Prevalence of Health Related Disability among Community Dwelling Urban Elderly from Middle Socio-Economic Strata in Serampore

By Partha Talukdar

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Abstract- The present study has been conducted in Serampore, West Bengal. The health of geriatric population is a present as well as future concern. This poses mounting pressures on various socio-economic fronts of the state, including pension outlays, health care expenditures, saving levels etc. This makes it necessary to look into the various aspects of their problems: Health, social rejection, economic, psychological and other allied aspects. In the traditional joint families, infirmities were taken care of by the individuals, immediate circle of relations and family members. Older people enjoyed a sense of honour and authority and had the responsibility in decision-making. However, in recent times, as a result of changing circumstances due to demographic transition, rapid pace of industrialization and urbanization, disintegration of joint family structures into unitary ones, the older people become more vulnerable to physical disabilities as a result of different morbidities and poor health seeking behaviour. This study will prove to be useful for the planners and policy makers in Government and private organizations and will help in enhancing the understanding of the problems of elderly people in the state.

Keywords: morbidity, elderly population, ageing, physical disabilities.

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Strictly as per the compliance and regulations of:

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Abstract- The present study has been conducted in Serampore, West Bengal. The health of geriatric population is a present as well as future concern. This poses mounting pressures on various socio-economic fronts of the state, including pension outlays, health care expenditures, saving levels etc. This makes it necessary to look into the various aspects of their problems: Health, social rejection, economic, psychological and other allied aspects. In the traditional joint families, infirmities were taken care of by the individuals, immediate circle of relations and family members. Older people enjoyed a sense of honour and authority and had the responsibility in decision-making. However, in recent times, as a result of changing circumstances due to demographic transition, rapid pace of industrialization and urbanization, disintegration of joint family structures into unitary ones, the older people become more vulnerable to physical disabilities as a result of different morbidities and poor health seeking behaviour. This study will prove to be useful for the planners and policy makers in Government and private organizations and will help in enhancing the understanding of the problems of elderly people in the state.

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I. Introduction

The phenomenon of population ageing is becoming a major concern for the policy makers all over the world during the last two decades. Ageing of population is affected due to downward trends in fertility and mortality i.e. due to low birth rates with long life expectancies. Life expectancy at birth is projected to continue to rise in the coming years all over the world. The aged population has specific health problems that are basically different from those of adults or young persons. Most diseases in the aged are chronic in nature-cardiovascular, arthritis, stroke, cataract, deafness, chronic infections, cancer. Disease process is usually multiple. Availability and utilization of health services is an important determinant of the health status of population. The needs for health services tend to vary directly with the age of the individuals. The older the one gets, the more health care he needs. Although the aged people face multiple health problems, even then, they do not consider seeking medical aid and as a result, many conditions remain unreported and untreated till they become complicated. This emphasizes the need for strengthening of health care system for elderly population. According to Paul Wallace, all individuals should be prepared to face later years in life within their own limitation gloriously. Chhattisgarh is moving fast towards an 'aged society', with the aged population constituting 7.2 percent (India 8 percent) and in another 10 years, percentage of elderly is projected to be 10 percent. Though a large number of studies on various factors influencing the aged are available in western countries, not much data have been generated as applicable to the Indian scenario. Urban areas are expected to grow at higher rate as compared to non-urban. Consistent with these changes; there were health institutions both demographically and epidemiologically, hence associated with the changes in prevalence of chronic illnesses.

II. Material and Methods

Serampore is an important city of Hooghly district, state of West Bengal, India. At the time of 2011 census, the population within the Municipal area of Serampore was 181,842.Study was conducted in randomly selected 32 areas distributed in Serampore city including Urban and Slum areas. List of zones and wards including Slum and Urban areas were obtained from Municipality of Serampore. From eight zones of Serampore city by simple random technique, four zones were selected. Out of the four zones, four wards were selected by simple random technique. From each ward, one slum area and one urban area were included in the study using simple random technique. A total of 32 areas were included in this study. Door to door survey was conducted. From each area, 20 elderly were included in study.

Sampling method: Multi stage simple random sampling technique.

Sample size: 640

Sample size was calculated by using statistical formula, n= Z2 l-a/2 P (l-P)/d

P = Morbidity Problems (50%),
d= Absolute Precision (4%), Confidence level= 95%

As there was no baseline study in Serampore, therefore it was not possible to estimate 'P', so a figure

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of 0.5(50%) was used. This is the 'safest' choice for the population proportion, since the sample size required is largest when P = 0.5(50%) [128].

A total of 600 figures come using statistical formula. For making uniformity, 20 subjects from each of 32 areas were selected that comes 640. Therefore, a total 640 subjects were included in the study.

III. Objectives of the Study

1) To study morbidity pattern in elderly population of Serampore city.
2) To determine the pattern of morbidity in elderly population of Serampore city.
3) To study the health-care seeking behaviour of elderly population.
4) To make suitable recommendations on the basis of the study.

IV. Observations and Discussion

Table 1 : Sex wise distribution of level of cognition among studied elderly

Level of cognition	Male		Female		Total	
	No	%	No	%	No	%
Normal	89	47.34	99	52.65	188	29.37
Some degree of mental confusion	155	37.25	261	62.74	416	65
Severe confusion	23	63.88	13	36.11	36	5.62
Total	267	41.71	373	58.28	640	100

Chi-square = 13.123 (df = 2, p < 0.001)

Above table shows statistically significant relation between level of cognition and sex of study population. Cognition was normal in 29.37% elderly whereas 65% had some degree of mental confusion, 5.62% had severe confusion. Severe confusion was more among males(63.88%) than females (36.11%).In another study by Srinivasan Krishnamachari et al (2010), reported that cognitive impairment was shown to be positively associated with disability and was independent of age, gender and co-morbid medical condition. Present study shows sex differentiation among cognitive impairment. More males were severely confused than females.

Table 2 : Association of Morbidity with Socio-economic status in elderly population

SES	Morbid		Healthy		Total	
	No	%	No	%	No	%
Class I	68	(94.44)	4	(5.55)	72	11.25
Class II	158	(91.32)	15	(8.67)	173	27.03
Class III	120	(95.23)	6	(4.76)	126	19.68
Class IV	229	(98.28)	4	(1.71)	233	36.40
Class V	35	(97.22)	1	(2.77)	36	5.62
Total	610	(95.31)	30	(4.68)	640	100

Chi-square = 11.162 (df = 4, p = 0.024)

Above Table-2 shows that there is statistically significant association between morbidity and socio-economic status. Maximum morbidity(37.54%) was observed in Class IV Socioeconomic status(98.28%) followed by Class V (97.22%), Class III (95.23%), Class I (94.44%) and Class II (91.32%).In present study, maximum morbidity was in Class IV and V Socio-economic group and all belonged to slum areas and were vulnerable group related to both environmental factors and literacy status.

Table 3 : Age and sex wise distribution of illnesses in elderly

Age groups in yrs	No examined	Persons ill	Number of illness		Total illnesses	Mean no of illnesses
			Male	Female		
60-74	523	495(94.64)	652	1303	1955	3.94
75-84	114	112(98.24)	261	226	487	4.34
>85	03	3(100)	0	19	19	6.33
Total	640	610(95.31)	913	1548	2461	4.03

Above Table-3 shows that, out of 640 elderly included in the study, 610 (95.31%) were found to have one or more illnesses at the time of examination. There was 2461 illnesses in 610 persons, 913 in males and 1548 in females. Mean number of illness was 4.03. In males, 3.78 whereas in females, mean number of illness was 4.19. There was positive association between mean number of illness and advancement of age. Mean illness for young old was 3.94, for old was 4.34 and for very old was 6.33.

Prevalence of illness was 100% among very old, 98.24% among old and 94.64% among young old. Similar findings were observed in another study done by M Jamal et al (1977), observed that 88.66% in their study were found to be ill;86.67% males and 90.78% females. Illness was observed more frequently in older age group; 79.36% in young old to 100% in very old. Raj and Prasad (1970) observed that the brunt of illnesses fell on the persons who were 80 years and over.

Table 4 : Age wise distribution of total illnesses in study area

Age group	Slum		Urban		Total	
	No	%	No	%	No	%
60-74	950	(75.15)	1005	(83.95)	1955	(79.43)
75-84	295	(23.33)	192	(16.04)	487	(19.78)
>85	19	(1.50)	0	0	19	(0.77)
Total	1264	(51.36)	1197	(48.63)	2461	(100)

Chi-square = 40.538 (df = 2, p < 0.0001)

Above Table-4 shows statistically significant relation between age and illness of slum and urban elderly. Overall total illness was more in young old (79.43%), followed by old (19.78%) and very old (0.77%); but the mean was increasing with advancement of age. In urban areas, 83.95% of illnesses lying in young old

whereas in slum areas, 75.15% illnesses were in young old. Young old in urban areas were more overweight and obese and physically less active, whereas young old in slum areas were more active and were heavy activity performer. In old and very old, illnesses were more in slum than urban dwellers.

Table 5 : Age sex wise distribution of spells of illness in morbid elderly (n=610)

Age groups in years	Persons ill		Spells of illnesses			
	Male	Female	Male	Mean Spells	Female	Mean Spells
60-74	176	319	773	4.39	1526	4.78
75-84	65	47	293	4.50	262	5.57
>85	0	3	0	0	22	7.33
Total	241	369	1066	4.42	1810	4.90

Chi-square = 83.484 (df = 2, p < 0.0001)

Above Table-5 shows statistically significant relation between mean of spells of illness and age. In both sexes, mean spell was increasing with

advancement of age. In males, mean was more (4.42) in comparison to females (4.90).

Table 6 : Distribution of elderly as per subjective perception of health status

Perceived Health status	Number of elderly	Percentage (%)
Well	174	27.18
Ill	466	72.81
Total	640	100

Table-6 shows that 72.81% population perceived themselves ill, whereas 27.18% perceived well.

Table 7 : Sex wise distribution of subjective perception of health status in elderly

Health status	Male	Female	Total
Well	85(31.85%)	89(23.86%)	174(27.18%)
Ill	182(68.16%)	284(76.13%)	466(72.81%)
Total	267	373	640(100%)

Chi-square = 4.999 (df = 1 , p = 0.025).

Above table shows that72.81% population perceived themselves ill. Out of the total female population, 76.13% and out of the total male population, 68.16% perceived themselves ill.

Table 8 : Age wise Health seeking practice of elderly (n=466)

Age group (years)	Treatment taken	Treatment not taken	Total
60-74	361(97.30%)	10(2.69%)	371
75-84	92(100%)	0	92
>85	3(100%)	0	3
Total	456(97.85%)	10(2.14%)	466

Chi- square 2.617 (df 2, p = 0.270).

Above table shows that 97.85% of the elderly were observed to be receiving treatment where as 2.14% were not receiving treatment. With advancement of age, health care seeking was increased from 97.30% in young old to 100% in very old.

Table 9 : Sex wise Health seeking practice of elderly (n=466)

Sex	Treatment taken	Treatment not taken	Total
Male	180(98.90%	2(1.09%)	182
Female	276(97.18%)	8(2.81%)	284
Total	456(97.85%)	10(2.14%)	466

Chi-square 1.559 (df=1, p = 0.211).

Above table shows that, out of total 466 elderly who perceived themselves ill, 97.85% were taking treatment whereas 2.14% did not take any treatment. Among males who perceived themselves ill, 98.90% had taken treatment whereas among females 97.18% had taken treatment.

Table 10 : Health seeking as per agency of treatment in Urban and Slum elderly

Area	Government	Private	Quacks	Others	Total
Urban	72(29.26%)	127(51.62%)	38(15.44%)	9(3.65%)	246(53.94%)
Slum	55(26.19%)	35(16.66%)	82(39.04%)	38(18.09%)	210(46.05%)
Total	127(27.85%)	162(35.52%)	120(26.31%)	47(10.30%)	456(100%)

Chi-square = 86.24 (df = 3, p= 0.000).

Above Table-10 shows that, out of total 466 elderly who perceived themselves ill, 456 elderly were taking treatment. Out of 456 elderly who were taking treatment, 53.94% were residing in urban areas whereas 46.05% were residing in slum areas. Out of various agencies, maximum were utilizing private facility (35.52%) followed by Government agency (27.85%), quacks (26.31%) and 10.30% from other source. In urban elderly, maximum were utilizing private facility (51.62%), followed by Government (29.26%), quacks (15.44%) and others (3.65%). Among slum dwellers, maximum elderly went to quacks (39.04%) followed by Government facility (26.19%), others (18.09%) and private facility (16.66%).This may be due low socio-economic status of slum elderly and high socio-economic status among urban dwellers.

Table 11 : Distribution of reasons for not utilizing Government facility

Reasons	Persons	Percentage (%)
Health centre too far	16	4.86
Facility available but lack of faith	4	1.21
Long waiting time	147	44.68
Due to misconduct of staff	110	33.43
Others*	52	15.80
Total	329	100

*Others included OPD time not suitable.

Present study shows that, out of total 456 elderly seeking treatment from different agencies, only 127 elderly were taking treatment from Government facility ; rest 329 were not utilizing Government facility. Above

table shows that most common reasons for not utilizing Government facility were long waiting time (44.68%), due to misconduct of staff (33.43%) and others. Others included not suitable OPD time. The least common reasons were too far health centre (4.86%), lack of faith (1.21%).

Table 12 : Distribution of reasons for not utilizing Government facility in Urban and SlumElderly

Reasons	Urban		Slum		Total	
	No	%	No	%	No	%
Health centre too far	1	0.57	15	9.67	16	4.86
Facility available but lack of faith	3	1.72	1	0.64	4	1.21
Long waiting time	95	54.59	52	33.54	147	44.68
Due to misconduct of staff	23	13.21	87	56.12	110	33.43
Others*	52	29.88	0	0	52	15.80
Total	174	100	155	100	329	100

Chi-square = 114.34 (df= 4,p = 0.000)

Table-12 shows that total 329 elderly were not utilizing Government facility, out of which 174 belonged tourban areas and 155 belonged to slum areas. Most common reasons for not utilizing government facility were long waiting time in 44.68%, Misconduct of staff 33.43% and others 15.80%. Least common reasons were too far health centre (4.86%) and lack of faith (1.21%).Common reasons for not utilizing Government facility among urban elderly were long waiting time in 54.59%, misconduct of staff 13.21%; whereas in slum elderly, misconduct of staff was the major reason in 56.12% for not seeking care from Government facility, followed by long waiting time (33.54%).

Table 13 : Health seeking as per system of medicine (n=456)

Age group (years)	Allopathic	Ayurveda	Homeopathy	Others	Total
60-74	308(85.31)	14(3.87)	18(4.98)	21(5.81)	361
75-84	86(93.47)	1(1.08)	0	5(5.43)	92
>85	3(100)	0	0	0	3
Total	397(87.06)	15 (3.28)	18(3.94)	26(5.70)	456

Chi-square = 7.382 (df = 6, p = 0.286) Figure in parenthesis denote percentages.

Above table shows that majority of the elderly availed modern allopathic system of therapy (87.06%). Homeopathy was also used by a substantial percentage of elderly (3.94%). Advancement of age had positive association with allopathic system of therapy from 85.31% in young old to100% in very old age groups.

Table 14 : Distribution of reasons for not seeking health care (n=10)

Reasons for not seeking health care	Persons	Percentage
Financial reasons	1	10
Considered disease due to age	1	10
Nobody to take me to hospital	5	50
Health services too far	3	30
Total	10	100

Out of 466 who perceived themselves ill, only 10 did not take any treatment. Above table shows that 50% were not seeking health-care due to nobody was available to take them to hospital, 30% were not seeking health-care due to too far health services, where as 10% shows financial reasons and disease due to old age were observed in 10%.

Table-14 : Distribution of elderly spending on health as percent of per capita income in Urban and Slum areas

% of Per capita income	Urban		Slum		Total	
	No	%	No	%	No	%
<10%	161	50.94	155	49.05	316	62.94
10-20%	56	56	44	44	100	19.92
20-30%	29	80.55	7	19.44	36	7.17
>30%	0	0	4	100	4	0.79
Total	246	49.00	210	41.83	456	100

Chi-square = 16.258 (df = 3, p = 0.001)

Above table shows statistically significant relation between urban and slum elderly on health spending. Table-14 shows that, expenditure on health was more in urban than slum elderly. This is similar to trend at national and international level. Those who are more developed and economically more sound are spending more on health than developing countries. In slum areas, maximum of their income is spent on food. In another study by Srinivasan Krishnamachari et al (2010), reported that majority of the elderly spent less than 10% of their monthly income on medication and health related issues.

Table 15 : Distribution of diseases of genitourinary system

Diseases	Male(n=241)	%	Female(n=369)	%	Total(n=610)	%
Urinary Incontinence	6	2.48	1	0.27	7	1.14
BPH	19	7.88	0	0	19	3.11
UTI	14	5.80	10	2.71	24	3.93
Stress Incontinence	0	0	1	0.27	1	0.16
Trichomonas vaginitis	0	0	3	0.81	3	0.49
Carcinoma Cervix	0	0	1	0.27	1	0.16
Prolapsed Uterus	0	0	2	0.54	2	0.32
Total	39	-	18	-	57	-

Note: Multiple disorders have been seen in many subjects.

The study shows, prevalence of Genitor urinary system disorders was 7.37%; among males prevalence was 12.03% whereas in females 4.33%. Above table shows, out of all disorders of Genitor- urinary system, common disorders were Urinary tract infection (UTI) (3.77%), Benign Prostatic Hypertrophy (BPH) (3.44%), Urinary Incontinence (1.14%). The least common condition was Trichomonas vaginitis (0.49%), Prolapsed Uterus (0.32%), Stress Incontinence (0.16%), and Carcinoma Cervix (0.16%). Among males, the commonest condition observed was Benign Prostatic Hypertrophy followed by UTI, whereas among females, Urinary Tract Infection was the commonest illness. In other study done by Shradha K et al (2012) reported prevalence of Genitourinary disorders as only 1.7%. The commonest condition was Renal calculi (1.4%), Urinary Incontinence (0.9%), Urinary frequency (0.9%) and Urinary Tract Infection (UTI) (0.9%). Renal Calculi and Urinary Incontinence was almost equally distributed in both genders, while Urinary frequency and UTI was reported by only female respondents. Present study was different from Shradha K et al (2012), UTI were distributed in both genders. P Ray Karmakar et al (2012), in their study showed that 9.8% elderly had Genito urinary system disorders. Male suffered more (10.3%) than females (9.3%), which is comparable to 9.35% observed by Purohit and Sharma (1976). In present study almost similar feature has been reported. A study from Israel by Polliack and Bialik (1975) revealed very high prevalence (over 33.0%) of Benign Prostatic Hypertrophy, which might be due to older study population (65 years and above) and possibly better cooperation in conducting internal examination, on account of greater awareness and health consciousness. In the present study, the elderly population is 60 years and above thereby diluting the percentage of BPH cases found, as this is a disease more common in higher age groups. In present study, there was limitation for internal examination of female and male genital organ. Diagnosis was made on the basis of history, presenting symptoms and available medical records and medicines if possible.

V. Conclusion

The present study is an endeavour to find out the morbidity pattern among elderly in Serampore city on a small scale of young growing state of West Bengal, along with the existing health practices and finally to suggest a pattern of health services suitable for the elderly population in the city. The study was conducted in 640 elderly subjects selected randomly from 32 areas

including urban and slum areas from 8 zones and 77 wards of Serampore city. Elderly persons in the age group, 60 years and above were 63635 (6.3% of total population in Serampore city), out of which only 640 persons (267 males and 373 females) were included in the study. Elderly females 373 (58.28%) out-numbered elderly males 267 (41.71%). Majority of the elderly persons (81.71%) belonged to "young old" age group. Bulk 40.15% of the elderly persons received education upto higher secondary. Graduates and above was only 15.78%, out of which 83.16% were in urban whereas 16.83% were from slum areas.

36.40% of the elderly population belonged to socio-economic Class IV, followed by Class II. A large proportion (84.07%) was living in joint families and 15.93% in nuclear family settings. Only 5.93% were living alone. 51.09% of the elderly were themselves heading the family with males predominating. A large proportion 42.03% of elderly population was unemployed. The principle occupation of the persons who were currently employed in some gainful occupation was agriculture/ shop owner/clerical 11.25%, while 18.12% were professional including retired persons. A large proportion 48.28% was financially dependent on others. Only 14.84% were receiving old age pension. Out of total dependent, 66.66% were dependent on their children, 13.26% on grand children and 1.29% on spouse, 14.56% on others. A small proportion 33.59% was aware about various Government welfare schemes for the elderly. The geriatric population is a dependent population. Hence, health care delivery system should reorganize their timing other than routine schedule. Periodic comprehensive health check up, preferably twice a year must be carried out and primary health care delivery must be ensured to geriatric population.

REFERENCES RÉFÉRENCES REFERENCIAS

1. Aggarwal Anupam. *A study of the morbidity status of geriatric population in the rural areas of Delhi*, New Delhi, India, 1992.
2. Campbell AJ, Reinken J, Allen BC. *Thyroid disease in the elderly in the community.* Age Ageing 1981; 10: 47-52.
3. Goel PK, Garg SK, Singh JV et al. *Unmet needs of the elderly in rural population of Meerut.* Indian J Community Med, 2003; 28: 165-6.
4. Goswami S et al. *Premature Birth: An Enigma for the Society?* European Journal of Medicine, Vol 6, No 4: pp 215-225, DOI-10.13187/ejm.2014.6.215.
5. Goswami S, Sahai M. *A Study of Psychosocial Risk Status and Knowledge of Reproductive Health in Adolescents in Serampore City.* European Journal of Medicine, 2015, Vol 9, Is 3: pp 139-149, DOI:10. 13187/ejm.2015.9.139.
6. Hanger HC, Sainsbury R. *Screening the elderly-a Christchurch study*. The N Z Med J, 1990 Oct 10; 103 (899): 473-475.?>
7. Krishnamachari Shrinivasan, Mario Vaz, Tinku Thomas. *Prevalence of health related disability among community dwelling urban elderly from middle socio-economic strata in Bengaluru*, India. Indian J Med Res 131, April 2010: p 515-521.
8. Lena A, Ashok K, Padma M. *Health and social problems of the elderly: A cross-sectional study in Udupi Taluk, Karnataka*. Indian Journal of Community Medicine, Vol. XXIX, No 1, Jan-Mar, 2004.
9. Lena A, Ashok K, Padma M. *Health and social problems of the elderly: A cross-sectional study in Udupi Taluk, Karnataka*. Indian Journal of Community Medicine, Vol.34, Issue 2, April 2009.
10. Longo et al. *Textbook of Harrison's Principles of Internal Medicine. 18th edition*. The McGraw Hill Companies, Inc. U.S. 2012, p 570.
11. Mittra et al. *A social study in the aged population of the urban health centre*, Anambah, Lucknow". Ind J.P. & S.M. 2: 139.
12. P Ray Karmakar, A Chattopadhyay. *A study on morbidity pattern and care seeking behaviour of elderly in rural area of West Bengal, India*. International Journal of Basic and Applied Medical Sciences ISSN; 2277-2103, 2012, Vol. 2 (3) September-December: p. 221-227.
13. Purohit CK and Sharma R. *A study of aged 60 years and above in social profile*. Ind J Geront, 1972; 4: 71-83.
14. Purohit CK, Sharma R.*A study of general health status of persons aged 60 years and above in R.H.T.C. area Naraila*. Ind J Med Res 1976, 64 (2): 202
15. Raj B.A. *Medico social study of aged persons in certain villages*. Ind Med Gaz 1971; 10 (9): 25-31.
16. Raj B, Prasad BG. *Health status of aged in India: A study in three villages*. Geriatrics 1970; 25: 142-158.
17. Sharma KL. *Leisure time activities of retired persons*. Ind J Geront 1969; 1 (1): 32-37.
18. Shraddha K, B Prashantha et al. *Study on morbidity pattern among elderly in urban population of Mysore, Karnataka*, *India*. International Journal of Medicine and Biomedical Research, Volume 1, Issue 3, September-December 2012; 1 (3): 215-223.
19. Sulakshna S Baliga, Praveen S Gopakumaran et al. *Treatment seeking behaviour and health-care expenditure incurred for hypertension among elderly in urban slums of Belgaum city*. National Journal of Community Medicine, Vol 4 (2), April-June 2013.
20. Swash Michael. *Hutchinson's Clinical Methods*, 20th edition ELBS with W.B. Saunders Company Ltd. 1995: p 387.
21. *The Seventh Report of the Joint National Committee on Prevention, Detection*, Evaluation and Treatment of High Blood Pressure, NIH Publication No. 04-5230, August 2004.
22. Vijayakumar S. *Population ageing in India.* Help Age India Research Development Journal Vol 5 (2) 1999.