28 aged experienced deterioration in memory and learning, attention and concentration, thinking, use of language and other mental functions. These complaints were evaluated on standard scientific assessment and taken into consideration for diagnosis. Dementia Rating Scale -2 (Jurica PJ *et al* 2001) has been utilized in the present study. The diagnosis of senile dementia was confined on the basis of obtained scores on the scale, which is as follows :-

Factors	Normal control	Senile dementia
Attention	79.55	32.22
Initiation/ reservation	23.55	10.04
Construction	21.37	8.93
Conceptualisation	2.55	1.45
Memory	21.18	9.79
Total score	10.91	5.87

Apart from the above scale, mini-mental state examination (Folstein MF *et al.*, 1975), Short term memory span following method (Peterson and Peterson 1969), Long term memory span measured by Chaudhary OP (1978), span of attention (determined by utilizing apparatus Tachistoscope designed by the centre of psychological testing, Chowkaghat, Varanasi) and Human maze learning based on Thorndiak (1911) Trial and Error procedure were also carried out. Neurochemical assessment likes nor-adrenaline (Griffiths *et al.*, 1970) and 5-HT (Snider *et al.*, 1965) were also measured. After detailed preliminary screening and diagnosis of the subjects the hydro-alcoholic extract of *Bacopa monnieri* in the dose of 900 mg in two divided doses i.e. 450 mg morning, 450 mg evening were orally given to the aged subject both normal and senile dementia group for a period of six months. The results obtained were statistically analysed.

Preparation of test drug

The hydro-alcoholic extract of *Bacopa monnieri* was added with additional additive to make final capsule of 500 mg. Each capsule contained 450 mg of drug extract and remaining additive. The safety and efficacy profile of this drug is established by us in extensive pre-clinical studies before going for human use of the drug, as well as the ethical approval was also obtained. An informed consent of the participants was taken before starting the trial.

Results and Observations

The diagnosed senile dementia cases when treated with hydro-alcoholic extract of Brahmi (*Bacopa monnieri*) has shown neuro-modulatory effects. The cognitive screening tests of ageds were done on Mini mental state examination which includes the assessment of orientation, concentration, mental flexibility (i.e working memory), short term memory and constructional praxis was found improved in senile dementia cases and also in normal ageds. Those ageds also showed behavioural regulation along with improvement in sleep pattern under drug treatment for six months (Table 1, 2).

Memory span scores also improved following drug treatment in normal as well as demented ageds. The pattern of memory performance indicates that the drug has arrested the further memory loss in senile dementia cases (Table 3,4). A high score of anxiety and

depression was found to be associated with ageds of both series of cases. Following six months of Brahmi therapy a significant reduction is recorded in both group of cases (Table 5,6). The drug Brabmi has shown neuro-chemical modulation measured in terms of non-adrenaline and 5-HT which increased to a significant level following test drug treatment. In one of the series conducted by us the drug Brabmi revealed potentiality to stop the further acetylcholine loss among the aged population, suffering from senile dementia. The drug did not show any allergic, neuro-endocrine or metabolic side effect. It is safe and can be given for longer time.

Discussion

There is no standard drug therapy for age related cognitive decline, several experimental “nootropic” agent may provide improvement in cognitive function. Nootropic drugs are used specifically to facilitate learning and memory and prevent the cognitive deficits associated with dementia. The test drug *Bacopa monnieri* has been found as a potent noo-tropic agent showing beneficial effect in improving memory and attention.

A common problem in the treatment of elderly patients with dementia is the management of behavioural disturbances particularly agitation and aggression. Benzodiazepines, buspirone, trazodone and some β -adrenergic, antagonists are used to treat behavioural disturbances like agitation, aggression and impulsivity in patients with dementia and other cognitive disorders. But the results are unsatisfactory due to the adverse side effects as it may produce further cognitive impairment (Salzman C. 1990, Ramsdell J. W. *et al.*, 1990). In the present study *Bacopa monnieri* when given for six months to the demented ageds showed marked improvement in psychological complaints.

Animal studies suggest that diet high in antioxidant rich food, may be beneficial in slowing age related cognitive decline (Perrig WJ *et al.*, 1997). Among people aged 65 and older, higher Vitamin-C, Vitamin-E, beta -carotene levels in blood have been associated with better memory performance (Joseph JA *et al.*, 1998, Masaki KH *et al.*, 2000).

Table 1 : Effect of organic extract of *Bacopa monnieri* in the management of various complaints associated with ageds suffering from cognitive deficits

Group score	No. of Cases	Aggression		Sleep disturbance		Communi- cation		Complaints (In percent)			
								Depression		Psychotic Features	
		BT	AT	BT	AT	BT	AT	BT	AT	BT	AT
Normal	33	6 (18.18)	4 (66.67)	9 (27.27)	8 (88.89)	-	-	11 (33.33)	8 (72.72)	2 (6.06)	2 (100)
Dementia with cognitive deficit	28	26 (92.85)	18 (69.23)	28 (100)	19 (67.86)	27 (96.43)	20 (74.07)	28 (100)	17 (60.14)	19 (67.86)	15 (78.94)

BT = Before treatment; At = After 6 months therapy and improvement in percent.

Table 2 : Effect of organic extract of *Bacopa monnieri* on mini-mental state examination among ageds suffering from cognitive deficits particularly dementia

Groups	No. of	Mini-mental state examination (Score)				Comp. Initial Vs. 6 months Therapy
		Initial	After 2 months Therapy	After 4 months Therapy	After 6 months Therapy	
Normal	33	18.24±2.75	18.92±3.01	19.66±2.75	20.45±3.11	P<0.01
Dementia with cognitive deficit	28	10.22±1.84	10.84±2.01	10.91±1.75	11.34±1.06	P<0.01

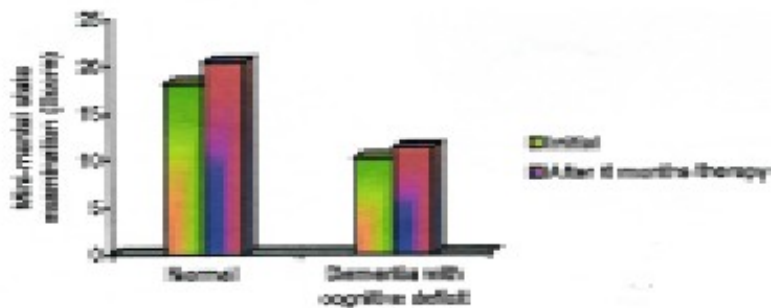


Table 3: Data for the cognitive test of the promotion of SN in the final test

Groups	N of cases	Sutton memory span (sec)												Cognitive Words		
		Initial			After 2 months delay			After 4 months delay			After 6 months delay			After 12 months delay		
		3sec	9sec	18sec	3sec	9sec	18sec	3sec	9sec	18sec	3sec	9sec	18sec	3sec	9sec	18sec
Normal	33	530 ±106	523 ±094	484 ±088	571 ±104	566 ±122	502 ±098	530 ±122	572 ±104	516 ±075	575 ±102	562 ±111	540 ±084	P605	P605	P601
Patients with cognitive deficit	28	228 ±035	204 ±054	171 ±066	244 ±091	223 ±068	186 ±062	286 ±084	239 ±066	198 ±075	296 ±082	264 ±066	201 ±062	P601	P601	P605

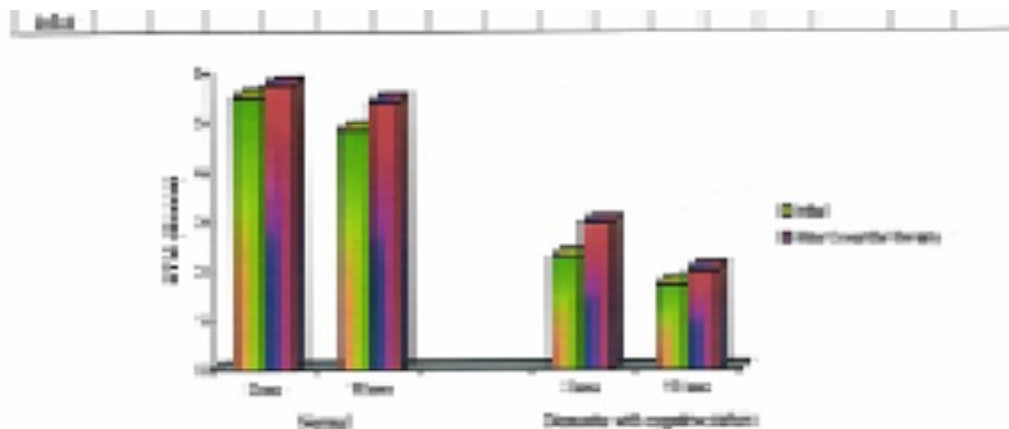


Table 4 : Effect of organic extract of *Bacopa onnieri* on LTM among demented ageds

Groups	No. of cases	Long term memory span (score)								Comp. Initial Vs 6 months therapy	
		Initial		After 2 months therapy		After 4 months therapy		After 6 months therapy		Repetition of words 1 time	Repetition of words 4 time
		Repetition of words 1 time	Repetition of words 4 time	Repetition of words 1 time	Repetition of words 4 time	Repetition of words 1 time	Repetition of words 4 time	Repetition of words 1 time	Repetition of words 4 time		
Normal	33	2.94±0.61	2.55±0.86	3.04±1.02	2.64±0.72	3.16±0.91	2.63±0.82	3.28±1.01	2.83±0.62	P>0.05	P>0.05
Dementia with cognitive deficit	28	0.94±0.22	0.70±0.14	1.06±0.25	0.76±0.12	1.24±0.35	0.88±0.16	1.28±0.29	0.91±0.15	P>0.01	P>0.001

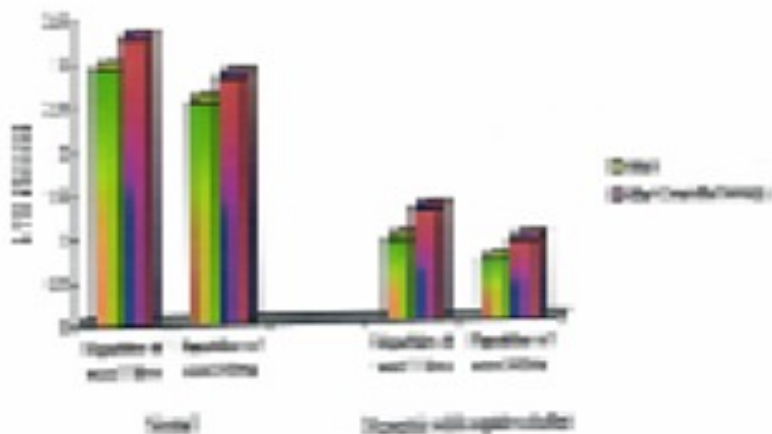


Table 5 : Effect of Bacopa monnieri on anxiety score among the demented ageds

Groups	No. of cases	Anxiety (Score)				Comp. Initial Vs 6 months therapy
		Initial	After 2 months therapy	After 4 months therapy	After 6 months therapy	
Normal	33	59.82±2.93	57.76±3.22	57.16±3.45	55.28±2.75	P<0.001
Dementia with cognitive deficit	28	63.84±3.14	61.92±2.71	60.74±2.65	60.12±2.44	P<0.001

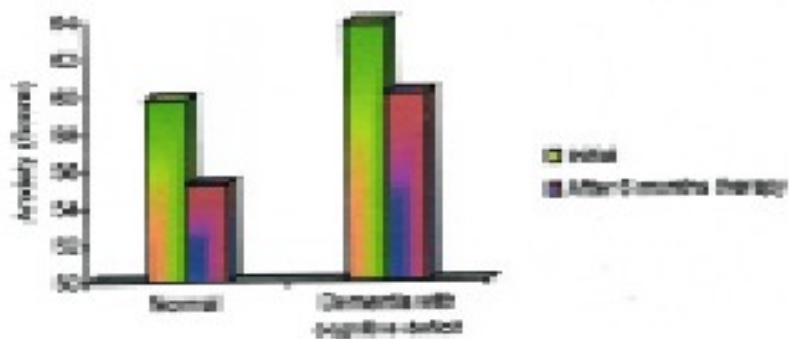


Table 6 : Effect of Bacopa monnieri on depression score among demented ageds

Groups	No. of cases	Depression (Score)				Comp. Initial Vs 6 months therapy
		Initial	After 2 months therapy	After 4 months therapy	After 6 months therapy	
Normal	33	9.35±1.62	8.45±1.70	7.36±0.96	7.25±0.88	P<0.001
Dementia with cognitive deficit	28	13.64±2.14	11.82±2.06	11.25±1.25	10.80±1.32	P<0.001

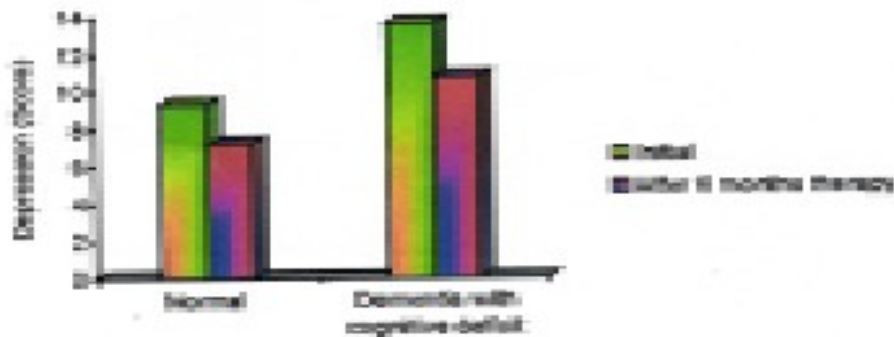


Table 7 : Effect of organic extract of *Bacopa monnieri* on nor-adrenaline level among demented ageds

Groups	No. of cases	Nor-adrenaline ($\mu\text{g/ml}$)				Comp. Initial Vs 6 months therapy
		Initial	After 2 months therapy	After 4 months therapy	After 6 months therapy	
Normal	33	5.02 $\pm$ 1.03	5.98 $\pm$ 1.22	6.72 $\pm$ 1.34	6.84 $\pm$ 1.60	P<0.001
Dementia with cognitive deficit	28	2.45 $\pm$ 0.75	2.72 $\pm$ 0.38	3.09 $\pm$ 0.84	3.88 $\pm$ 0.52	P<0.001

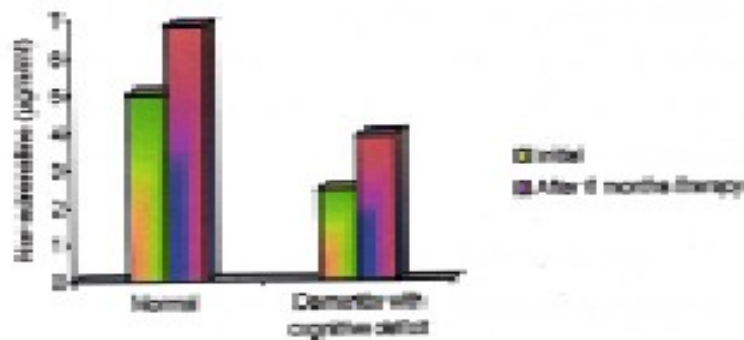
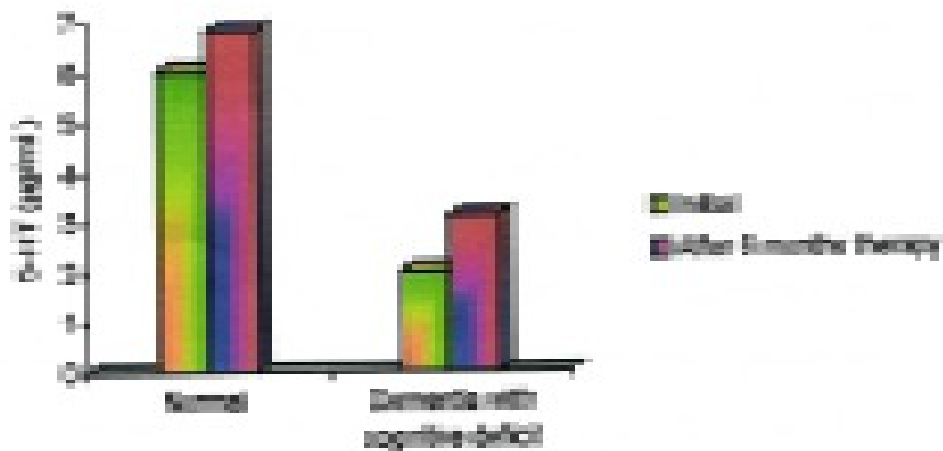


Table 8 : Changes in 5-HT level following organic extract of *Bacopa monnieri* treatment among demented ageds

Groups	No. of cases	Depression (Score)				Comp. Initial Vs 6 months therapy
		Initial	After 2 months therapy	After 4 months therapy	After 6 months therapy	
Normal	33	9.35±1.62	8.45±1.70	7.36±0.96	7.25±0.88	P<0.001
Dementia with cognitive deficit	28	13.64±2.14	11.82±2.06	11.25±1.25	10.80±1.32	P<0.001



The hormone DHEA (dehydroepiandrosterone) improves brain cell activity and facilitates changes in nerve cells, allowing them to record new memories, enhances acetylcholine release from hippocampal cells with ageing and Alzheimer's disease (Maurice T *et al.*, 1997, Danenberg HD *et al.*, 1996). Similarly the hormone melatonin is a potent antioxidant that regulates the body's function and enhances cognitive performance (Magri F *et al.*, 2004, Peck JS *et al.*, 2004).

The B Vitamins, including folate, protect brain function by regulating energy metabolism. B vitamin deficiencies may impair memory and increase anxiety; confusion irritability and depression (Morris MC *et al.*, 2004, McDowell I 2001). Apart from the above various drugs that are currently being investigated are ergoloid mesylates, derivatives of an inhibitory brain chemical called GABA (vinpocetine and bifemelane) also known by the investigational drug names Piracetam [Nootoprl], oxiracetam, and nebracetam.

Senile dementia of Alzheimer's type (SDA T) is characterised by the destruction of nerve cells in the main area of the brain involved in higher mental functions. The most important is the loss of pre-synaptic cholinergic neurons that resulting in decrease of acetylcholine concentration which is broken down by the enzyme acetylcholinesterase (AChE) resulting in loss of memory and other cognitive functions. Bacopa monnieri is a drug which crosses the blood brain barrier and prevent AChE from destroying acetylcholine (Agrawal A *et al.*, 1990). Therefore it is concluded that by increasing acetylcholine concentration in the brain Bacopa monnieri is effective in alleviating some of the symptoms associated with acetylcholine loss.

A number of reference have demonstrated that patients sufferin~ from Alzheimer's or other memory disorders gain significant benefit from Bacopa monnieri both in terms of better, memory and life quality. In the present series of investigation it has been observed that both cognitive and memory function improved when Bacopa monnieri given in the dose of 900 mg per day. The memory enhancing properties of Bacopa monnieri suggest that it may be an effective agent for improving memory and learning in healthy human. The finding suggest that Bacopa monnieri not only protects from effects of

senile memory deficits, but also provides a unique supplements for supporting memory in the healthy aging human as well.

Reactive oxygen species (ROS) are suppose to playa role in the neuronal damage occurring in ischaemic injury and neuro-degenerative disorders. *Bacopa monnieri* has shown anti-oxidant effect (Tripathi YB 1996), prevent the formation of ROS and lipid per-oxidation in brain synaptosomes. The worker observed that *Bacopa monnieri* significantly decreased oxidative stress and thus it may reduce the neuronal damage in pathological situations.

Further, *Bacopa monnieri* have shown a number of cognitive enhancing effects. It improves memory and learning and has anti-anxiety effects. Dubey *et al.*, (1984) has shown that Brahmi have anabolic as well as tranquillising property which has major role in the improvement of mental health status. Recently, studies have reported that old age dementia and mental deficiencies cases, the drug Brahmi has revealed its scope as safer medicinal agent arresting further memory loss along with improving the overall mental performance (Agrawal A *et al.*, 2000, Agrawal A *et al.*, 1993). Further, Brahmi showed a significant improvement in general mental ability and behavioural pattern including cognitive function (Dubey GP *et al.*, 1994, Agrawal A *et al.*, 2000).

Agrawal A *et al.*, (1993) showed Brahmi has potentiality to regulate altered level of brain biogenic amines and improve learning abilities. Cholinergic neurotransmitter declines with advancing age. Increased acetylcholine synthesis is seen after *Bacopa monnieri* supplementation which improved memory and learning skills, elevated mood, prevent memory loss in elderly people. In a recent study, the drug Brahmi increased whole brain acetylcholine, epinephrine, nor-epinephrine, GABA, glutamate and histamine level among the rats (Pathak 1990).

Conclusion

Aged adults face a loss of cognitive power and impaired mental functions. Numerous research is in support of a number of anti-aging therapies particularly brain aging. But applications of modern synthetic chemicals are restricted due to their adverse reactions. It is concluded that some of the cognitive functional decline may be prevented or at least delayed following application of *Bacopa*

monnieri. The test drug has potentialities to slow age dependent brain cell changes, preserves vital functions and maintain mental health without any side effect.

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Demographic Health Profile in Urban and Rural Elderly Population

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ABSTRACT

Comprehensive data on health and elderly was collected from 4 different income groups. Attempts have been made to identify various disorders in elderly subjects. Results shows that hypertension and diabetes mellitus are prevalent disorders of middle class population while anemia is most common in lower strata. One of the important finding of the study : diabetes (41.66%) was maximum in the lower middle class compared to other 3 groups probably due to the fact that lower middle class are constantly under stressful conditions for day to day life compared to other groups. Elderly suffered from more than one disorder and the incidence increased with higher income. Pulmonary functions were within normal limits. However, values were low in group I. Psychomotor tests particularly response to colour and auditory stimuli was significantly higher in lower middle class compared to middle class signifying slowness in alertness to external stimuli. It could be related to educational status of middle class population. Reduced alertness in lower middle class could also be due to stress.

Key words : Urban and rural elderly, Hypertension, Diabetes, Pulmonary functions, Psychomotor tests.

Comprehensive data on health and elderly is not available. Epidemiological studies on health profile of regional population has been reported and most of the studies regarding HT and Diabetes are in the general urban population (Patel JC, *et al.*, 2003; Li W, *et al.*, 2005, Thome RA, *et al.*, 2005, Meisinger C, *et al.*, 2005). Prevalence of hypertension and diabetes have also been reported from various parts of India (Ramachandran A, *et al.*, 1997, Singh RB, *et al.*, 1997, Verma NPS, *et al.*, 1986, Ramachandran A, *et al.*, 1988, Gupta SP, *et al.*, 1979, Kennes WB *et al.*, 1986). However, comparative data in different income groups has not been reported.

Psychomotor performance was previously reported by us in volunteers (Jaguste VS, DAdkar VN, Dhar HL, 1991), patients attending OPD (Shah AH, *et al.*, 1999), and nursing students (Shah AH, *et al.*, 2002). Pulmonary functions were also studied by us in elderly subjects (Pathak JD, *et al.*, 1989). However, there are few studies in elderly subjects reported from elsewhere in the country.

Purpose of the present study was to have comprehensive data on health in Indian elderly Attempts have been made to identify various disorders in elderly subjects and its relation to earning.

Methods and Patients

We have studied overall health status comprising of elderly subjects from different parts of Mumbai as well as nearby, rural areas along with pulmonary functions and psychomotor tests. In the first phase, detailed proforma regarding social and health status was filled by all the elderly subjects. Then various functional studies particularly pulmonary functions and reaction time was carried out. Patients were divided into four income groups: lower class, lower middle class, and upper middle class. Criteria for hypertension and diabetes : Hypertension (systolic blood pressure $\geq$ 140 mmHg or diastolic blood pressure $\geq$ 90 mmHg or use of anti-hypertensive medications), and diabetes mellitus (fasting serum plasma glucose level $\geq$ 7 mmol/L or use of anti-diabetic medications) and impaired fasting glycaemia ($\geq$ 6.1 to $<$ 7 mmol/L) was also determined. Criteria for various classes : Group I - labourers / working class, Group II - service class (clerks/ Junior officers in bank, government job etc.), Group III - Senior officers/ executives, Group-IV : property owners/ business class.

Results

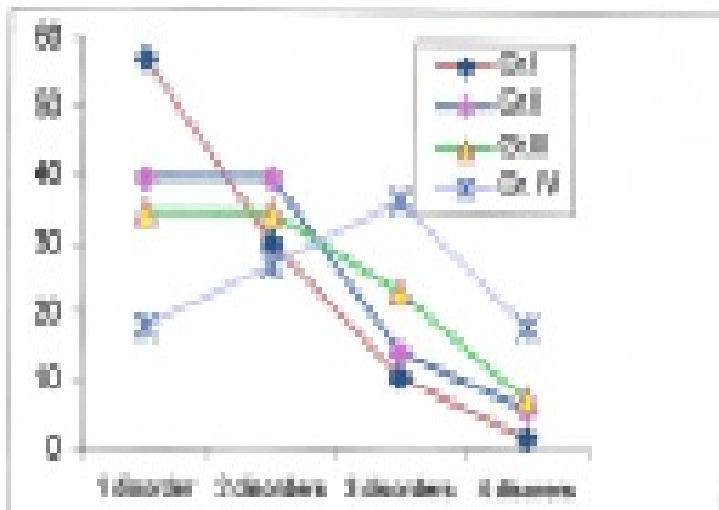
Results show that hypertension and diabetes mellitus, cataract, arthritis, obesity, asthma and anemia are the common ailments in the elderly and that the same individual can suffer from more than one disorders. However, hypertension and diabetes mellitus are prevalent disorders of lower middle class population (Gr. II) while anemia is most common in (Gr. I) lower strata. (Table 1). Elderly suffered from more than one disorder and the incidence with higher income (Table 2 and Fig. 1).

Table -1 : Various Disorders in Elderly in Different Social Strata

	H.T.	D.M.	Cataract	Arthritis	Obesity	Asthma	Anemia
Group-I (n=56) n	-	-	10	5	-	-	13
%	-	-	17.86	8.93	-	-	23.21
Group-II (n=48) n	15	20	8	2	-	4	-
%	31.25	41.66	16.66	4.17	-	8.33	-
Group-III (n=26) n	10	2	3	6	-	4	-
%	38.46	7.69	11.54	23.07	-	15.38	-
Group-IV (n=33) n	14	6	6	3	3	-	-
%	42.42	18.18	18.18	9.09	9.09	-	-

Table -2 : Number of Disorders in Various Groups

	1 disorder	2 disorder	3 disorder	4 disorder
Group - I	57.14	30.36	10.71	1.78
Group - II	39.58	39.58	14.58	6.25
Group - III	34.62	34.62	23.08	7.69
Group - IV	18.18	27.27	36.36	18.18



All values in Percentages

Pulmonary functions in all the group were within normal limits. Average values regard from 334 L/min to 403 L/min, highest in upper middle class and lowest in lower class however, the difference was not significant. Psychomotor tests particularly response to colour and auditory stimuli was significantly higher in lower middle class compared to middle class signifying slowness in alertness to external stimuli (Table 3). It could be related to educational status of middle class population (Shah AH, *et al.*, 1999) who are more conscious about their physical, mental and general wellbeing and more stressful conditions amongst lower income group.

Table -3 : Pulmonary functions and Psychomotor tests in Elderly

	Pulmonary functions PEFR (L/min)	Psychomotor test : Reaction time (m sec)			
		Yellow	Red	Green	Auditory
Group-I (n=56)	334.30 ±117.40	405 ±182	332 ±182	370 ±194	336 ±140
Group-II (n=48)	374±105 ±105	244±55 ±55	258±69 ±69	234±49 ±49	323±57 ±57
Group-III (n=26)	372±121 ±121	194±28 ±28	193±23 ±23	187±49 ±49	171±31 ±31
Group-IV (n=33)	403±97 ±97	174±27 ±27	183±54 ±54	175±27 ±27	151±37 ±37

Discussion

Reports on health profile of elderly population in India are few and far between. One of the important finding of the study : diabetes (41.66%) was maximum in the lower middle class (Gr. II) compared to other 3 groups probably related to stress.

Comparative figures in general population from Chennai city (Ashabai P.V. *et al.*, 2001) was very low (2.9%) while in higher age group (age > 40 years) was 10.5% which is much lower than ours. It could be due to different life style and the environmental factors having less impact on stress. Other Urban population studies from various parts of India : Ramachandran - urban population in India (Ramachandran A, *et al.*, 1997), Verma from urban area, New Delhi (Verma NPS, *et al.*, 1986), and Ashabai in selected Indian urban population (Ashabai PV *et al.*, 2001) showed higher prevalence than report from Chennai but still lower than our findings. Higher incidence in our study was in selected elderly population against general population. Ramachandran (Ramachandran A, *et al.*, 1988) however, showed higher incidence (71%) of known diabetics in urban population.

In a study from Sri Lanka (30-65 years) the prevalence of diabetes was 14.2% for men and 13.5% for women while impaired fasting glycaemia was 14.2% for men and 14.1% for women (Wijewardene K, *et al.*, 2005). King H, *et al.*, (2005) reported prevalence of DM in 5% in Siemreap (rural) and 11% Kampong cham (semi urban). This values are lower than our observations in Gr. II and Gr. IV, could be due to racial factors and wide ranging age groups where as our study was in elderly age group.

The incidence of hypertension in our study was 31-42% which is a well-known major risk factor for cardiovascular diseases. The percentage increased with high income group. In our previous population study from city of Mumbai (10-79 years old) the prevalence of hypertension was quite low (7.77%) in a mixed population mostly comprising of adult population (Patel JC *et al.*, 2003). Another report from Mumbai (Anand MP, 2000) observed 26.78% prevalence in men and 27.65% in urban executive population (28-65 years). Values from Chennai urban population (age 20-70 yrs.) was 23.9% in men and 19.9% in women (Deepa R, *et al.*, 2003).

However, results of similar study from Sri Lanka (Wijewardene K, *et al.*, 2005) in the age groups of 30 to 65 years showed higher incidence (18.8% for men and 19.3% for women) : Since our study group comprised of elderly subjects, it resulted in higher incidence of hypertension.

There was absence of HT in rural population in our study. However, Patel reported prevalence of 7.82% in rural population of Gujarat (Patel JC, 1986). Difference might be due to different life style. Reports from other parts of India : prevalence of HT was found to be 3.57% from Haryana (Joshi PP, *et al.*, 1993), 26% from western region (Kennes WB, *et al.*, 1986). While rural study from Nagpur district reported low incidence (4%) in young compared to 60+ (17.2%) (Gupta SP, *et al.*, 1979). Gupta et al reported prevalence in rural population (20-70 yrs) as 24% in men and 17% in women (Gupta R and Sharma AK, 1994) and a study from north showed lower incidence : values were loss; 3% for men and 5.8% for women (Pathak JD, *et al.*, 1978). Difference could be due to less number of subjects in our study.

A population-based study, recruiting 881 elderly subjects of Cimbrian origin and comparing them with a standard control population (SCP) having comparable general characteristics and lifestyle showed age-adjusted systolic blood pressure and pulse pressure that were higher in the Cimbrians than in the SCP, while diastolic blood pressure was comparable. The prevalences of arterial hypertension, isolated systolic hypertension, and pulse hypertension were significantly more representative among Cimbrains than SCP. The prevalences of diabetes, was higher among the former than the latter.

Higher incidence of HT was related to obesity in 46.66% in higher middle class in or study. In contrast, Lebanese adult population. (Equal or above 30 year old) from all regions in Lebanon, revealed that 23.1% of the respondents were hypertensive. In our study, prevalence of hypertension increased with age ($P < 0.01$) and hypertension tended to occur more in the less educated and the unemployed ($P < 0.01$). The prevalence of hypertension increased significantly with an increase in body mass index particularly in female patients.

Comparative study of social status shows that hypertension and diabetes mellitus affects middle class elderly more than lower class. However, anemia was more common in lower strata which was expected due to lower socioeconomic condition and poor quality diet.

Pulmonary function viz peak expiratory flow rate (PEFR) in all the groups was comparable however, psychomotor test was significantly altered in lower strata compared to upper class. No such studies have been reported from elsewhere. Earlier it has been reported that pulmonary functions decline with age (Pathak JD *et al.*, 1989) however, in the present study, values in the elderly population showed comparable values with young nursing students which could be due to large number of students than elderly. (Shah AH, *et al.*, 2002). It is possible that our elderly population who have volunteered for the study are more active and many of them are conscious about life style.

Psychomotor test viz. Reaction time to colour and auditory stimuli were nearly doubled in lower middle class compared to other classes. This is attributed to psychological changes coming with age and that reaction in young and elderly was 1:1.4 (27). It was observed that reaction time in a study of general population increased with age and quicker reactions correspond with higher education (Shah AH, *et al.*, 1999).

Elderly suffered from more than one disorder and it was interesting to find that incidence increased with higher income. No such study has been documented, from India.

Conclusion

It is possible that diabetes in rural population in stress related and it needs better attention. Pulmonary functions were at the lower level, could be due pollution and smoking habits which was reflected on slower reaction time. Elderly subjects suffer from more than one disorders which has been correlated with income.

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Screening of Cognitive Impairment and Depression in Elderly Patients

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ABSTRACT

The paper aims to assess the cognitive impairment and depressive symptomatology in elderly and to examine its distribution and associations with age, gender and literacy. 153 geriatric patients (age 60 yrs and above) attended the CPGP OPD (March-05 to April-05) were administered The Hindi Mental Status Exam (HMSE) by C. Ganguli et al., 1994, Geriatric Depression Scale-15 (GDS-15). Out of the total 153 patients, 82 were male and 71 were Female. 41.2% were Illiterate, while only 14.4% were having education more than 10th standard. 39.2% were cognitive impaired (score<22). 30.8% (60-70years), 53.8 % (70-80years) and 85.7 % (> 80years) were cognitive impaired. (p=0.0086). 47.9% female and 31.7% male were cognitive impaired. (p=0.01). Education also having the positive association with HMSE score (p=0.004). 68.3% (Illiterate), 42.5% (up to 5th std.) while 41% (more than 10th std) were having GDS score>5 (p=0.0003). Education also having the significant association with depression (p=0.0007). 47.6% male and 52.1% female were depressed (p=0.57). 80% cognitive impaired also having depressive symptoms. Age, gender and illiteracy were significantly associated with the cognitive impairment while only age and illiteracy were significantly associated with depression.

Keywords: Old age, Gender education, Cognitive impairment, Depression.

Ageing is a universal process. Ageing is generally defined as a process of deterioration in the functional capacity of an individual that results from structural changes, with advancement of age. In most gerontological literature, people above 60 years of age are considered an 'old' and as constituting the 'elderly' segment of the population.

The UN defines a country as 'ageing' where the population of people over 60 years reaches 7%. By 2000 India had exceeded that proportion (7.7%) and is expected to reach 12.6% in 2025. The Indian aged population is currently the second largest in the world. The absolute number of the over 60 population in India will increase from 76 million in 2001 to 137 million by 2021 (Registrar General of India). Population ageing is the most significant result of the process known demographic transition. Reduction in fertility and reduction in mortality due to improved medical facilities and improved life styles, all lead to increased proportion of older people in the total population.

Primarily because of lack of resources for health research developing countries like India have not able to report reliable data on mental health of elderly. The prevalence rate of mental morbidity among the aged was estimated at 89/1000 population which when projected yielded a figure of nearly 4 million for the country (Venkoba Rao *et al.*, 1983). This figure is lower than the other western countries like UK where the rate is as 263/1000 (Kay *et al.*, 1964). Affective disorders, particularly Depression, late Paraphrenia and Dementia (Psycho-organic syndrome) form the bulk of total mental morbidity in the elderly. The former group forms two-third while the psycho-organic syndromes form one-third of the total mental morbidity. The overall prevalence rate of psychiatric morbidity rises from 71.5% for those over 60 to 124 in the 70s to 155 in those over 80 (Venkoba Rao, 1983).

With advancing age, cognitive functions may remain stable or decline. Cognitive functions that decline include selective attention, naming of objects, verbal fluency, complex visuospatial skills and logical analysis. In India there are estimated cases around 4 million. An average incidence rate of cognitive decline 12 to 15 per 1000 persons –years has been reported for people 65 years and older (Ganguli *et al.*, 2000 and Andersen *et al.*, 1999). The prevalence rate of major depression is around 60/1000 population (Venkoba Rao 1996). Women are affected twice as often as males.

Methodology

Sample

Present study was done at the Curative and Preventive General Practice (CPGP) OPD, SSG Hospital, Vadodara. This study was done in the duration of one month (March-05 to April-05). Very severely ill patients and non-cooperative patients were excluded from the study. So, total 153 elderly subjects, 82 male and 71 female subjects were enrolled in the study. Prior consent was taken before taking any information. Information was collected on pre-tested semi-structured performa. Analysis was done using Epi-info version 6.04d.

Table 1: Distribution of elderly according to age and sex

Age Group	Male		Female		Total	
	No	%	No	%	No	%
60-69	56	68.3	51	71.8	107	69.9
70-79	23	28	16	22.5	39	25.5
80-89	3	3.7	4	5.6	7	4.63
Total	82	100	71	100	153	100

Table no.1 shows that majority of the subjects (69.9%) belonged to age group of the 60-69 years. Proportion of female subjects was higher in the very old age group, 80-89 years. It might be due to the fact that female had higher life expectancy than the male at the age of 60 years or above.

Table 2: Distribution of elderly according to sex and education

Education	Male		Female		Total	
	No	%	No	%	No	%
Illiterate	29	35.4	34	47.9	63	41.2
Up to 5 th std	27	32.9	13	18.3	40	26.1
5 th to 10 th std	15	18.3	13	18.3	28	18.3
>10 th std	11	13.4	11	15.5	22	14.4
Total	82	100	71	100	153	100

$$\chi^2 = 4.67, \text{ d.f.} = 3, \text{ p} = 0.197$$

Table no. 2 shows that overall 41.2% subjects were illiterate and 58.8% subjects were literate, which is almost similar to Gujarat

literacy rate (58.6%). Illiteracy was comparatively higher in female (47.9%) than the male (35.4%), but the difference was not statistically significant ($p=0.197$). Higher education was quite low in both male and female.

Table 3: Distribution of elderly according to age and education

Education	Age in years							
	60-69		70-79		80-89		Total	
	No	%	No	%	No	%	No	%
Illiterate	36	33.6	24	61.5	3	42.9	63	41.2
Up to 5 th std	25	23.4	12	30.8	3	42.9	40	26.1
5 th to 10 th std	24	22.4	3	7.7	1	14.3	28	18.3
>10 th std	22	20.6	0	0	0	0	22	14.4
Total	107	100	39	100	7	100	153	100

$\chi^2 = 19.7$, d.f. = 6, $p < 0.05$

Table no. 3 shows that the level of illiteracy was higher in advancing age. Also higher education also decrease with the advancing age and the difference was statistically significant ($p < 0.05$).

Tools

Cognitive Impairment

Several screening tests for cognitive impairment have been validated; the *Mini-Mental Status Examination* (MMSE), prepared by Folstein *et al.*, (1975) is popular because it efficiently tests most of the major aspects of the cognitive function. Though it is not culturally accepted for the developing countries like India where the illiteracy is widely prevalent. Taking into consideration of these facts, we used *Hindi Mental Status Exam* (HMSE) prepared by (Ganguli *et al.*, 1995). Total score was 30. For the HMSE operational Cut-off point taken, 90th percentile of the score i.e. Score that identified the 'most cognitive impaired' tenth of the sample. So cut-off score for HMSE was 22. Score < 22 suggestive of Cognitive impairment.

Depression

For the assessment of the Depression we used *Geriatric Depression Scale-15* (GDS-15), prepared by Sheikh *et al.*, (1986). It is easy to administer and needs no prior psychiatric knowledge. Total

score was 15. Cut-off score for GDS was 5. Score > 5 suggestive of Depression.

Results and Discussion

Table 4: Relationship between sex and cognitive impairment

HMSE Score	Male		Female		Total	
	No	%	No	%	No	%
0-21	26	31.7	34	47.9	60	39.2
22-26	17	20.7	20	28.2	37	24.2
27-30	39	47.6	17	23.9	56	36.6
Total	82	100	71	100	153	100

$\chi^2 = 9.21$, d.f. = 2, $p < 0.01$

Table No. 4 shows that Cognitive impairment was significantly higher in female than the male ($p < 0.01$). Overall 39.2% subjects had HMSE score < 22 suggestive of cognitive impairment. 31.7% male and 47.9% female had cognitive impairment. Higher HMSE score was comparatively lower in female than male.

Table 5: Relationship between age and cognitive impairment

HMSE Score	Age in years							
	60-69		70-79		80-89		Total	
	No	%	No	%	No	%	No	%
0-21	33	30.8	21	53.8	6	85.7	60	39.2
22-26	28	26.2	8	20.5	1	14.3	37	24.2
27-30	46	43	10	25.6	0	0	56	36.6
Total	107	100	39	100	7	100	153	100

$\chi^2 = 13.61$, d.f. = 4, $p < 0.01$

Table No. 5 shows that advancing age was significantly associated with cognitive impairment ($p < 0.01$). 30.8% subjects in the age group of 60-69 years, 53.8% subjects in the age group of 70-79 years and 85.7% subjects in the age group of 80-89 years had cognitive impairment. Higher HMSE score was also low in the very old age group.

Table No. 6 (see on page 355) shows that the Illiteracy was significantly associated with cognitive impairment ($p < 0.01$). As the

level of education increased percentage of cognitive impairment decreased and the score of HMSE increased.

Table 7 : Relationship between sex and depression

GDS Score	Male		Female		Total	
	No	%	No	%	No	%
0-5	43	52.4	34	47.9	77	50.3
>5	39	47.6	37	52.1	76	49.7
Total	82	100	71	100	153	100

$\chi^2 = 0.3$, d.f. = 1, $p = 0.57$

Table No. 7 shows that the overall 49.7% subjects had GDS score > 5, suggestive of depression. 47.6% male and 52.1% female subjects had depression. Depression was not significantly associated with gender ($p = 0.57$).

Table 8: Relationship between age and depression

GDS score	Age in years							
	60-69		70-79		80-89		Total	
	No	%	No	%	No	%	No	%
0-5	65	60.7	11	28.2	1	14.3	77	50.3
>5	42	39.3	28	71.8	6	85.7	76	49.7
Total	107	100	39	100	7	100	153	100

$\chi^2 = 15.9$, d.f. = 2, $p < 0.001$

Table No. 8 shows that 39.3% subjects in the age group of 60-69 years, 71.8% subjects in the age group of 70-79 years and 85.7% subjects in the age group of 80-89 years had depression. It shows that depression was significantly higher in the advancing age ($p < 0.001$).

Table No. 9 (see on page 356) shows that the depression was significantly associated with illiteracy ($p < 0.001$).

Table 6: Relationship between education and cognitive impairment

HMSE score	Illiterate		Up to 5th std		Education 5th to 10th std		>10th std		Total	
	No	%	No	%	No	%	No	%	No	%
0-21	35	55.6	14	35	6	21.4	5	22.7	60	39.2
22-26	15	23.8	13	32.5	6	21.4	3	13.6	37	24.2
27-30	13	20.6	13	32.5	16	57.2	14	63.4	56	36.6
Total	63	100	40	100	28	100	22	100	153	100

$\chi^2 = 18.66$, d.f. = 6, $p < 0.01$

Table 9 : Relationship between education and depression

GDS score	Illiterate		Education						Total	
	No	%	Up to 5th std		5th to 10th std		>10th std		No	%
0-5	20	31.7	23	57.5	21	75	13	59.1	77	50.3
>5	43	68.3	17	42.5	7	25	9	40.9	76	49.7
Total	63	100	40	100	28	100	22	100	153	100

$\chi^2 = 17.02$, d.f. = 3, $p < 0.001$

Table 10: Relationship between cognitive impairment and depression

GDS score	HMSE score							
	0-21		22-26		27-30		Total	
	No	%	No	%	No	%	No	%
0-5	12	20	26	70.3	39	69.6	77	50.3
>5	48	80	11	29.7	17	30.4	76	49.7
Total	60	100	37	100	56	100	153	100

$\chi^2 = 31.5$, d.f. = 2, $p < 0.001$

Table No. 10 shows that 80% cognitive impaired subjects had depression. As the HMSE score increased the percentage of depression decreased. It shows that cognitive impairment and depression were significantly associated with each other ($p < 0.001$).

Overall 39.2% subjects had cognitive impairment. 31.7% male subjects and 47.9% female subjects were cognitive impaired ($p < 0.01$). Advancing age and Illiteracy both were significantly associated with cognitive impairment ($p < 0.01$). These findings are quite high than other studies. Fillenbaum *et al.*, (1999) in his study on rural older population in Northern India reported that 21.5% subjects had cognitive impairment. 30.8% subjects in the age group of 60-69 years, 53.8% subjects in the age group of 70-79 years and 85.7% subjects in the age group of 80-89 years had cognitive impairment and the difference was statistically significant. Chandra *et al.*, (1998) in a rural area of North India found that overall prevalence rate of 0.84% for all dementias in the aged 55 years and older and an overall prevalence rate 1.36% in the population aged 65 years and older. The overall prevalence rate of Alzheimer's diseases was 0.62% and 1.07% in the 55 years and 65 years elderly of Alzheimer's disease and dementia, but neither gender nor literacy was associated with prevalence. Denise *et al.*, (2003) in his study observed that cognitive impairment did not differ by gender. Lower education attainment was associated with cognitive impairment. Increasing age was associated with cognitive impairment. 15% in the age group of 65-69 years and 51% in the age group of more than 85 years had cognitive impairment.

In this study 49.7% subjects had depression. 47.6% male and 52.1% female had depression. Gender was not significantly associated with depression ($p=0.57$). Although advancing age and illiteracy both were significantly associated with depression ($p<0.001$). Venkoba Rao *et al.* (1982) found 6% prevalence of depression in a semi-urban southern Indian community population aged 60+. While Ramchandran *et al.* (1979) reported a prevalence of 23.6% for depression in elderly. Sheikh *et al.* (1991) reported a prevalence rate of depression of 23% in a US study population. Venkoba Rao (1993) reported evidence of a male preponderance among older depressed patients in the state of TN in south India. Ganguli *et al.*, (1999) in a rural North India found that greater number of depressive symptoms were associated with old age and illiteracy. Among the illiterate, there were no gender difference while among literate, higher GDS score were found among women.

While studying the relationship between cognitive impairment and depression, it was found that cognitive impairment was higher in depressed subjects ($p<0.001$). A study by Ganguli *et al.* (1999) among Ballabgarh elderly reported that higher depressive symptoms scores were independently and significantly associated with cognitive impairment.

Poor scores on cognitive impairment in depressed subjects may represent some form of 'depressive pseudo dementia'. In other words, depressed subjects with poor motivation and attention may perform poorly on cognitive function test. Same way, depressive symptoms could be manifestations of degeneration of noradrenergic neurons in Alzheimer's disease (Forstl *et al.*, 1994). They could be due to the individual's emotional response to self-awareness of failing abilities and autonomy, since demented persons who deny their memory loss are less likely to be depressed (Sevush and Leve, 1993; Tobiansky *et al.*, 1995).

Conclusion

Age, gender and illiteracy were significantly associated with the cognitive impairment while only age and illiteracy were significantly associated with depression. Cognitive impairment and Depression both were also significantly associated with each other.

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Geriatrics : Its Importance and its Present Status in India

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ABSTRACT

The advancement of medical science and increased awareness among the people have brought about a sharp decline in mortality and a steady decline in fertility. This has resulted in a worldwide shift in the demographic profile and have lead to a significant increase in the aged population. The shifting demographic trend was so far considered a feature only in the industrialized world. But with the benefits of modern medicine and public awareness spreading to the developing nations as well, the changing demographic trend is increasingly becoming a reality in the developing countries too. The present scenario is such that about two thirds of all older people are concentrated in the developing world and by 2025 this figure is projected to rise further. The tragedy lies in the fact that though the industrialized nations have a well equipped service delivery system targeted for the elderly, the scenario remains utterly dismal in the developing nations where the need is all the more. This article tries to analyse the present status of geriatric care in India and its future relevance and stresses on the need for an immediate change in the attitude of the government as well as the general community. In this context it stresses on incorporating 'gerontology' as a component of medical education and also redefining the job responsibilities of the health workers at the community level.

Keywords : Demographic profile, Geriatric care, Medical education, Community health worker.

The advancement of medical science and increased awareness among the people have brought about a sharp decline in mortality and a steady decline in fertility. This has resulted in a worldwide shift in the demographic profile and have lead to a significant increase in the aged population

Table 1 clearly shows the declining trend in the Crude Death Rates and Total Fertility Rates with an increase in the life expectancy at birth and the geriatric population worldwide and also makes projections of the trend thus set continuing into the future with a substantial increase in the population aged 60 years and above.

Though this demographic shift signifies the triumph of modern medicine and public awareness yet at the same time it throws up a challenge to the modern society and demands the health care system to get equipped accordingly to serve the present and the future need of the community. The shifting demographic trend was so far considered a feature only in the industrialized world. But with the benefits of modern medicine and public awareness spreading to the developing nations as well, the changing demographic trend is increasingly becoming a reality in the developing countries too.

Table 2 clearly depicts the same worldwide trend in demographic shift becoming a reality in the developing countries as well.

Moreover out the total world population of 6,464,750 with 5,253,484 living in the less developed regions (United Nations Population Division. World Population Prospectus. 2004), the present scenario is such that about two thirds of all older people are concentrated in the developing world and by 2025 this figure is projected to rise further (Aging and Life Course, WHO). The tragedy lies in the fact that though the industrialized nations have a well equipped service delivery system targeted for the elderly, the scenario remains utterly dismal in the developing nations. This article tries to analyse the present status of geriatric care in India and its future relevance and stresses on the need for an immediate change in the attitude of the government as well as the general community. In this context it stresses on incorporating 'gerontology' as a component of medical education and also redefining the job responsibilities of the health workers at the community level.

Table 1 : World

	1970- 1975	1975- 1980	1980- 1985	1985- 1990	1990- 1995	1995- 2000	2000- 2005	2005- 2010	2010- 2015	2015- 2020			
Total Fertility Rate (children per woman)	4.49	3.92	3.58	3.38	3.04	2.79	2.65	2.55	2.46	2.38			
Crude Death Rate (per 1,000 population)	11.5	10.8	10.3	9.7	9.5	9.1	9	8.9	8.8	8.8			
Life Expectancy at Birth (Males)	56.6	58.2	59.5	61	61.6	62.3	63.2	64.3	65.5	66.6			
Life Expectancy at Birth (females)	59.6	61.7	63.3	64.9	66	67	67.7	68.7	69.9	71.2			
	1970	1975	1980	1985	1990	1995	2000	2005	2010	2015	2020	2025	2030
Percentage Aged 60 or Over	8.4	8.6	8.6	8.9	9.2	9.5	10	10.4	11.2	12.4	13.6	15.1	16.7
Percentage Aged 65 or Over	5.5	5.7	5.9	5.9	6.2	6.5	6.9	7.4	7.7	8.4	9.4	10.5	11.8
Percentage Aged 80 or Over	0.7	0.8	0.8	0.9	1	1.1	1.2	1.3	1.5	1.7	1.9	2	2.4

Source: World Population Prospectus. The 2004 Revision Population database. United Nations Population Division.

Table 2 : Less Developed Countries

	1970- 1975	1975- 1980	1980- 1985	1985- 1990	1990- 1995	1995- 2000	2000- 2005	2005- 2010	2010- 2015	2015- 2020			
Crude Death Rate (per 1,000 population)	12.2	11.3	10.5	9.7	9.4	8.9	8.7	8.6	8.4	8.3			
Total Fertility Rate (children per woman)	5.44	4.65	4.15	3.84	3.41	3.1	2.9	2.75	2.63	2.52			
Life Expectancy at Birth (Males)	54.1	55.9	57.4	59	59.9	60.8	61.7	62.9	64.1	65.3			
Life Expectancy at Birth (females)	55.6	57.9	60	61.7	63.2	64.4	65.2	66.4	67.8	69.1			
	1970	1975	1980	1985	1990	1995	2000	2005	2010	2015	2020	2025	2030
Percentage Aged 60 or Over	6.2	6.2	6.4	6.6	6.9	7.2	7.7	8.2	8.9	10.1	11.3	12.8	14.5
Percentage Aged 65 or Over	3.8	3.9	4.1	4.2	4.4	4.7	5.1	5.5	5.9	6.5	7.5	8.6	9.9
Percentage Aged 80 or Over	0.4	0.4	0.4	0.5	0.5	0.6	0.7	0.8	0.9	1.1	1.2	1.4	1.7

Source: World Population Prospectus. The 2004 Revision Population database. United Nations Population Division.

Demographic Shift in India

India is no exception to this global trend in demographic shift. Fertility in India has declined substantially. Since the mid-1960's, India has covered a long way to the replacement fertility of just over two births per woman (Adlakha Arjun, 1997). Between 2001 and 2026 because of the declining fertility, the proportion of population aged under 15 years is projected to decline from 35.4 to 23.4 percent and the proportion of the middle (15-59 years) and the older ages (60 years and above) are said to increase considerably. With the declining fertility, alongwith with the increase in life expectancy, the number of older persons in the population is projected to increase by more than double from 71 million in 2001 to 173 million in 2026 - an increase in their share to the total population from 6.9 to 12.4 percent (Census of India 2001, Population Projections for India and States 2001-2026).

Table 3 points out the demographic shift in India in conformity with the rest of the world.

But with the public health care delivery system totally lacking a component of geriatric care and the private health care providers making half hearted efforts, the need is utterly mismatched in comparison to the supply. Thus it is quite obvious that majority of India's elderly living in the rural areas and amidst poverty are denied of the basic health rights.

Associated Epidemiological Transition

The demographic transition has brought about a shift in the pattern of diseases also. With the aging in the population the burden of Non Communicable Diseases is rising. The developing countries like India are thus faced with a dual burden of NCDs as well as communicable diseases the menace of which still loom large in these countries. Cardiovascular Diseases and Atherosclerosis, Cerebrovascular Diseases, Chronic Obstructive Pulmonary Diseases, Pneumonia and Septicemia, Tuberculosis, Renal Diseases, Cancer, Alzheimer's Disease and other mental disorders, Musculoskeletal Pathology leading to falls and associated fractures, prostate hyperplasia, deafness, cataract, dental problems, constipation have been the leading causes of morbidity and mortality in the elderly (Nadine R. Sahyoun, Harold Lentzner, Donna Hoyert, Khristen N. Robinson, 2001).

Table 3 : India

	1970- 1975	1975- 1980	1980- 1985	1985- 1990	1990- 1995	1995- 2000	2000- 2005	2005- 2010	2010- 2015	2015- 2020			
Total Fertility Rate (children per woman)	5.43	4.83	4.48	4.15	3.81	3.43	3.07	2.76	2.5	2.29			
Crude Death Rate (per 1,000 population)	15.9	13.9	12.9	11.6	10.4	9.4	8.8	8.3	7.9	7.6			
Life Expectancy at Birth (Males)	51.2	53.3	54.9	57.1	59	60.4	61.7	63.2	65	66.6			
Life Expectancy at Birth (females)	49.3	52.4	55	57.5	60.1	62.7	64.7	66.7	68.7	70.5			
	1970	1975	1980	1985	1990	1995	2000	2005	2010	2015	2020	2025	2030
Percentage Aged 60 or Over	6	6.2	6.5	6.6	6.8	7.1	7.5	7.9	8.5	9.4	10.6	12	13.6
Percentage Aged 65 or Over	3.7	3.8	4	4.2	4.3	4.5	4.9	5.3	5.7	6.2	7	8.1	9.3
Percentage Aged 80 or Over	0.3	0.3	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1	1.2	1.3	1.6

Source: World Population Prospectus. The 2004 Revision Population database. United Nations Population Division.

Present Status of Gerontology and Geriatric Care in India

The community researchers in India have done important studies and come up with conclusive findings on the poor, the backward classes, the landless and the women in general but the elderly comprise one very important vulnerable group who have so far been neglected. It is only recently that researchers have started taking an interest in this branch of science which is still in its infancy in the country. But the stand undertaken by the government to modify the health care delivery in the country with the changing needs brought about by the demographic and epidemiological shift has been very depressing. The series of propositions put forth by the researchers to make the basket of services more appropriate to the demographic transition have all fallen on deaf ears and the government has remained steadfast in its stand not to adequate services for the elderly population of India. It is quite clear that with the lack of definite social security and after retirement benefit measures with majority of the Indians who work in the unorganised sector, the elderly and particularly the elderly women are one of the most tenuous links in the economy (Gupta Indrani, Sarkar Deepa, 2003). Moreover with the disintegration of the concept of the joint family and adoption of the Western norms of the nuclear family there has been a major change in the outlook of the Indian people. This is already having a great impact on the growing elderly population who bear the brunt of social isolation. The hospitals are considered as safe dumping havens for the elderly by the family members who at the same time do not forget to boast of providing their parents with the best available treatment. It is an urgent need of the time to make sure that the elderly enjoy an improved quality of life.

Despite having one of the highest number of elderly bureaucrats in the union cabinet, the Indian Government has so far turned a cold shoulder towards its growing elderly population. The benefits for the Senior Citizens that exist in this country are mainly enjoyed by the wealthy few and it hardly percolates down to the majority of the elderly population struck by poverty and ignorance. The government should make sincere efforts to distribute the privileges equally, specifically targeting the elderly poor to bring them out of their misery, otherwise the very purpose of these policies is only half fulfilled. It was a good move by the Ministry of Social Justice and Empowerment to launch the Project OASIS (Old Age Social and Income Security) in the year 1999 to commemorate the International Year of Old Persons. The Project OASIS committee made some revolutionary recommendations on the pension sector

reforms. The recommendations stated in the project held substantial promise for millions of elderly Indians badly in need of a social security (Project OASIS). Unfortunately even after so many years, its proper implementation has remained an unheard cry. The women (within the elderly population) are no doubt most severely affected by this indifferent attitude on the part of the government. Though the government acknowledges the need of preventing women from being victims of 'triple neglect and discrimination on account of gender, widowhood and age', yet there has been no real urge from the government to formulate a concrete strategy to address their needs (Majumder Swapna, 2003).

Disability is a growing concern as a result of this demographic shift. The 2001 census has pointed the proportion of disabled in India as 2.13 % of the total population. Classification of the disabled population by different categories of disabilities shows that the proportions of people with seeing disabilities are highest followed by movement disability. Though the reason for this trend is not clear it could be an effect of the natural process of ageing brought about by the demographic shift. Classification of the total disabled population by residence shows that nearly 75 percent of the total disabled live in rural areas. Presently specific network facilities focussed towards the elderly disabled are lacking in our country. The very few of those centres that exist are mostly urban based. The network of services for the disabled elderly should be increased in the rural setups (Kishore Bhanushali).

Today there hardly exists any services at the primary health care level to offer to the elderly. As the need of the society is changing, the grassroot level workers with their age old set of services are getting outdated and less and less acceptable to the society. There is an urgent need to redefine the job responsibilities of the health workers so that they can serve the society in a better way (Nair V.M, Thankappan K.R., Sharma P.S., Vasan R.S, 2001). They can be trained to check blood pressure and also diagnosis and counselling of certain mental disorders. They can make the patients aware of the more common forms of cancer in the country and give advises about early detection of those and also escort the patients to the screening centres.

There is also a need to modify the curricula in the public health and medical education in the country. It is only recently that this country has understood the importance of Public Health. The course curricula in the handful of the already existing Public Health and Community Medicine courses do not give importance to geriatrics. The scholars who pass out as Community Medicine and Public Health professionals from different

Indian institutions are all well trained and fluent in other aspects of Public Health but when it comes down to geriatrics they share the same indifferent attitude. In the present medical world in India geriatrics practically has no existence as an independent stream. There is a dearth of opportunities as well as interest for this stream among the medical professionals in this country. Geriatrics is considered as unimportant and there is hardly any enthusiasm among the medical or social science students to specialise in it. There is thus a huge need to reorient the medical education with a module on 'gerontology and geriatric care' so that the fresh scholars who are the future generations of clinicians, researchers and policy makers undergo a change in their present attitude and handle the demographic transition in an effective way.

Most of the community efforts in India that have so far been targeted for the elderly have been from different NGOs working among the geriatric population. Yet the number of these NGOs and their technical expertise in the area far lag behind the need of the hour. The standard of many of the old age homes in India are deplorable. There is a dearth of counseling centers for the elderly where they can be given comprehensive medical advice and support if needed and also advised about important financial investments to help them get the best out of their monetary assets. The handful of such centers that exist in India are totally out of reach of the poverty stricken elderly population living in the rural areas who need their guidance the most.

Conclusion

The present scenario and the future appeal of geriatrics in India is such that there is need for change in the attitude of not only the government but also the people. The elderly should be considered not as a burden to the society but their valuable experience should be utilised 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 service towards their children and the nation. It is high time that the Indian policy makers give due importance to the forthcoming age wave. The government should make an earnest and accelerated attempt to bring about reforms in the pension sector and design a suitable social security system and improve the health care facilities for the elderly. The government should realise the importance of geriatrics and make strong efforts to incorporate it in the curricula of the existing and the future Public Health and Medical Institutions in this country. Though this is a mammoth task to achieve in isolation by the

public and private sectors but solvent and effective ways can be found out through joint approaches and strategies (Aging and Lifecourse, World Health Organisation).

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Education for understanding Old Age and its Acceptance by Children and Elders

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ABSTRACT

Since the Western society, and the youth in particular have a negative attitude towards the elderly, we attempted to change the prevailing views of school children towards the elderly, by establishing frameworks for inter-generational activities. The intervention was comprised of children belonging to two age groups, and one group of elderly people. The age range of the children was chosen on the basis of findings indicating that as children grow older, their negative attitudes towards the elderly intensify. Our study showed that the middle school students viewed the elderly in a more negative light than the elementary. The conclusion is that it is necessary to educate children from an early age to perceive elderly in a positive light.

Keywords : Elderly, Children; Intergenerational activities

One of the major achievements of the 20th century was the increased rate of longevity in the Western society. Populations are aging all over the world and we have seen that the actuality of the increased life expectancy is gaining momentum and the public is becoming increasingly aware of the subject. The Western society views the elders as a dependent and weak person, feeble and

handicapped. The old are considered people who lack creativeness and as those who can no longer contribute to society. Many elements comprise this negative image, one of the most important of which concerns the way in which the aged appear or are presented in the media. First, the old rarely appear on television and when they do, they are usually characterized as unhealthy, unhappy, uninteresting, unfashionable, unproductive and uncreative. Sometimes, old people are used in television commercials for promoting products such as vitamins, medicines, certain foods or protected tenancy projects. In these cases, the old are shown in a positive light as active and happy people, but this is of course for commercial reasons, when their appearance might help in selling the products.

Reality, of course, is different from the existing negative image that the elderly have in our society. Over 80% of the people aged 65 and over are independent, active and relatively healthy. This does not mean that old age does not hold problems in store as well, such as chronic illnesses and loneliness, but nevertheless most of the elderly lead a normal and happy life. It is not an easy mission to try and change the prevailing attitudes in the public regarding the old, but it is nevertheless achievable. Hence, we would like to suggest an intervention program that will examine the attitudes of the young towards the old and their influence on both sides, on the young on the one hand and on the old, on the other.

Tuckman and Lorge (1953) have shown that 12-year-old children express negative attitudes towards the elderly. Another study (Axelrod and Eisdorfer, 1961) has shown that young children do not understand that aging is a continuous process. Further, as the subjects' age increased, so did the number of stereotypes and negative attitudes which they expressed. Tuckman and Lorge (1954, 1958a, 1958b) have shown that older people tend to acquire misconceptions and form stereotypes regarding the elderly to a greater extent than do younger people.

Prevailing attitudes are that the aging process is portrayed by an increasing lack of economic security, by family disintegration, physical and mental deterioration, rigid personality (Tuchman and Lorge, 1954), loss of interest in success and achievements, and fear of

loneliness and dependency (Golde and Kogan, 1959). Old age is a period that is characterized by unpleasantness, risk, and a lack of values (Kastenbaum and Durkee, 1964). The common abovementioned negative attitudes are learned and internalized by the young and become entrenched with age, so that the elderly even perceive themselves in a negative light.

The effective ways of introducing the elderly and old age to children are to establish frameworks for intergenerational activities and joint activities for children and elderly people. Researchers of old age concluded that old people who are in contact with the young retain their liveliness and alertness more than those who do not. Contact with youth is an excellent means by which to push aside senility.

The children, too, will find it interesting to establish relations with the old because their wisdom and experience might impart to the young the distinction between what is important and what is unimportant, teaching them that things are not always what they seem, and instill in their heart respect for the simple and humble things, for what is true and loyal in their life.

The intervention model will deal with the educational level and specifically with children aged 11-12 and 13-14. It is important to educate the children to become familiar and respect the old, not necessarily because they are old but because respect has to be shown to any person as such, regardless of the person's gender, race, religion and age. It is important to teach the children that life is a succession that begins with birth and ends with death, and the dichotomy of young and old should be removed, especially from the definition of old age in terms of chronological age.

According to the processed data, no change occurred in the children's perception of the elders' situation before and after the program. However, as a result of the program the elementary school children viewed the elderly as being more rigid and more conservative than did middle school students. This fact leads to the conclusion that it is of great importance to preserve the existing values of younger children, and start educating children from an early age to understand, accept and view old age in a different light.

Methods

Subjects

The study subjects comprised children belonging to two age groups, and one group of elderly people. The age range of the children was chosen on the basis of findings indicating that as children grow older, their negative attitudes towards the elderly intensify. The first group of children consisted of 30 pupils, 17 boys and 13 girls, aged 11-12 year, who were studying in the 6th grade at an elementary school in Kiryat Tivon, a small town in the north of Israel. The second group of children consisted of 30 pupils, 12 boys and 18 girls, aged 13-14 years, who were studying in an 8th grade class at a middle school in the same town. The choice of the 8th grade for the present study was made by the school principal. The elderly group consisted of 30 people, 20 female and 10 male, aged 80 and up, from the same town in the north of Israel where the children's schools were located. The elderly come to the Seniors' Day Care Center five days a week, where they enjoy a variety of services and activities (Korazin, 1994).

The programs

The two children's groups participated in a year-long joint activity program with the elderly group, the aim being to examine whether the program would change the children's attitudes to the elderly.

Research process

Stage I: A preliminary meeting which was attended by the school educational counselor, the class homeroom teachers, a representative of the elderly people, a representative of the students and the researcher. The purpose of the meeting was to define the goals of the activities, and their duration and frequency.

Stage II: Meetings at each of the two schools with the children participating in the study. In these meetings, the students were informed about the Day Care Center, the people attending it, and the activities. This was followed by a personal story being told by an old person about his or her immigration to Israel, present life, and personal difficulties associated with old age. At this stage, in order to establish

the reference point, the questionnaires (see details in “Research tools” in the following page) were administered for the first time.

Stage III: The joint activities were held at the Day Care Center and at the schools, intermittently (the Discussion presents the details of the activities and their goals). In an effort to increase the effectiveness of the activities, dates for the joint activities were set in advance.

Stage IV: In an effort to examine whether the activities caused a change in the students’ (ages 11-12 and 13-14) attitudes towards old age, the questionnaires were administered once again.

RESEARCH TOOLS – THE QUESTIONNAIRES

The study utilized two tools:

1. The Palmore Test (Palmore, 1977).
2. A semantic differential tool that included 25 pairs of adjectives.

The Palmore Test (Palmore, 1977) was translated into Hebrew and was pre-tested to ascertain that it was understood so that the answers considered correct by Palmore in the USA would be considered to be correct also in Israel. All the items were documented and were found to be parallel to the answers in the original Palmore Test. The Palmore Test is a short tool that comprises 25 statements. The subject indicates whether s/he agrees or disagrees with the contents of the statement. The Test includes statements referring, on the one hand, to the physical, mental and social attributes of the elderly, and on the other, to common misconceptions regarding the aging process. The tool was used in more than 30 studies in the past, with quite consistent results. Examination of the reliability of this tool in the present study was by the α coefficient.

The second tool, the semantic differential, is a method used to observe and measure psychological intentions of concepts. Osgood et al. (1957) maintained that there is a considerable degree of overlap in verbal and behavioral definitions between people. Each concept has common meanings; however, there are also secondary meanings, some of which are common to different groups in the population, and some of which are unique. In order to examine the extent to which certain

concepts are understood by different groups, Osgood developed the differential tool which includes two main components:

1. The examined concepts (in the present case, the children)
2. Pairs of contrasted adjectives.

In the study process, the subject received several pages, with a different concept at the head of each page. Under the concept appeared a list of pairs of adjectives. A 7-point scale is presented between each pair of adjectives. For example:

Fast | 1 | 2 | 3 | 4 | 5 | 6 | 7 | Slow

The subject was instructed to indicate through the pair of words how s/he perceives the concept at the head of the page, by circling one of the numbers on the scale from 1 to 7, for all the pairs on the page. For example, in the case of the fast/slow adjectives, if the subject believes that the elderly are very fast, s/he should circle 1, if s/he thinks that elderly are very slow, s/he should circle 7, or s/he can circle one of the intermediate levels, to denote a value between very slow and very fast.

Of the 25 items of the differential tool, 20 were selected on the basis of previous studies (Eisdorfer and Altrocchi, 1961; Kogan and Wallach, 1961). The remaining five items were chosen on the basis of recent empirical findings [ref]. The tool's reliability was examined in the present study using the internal consistency coefficient – Cronbach's α .

STATISTICAL AND ANALYTICAL TOOLS

The study employed statistical methods such as PCA, Varimax-type rotation, t-tests for independent samples, bi-factorial variance analysis of the MANOVA and ANOVA types and *post-hoc* analyses of the simple effects type. To avoid duplication, these methods will be described in detail in the Results Chapter.

Results

SEMANTIC DIFFERENTIAL TEST

A factorial analysis of the PCA type was conducted with Varimax rotation in order to map the perception of the elderly into several

subworlds of content. Five theoretical factors were found to comprise the variable of “the elder’s perception”. As seen in Table 1, the five factors, taken together, are able to account for 65% of the variance in “the elder’s perception” among the scores of the subjects.

Table 1: Items (question numbers) belonging to each world of content. Five worlds of content were found, accounting for the variables and included in the variable of “the elder’s perception”

Item	Factor-1 Productive- unproductive	Factor-2 Pleasant personality unpleasant personality	Factor-3 Active – lazy	Factor-4 Flexible – rigid	Factor-5 Liberal – conservative
	9	7	1	4	20
	12	10	2	6	22
15 (reserved)	14	3	13	8	
17	19	5			
18	21	11			
23 (reserved)	16	(reserved)			
24					
25					
% of accounted variance (total=65%)	20.11%	15.3%	12.89%	9.3%	6.94%
Cronbach α	0.74	0.71	0.69	0.67	0.6

To examine the differences in “the elder’s perception” according to the five dimensions, t-tests for independent samples were performed. The results are presented in Table 2.

Table 2: The means and the standard deviations of each of the dimensions of “the elder’s perception” by elementary and middle school students at Time 1

Adjectives	Elementary mean and (standard deviation)	Middlemean and (standard deviation)	t(74)
Active-lazy	4.3 (0.78)	4.18 (0.75)	0.43
Flexible-rigid	3.2(0.29)	3.8(1.07)	-2.45*
Productive-unproductive	3.64(0.99)	3.82(0.75)	-0.91
Liberal-conservative	3.72(0.99)	4.44(0.54)	-4.08**

Pleasant personality – unpleasant personality	3.57(1.39)	3.39(0.87)	0.7
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* $p < 0.05$; ** $p < 0.01$

In summary, significant differences were found between elementary and middle school students in their perception of the elderly on the dimensions of rigid-flexible and liberal-conservative. The middle school students perceived the elders as being more rigid and more conservative than did the elementary school students.

The questionnaire was administered again (Time 2) following the intervention program. Again, in order to find out whether the differences between elementary and middle school students are significant, t-tests for independent variables were computed, as shown in Table 3.

Table 3: The means and standard deviations of each dimension of the elementary and middle school students' perception of the elderly at Time 2

Adjectives	Elementary mean and (standard deviation)	Middlemean and (standard deviation)	t(74)
Active-lazy	4(0.82)	3.12(0.76)	0.39
Flexible-rigid	3.83(1.11)	3.12(0.82)	2.74**
Productive-unproductive	3.81(0.98)	3.6(0.98)	-0.91
Liberal-conservative	4.26(0.66)	3.81(1.05)	1.85*
Pleasant personality – unpleasant personality	3.39(0.87)	3.51(1.44)	-0.4

The t-test for the two independent samples found that, after intervention, the elementary school students perceived the elderly as being more rigid ($m=3.83$) than did the middle school students ($m=3.12$). This difference was found to be significant ($t(53)=2.74$, $p < 0.01$). Examination of the subjects' perception of the elderly as liberal-conservative also showed that the elementary school students perceived the elderly to be more conservative ($m=4.26$) than did

middle school students ($m=3.81$). This difference was found to be significant ($t(53)=1.85$, $p<0.05$).

In order to examine the influence of the program on the two different age groups, on all the dimensions of “the elder’s perception”, a bi-factorial variance analysis, MANOVA, was conducted. This test did not yield significant differences on the various dimensions between Time 1 and Time 2, beyond the children’s age [$F(5,121)=0.07$, n.s.]. Also, no significant differences were found between the elementary and middle school students on all the dimensions together, except for the time (1 or 2) of the examination [$F(5,121)=0.02$, n.s.].

The interaction between the time of the questionnaire and the age group had a combined effect on all the dimensions together [$F(5,121)=7.55$, $p<0.0001$]. It was found that the time of the questionnaire and age of the children, together, had a significant influence on their general perception of the elderly (5 dimensions). To examine the source of the significance, five uni-factorial variance analyses (ANOVA) of the subjects’ scores were conducted and a significant interaction was found in the influence on the dimension of flexibility-rigidity [$F(1,125)=12.62$, $p<0.001$] and on the dimension of liberal-conservative [$F(1,125)=8.18$, $p<0.005$]. The interaction examination showed an influence on all five dimensions. In order to examine which dimensions were most heavily influenced, if any, the MANOVA test was separated into five ANOVA tests. That is, in each test, the combined influence/interaction between the questionnaire time and the age of the children was examined on each of the five dimensions. Of the five ANOVAs conducted (which examined each time one independent variable composed of the interaction (multiplication) of age X time), the scores for two dimensions were found to be significant: flexibility-rigidity and liberal-conservative (the results are similar to the t-test values, and are not surprising). To examine the source of the significance, a *post-hoc* analysis of simple effects type was conducted. The analysis showed that the questionnaire time had a significant influence on the children’s perception of the elders’ rigidity and conservatism in the two different age groups. It was found that before the program, at Time 1, the

children's age had an influence on the flexibility-rigidity dimension [$F(1,73)=6.01$, $p<0.017$], so that the middle school students perceived the elders as being more rigid ($m=3.79$, $SD=1.07$) before the program than did the elementary school students ($m=3.22$, $SD=0.79$).

After the program, at Time 2, the children's age too, had a significant influence on their rigidity perception [$F(1,53)=7.51$, $p<0.055$]; however, this time the perception of the elderly as being rigid was higher among elementary school students ($m=3.83$, $SD=1.12$) than among middle school students ($m=3.12$, $SD=0.82$). Thus, the program decreased middle school students' perception of the elders as being rigid, but increased that of elementary school students.

Another analysis was done to examine the varying influence of the children's age at each of the questionnaire times on the liberal-conservative dimension. A significant influence was found for age on the conservative dimension at Time 1 [$F(1,74)=5.67$, $p<0.02$], the middle school students perceiving the elders as being more conservative ($m=4.44$, $SD=0.54$) than did the elementary school students. At Time 2, a change was found in the significant influence of the children's age on their perception of the elderly as being conservative [$F(1,521)=3.44$, $p<0.05$]. The middle school students now perceived the elders as being less conservative ($m=3.8$, $SD=1.05$) than did the elementary school students ($m=4.26$, $SD=0.66$).

Thus, it can be said that here too, the program changed the middle school students' perception of the elderly as being conservative (decreased this perception), but increased this perception among elementary school students.

PALMORE TEST

A factorial analysis was conducted with Varimax rotation. It was found that the questions fall into four internal dimensions of "the elder's perception": cognitive, physical strength and health status, mental status and personality, and economic and employment status. The variance in the dimensions' perception between the subjects on the four factors accounts for 55.66% of the variance in "the elder's perception".

Table 4: Items with a loading higher than 0.45 on the factors, the percent of accounted variance on each factor, and the reliability coefficient – Cronbach's α for each factor

Items	Cognitive perception	Physical strength + health	Mental status+ personality	Economic status+ employment
	1	3	4	19
	2	5	10	20 (reversed)
	7 (reversed)	6	15	23
	11	8	16	
	12	9 (reversed)	(reversed)	
	13	18	22	
	17		(reversed)	
	14			
Accounted variance (total = 55.66%)	18.28%	14.29%	12.65%	10.43%
Cronbach α	0.71	0.69	0.65	0.61

Table 4 presents items only under the dimension to which they made a significant contribution and also indicates to what extent each of the dimensions contributed to the total variable. It can be seen that the highest percent of the accounted variance is that of cognitive perception. The lowest contribution was that of the economic status and employment dimension. Cronbach's α is also presented. The table indicates as "reversed" those questions that were coded reversely.

A final score was computed for each subject. In the questionnaire, subjects were presented with negative statements regarding the elderly and had to indicate their view by circling yes/no. The sum of the positive responses composed the final score. This process was repeated separately for each dimension and the items making up the dimension. A high final score indicates a more negative perception of the elderly, while a low score indicates a more positive one. To examine the difference in the children's perception of the elder's status according to the four dimensions, t-tests were conducted for independent samples.

Table 5 presents the means and the standard deviations of each of the dimensions of elementary and middle school students' perception

of the elder's social, economic, health, etc. situation. t-tests were designed to examine whether a significant difference exists in a certain attitude, in the comparison between two age groups that are independent of each other.

Table 5: Means and standard deviations of each dimension of “the elder’s perception” among elementary and middle school students at Time 1

	Elementary mean and (standard deviation)	Middlemean and (standard deviation)	t
Cognitive perception	3.4(1.6)	3.52(1.6)	-0.29
Health status	3(1.44)	3.09(1.5)	-0.21
Mental status + Personality pattern	2(1.74)	2.29(1.69)	-0.82
Economic status + employment	1.1(0.66)	1.24(0.63)	-0.75

The study results: the t-test for two independent samples did not find a significant difference between elementary and middle school students regarding the four perceptions of the elderly. Following the intervention program, the differences on these dimensions between elementary and middle school students were examined once again.

Table 6: The means and standard deviations on each dimension among elementary and middle school students at Time 2

	Elementary mean and (standard deviation)	Middlemean and (standard deviation)	4t(107)
Cognitive perception	3.45(1.5)	3.40(1.53)	0.16
Health status	3(1.45)	3.07(1.45)	-0.14
Mental status + Personality pattern	2.1(1.72)	1.8(1)	2.1*
Economic status + employment	1.13(0.62)	1.15(0.63)	0.72

Table 6 shows that significant differences were found between elementary and middle school students' perception of the elders' situation only on one dimension, that of mental status. Middle school students perceived the elders' mental status as being higher than did elementary school students.

In order to examine the program's influence on the different age groups on all the dimensions of their perception of the elders' situation, a bi-factorial variance analysis between subjects (MANOVA) was conducted, yielding significant differences in the children's perception of the elder's situation on all the dimensions together, between the two questionnaire times [$F(1,152) = 6.72$, $p < 0.0001$]. To examine the source of the significance and to examine more deeply, not only the general influence but also the influence on each dimension separately, four uni-factorial variance analyses (ANOVA) between subjects were conducted, comparing their attitudes at Time 1 and Time 2 on each dimension. The results are presented in Table 7.

Table 7:

	Time 1	Time 2	F(1, 152)
Cognitive perception	3.44(1.54)	1.96(1.87)	24.12*
Health status	3.03(1.46)	1.75(1.6)	22.31**
Mental status + Personality pattern	2.31(1.7)	1.29(1.54)	14.98*
Economic status + employment	1.17(0.57)	0.77(0.61)	11.33**

* $p < 0.05$; ** $p < 0.01$

It can be concluded that on each of the four dimensions, the children's perception of the elder's situation improved significantly following the program. Also, no significant differences were found between middle and elementary school students beyond the examination times in all the dimensions [$F(4,149)=0.32$]. This leads to the conclusion that the elementary and middle school students in the study perceived the elderly on all four dimensions in an identical manner. Also, a marginal combined influence was found for the age of the children and questionnaire times on all the dimensions together [$F(1,149)=158$, $p < 0.05$] $\rightarrow$ [$F(4,149)=158$, $p < 0.09$]. To examine the

source of the significance, four uni-factorial variance analyses (ANOVA) between the score of the subjects were conducted yielding that the interaction between the age of the children and the questionnaire time had an influence only on the mental and personality dimension [$F(1,52)=3.74$, $p<0.09$]. To examine the source of significance, a simple effect analysis was conducted, finding a significant influence for the age of the children on the mental status only at Time 2 [$F(1,54)=2.74$, $p<0.05$], so that middle school students perceived the elders as being more mentally healthy ($m=1.8$, $SD=1$) than did elementary school students ($m=2.1$, $SD=1.72$). No influence was found for the age of the children on the dimension of mental health at Time 1 [$F(1,104)=0.6$, n.s.].

Discussion

The main goal of the present study was to examine the influence of a joint activity program for elderly people and children; to find out whether a change has occurred in the children's perception of the status of the elderly following a joint program administered for one school year.

According to the processed data, no change occurred in the children's perception of the elders' situation before and after the program. However, as a result of the program the elementary school children viewed the elderly as being more rigid and more conservative than did middle school students. This fact leads to the conclusion that it is of great importance to preserve the existing values of younger children, and start educating children from an early age to understand, accept and view old age in a different light. This should be accomplished through joint activities, such as positive stories about old people, discussions about aging and being old, visiting old age homes, helping the elderly. Young children do not understand that aging is an ongoing process and tend to adopt negative views regarding aging from their environment. They absorb from the environment the idea that the elders are poor, weak, sick, grumpy, and experience physical and mental deterioration. Such a negative view is internalized by the young and deteriorates with age. By the time they reach early adulthood, it is already difficult to change their views. Furthermore, the elders, too, are aware of how the society treats them

and value themselves as being unproductive, non-contributing, and a burden on society.

As we have already noted, the assumption was that it is possible to change the way children view elders through joint activities for elders and children, and at the same time generate a change in how elderly perceive themselves. Society is like a mirror: the way the elderly present themselves to society/children is how way they will be perceived and accepted.

We chose to conduct the study using children aged 11-12 and 13-14, since we consider them to be old enough at these ages to accept and understand the situation of the elderly, and, even if they have negative perceptions of the elderly, to have the capacity to change their mind. However, the program was administered for one school year, the goal of which was to cause a change in the children's views about the elderly, did not bring about the desired change. Nonetheless, the younger children, that is, those aged 11-12 years, had held more positive views of the old before the program administration. This fact makes us think that the intervention should begin earlier, and its goal should be to preserve younger children's existing views, that is, a more positive perception of old age.

SUITABILITY OF THE QUESTIONNAIRES AND THE ACTIVITIES

The questionnaires administered belong to a research model of the quantitative type and were filled out by a sample that formed a representative sample of the student population. We found the questionnaires to be very suitable tools for examining the situation of the elderly as perceived by the children. Take for example the differential tool that was designed to examine psychological meanings of concepts or the extent to which certain concepts are understood by a certain group, in our case a group of elderly people. It can be seen that, using this tool, we can gather clear and intelligible data as to whether the elderly are perceived by the children as active-passive, rigid or flexible, healthy or unhealthy, etc.

The second tool used, the Palmore test, was designed to examine physical, mental and social attributes. The test consists of statements

that relate to these attributes, and the subjects are asked to circle “yes” or “no”, indicating whether they agree with the statement or not.

Following the first administration of the questionnaires to the children, an intervention program was developed, which included joint activities for children and elders. The activities were classified into three areas: physical, mental and social and were aimed at meeting the needs of both the elders and the children, as these emerged from the test findings. For example, joint chess games once a week and annual tournaments are aimed at developing the cognition of both the young and the old, to prove that old people can still play and even win and to develop thinking, learning and memory processes. There were times when an elder did not remember how to play and in this case a student sat by him and reminded him of the rules of the game, and the elder resumed playing. In a reverse case, an elder taught a child how to play chess. The child began playing and even won games later on.

Other benefits which the children gained during the games were tolerance and respect for the elderly who were sometimes slower than the students. Twice during the year we held simultaneous chess tournaments against a national champion, in which both old and young, from Tivon and the periphery, participated.

Other joint activities included intergenerational sports-days and joint gymnastic lessons, which were held once a month at the Day Care Center and at the children’s school, alternately. In these activities, both the children and the elders participated, helping each other with great patience, and with a smile. The children were heard wondering: “I never knew that they could play football, throw a ball into the basket or even climb a ladder”. The children learned that the elderly, despite their age, are still capable of exercising and doing things, not to mention the elders who benefited greatly from this kind of activity. It instilled in them a *joie de vivre*, sportive spirit, and a feeling of “I am still capable and able”. The sports days concluded with a ceremony at which certificates of merit were given to the winning teams, and more than once a group of elders won. These activities strengthened the emotional bond between the children and the elders, who learned to see each other in a different light.

Birthdays were celebrated at the Day Care Center one day a month for all those who were born during that month. The children were invited to each birthday party, at which they celebrated their birthdays and exchanged congratulations.

Around the Jewish holidays, a joint activity of arts and crafts was held for the elders and the students. For example, for the festive of Purim (a Jewish holiday) a children's costume parade was held at the Day Care Center, the atmosphere was very cheerful and at the end of these activities the elderly and the children exchanged Purim gifts.

Holocaust stories were chosen as a cognitive and emotional activity. The first meeting with the elderly people was devoted to an introduction and coordination of expectations. At this meeting, each elderly person and student introduced him or herself and presented I or her expectations. In addition, each elderly person was given a page on which was written guiding questions regarding future meetings. Two more meetings were held in which the students were divided into groups of four, each group interviewing one elderly person. At the end of the series of meetings a discussion was held with the students, their teacher and a representative of the Day Care Center to find out how the children perceived the situation of the elderly and whether they viewed them differently following the interviews.

The students were very moved and noted that it is almost impossible to believe what these people have been through and how they survived, or to understand from where they drew the strength to go on, to immigrate to Israel and build a family.

Moshe, who was four years in the concentration camps in Germany said: "When I was in the camps and I marched in the cold, feeling hungry, shivering and sick, I swore that if I survived this hell I would go to America and marry a non-Jewish woman so that my children would not be Jewish. But, as you can see, I did the opposite. The war ended, my heart drew me to immigrate to Israel with all the difficulties and suffering; I married a Jewish woman, I had two children and today I live in Kiryat Tivon". The children listened to I story eagerly and when he finished "attacked" him with questions and refused to end the meeting.

The elderly people were very excited to tell their story. Some cried and even complained of accelerated heartbeats. The relations established were personal and significant despite the age gap. The students experienced positive meetings with the old; meetings that shed a different light on old people. The elderly enjoyed the children's attention and interest and recollecting their experiences once more, this time as part of the sequence of their whole life. The children learned to see that being old is an integral part of life. Some of the elders discussed the subject of the Holocaust for the first time, since they had never dared to talk about it with any of their family members. The elders' sense of self-worth increased due to their feeling that they had contributed to the children's knowledge and transmitted their legacy to the next generation. Through the relation and the experience, the children witnessed a model of man's ability to cope with difficulties and overcome them.

The goal of these meetings was to create a relation between old and young people by passing on stories and memories in a personal way from the older generation to the young generation, while processing the memories as part of the life summary of each elderly person.

One of the conclusions we reached is that the program should start at a much earlier age, that of 5-6 years old, in order to show the beauty and the positive aspects of being old to very young children. Children should grow up with the concept of aging and see it as a part of the life cycle. In this context, the example of a plant that grows until it droops can be used. We have to take good care of it, water it, supply nutrients and foster the plant. The same holds true for the aged person. Old people should be treated with respect, patience and tolerance. We have to teach the children how to accept those who are different from us, and, as already mentioned, learn that old age is not an illness.

In old age, it is possible to be active, to create, to contribute and do many things. Old people are not necessarily bent and weak, people who are incapable of running their own lives. On the contrary, they can be active, and there is still a lot to be learned from each of them. Most have a history that is interesting to hear and to learn about. They were children once, grew up, immigrated to Israel and helped to build

the country. Children should know that they too will be old some day and that “old age can be beautiful if we make sure that it is so”.

Conclusions

In a modern society, where many people reach old age, it is necessary to think about integration of the young and old generations. In order for appropriate behavior towards and consideration of the old in society to prevail, an approach of love and respect towards the grandparent in the family and the willingness to help an elderly neighbor has to be instilled in the children, along with good manners towards everybody, and especially towards elderly people, wherever they meet them: in public places, in the bus, in the street, at home and in the family circle.

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Self-Rated Mental Health of the Elderly on their Life Satisfaction

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ABSTRACT

The elderly population is rapidly increasing all over world. This older population is thus accompanied with many unwanted aspects of life, especially in health related problems, satisfaction, frustration, frailty, disabilities and cognitive impairments. Elderly persons are commonly facing the problems of helplessness, aggression, loneliness and lack of self confidence. The continuous degradation of self-rated mental health and dissatisfaction from one's life among the ageing is also on the rise as life expectancy increases. Therefore, there is a higher probability of depression and suicide rate in old age. The present study is made as an attempt to study self rated mental health and life satisfaction of the elderly. The sample for the study consists of 200 elderly persons who are 60 years and over taken from a neighborhood of Delhi. The result indicates that significant difference among male and females. Age difference shows significant bearings in their life satisfaction and self rated mental health. But the age found to have no strong bearing on the life satisfaction and self rated mental health. The discussion of the study is made based on the personal experience through the interaction with the elderly persons along with established findings.

Keywords: Self-rated mental health, Life satisfaction, Elderly, Personal experience.

India is moving towards becoming a graying nation. The advancement in technology in the field of medical science lowered the infant mortality rate and increased the life expectancy period. Thus, efforts are required to improve the physical, social, mental and spiritual aspects of the life of elderly people.

Growing older is associated with drawing nearer towards unwanted consequences. These unwanted consequences are irreversible in nature accompanying with several degenerative characteristics such as declining in health, reducing physical strength, minimizing in vitality, lowering economic conditions, and social status, weakening social supports, reduced social networks, and slowing down of cognitive processes. As a result, such conditions automatically promote the feeling of isolation, feeling of alienation, feeling of loneliness, experiencing hopelessness, and letting to relatively perceive a disintegrated social environment. The mental health of the elderly thus has greater chance to be negatively affected than the general population as they have better chance to suffer in greater amount of disabilities (Chao, *et al.*, 2004).

These older population is suffering with lots of health related problems; frailty, disability and cognitive impairments. During the old age elderly people adopt the pessimistic attitude towards future. In the absence of social support network, indifferent attitude of care takers, increased dependency, physical illness, and state of unhappiness, loss of activities from life and many more are responsible for the poor self rated mental health and life satisfaction.

In India ageing is considered as negative ageing, where elderly people consider themselves as unwanted, and burden on the society. This attitude will result into low self-esteem a lethargic and inactive life. They took themselves to away from all worldly activities and continuously think for their past, where they sacrificed their life for those who are not taking care of them now.

The self rated mental health and life satisfaction of the elderly depends on how the elderly perceiving the presence and absence of social support-

- (1) Perceived willingness of others (members of the family, relatives, and society) to listen when they want to talk,

- (2) Perceived level of caring by the fellow members and supports provided to them, and
- (3) Perceived reliability of others to provide support in times of sick and trouble.

The self-perception of health was found to be associated with the severity of health problems. The respondents who had serious health problems had a poor self-perception of health (Batra, 2004). The decline in physical strength limits the older person's activities. Studies shows 60% of the elderly persons experience major illness or injury which affects their activities of daily living. Those who expressed good life satisfaction had better social supports, a positive life review, a fair amount of physical and mental activity, and were self confident in most of their affairs (Ramamurti, 1989).

Self-rated mental health reflects the degree to which people are satisfied with their life and whether they can lead their usual life and activities, which is more important to most people than whether they are labeled with a particular diagnosis. Investigating the self rated mental health as one of the interpretations of functional status point among an elderly population can be served as an instrument for understanding the mental health of the elderly. Though self rated mental health has been a less focus of attention even within the study of health care, but is may be more relevant to the goal of community health programs than mortality and morbidity rates. Self-rated mental health reflects the degree to which people are satisfied with their life and whether they can lead their usual life and activities, which are more important to most people than whether they are labeled with a particular diagnosis.

Over percent of the elderly confessed to facing increasing stress and psychological problems in modern society, while 77 percent said that the mother-in-law daughter-in-law conflict was on the increase. 62.9 percent of the elderly felt that the role of grand children will decrease in future. Over 87 percent of the elderly stated that the government was not doing enough to take care of the elderly in India and about 38 percent supported the right to die (euthanasia) movement. These data indicated that the mental health condition of the elderly in India.

Women were relegated to a lower social and professional position in Indian culture. Its roots perhaps lie in the lower social status enjoyed by the girl child in the family and social setting (Jamuna, 1999), the preference for male progeny among couples and the traditional patriarchal male lineage. All these factors affect the perceived mental health, life satisfaction and status of women in the society. Widowhood and increased dependency increases the vulnerability of elderly during the so-called golden period of their life. Sharma and Dak (1987) reported that widow's experience more economic and health problems, that is responsible for their poor adjustment. Nand i, *et al.*, (1997) found 63.4 percent of widowed as opposed to 36.6 percent of married people suffering from depression.

The decline in self-rated mental health and life satisfaction is associated with the losses due to ageing, comprised quality of life, socio-economic problems, widowhood and increased dependency. Elderly people are more vulnerable to depression, lower life satisfaction and Psychological distress. A feeling of successful completion of task influenced life satisfaction and obligation in one's lives so far, values and meaning in education level, health status and disability, work status and living arrangement. (Chadha, Aggarwal and Mangla, 1990)

A feeling of successful completion of tasks influenced life satisfaction and obligation in one's lives so far, values and meaning in life, quality of social support and networks, educational level, health status and disability, work status, socioeconomic status and living arrangement. (Chadha, Aggarwal and Mangla, 1990). Life satisfaction in most of the studies has been used as dependent variables. Sometimes it was used synonymous to good adjustment, mental health, psychological well being. Successful ageing is measured in terms of good life satisfaction found to be related to better social support, greater belief in philosophy of Karma, self acceptance of ageing changes, flexibility, positive perception of health and economic well being. The less life satisfaction and prolonged period of neglect and a feeling of being unwanted and worthless increases the vulnerability to more self destructive behavior, suicide and depression. Rao (1997) pioneer researcher in the field of Geropsychiatry, considered the elderly a high risk group for self destructive behavior. The suicidal rate increases from the young old to

the old-old group. The rate of completed suicide in the age group of 50+ is around 12/100,000, which is higher than the rate of 7/100,000 for general population. The ratio of completers to attempters is about 1:7, higher than 1:12 or 1:15 for the younger age group (Rao, 1991)

Most elderly people complain that they forgot the things quickly because of this they feel helpless in many spheres of daily work life. Dementia is the common problem reported as more from the young old group enters the old-old group (Rao, 1998). Behavioral symptoms results into personality changes, affective and psychotic symptoms such as stealing, suspicion, wandering and aggression. Elderly people suffering from mild dementia are found to be less cheerful, inactive, less responsive and self-centered. Most probably family members are also less concerned about or even refuse to accept certain mental diseases as a 'disease'.

It is reported that nearly 60 percent of the aged are not satisfied with the personal and financial help extended by their members, while compared with their counterparts living in nuclear families and post parental families, the aged in joint families are getting better personal and health care from their family members (Kumar, 1997). The dissatisfaction was found to be more in nuclear family and those who were living alone. The elderly staying in joint families and extended families were found to be satisfied with the available health services. The joint families have division of labor and the aged individual had some role or the other to play. This kept the aged individuals occupied and made their life more meaningful while their maintenance was not an undue burden on the family (Rammamurti, 1970). The nature of behavioral symptoms was found to depend on the stage and severity of dementia. However, psychotic symptoms like suspicion were seen in moderate stage and could have been the result of cognitive deficits.

According to Prakash (2004) there are at least 6-12 symptoms and in which 2 to 3 are diagnosed as common. Most common are expected mental problems of the older persons, in order of prevalence, would probably: anxiety, severe cognitive impairment, and mood disorders. First described in 1907, Alzheimer's disease is one of the diseases leading cause of death among to elderly. An adult's chances of developing the illness are one in 100. The chances of family members of a person suffering from Alzheimer's increase fourfold. Alzheimer's

disease is a slow and gradual disease that begins in the part of the brain which controls the memory. As it spreads to other parts of the brain, it affects a greater number of intellectual, emotional and behavioral abilities. Symptoms of Alzheimer's disease begin slowly and progress in stages to include the following: loss of recent, short-term memory, mild personality changes, such as increased apathy, or social withdrawal, decrease in ability to think abstractly, hand le money, work with numbers when paying bills, understand what they read, or organize their day, irritability, agitation, loss of neatness in appearance, confusion, disorientation (Shadlen, and Larson, 1999). Ultimately, elderly patients become erratic in mood, uncooperative, incontinent, stop conversing with others, become unable to care for themselves. Still there is no known cause of Alzheimer's disease and yet it becomes the important focus area of gerontology. Patients with Alzheimer's have inappropriate levels of the enzyme choline acetyl transfers, which is important in memory loss and disorientation. Until a cause is found, there is still no cure for Alzheimer's disease (Tuokko, Hadjistavropoulos, Miller, Betattie, 1992).

People are living longer with current medical advances and healthier lifestyles. As a result, the number of cases related with elderly abuse (mentally and physically) will also increase. And the impact of elder abuse as a public health issue will like to grow. Mental or emotional abuse is a conduct that causes mental anguish leading to mental health problems of the elderly. Examples of mental affecters include threats, verbal or nonverbal insults, isolation, and humiliation for being old and disable. Some legal definitions identified of at least 10 episodes of this type of behavior within a single year to constitute abuse. Within the elderly community, women are believed to be the most common victims of being abused, perhaps because they report abuse at higher rates or because the severity of injury in women typically is greater than in men. By definition, elder mental and psychological abuse occurs in the elderly, although there is no universally accepted definition of when old age begins (American Medical Association, 1992). Physical and mental impairment of the elderly can be resulted from due to abuse meted out to the elderly people by the members of the society including kit and kin. Recent studies have failed to show direct correlation between patient frailty and abuse, even though it had been assumed that frailty itself was a risk factor for abuse. Physical and mental impairment nevertheless

appear to play an indirect role in elder abuse, decreasing seniors' ability to defend them or to escape, thus increasing vulnerability.

Theories suggest that elder abuse is caused by the stress associated with caring for an elderly patient, compounded by stresses from the outside world (American Medical Association, 1992). The effect of stress factors (eg, alcohol or drug abuse, potential for injury from falls, incontinence, elderly persons' violent verbal behavior, employment problems, low income on the part of the abuser) may all culminate in caregivers' expressions of anger or antagonism toward the elderly person, resulting in violence (American College of Emergency Physicians, 1998). Stressful modern societies are partly due to income inequalities, and the resulting damage to population health is consistent with the theories that drive the field of social epidemiology (Pickhart, Bobak, Rose, and Marmot, 2003).

Other risk factors in abuse are (1) shared living arrangements between the elder person and the abuser, (2) dependence of the abuser on the victim, and (3) social isolation of the elder person and sharing of properties. Many urban centers in developing countries are competing now with the western norms of family and Society care without providing matching services what is owed to the elderly (Khand elwal, 2003).

Understanding of perceived physical health of the older person is a major challenge to the gerontologist. Perceived physical health is often dependent on multidimensional concept that can encompass sensory and cognitive function, personality and motivation, and even environmental factors an individual embedded with. There are distinctly different patterns in health risk for different age groups that are reflected also in statistics of physical function. Isolating the different dimensions would be unauthentic and difficult task in the study to perceived physical health of the elderly. On the other hand , the multidimensional nature and its complexity of integrated outcome of the personal characteristics in perceiving physical health is also the source of their strength and importance in research in gerontological studies.

There are probably many instruments available for perceived physical health of the elderly used by different researchers, and there is very little standardization even among the most widely used instruments such as activities of daily living. Most of the studies used

an index that combines self reported physical status various mobility items and other sicknesses. Some items when asked if the elderly experience difficulty on rating and perceiving physical health, there are several factors involved to determine one person's perception of physical health status.

Objectives of the study

The main objectives of study are to make in depth investigation about the psychological health of the elderly mainly in two areas. They are as:

I. To assess the influence of self rated – mental health and life satisfaction on the male and female elderly.

II. To compare the elderly grouped in three categories (on the bases of their age) on their self rated mental health and life satisfaction.

Methodology

Sample

The investigation was carried out on a sample of 200 persons ageing 60 years and over. The age range of the present sample was 60-94 years. The sample was taken from the Neighbourhood Delhi and consisted of 114 males and 86 females. The method employed was random stratified sampling method. The sample was divided into three age groups as: Group A: 60 -69 years (Young-Old), Group B: 70-79 years (Old), and Group C: 80 years and over (Old-Old).

Tools Used

The elderly were assessed on different aspects, which may be considered to be the predictors of psychological health. The tools used to study different areas were given in detail below :

I. ***Self-Rated Mental Health:*** This tool was prepared by principal investigator along with the researchers to analyze the mental health of an individual. A list of 32 items included with two categories of response option as “Yes” or “No”. The response of “Yes” means they do not have sound mental health and “No” means that they have sound mental health and able to think in a positive manner. A score of “zero” is given to response of “Yes” and “1” to response of “No”.

II. Assessment of Life Satisfaction: This tool was prepared by N.K.Chadha and John van Willigen (1995) to understand the psychological well being of an individual. It refers to the attitude that individual have about their past, present and future. A list of 28 items is included with seven categories of response option as “Strongly Disagree”, “Disagree”, “Slightly Disagree”, “Neutral”, “Slightly Agree”, “Agree” and “Strongly Agree”. There are two categories of items, positively worded and negatively worded. Positively worded items scored from 7 to 1 for response categories of strongly agree to strongly disagree. On the other hand for negatively worded items the score would be from 1 to 7 for response category of “Strongly Agree” to “Strongly Disagree”.

RESULTS AND INTERPRETATION

The data were treated statistically employing both the Descriptive and Inferential Statistics. The data were subjected to statistical analysis (Descriptive Statistics) by using a software package called SPSS to obtain Mean and Standard Deviation. And then the Inferential Statistics was employed to determine the level of difference.

Table1: The comparison of man and woman on the various indicators of self rated mental health and life satisfaction.

S. No	Variables	Male (114)		Female (86)		T-value
		Mean	SD	Mean	SD	
1	Self rated mental Health	23.10	6.50	20.62	6.29	2.77**
2	Life satisfaction	137.42	27.5	122.37	27.6	3.80**

** denotes pair of groups significantly different at 0.01 level

*denotes pair of groups significantly different at 0.05 level

Table 1 shows the comparison between male and female elderly on self rated mental health and life satisfaction. The comparison is made between male and female on self rated mental health depict a significant difference. It shows that female elderly have lower self rate mental health as compare to their male counterparts. Similarly female elderly are showing significant difference when their level of life satisfaction is compared with males. It is found that they are showing lower level of self rated mental health and life satisfaction as compare to the male elderly.

Table 2: The comparison between Young-Old and Old age categories of the elderly on the various indicators of self rated mental health and life satisfaction

S. No	Variables	Young-Old (133)		Old (61)		T-test
		Male MEAN	SD	Female MEAN	SD	
1	Self rated mental health	22.6	5.86	21.3	7.41	.50
2	Life satisfaction	132.4	27.3	130.2	30.6	1.30

Table 2 Shows the comparison between young old and old on self rated mental health and life satisfaction in the old age. The comparison of age categories of young old and old on self rated mental health and life satisfaction indicates no significant difference among these groups at any level of the significant difference. However the mean scores showed that young old category of elderly are better in self rated mental health and life satisfaction when compare with the old category of elderly people.

Table 3: The comparison between Young-Old and Old-Old age categories of the elderly on the various indicators of self rated mental health and life satisfaction.

S. No.	Variables	Young Old(133)		Old-Old(5)		T-Test
		Means	SD	Mean	SD	
1	Self-rated Mental Health	22.6	5.86	14.8	8.13	1.98*
2	Life Satisfaction	132.4	27.3	107.8	29.8	2.89*

** denotes pair of groups significantly different at 0.01 level

*denotes pair of groups significantly different at 0.05 level

Table 3 shows the comparison between ‘young old’ and ‘Old-Old’ group of elderly on self rated mental health and life satisfaction. When the age category of ‘young old and ‘young old’ and old-old compared on the self rated mental health and life satisfaction the

result yield significant difference exist between them. The mean scores showed that young old elderly people are high self rated mental health and high life satisfaction when compared with old-old category of elderly.

Table 4: The comparison between Old and Old-Old age categories of the elderly on the various indicators of self rated mental health and life satisfaction

S. No.	Variables	Old (61)		Old-Old (5)		T-test
		Mean	SD	Mean	SD	
1	Self-rated Mental Health	21.3	7.4	14.8	8.1	1.57
2	Life Satisfaction	130	30.6	107.8	29.8	1.89

Table 4 Shows the comparison between ‘Old’ and ‘Old-Old’ group of elderly on self rated mental health and life satisfaction .When the age category of ‘old’ and ‘old –old’ group of elderly are compared on self rated mental health and life satisfaction results do not indicate significant difference exist at any level. The mean score showed that ‘old’ group of elderly people shows better self rated mental health and high life satisfaction when compared with ‘old –old’ group of people.

Discussion

Each person passed through different stages of life fulfilling the obligations owed to family, society, elders and goals. Old age was considered as a time for moving towards higher goals – of self actualization. But as this philosophy is not in practice old age is perceived as a ‘problem’. In the young age people are busy in fulfilling their basic requirements of one’s and others, but in old age they encountered with lots of problems associated with the retirement widowhood, ill health and dependences on others. It will result into poor physical, psychological and social health. In old age people disengage themselves from the active life spend most of their time in worrying about their caregivers. Life satisfaction and self-rated mental health are declining with the age. Till the age of retirement they are fully active and others are dependent on them both in work life and non-work life. But retirement disturbs the daily routine of the people; suddenly they got plenty of time and nothing to do with that time Lots of adjustment problems are faced by elderly people due to

retirement and widowhood. Thus as the retirement age increases the self-rated mental health and life satisfaction decreases. Social interaction is a major source of life satisfaction in (Prakash, 1991) decline health is often the cause of distress in the old age. Older elderly were found to have poorer quality of life, poor subjective well-being and self esteem compared to middle aged elderly men (Rathore, 1992).

Women are more vulnerable to lower self-rated mental health and life satisfaction. Aggarwal and Chadha (1990) also reported that old women rated high on hopelessness and were less satisfied with life as compared to old men (think before getting grey). In Kerala, which has the highest proportion of elderly in India and has several social security schemes, 73.6% of the rural females and 76% of the urban females are fully dependent on others. This shows how vulnerable elderly women are even in Kerala, known for its high order of social investment. The economic dependency ratio among females is the lowest in the rural areas of Himachal Pradesh where 48.7% of the females are fully dependent on others. Himachal has the highest ratio of economic independence (23.6%) among females in rural areas. A remarkable aspect about elderly is that the massive migration of young ones from the rural areas to the cities all over India, the elderly are left to fend for themselves, look after the children as well as cattle and whatever land they possess (Bose, 1997). Widowed as well as the single and divorced show mental disorder rates substantially higher than married (Bellin and Hardt, 1958; Mallhotra and Chadha 1997) also reported that aged widower share more difficulty in daily activities.

Although old age is the period of decline but the significant differences are found among the different age groups of elderly people. Some are more vulnerable to the decline of their age but there are old people who maintain their activeness and optimism till end. As people grow older the problem increases (Chadha, Bhatia, Chao Rohtagi and Mir, 2004). The young old people show better self-rated mental health and life satisfaction. The balance among physical, economic, psychological and social factors is disrupted in old age. Acute and chronic illness, inadequate housing and income, inaccessible public services and insufficient social support are some of the factors that lead to dependency in old age. This dependency weakens the self-rated mental health and life satisfaction (Kumar 1997).

Conclusion

Women are suffering more than men when measured on the scale of self rated mental health and life satisfaction. From a very long time in Indian society women were socially suppressed, the preference for male progeny among couples. Elderly women were more susceptible to mental problems and are less satisfied with their life as compared to elderly males. Women were used to of spending all their time in serving for family members and least bothered for their own health, likes, dislikes and life as a whole. Widows are in a more problematic condition as they are economically dependent and are not given proper place in the family.

The comparison between the elderly person categorized in three categories Young-Old, Old and Old-Old were found to be in a better self rated mental health and life satisfaction. Due to increasing age they become victims of dementia, depression, poor physical and economic dependency on others, affect the interpersonal relations and hamper the social life. Therefore the self rated mental health and life satisfaction decreases with age.

Some of the important issues requiring immediate attentions for the social gerontologists and geriatrists are:

1. Decreased economic status of the elderly and independence in old age as a consequent of the continuous growth of the elderly population.
2. Disruption of family support system due to liberalization, urbanization, migration, and individualization processes,
3. Increasing numbers of old people living by themselves without social support in the urban areas and rural areas as the numbers of children and grand children migrated to towns and cities for greener pastures.
4. Loneliness and consequent emotional problems,
5. New challenge to adjustment to the changing social cultural transition in the present generation.
6. Physical and psychiatric morbidity due to happening of the stressful situations in the cut throat competitive world of the present century,
7. Widowhood, exposing women to more physical and psychosocial risks; and poor utilization of health and welfare services by the older people.
8. Bereavement, i.e., death of a near relative, which is usually the spouse, in the case of the elderly. Sometimes it may, even be the

loss of a child, which is even more painful (Chadha, Bhatia, Chao, Rohatgi, and Mir, 2005).

To cater all these listed factors in carrying out the research and welfare care system for the elderly, the researches through established university and medical institutions where geriatric and gerontological studies were given less importance and are unable to come out of the formal culture of degree courses. Therefore separate institutes are required for gerontological studies to cater the needs of the society. Only when these needs are well looked into and well researched, the general public would have better chance to notice the importance of elderly presence in the society and we can expect to change their attitudes towards their elderly (Chadha and Seth, 2005). In India, it is difficult to found any general hospital centering geriatric clinic except some national important Medical research institutions. Even then, there is no systematic data for inpatients or outpatients. Reasons for this under utilization could be attributed to different factors such as stigma, denial of problems, access barriers, funding issues, lack of awareness among the general public that mental problems can be treatable, lack of collaboration and coordination between mental health and aging networks, public stereotypic attitudes towards the elderly persons, lack of perceived advantages of the presence of the elderly persons in the society, and shortages of appropriate health professions along the line of lack of public awareness among the members of the society about the significance of the elderly problems.

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The Relationship of E-culture with Loneliness and Life-Satisfaction among the Elderly

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ABSTRACT

This research study explores the relationship of e-culture with loneliness and life satisfaction among the elderly. Sample for this study comprised of 120 elderly individuals (60 females and 60 males respectively) from Pondicherry (a Union Territory of India). The age range of the samples were between 60 to 73 years (Mean age= 64.3 years). Tools used for data collection were the (1) e-culture inventory (Patel and Rajendran., 2005) and (2) the UCLA loneliness scale (Russell et al., 1980), and (3) the satisfaction with life scale (Campbell et al., 1976), chosen after a comprehensive review of related literature. Data collection was spread over a period of 2 months (60 days). The responses obtained were scored and statistically analyzed. Pearson's product moment correlation was calculated. Results indicated that e-culture was positively and significantly related to life satisfaction but a negative and significant relationship existed with loneliness.

Key words : E-culture, Elderly, Loneliness, Life satisfaction.

Electronic technology is changing our life-style to a great extent. Prevalence and excessive use of electronic products found among people, cutting across cultural differences, have set in a trend for e-culture. Electronic-culture is new. It is emerging as a transnational and

global phenomenon; not confined to geographical boundaries. Internet, especially, is expected to bring in sweeping and lasting cultural transformations. For instance, terms like e-commerce, e-business, e-banking, e-mails, e-organizations, e-governance, e-journals, e-books, e-medicine, internet, web-shopping, etc have become part of the current lexicon.

The advances and breakthroughs made in the fields of information and communication technology (ICT) and electronics during the present and previous centuries have resulted in the emergence of e-culture. Though the ICT revolution started in the near past its progress towards networking is achieved only recently through the impetus provided by the Internet (Uzelac, 2003). According to Mercer (2003) it is the ICT-availability and access to Internet that provides scope for production of e-culture. However, today the emergence of e-culture is taken for granted due to prevalence of the interactive digital applications of the ICT such as Internet and mobile technologies (Mitchell, 2003).

Van Dijk (2001) identified four different types of access to ICT as conditions for the emergence of e-culture, namely, motivation, possession, use and skills. Motivation concerns psychical access to ICT: the interest in it, the will to use it and the lack of fear of new technology. Possession means, in this context, the availability of equipment and an Internet connection at home or at work, school or university. The third component of access is the actual use that people make of available possibilities. The use depends in part on the fourth form of access, namely the possession of digital skills (De Haan and Huysmans, 2002).

E-culture though prevalent widely, is a recent phenomenon. The scientist community has not explored much of it now. De Haan and Huysmans (2002) cautions that the exploration of e-culture may only be the start of a long-term process of change taking place at a global level. Research on e-culture presently is at a rudimentary level and so is its concept. Scholars in this field have tried to define e-culture in various ways, but all being far from conclusive.

E-culture is increasingly perceived as a new digital media culture or digitalization of culture. Netherlands council for culture (2004) argues that, within the context of the 'digitizing society,' e-culture should be seen as the integration of ICT into the primary processes of

productivity, distribution, presentation, preservation and (re)utilization of cultural expression. According to the view of De Haan and Huysmans (2002) the term 'e-culture' is stated to refer to the diffusion of new technology, its application for various avenues such as information and communication in addition to shifts effected in related attitudes, values and norms. Patel and Rajendran (2005) have defined "electronic culture" as "increased use of electronic goods by individuals in various areas like home, office, public places and those they carry personally with them, to fulfill their psycho-social needs."

E-culture is both technological and a social development. There is a widespread consensus that new digital and networking technologies like the World Wide Web (WWW) and the Internet have the capacity to reorder the domains of everyday social and personal life (Dona Kolar-Panov, 2003). Cultural habits and participation in cultural life are changing as a corollary of e-culture. Hence, it would be pertinent here to consider briefly the concept and importance of culture in the light of a psychological focus leading to the study on the impact of e-culture.

According to Brislin (2000) one of the major assumptions of cross-cultural social psychology is that culture shapes human behavior. Numerous advanced theories of social behavior indicate that cultural factors play significant role in the determination of behavior, shaping values, self, and motivation of individuals (Markus and Kitayama, 1991). Lehman *et al.*, (2004) point out that culture and psychological processes influence one another and a dynamic interplay exists between them.

Culture aims to ensure a harmonious relationship between humans and their environments. Psychological well-being remains the main focus of cultural norms and practices. Myers and Diener (1995) refer to life-satisfaction as one of the three key aspects of psychological well-being, the others being positive and negative affect. Life satisfaction stands together with the affective elements to yield a relatively comprehensive picture of psychological well-being (Diener *et al.*, 1999). Chirkov *et al* (2005) found 'culture-fit' is positively associated with life satisfaction. Adjustment to cultural demands is essential for psychological well-being and life-satisfaction. But cultures are diverse and dynamic social systems and not static monoliths (Bandura, 2002). Cultural changes are inevitable and tend to create new demands which the elderly may find difficult to fulfill. Now the dawning of e-

culture emphasizes the acquiring of digital skills and demands shifts in related attitudes, values and norms. Access and usage of electronic technology will be an important determinant of life-satisfaction in this era of e-culture.

Culture also emphasize the importance of group living because from an evolutionary perspective, solitude (loneliness) is dangerous; mutually supportive collective behaviour is beneficial, both for survival and sexual reproduction. Thus, it makes sense to assume that humans have an evolved tendency toward the establishment of shared beliefs, behaviours, and normative structures that help hold social collectives together (Campbell, 1982). Loneliness is popularly viewed as a relative deficit in social relationship with others in the environment. Russell, Peplau, and Cutrona (1980) defined loneliness “as the relational deficit reflecting interpersonal and social relationships that the individual evaluates as quantitatively inadequate or too few in numbers.” It has been conceived as a problem for everyone from children to elderly, however, elderly experience more loneliness because their spouses might be deceased, their friends might have either moved away or died, their children might be in distant places/ cities or on account of physical disabilities (Peplau *et al.*, 1982). Mullins and Mushel (1992) indicated that the elderly people desired to be part of a social network and also prefer the existence of a set of friends but not emotional commitment to a set of friends. They also pointed out that the inability to be part of a social network and lack of friends in old age results in the experience of loneliness. The rapid spread of e-culture enabling easy access to information and facilitating communication with others may help elderly reduce loneliness. Especially, the Internet provides people access to a complete new space and society known as ‘cyber society’. Anybody who enters this virtual world can expect an almost infinite number of possibilities to retrieve information, engage in social interactions and build up lasting relations. There, with the exception of the physical body, the individual can encounter almost everything which can also be found in “real society”: such as membership, role playing, emotions, work, commodities, discussions, etc. Like the conventional reality the cyber experience can also form identity (Jones, 1997). Hence the Internet is considered as an identity-based technology (Langer, 2003). But the onset of electronic culture also poses new demands which the elderly must cope with; failing may result in the experience of loneliness.

Purpose of the Study

Reviews done indicate that studies on e-culture are fragmented and inadequate. Scanty information is available about the influence of e-culture, both at international and national levels. The scientist community has just begun to recognize the importance of e-culture and its influence. At present there are not much substantial empirical evidences available on the impact of e-culture. In India, unfortunately, the research efforts in understanding and investigating the status of e-culture have not yet gained momentum. The research and academic community are dormant regarding the influence of e-culture. Deplorably, many researchers belonging to various disciplines are yet to take up this issue. In particular, from a psychological perspective, e-culture still remains unexplored. India is one of the poorest countries in exposing commercial contents on the global platform using digital media. However, the scope of India's strength in this direction is immense. The government of India as well as many NGOs stand dedicated and determined to enrich and enhance the e-status of India. Osama Manzar's (2005) book "The Best E-contents 2005" published by 'Digital Empowerment Foundation' (DEF) is an eye-opener regarding the e-contents in India. India is perhaps one of the most uniquely positioned countries in the world.

The present investigation is significant because looking around one finds a number of problems in our society especially related to the elderly. The changing demographic profile of India where there is a rapid increase in the aged population, it is increasingly becoming vulnerable due to the process of urbanization and industrialization (Venkoba Rao, 1992). Chadha and Easwaramoorthy (1993) have critically evaluated the need for a comprehensive study on elderly in India.

Reviews made on psychological well-being indicate that not much is known about age-related changes in life satisfaction, most studies has focused on the role of positive and negative affect. Studies on the impact of cultural changes upon life-satisfaction among the elderly in Indian context appear negligible. Loneliness has become the subject of substantial empirical research only recently. One impetus for the new interest is the realization that loneliness is a serious and widespread problem for millions today (Weiss, 1973).

Lakshminarayanan (1993) found that the elderly people feel lonelier than any other population. Research on loneliness among the elderly particularly in Indian context also appears inadequate (Patel, 1998).

Despite, a developing country, its wealth of information, resources, and knowledge capacity puts the country in the list of top 5 countries in the world. India like other nations of the world is no exception to the global process of digitization. India certainly is getting transformed into an e-society, at a faster pace (Osama Manzar, 2005). There are no substantial empirical evidences available regarding the reaction of Indian elderly to the e-cultural phenomenon. Adapting to e-culture demands the acquiring of digital skills (De Haan and Huysmans, 2002). The elderly might find this difficult which may leave them less satisfied with life and also feel lonelier. No studies relating e-culture, loneliness and life-satisfaction among the elderly were also found. Hence this investigation is a pioneering effort made to explore the relationship of e-culture with loneliness and life-satisfaction in Indian context. This investigation will enlighten the academic and research fraternity throwing light on the relationship of e-culture with loneliness and life-satisfaction among the elderly.

METHOD

Sample

The sample for this study comprised of 120 elderly individuals (60 females and 60 males respectively) from Pondicherry (a Union Territory of India). The age range of the samples were between 60 to 73 years (Mean age=64.3 years). Samples were restricted to the educated segment of the elderly population, those with a minimum of a graduate degree and above were only included in this study. Purposive sampling technique was adopted.

Tools used

The research tools used in this study for data collection were the (1) e-culture Inventory, (2) UCLA Loneliness Scale, and (3) Life-Satisfaction Scale, selected after a comprehensive review of related literature.

(1) *E-culture inventory*

This inventory was developed by Patel and Rajendran (2005) to measure e-culture. It evaluates e-culture based on multiple electronic products people use in different areas such as home, office, public places and those that they carry personally with them. Under each area certain electronic items used by people such as (a) Personal computer, (b) Internet, (c) digital diary, (d) mobile phone, (e) micro-oven, (d) disc-man, (e) Digital cameras, (f) lap-tops, (g) automatic washing machine, (h) DVD players, and frequent visits to (i) computerized shops/ movie halls/ theme parks/ ATMs, etc were stated and verified. The inventory consists of 42 items with 2 responses, i.e., “yes” and “no” respectively for each item. The 42 items are classified into 4 areas, namely, home=16 items, office=11 items, personal=8 items and public=7 items. The score for ‘yes’ in home area is 2, in office is 1, in personal area is 3 and in public area is 1 were as the score for ‘no’ in all the areas is 0. The maximum score possible in this inventory is 74 and the minimum score is 0. High score indicates high e-culture and low score indicates low e-culture. The reliability and validity co-efficient values for this inventory were 0.72 and 0.85 respectively found significant at 0.001 levels.

(2) ***Revised University of California at Los Angeles (UCLA) Loneliness Scale***

This scale was developed by Russell *et al.*, (1980). It is a 20 item self-report on which respondents express how often their feelings and behaviours reflect perceived isolation and dissatisfaction with social relationships. This scale consists of 10 statements dealing with satisfaction of one’s social relationships and 10 statements dealing with dissatisfaction of one’s social relationships. Respondents indicated how frequently they experience each item on a scale from 1 to 4, corresponding to ‘never,’ ‘rarely,’ ‘sometimes,’ and ‘often’ respectively. Russell *et al.*, (1980) determined high internal consistency reliability for the instrument yielding a co-efficient alpha of 0.94. They also found acceptable concurrent validity and discriminant validity. Split-half reliability in Indian context was 0.71 (Jha, 1988).

(3) ***Life-Satisfaction Scale***

This scale was constructed by Campbell *et al.*, (1976) to measure life-satisfaction. The scale consists of 7 items based on Likert-type of scaling technique with 5 responses, namely, ‘very happy,’ ‘pretty

happy,' 'happy,' 'not happy,' and 'not too happy,' and the scores range from 1 to 5 respectively. The maximum score possible in this scale is 35 and the minimum score is 7. The test-retest reliability reported for this scale and the validity worked out with Psychological Well-being Scale and with Index of Domain Satisfaction was found to be significant.

Procedure

The samples of this study were personally and individually contacted and data was obtained through face-to face interview. The duration of data collection were spread over a period of two months (60 days). The obtained responses were scored and statistically analyzed.

Table I: Showing the Mean, SD, SE_M and t-test for e-culture score of the groups on the basis of gender.

Gender	N	Mean	SD	SE _M	t-value	LS
Male	60	34.80	15.46	1.09	1.35	NS
Female	60	32.37	15.96	1.44		

Table II: Showing the Pearson's moment correlation co-efficient for e-culture with loneliness and life-satisfaction.

Variables	r
Loneliness	-0.171**
Life-satisfaction	0.154**

** significant at 0.001 levels

*significant at 0.005 levels

Discussion

The main aim of this research study was to explore the relationship of e-culture with loneliness and life-satisfaction among the elderly. For this purpose Pearson's product moment correlation were calculated, since no significant gender differences were found as indicated in Table I the results for both sexes are combined and given in Table II.

It is inferred from the results summarized in Table II that e-culture has a highly significant positive relationship with life-satisfaction but is negatively and significantly related to loneliness.

In this study e-culture has been conceptualized as increased use of electronic products. The outcome of the present research indicates that more use of electronic items by the elderly results in high life-satisfaction. This outcome of the present study can be defended by the view that access to electronic technology and use of electronic products by elderly has multiple implications, it connotes that the elderly possesses the required digital skills, is active and productive, is mentally and physically healthy, has adequate economic support and is progressive minded. Van Dijk (2001) has already identified four different types of access to information and communication technology (ICT) as conditions for the emergence of e-culture, namely, motivation, possession, use and skills. Hence, the elderly individuals who are high in e-culture may find it easy to adjust to the demands of e-environment and thereby experience more life-satisfaction.

The finding of this research that e-culture is inversely related to loneliness among elderly indicates that increased use of electronic products by elderly individuals results in low level of loneliness and vice versa. The rationale for this finding might be that the preoccupation with electronic products especially multi-media technologies by the elderly may make them feel part of a social network or be a replacement for the lack of friends. The information and communication technology (ICT) championed by Internet and mobile technology ensuing in e-culture has made access to information and communication between people simple, effortless and undemanding. Loneliness which is popularly viewed as relative deficit in adequate social relations may be compromised by increased indulgence in electronic technology making contacts and communication easy for the elderly. Further the elderly individuals possessing the motivation and skills to use electronic products may have more perceived control over their environments. Patel (1998) has empirically proved that increased perceived control results in decreased loneliness among the elderly.

Conclusion

The present study reveals that e-culture is positively and significantly related to life-satisfaction and loneliness is negatively and significantly related to e-culture among the elderly.

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Analytical study of economic problems faced by the elderly single and suggestions to improve these problems

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ABSTRACT

A study was conducted to examine the economic problems faced by the elderly single living in rural and urban areas of Punjab. A random sampling technique was used to select a sample of 160 (80 each from rural and urban areas). The economic problems faced by elderly were insufficient amount to spend on them as and when required, forced to meet the emergencies in the families, directed to spend on medical expenses on their own. They were forced to make the expenditure for the reasons: families being financially not very sound, hike in consumable commodities and social rituals. The suggestions given by the elderly to make their living comfortable were: money to be kept in reserve, availability of pension in time, amount of pension to be increased.

Keywords : Elderly single, Economic problem, Suggestions

Human life is divided into different stages of life such as childhood, adolescence, youth, adulthood and old age. Old age is generally the chronological age, a universal phenomena and a challenge to everyone who reaches it irrespective of occupation, skill or learning (Tungdim *et al.*, 2002). In most gerontological studies, persons above sixty years of age are coined as old and comprise the elderly sector in India. The elderly in India accounted for 5.7 per cent in 1910 and it is estimated to reach 12.6 per cent in 2020 AD.

A common life event that causes stress during middle years of life is the loss of spouse. The marital dissolution of the aged persons has a strong bearing on their socio-economic as well as mental well-being. The married persons tend to enjoy higher levels of survival, mental health, use of health services, social participation and life satisfaction as compared with those who are widow or widower. Life of the elderly at this stage become pathetic as they are doubly affected due to combined effects of ageing and being single (Chakravarty, 2001). The emotional support which one spouse provides to the other becomes all the more important during old age as the person in this age generally becomes more alienated. It is the wife who consoles the husband in his difficulties and worries. In the same way, the husband provides emotional support to the wife in despair. But due to hard luck, if a couple loses his/her partner or person becomes widow/widower in such a situation the individual feels insecure to live on the rest of life. These circumstances reduce their sense of control and well-being significantly.

The problems of elderly are rapidly increasing in its magnitude especially with reference to being single (either unmarried or lost their spouse) are still more acute. Aged who lost the spouse are often forced to give up independent household, move with children or relative, give up claim on property and become dependent due to the disintegrating system, changing social value, low income, inadequate accommodation, loneliness, ill health and the negligence have together caused serious problems for the aged. The elderly people who used to be the main decision-makers in every family in the past have now become unwanted individuals. After the retirement, the financial problems seems to be miserable as majority of them had no regular income, savings are low, those who had land-holdings cannot manage it and few are even involved in property dispute hence have to depend

on other family members to support them. The present study is an attempt in this direction with the following specific objectives :

1. To study the extent of economic problems of the elderly single in rural and urban households.
2. To examine the factors associated with the problems of elderly.
3. To seek suggestions from the elderly to overcome their problems.

Methodology

The study was conducted purposively in rural and urban areas of Ludhiana district of Punjab state. From urban area i.e. Ludhiana city four localities were randomly selected. In the same manner from rural area of Ludhiana district, a list of blocks was obtained out of which only 2 blocks viz : Ludhiana I and Dehlon were selected randomly. From each block a list of villages was obtained from the office of B.D.O. Four villages from each block were selected randomly for the present study. Twenty respondents (10 females and 10 males) were selected from each randomly selected locality of Ludhiana city. Constituting 80 respondents from urban area. In case of rural area 5 females and 5 males from each village with respect to two blocks were selected constituting again 80 respondents from rural area. Hence there were 160 respondents in the total study sample. Data were collected through personal interview method. The respondents showed keen interest and gave responses with great enthusiasm realizing that their problems may be recognized in research study which may promote efforts on the part of social and administrative agencies to minimise the same. The data were tabulated and analysed in terms of simple number and percentages. Chi-square test was applied to see the association of the factors with different problem faced by the elderly (single).

Results and Discussion

Socio-personal characteristics

This includes personal and family characteristics of aged i.e. age, education, marital status and duration of being single of elderly, family size, monthly income of respondents and family monthly income.

Age

It is evident from Table 1 that majority of the females from rural area but males from urban area were belonging to age group of 60-70 years. But on the whole respondents both from rural and urban area irrespective of their sex belonged to the age group of 60-70 years followed by 70-80 years of age and very few (10%) belonged to the age of 80 years and above. So the respondents age varied from 60-80 years and above in the total sample.

Education

As regards the education of respondents majority of the rural females (82.50%) and males (77.50%) were found to be illiterates followed by urban females (60%) and males (42.50%) Table1 On the whole majority of the respondents both females and males irrespective of area were again found to be illiterate.

It can be said that illiteracy level was higher among rural as compared to urban. Hence, the education level of elderly persons in urban area was found to be much better.

Marital Status

The table 1 indicates that from rural area majority (88.75%) respondents irrespective of the sex were widows/widowers. Similarly in urban area majority (97.50%) of respondents both (females and males) were again widows/widowers.

Duration of being single

It was observed that majority of respondents both from rural (73.75%) and (80%) urban areas were single since 15 years followed by (10%) rural and (16.25%) urban respondents single from the past 15-30 years. Whereas 5 per cent and 1.25 per cent respondents from rural and urban area were single from past 30 years and above.

Table 1: Background information of the respondents

Characteristics	Rural			Urban		
	Female (n=40)	Male (n=40)	Total (n=80)	Female (n=40)	Male (n=40)	Total (n=80)
Age (yrs)						
60-70	31 (77.50)	16 (40)	47 (58.75)	21 (52.50)	27 (67.50)	48 (60)

70-80	7 (17.50)	19 (47.50)	26 (32.50)	13 (32.50)	11 (27.50)	24 (30)
80 and above	2 (5)	5 (12.50)	7 (8.75)	6 (15)	2 (5)	8 (10)
Education						
Illiterate	33 (82.50)	31 (77.50)	64 (80)	24 (60)	17 (42.50)	41 (51.25)
Primary	2 (5)	5 (12.50)	7 (8.75)	4 (10)	5 (12.50)	9 (11.25)
Matric	3 (7.50)	3 (7.50)	6 (7.50)	9 (22.50)	5 (12.50)	14 (17.50)
Graduate	2 (5)	1 (2.50)	3 (3.75)	2 (5)	9 (22.50)	11 (13.75)
Post-graduate	-	-	-	1 (2.50)	4 (10)	5 (6.25)
Marital status						
Unmarried	-	9 (22.50)	9 (11.25)	1 (2.50)	1 (2.50)	2 (2.50)
Widow/widower	40 (100)	31 (77.50)	71 (88.75)	39 (97.50)	39 (97.50)	78 (97.50)
Duration of being single						
Upto 15 yrs	31 (77.50)	28 (70)	59 (73.75)	28 (70)	36 (90)	64 (80)
15-30 yrs	5 (12.50)	3 (7.50)	8 (10)	10 (25)	3 (7.50)	13 (16.25)
30 yrs and above	4 (10)	-	4 (5)	1 (2.50)	-	1 (1.25)
Family size						
Upto 5 (small)	31 (77.50)	24 (60)	55 (68.75)	28 (70)	29 (72.50)	57 (71.25)
6-8 (medium)	7 (17.50)	9 (22.50)	16 (20)	10 (25)	10 (25)	20 (25)
9 and above (large)	2 (5)	7 (17.50)	9 (11.25)	2 (5)	1 (1.25)	3 (3.75)
Monthly income of the respondents						
No income	18 (45)	8 (20)	26 (32.50)	15 (37.50)	9 (22.50)	24 (30)
Upto 2000	22	22	44	14	13	27

	(55)	(55)	(55)	(35)	(32.50)	(33.75)
2001-4000	-	4	4	3	2	5
		(10)	(5)	(7.50)	(5)	(6.25)
4001 and above	-	6	6	8	16	24
		(15)	(7.50)	(20)	(40)	(30)
Family Income						
Upto 5000	29	28	57	10	9	19
	(72.50)	(70)	(72.25)	(25)	(22.50)	(23.75)
5000-10,000	3	5	8	9	5	14
	(7.50)	(12.50)	(10)	(22.50)	(12.50)	(17.50)
10,000-15,000	5	5	10	6	7	13
	(12.50)	(12.50)	(12.50)	(15)	(17.50)	(16.25)
15,000 & above	3	2	5	15	19	34
	(7.50)	(5)	(6.25)	(37.50)	(47.50)	(42.50)

Figures in parentheses indicate percentages

Hence majority respondents both from rural and urban were single since 15 years, while there were no males living single since 30 years and above.

Family size

The size of the family of the elderly varied from small to large. The number of small families upto 5 members was 68.75 per cent from rural area and 71.25 per cent from urban area. There were 20 per cent and 25 per cent rural and urban elderly who belonged to family size of 6-8 members in households (Table1). In all maximum respondents had small family size upto 5 members from both rural and urban areas.

Monthly income of the respondents

Table 1 shows the monthly income of respondents ranged upto Rs. 4001 and above. In case of rural area equal number of both females and males were having monthly income upto Rs. 2000, followed by urban females (35%) and males (32.50%) who were having monthly income of Rs. 2000 only. There were 40% urban males who were having monthly income of Rs. 4001 and above.

In all it is clear from data that among rural respondents few number of males were getting monthly income Rs. 4001 and above while none the female respondent got the same, whereas among urban respondents a relatively more number of both females and males had

an income of Rs. 4001 and above. Hence the financial condition of the elderly in urban area was certainly better than that of their counterparts.

Family monthly income

Monthly income of the families of the respondents ranged from Rs. 5000 to Rs. 15000 and above. In rural areas a large number (71.25%) of respondents had an income of Rs. 5000 per month and 10 per cent had income between Rs. 5000-Rs. 10000 per month, whereas in urban localities 42.50 per cent respondents had income of Rs. 15000 and above. Only 23.75 per cent had income upto Rs. 5000 per month. About 17.50 per cent of respondents had income between 5000 to Rs. 10000, whereas the remaining had income ranging from 10000 to Rs. 15000 per month (Table 1).

Economic problems faced by elderly

Economic problems referred were : Financial problems directed to meet medical expenses, don't get sufficient amount to spend, forced to meet the emergencies in the family and contribute to family income. Table 2 illustrates that majority (70%) rural females had financial problems, were directed to meet the medical expenses and miscellaneous on their own and didn't had sufficient amount to spend as and when required (60%) each while among elderly males maximum (65%) were directed to meet the medical expenses on their own, 62.50 per cent didn't get sufficient amount to spend as and when required followed by financial problems.

As compared to urban respondents maximum number of both females (67.50%) and males (85%) didn't get sufficient amount to spend as and when required. The trend was almost similar in urban area as compared to rural area. Beside this, few number of respondents were also forced to contribute to family income and to meet the emergencies in the family as had poor financial status.

So on the whole, it may be concluded that maximum respondents both from rural and urban area suffered from financial problems and were directed to meet the medical expenses and miscellaneous on their own, as family members couldn't devote time for elderly and they didn't get sufficient amount to spend as and when required.

Table 2: Economic problems faced by the elderly

Economic Problems	Rural			Urban		
	Female (n=40)	Male (n=40)	Total (n=80)	Female (n=40)	Male (n=40)	Total (n=80)
Directed to meet the medical expenses and miscellaneous on their own	24 (60)	26 (65)	50 (62.50)	21 (52.50)	26 (65)	47 (58.75)
Don't get sufficient amount to spend as and when required.	24 (60)	25 (62.50)	49 (61.25)	27 (67.50)	34 (85)	61 (76.25)
Forced to meet the emergencies in the family	3 (7.50)	4 (10)	7 (8.75)	1 (2.50)	2 (5)	3 (3.75)
Forced to contribute to family income	-	-	-	1 (2.50)	2 (5)	3 (3.75)
Financial problems	28 (70)	24 (60)	52 (65)	24 (60)	18 (45)	42 (52.50)

Figures in parentheses indicate percentages

Multiple responses

Reasons for economic problems

Reasons for economic problem were: family financially not very sound, hike in consumable commodities, increase in expenditure on social rituals and payments of loans. It can be seen from the table 3 that among rural respondents majority (87.50%) females reasoned for financial condition of family not very sound, while maximum number (75%) of males responded for hike in consumable commodities. As compared to urban respondents majority of both females (70%) and 52.50 per cent males reasoned for hike in consumable commodities as the major reason followed by family financially not very sound. On the whole large number of respondents both from rural and urban area reasoned for hike in commodities and financial condition not very sound. While a relatively less number opted for increase in expenditure on social rituals and only a few respondents reasoned for payments of loans.

Table 3 : Reasons of economic problems faced by elderly

Reasons	Rural	Urban
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	Female (n=40)	Male (n=40)	Total (n=80)	Female (n=40)	Male (n=40)	Total (n=80)
Family financially not very sound	35 (87.50)	28 (70)	63 (78.75)	27 (67.50)	19 (47.50)	46 (57.50)
Hike in consumable commodities	32 (80)	30 (75)	62 (77.50)	28 (70)	21 (52.50)	49 (61.25)
Increase in expend. on social rituals	26 (65)	15 (37.50)	41 (51.25)	20 (50)	11 (27.50)	31 (38.75)
Payments of loans	-	4 (10)	4 (5)	-	2 (5)	2 (2.50)

Figures in parentheses indicate percentages

Multiple responses

Association of age with economic problems of elderly

The association of age with economic problems is presented in Table 4. The aged people belonging to age group of 60-70 years were actively involved in performing household work and outside work and faced more problems in comparison to the age group of 70-80 years and above.

Table 4 illustrates that rural females within age group of 60-70 years had more problems as compared to those who were 80 years and above, while among urban females the trend was almost similar. Among rural males belonging to 60-70 years of age had more problems as compared to those respondents of 80 years and above. On the whole the rural males experienced more economic influence as compared to their counterparts. Chi-square value was found to be significant in rural area which shows there was association of age with economic problems while the value was found to be non-significant among urban respondents.

Association of family size with economic problems of elderly

The association of family size with economic problems is presented in table 5. With regard to economic problems these elderly had to contribute financially more to the family in order to meet emergencies in the families, directed to meet medical expenses and miscellaneous on their own. Moreover they had a strict check on their spendings by their

son's for which they were debarred of spending independently rather had to contribute for the payment of

Table 4 Association of age with economic problems

Age (yrs)	Rural (N=4)					Urban (N=4)				
	NE	SA	E	FF	FP	NE	SA	E	FF	FP
Females										
60-70	19(47.5)	16(37.5)	3(7.5)	-	19(47.5)	7(17.5)	16(37.5)	1(2.5)	1(2.5)	1(2.5)
70-80	5(12.5)	7(17.5)	-	-	7(17.5)	8(20)	1(2.5)	-	-	8(20)
80 & above	-	2(5)	-	-	2(5)	6(15)	6(15)	-	-	6(15)
χ^2										
Niles										
60-70	1(3)	1(3)	3(7.5)	-	1(2.5)	17(42.5)	26(57.5)	2(5)	2(5)	1(2.5)
70-80	11(27.5)	1(2.5)	1(2.5)	-	9(22.5)	9(22.5)	9(22.5)	-	-	6(15)
80 & above	1(2.5)	3(7.5)	-	-	5(12.5)	-	2(5)	-	-	2(5)
χ^2										

Figures in parentheses indicate percentages

NE = Did not meet the need to open a business and/or sell land or their own

SA = Did not get sufficient amount to open a business and/or required

E = Forced to meet the needs of relatives in the family

FF = Forced to contribute to family income

FP = Financial Problems

* = Significant at 5% level

** = Significant at 1% level

Table 5 Association of family size with economic problems

	Family size	Rural (N=4)					Urban (N=4)				
		ME	SA	E	F	FP	ME	SA	E	F	FP
Females	Under 5	2(6)	1(4)	3(7.5)	-	2(5)	1(3.5)	1(4)	1(2.5)	1(2.5)	1(3.5)
	6-8	4(1)	7(17.5)	-	-	6(15)	6(15)	7(17.5)	-	-	7(17.5)
	9 & above	-	1(2.5)	-	-	-	-	2(5)	-	-	2(5)
	χ^2	5.88*					0.45				
Males	Under 5	1(4.25)	1(3)	4(1)	-	1(3.75)	1(4)	2(5.75)	2(5)	2(5)	1(3)
	6-8	6(15)	8(20)	-	-	8(20)	8(20)	1(2.5)	-	-	4(1)
	9 & above	3(7.5)	3(7.5)	-	-	2(5)	-	1(2.5)	-	-	-
	χ^2	1.27					1.11*				

Figures in parentheses indicate percentages

ME = Did not meet the criteria to pass as a household head on their own

SA = Did not get sufficient amount to pass as a head or were required

E = Food not met the needs of the family

F = Food contributed to family income

FP = Financial Problems

** = Significant at P < .05

Table 6: Association of family income and economic options

	Family size	Rural (N=4)					Urban (N=4)				
		NE	SA	E	F	FP	NE	SA	E	F	FP
Females	► Up to 5000	2(5)	2(5)	3(75)	-	2(5)	1(2)	1(2)	1(2)	-	1(2)
	► 5000-10000	3(75)	3(75)	-	-	3(75)	9(25)	5(25)	-	-	9(25)
	► 10000-15000	1(25)	1(25)	-	-	1(25)	2(5)	4(1)	-	-	3(75)
	► 15000 & above	-	-	-	-	2(5)	-	1(2)	-	-	2(5)
Males	► Up to 5000	2(5)	1(475)	4(1)	-	1(475)	6(5)	6(5)	2(5)	2(5)	6(5)
	► 5000-10000	4(1)	4(1)	-	-	5(25)	5(25)	5(25)	-	-	4(1)
	► 10000-15000	2(5)	2(5)	-	-	-	4(1)	4(1)	-	-	3(75)
	► 15000 & above	-	-	-	-	-	11(25)	1(475)	-	-	5(25)

Figures in parentheses indicate percentages

NE = Did not do the main job or was a child or was on their own

SA = Did not get sufficient amount of goods and services required

E = Food done at the expense of the family

F = Food contributed to family income

FP = Financial Returns

Table 7 : Suggestions of elderly regarding economic problems

Suggestions	Rural (n=80)			Urban (n=80)		
	Female (n=40)	Male (n=40)	Total (n=80)	Female (n=40)	Male (n=40)	Total (n=80)
► Money to be kept in reserve	6(15)	15(37.50)	21(26.25)	10(25)	20(50)	30(37.50)
► Availability of pension in time	17(42.50)	22(55)	39(48.75)	-	-	-
► Amount of pension to be increased	17(42.50)	22(55)	39(48.75)	14(35)	9(22.50)	23(28.75)

Figures in parentheses indicate percentages

Multiple responses

loans, emergencies, social rituals etc (Table 5). Chi-square value was found to be significant among rural females and urban males which shows that there was association of family size with economic problems.

Association of family income with economic problems

The association of family income with economic problems is presented in Table 6 indicates that the urban respondents having more income as compared to rural respondents had more economic problems as compared to one who has less income and was due to the division of property among children and were left with little or no money with them and had become completely dependent on their children. These are the children who did not care for them after wards.

Suggestions of elderly to overcome their problems

These were the suggestions which were given by the elderly to overcome their economic problems. These included : money to be kept in reserve, availability of pension in time, provision of pension to be increased.

Table 7 illustrates that rural females gave suggestions regarding availability of pension in time and provision of pension to be increased (42.50%) each, while few suggested for money to be kept in reserve. Among rural males the responses were almost similar. Incase of urban respondents both females and males suggested that pension needs to be raised, money to be kept in reserve to meet their own expenditure.

It can be concluded from the study that the economic problems faced by elderly were insufficient amount to spend on them as and when required, forced to meet the emergencies in the families, directed to spend on medical expenses on their own. They were forced to make the expenditure for the reasons: families being financially not very sound, hike in consumable commodities and social rituals. The suggestions given by the elderly to make their living comfortable were: money to be kept in reserve, availability of pension in time, amount of pension to be increased.

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Dealing with Loneliness in Elderly

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ABSTRACT

The paper presents loneliness as a biggest enemy of geriatric population. It is a chronic distressful mental state whereby an individual feels astrayed from or rejected by peers and is starved for emotional intimacy found in relationships and mutual activity. The paper also discusses the various categories of loneliness and strategies to combat loneliness.

Keywords: Loneliness, Categories of loneliness, Strategies to combat loneliness.

According to projections by the UN Population Division, there will be two elderly persons for every child in the world by 2050. This implies that the aged 60 and above, which currently constitute less than 20% of the population will account for 32% of the population by 2050.

Today, the biggest enemies of the geriatric population include solitude, loneliness, isolation, neglect and a sense of not being wanted. Our society has traditionally treated the care of the elderly as the responsibility of the younger generation. However, the rapid increase in the number of nuclear families, the growing urbanization and the global nature of employment opportunities are forcing a change in this implicit social contract. These changes are compelling many of our elderly to live alone, though it must be said that some of them have chosen to do so. Although the nature and magnitude may vary, their care is a major area of concern and a challenge to both the rich and the poor sections of our society.

UN Secretary General Kofi Annan, while referring to the ageing population had observed: "Trees grow stronger over the years, river wider and like with the age, human beings gain immeasurable depth and breadth of experience and wisdom. That is why older persons should not only be respected and revered but they should be utilized as the rich resource to society that they are".

Loneliness: The Concept

Loneliness and the state of being alone are different entities. Aloneness is simply being physically away from others. Loneliness, however, can be defined as a chronic, distressful mental state whereby an individual feels estranged from or rejected by peers and is starved for the emotional intimacy found in relationships and mutual activity (Weiss, 1973).

To further understand the state called loneliness, it is important to define what it is not. For example, it is neither depression nor grief. Though depression may result from loneliness, the two are not synonymous. A lonely individual is driven to establish new relationships to eradicate the distressful state he endures. A depressed individual, however, is unwilling to impose his/her unhappiness on others and therefore remains in isolation (Weiss, 1973). Loneliness also differs from grief. Though loneliness could result from the death of a spouse or the end of some significant relationship that may have comprised the bulk of an individual's social interaction, it is not equivalent to grief. Grief is the process of coming to terms with great loss while loneliness is simply a component of this procedure responding to the absence of the beloved (Weiss, 1973).

Loneliness is also not the self-imposed, constructive isolation of artists and writers viewed in an almost romantic light. Before Weiss' scientific studies were published in the early 1970s, psychologists reported in anecdotal fashion about the correlation between loneliness and creativity. They expounded on the positive relationship between isolation and the artistic process, implying that managing the loneliness of the operation was pivotal to producing a creative work. Though many artists seek voluntary solitude as a means to spark the Muse and focus on a project, constructive aloneness is not tantamount to a state of loneliness. In fact, when adolescents were tested for loneliness and creativity to determine if this correlation existed, an inverse relationship was found. Adolescents who rated themselves

highest on creativity engaged in complex, emotional attachments which offset loneliness. Moreover, those who rated highest on loneliness were less likely to engage in creative endeavors as the bulk of their energy was allotted to alleviating their state of loneliness.

Along this line, loneliness is also not the self-imposed isolation sought for spiritual purposes. Taoists speak of a state known as “returning” which is the centering of the self after having been involved in the day’s social activities. Returning constitutes isolation from others to cleanse oneself of their influences. The same is true of monks and nuns of many religions who live a cloistered existence, sometimes abandoning speech or other forms of human interaction as a means to achieve greater enlightenment on spiritual matters. Again, this is chosen solitude alleviating distractions and designed to achieve a specific goal, and does not accurately reflect the distressful, unwanted state of loneliness.

Categories of Loneliness

Loneliness can be divided into two categories with separate symptomatology and differing courses of treatment (Weiss, 1973). The first area is the loneliness of emotional isolation brought about by the loss of a significant relationship in one’s life through death or divorce. The only means by which this loneliness can be remedied is by finding another equally important relationship to fill the void, not just by becoming socially active in a superficial, non-intimate manner. Emotional isolation is strongly reminiscent of a child’s fear of abandonment (Weiss, 1973). In addition, this loneliness type is often accompanied by hyper-alertness and anxiety which makes the individual oversensitive to social cues leading them to misinterpret or exaggerate the intentions of others whether positive or negative (Weiss, 1973). This hypersensitivity further dampens the likelihood of filling the void they experience.

It is no coincidence that emotional isolation is compared to the fearful abandonment feelings of childhood. Attachment styles learned in childhood as a means of relating to a caregiver are repeated through adulthood as one bonds in other significant relationships (Baron and Byrne, 2000). Therefore an individual who achieves a secure attachment style with a caregiver in childhood is less likely to experience loneliness as an adult as they have developed trust and social skills that facilitate interpersonal relationships (Baron and

Byrne, 2000). Moreover, they are likely to have higher self-esteem which enhances their desirability.

Emotional isolation has also been termed “loneliness of early detachment experiences” (Hojat, 1987) and even “primary loneliness” to differentiate it from other temporary types as well as to emphasize its etiology as coming from the first and, as Freud would say, the most important relationship between mother and child. Though Weiss’ term of emotional isolation emphasizes adult attachment styles rather than early development and a broken bond between infant and mother, the etiological emphasis is clearly focused on an individual’s inability to relate to others rather than external, transitory circumstance.

The second type is called the loneliness of social isolation which involves the deficiency of a social network or “the absence of a place in an accepting community” (Andersson *et. al.*, 1987). The feelings in this form of loneliness revolve around boredom, a lack of focus, and a sense of being marginalized or rejected by peers. Once this individual has access to a network of social interaction, the symptoms usually dissipate. However, Weiss believed there were as many as six different types of relationships that are all required by an individual (Vincenzi and Grabosky, 1987) and a deficit in any one of them could produce feelings of social loneliness.

Those relationships include *attachments* which he defines as associations in which one feels a sense of safety and security such as with a spouse or parent; *social integration* wherein a network of relationships is provided in a group setting such as a neighborhood, church or club; and *opportunity for nurturance* which entails all associations that involve the individual acting as caregiver or simply being responsible for another’s well being in some fashion. Weiss also identified relationships for *reassurance of worth* which highlight acknowledgement of a person’s skills and abilities such as in a work setting; *reliable alliances* which involve having support and others to count on; and finally *guidance* relationships which are based on having sources when it is necessary to seek advice. The absence or paucity of any of these associations could bring about social loneliness as the many facets of an individual’s social needs are not being met.

Loneliness and Elderly

The elderly, in the age range from 60-75 years faces the issue of loneliness the most. At this life stage significant relationships come to an end. One may lose a spouse through death or divorce. Friendships cease due to death or retirement relocation. Children leave the nest for college or to begin their own lives, perhaps in other cities, and focus their energy away from the nuclear family. Moreover, due to failing health or an inability to drive or walk, an older person may become housebound furthering their isolation from the community. More revealing, however, is the locus of control attribution in the aged. Those who internalize the responsibility and control of their own lives were found to be less lonely than those who felt they had little control over the latter part of their lives (Moore and Schultz, 1987). In short, those who believed loneliness and isolation were a requisite facet of old age took fewer steps to alleviate solitude and therefore experienced greater depression and feelings of detachment from community and family.

Strategies to combat loneliness

1. **Keep busy** — If you are lonely, do with eagerness whatever is in front of you to do: write letters, visit people, fix something that needs to be fixed, take up a hobby, start collecting something of value, become amazed and fascinated by everything around you. Keep busily involved in everything that gets your attention—every little thing and every middle-sized thing can soon grow into big significant projects. The happiest person and the busiest person are one and the same. Cure loneliness by keeping busy.
2. **Involve yourself** — If you are lonely, involve yourself in community affairs. Many times when people retire they find themselves in a burned-out condition. Some elderly people just sit in a chair, stare out the window, or watch TV. This kind of mental attitude sets a person up to be lonely. And, if a person continues to be a hermit, there will come a time when an incurable loneliness will be the order of the day.
3. **Help others** — If you are lonely, look for and strive to cure the loneliness of someone else—it will cure your own. How about holding the hand of some of those people who made no

provisions for old age. There are myriads of people who need help—find them and help them by providing companionship.

4. **Avoid escapes** — If you are lonely, avoid day dreaming, sleeping too much, and watching too much TV. When you do dream dreams, make them possible, obtainable, and something you can work on. Dream magnificent goals for the future and start to bring them about. TV can be a life-saver on occasions; but to mesmerize your brain in a constant dose of radiation from the idiot box is a sure-fire way of becoming depressed and lonely. Too much sleep can be a powerful escape mechanism. We can find ourselves fleeing from guilt, responsibility, failure, and hopelessness. To run away through sleep is just like running away with alcohol—it only makes matters worse. Fight the tendency to sleep too much as if it was a demon from hell—it is.
5. **Choose to be happy** — If you are lonely, you are probably depressed and unhappy. Fight unhappiness with a direct attack of the will—choose to be happy in spite of the circumstances. Ask yourself the question, “How does my unhappiness change my situation?” The answer will be, “It doesn’t, it just makes it worse.” So make things better for yourself by choosing to be happy. Fight depression by talking out your problems. If alcoholics can join a group and get control of their drinking, you can join a group and get control of your depression. Talk to friends, a counselor, and keep talking until you find yourself maintaining an attitude of optimism.
6. **Collect good thoughts** — If you are lonely, collect inspirational thoughts, good jokes, meaningful poems, and literary masterpieces. Read lots of good books, if you can; if you can’t, have someone read to you. Make a list of good things that you read about and then try to memorize some inspirational quotation and share it with whoever comes your way. Collect good thoughts to share with those people who come your way, and soon others will search for your companionship like the proverbial guru of the mountain.
7. **Join a social group** — If you are lonely, join one of the many social groups in your community. See that you visit the Senior Clubs regularly and meet new people. You will find many individuals there that are involved in social gatherings of various

types. Commit yourself to one or more groups that you find of interest.

Loneliness is often caused by wanting people to do something for us. When we do things for other people, we are never lonely. Self-referenced thinking often leads to a barrenness of spirit that breeds discontent and loneliness. Think up, think out, toward people, think around, toward all the exciting things of life; and avoid thinking too much about yourself, and the problem of loneliness will disappear.

Loneliness generally occurs at specific times of the day or during specific days such as holidays, birthdays, and anniversaries. Planning ahead for these times so that you are active and busy with other things helps provide a very effective means of dealing with loneliness.

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Tribute of Dr. Alois Alzheimer

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With the present demographic transition in India, persons over 60 years in age are increasing in number much faster than the general population. There is a national awareness regarding the urgent need to take all possible measures for the care of the elderly population, most of whom are located in the vast rural and peri-urban areas.

With the gradual increase in age over 60 years, there are innumerable changes in the human body, that paves the way for many infirmities and degenerative chronic diseases which are rampant in the elderly population. Thus, cardio-vascular disorders, coronary heart disease, diabetes mellitus, kidney failure, cancer and various diseases ravage the life of the elderly population. Unfortunately, the medical practitioners and those employed in the vast network of primary health care in the rural and peri-urban areas are not fully aware of the diseases of the elderly. It is only now that the Medical Colleges have Geriatrics in their medical curriculum. However, one has to admit that the expertise in geriatrics of the doctors in most primary health care and even in district hospitals is almost negligible. There is countrywide awareness that all possible steps should be taken to improve the present unfortunate situation of the health status of millions of elderly, especially of those who are in rural and peri-urban areas and most of whom are unfortunately below the poverty line.

Of all the diseases which affect the elderly population, Alzheimer's disease is the most sinister not only for its manifestations in the life of the elderly sufferer, but also the tremendous impact on their careers. Alzheimer's Disease converts the sufferer mentally as

well as physically in all manners so that after a few years of suffering, he or she is very rightly regarded as a **caricature of the sufferer**. The sufferer cannot survive without a whole time care-givers for whom this experience is a nightmare. The care-givers very often feel that death is the only respite to their responsibilities.

Why is Alzheimer's Disease so cruel and sinister? Firstly, there is no confirmed method for its final diagnosis so that the sufferer continues to suffer without being diagnosed for proper treatment. We do not have any clear indication as to who can be the unfortunate victims of this disease excepting that women and very old persons are most commonly affected. Moreover, there are as yet no drugs which could be regarded as specific for this disease though a number of drugs are being used with some success. No hospitals or nursing homes will admit Alzheimer patients. Even the Homes for the Aged do not accept them. Worldwide, there would be several million Alzheimer patients and we have no idea as to their number in our country. The number must be enormous. No survey has been done so far. Since dementia is the predominant feature of this disease, it is difficult to differentiate it from other types of dementias.

The year 2006 is regarded as Alzheimer Centenary, since 100 years back a German Neurologist Dr. Alois Alzheimer, who was also a noted histologist-cum-pathologist, announced the unique nature of a disease so far not known. The description of the disease, that was named after him, was gleaned from his patient Frau Augusta, who came to his clinic with bizarre symptoms and after she was taken in as his patient, lived for only 5 years. During this period, she showed all manifestations of a disease which we now know as Alzheimer's disease. It was then considered as an "unusual disease of the cerebral cortex".

The patient was a woman in her fifties with memory loss, disorientation, hallucinations and ultimately her death. The woman had experienced the first symptoms some 5 years previously. She became successively unable to care for herself at home and rejected all attempts to help her. Upon hospitalization, her symptoms were disorientation, impaired memory, as well as troubles in reading and writing. The symptoms increased gradually to hallucinations and a gradual loss of higher mental functions. She spent the last few years of her life in a mental asylum in Munich.

Dr. Alzheimer performed an autopsy but could not find any change in the body. But on opening the skull, he was struck by the complete change in the brain structure and appearance. The brain which was characterized by the cerebral cortex becoming thinner than normal and with two abnormalities – one being senile plaque, a structure described earlier in the brain of elderly people and the other was neuro-fibrillary tangles. With his expertise in histopathology, he was able to identify the pathological changes in these abnormalities which have never been previously described.

Dr. Alzheimer's second case was a dementic 56 year old man Johann F, who was admitted to the University Psychiatric Clinic in Munich and there died soon after. This patient had brain damages similar to those of his first patient. Dr. Alzheimer presented the description of his first patient in the 37th meeting of the South West German Psychologists on 3rd November, 1906. It was unanimously agreed that this disease be known after him as Alzheimer's Disease.

Dr. Alzheimer was born in Germany in 1864 where he had early education and from where he was granted medical degree in 1887. The same year he defended his doctoral thesis, on the wax-producing glands of the ear. It was based on experimental research performed in the laboratory of the noted Swiss Physiologist and Histologist Rudolf Albert von Kolliker (1817-1905). In 1888, he joined the staff of the city mental asylum in Frankfurt, where he commenced his experience in neuro-psychiatry and devoted himself to his great interest - Neuropathology, thus becoming interested in research on the cortex of the human brain.

However, research into this disease represents a small segment of Dr. Alzheimer's clinico-pathologic interest on the histopathology of the brain. Dr. Alzheimer became one of the founding fathers of neuropathology producing a unique brain research traditions in Germany that lasted for almost a century. As mentioned earlier, Dr. Alzheimer's contribution was in numerous other areas. His studies of brain changes in different stages of Syphilis was an attempt to correlate clinical symptoms with pathology.

He described among other things, brain changes in arteriosclerosis and loss of nerve cells in Huntington's Chorea. He studied brain changes in epilepsy and among other changes, he described a comprehensive loss of nerve cells in the hippocampus in a

large part of epileptic patients which is now known as amon sclerosis.

His more than 10 years in Munich as Head of Anatomy Laboratory were his best. Students from various countries constantly occupied the seats in the laboratory and each one had the constant support of Dr. Alzheimer.

Dr. Alzheimer married a banker's widow in Frankfurt in 1894. Unfortunately, his wife died in 1901 after only 7 years of marriage in 1903. On his way to take up the post of Chair of the Department of Psychiatry at the University, he got a severe cold with complications, from which he never recovered. Though troubled by rapidly deteriorating health, he dedicated his last 3 years of his life in research. He died in 1950 at the age of 51 years and was buried next to his wife in the Jewish cemetery in Frankfurt.

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