



International Journal of Medical Research & Health Sciences

www.ijmrhs.com Volume 2 Issue 3 July - Sep Coden: IJMRHS Copyright @2013 ISSN: 2319-5886

Received: 7th Apr 2013 Revised: 5th May 2013 Accepted: 8th May 2013

Research article

A CROSS SECTIONAL STUDY OF THE MORBIDITY PATTERN AMONG THE ELDERLY PEOPLE : SOUTH INDIA

Piramanayagam A¹, *Bayapareddy N², Pallavi M³, Madhavi E⁴, Nagarjuna reddy N⁵, Radhakrishna L⁶

¹ Velammal Medical College Hospital & Research Institute, Anuppanady, Madurai, Tamilnadu.

^{2&6} Chennai Medical College Hospital & Research Centre, Irungalur, Trichy, Tamilnadu, India.

³ Sree Venkateswara Institute of Medical Sciences, Tirupati, Andhra Pradesh, India

⁴ Chettinad Medical College, Chettinad University, Chennai, Tamilnadu, India.

⁵ Kanchi Kamakoti Child trust Hospital, Chennai, Tamilnadu, India.

* Corresponding author email: bayapreddy916@gmail.com

ABSTRACT

Background: In 1950, just 8% of the world population was aged 60 years or over, by 2005 that proportion had risen to 10% and it is expected to be more than double over the next 45 years, reaching 22% by 2050. Evaluation of the morbidity profile will have implications for providing health care for the elderly population and its costs. Aim: To find out the morbidity pattern among geriatric population.

Methodology: A community based cross sectional study conducted during the period of December 2011 to June 2012. In the first stage twenty two villages were selected, in a second stage by simple random sampling method twenty seven elderly persons who were aged 60 years and above willing to participate were selected, from each of the selected village a total of 594 were included. Data was analyzed by SPSS Version 12 Statistical Software.

Results: Out of the 594 elderly persons, 309 (52.1%) were males and 285 (47.9%) were females; 498 (83.9%) were affected by one or more diseases. Prevalence of morbidity among elderly males and females was 240 (77.6%) and 258 (90.9%) respectively. Most prevalent diseases were related to ocular 422 (71%) followed by cardiovascular 291 (49%). Respiratory system disorders were present in 77 (12.9%) elderly. **Conclusions:** Current status of the elderly in India introduce to a new set of medical, socio-cultural, and economic problems that would arise if a timely initiative has not been taken in this direction by the policy makers; hence this data will enhance understanding of the health status of the elderly and morbidity pattern and it will help to prepare appropriate intervention strategies.

Keywords: Geriatrics, chronic morbidity, acute morbidity.

INTRODUCTION

Ageing is a universal process and is regarded as a normal biological phenomenon. From the time immemorial people have tried to conquer aging

and live a long and healthy life. In 1950, just 8% of the world population was aged 60 years or over, by 2005 that proportion had risen to 10%

and it is expected to more than double over the next 45 years reaching 22% in 2050.¹ Hippocrates (460 BC - 377 BC) considered that diet and exercise were the chief factors in living a long and healthy life.² The elderly are one of the most vulnerable and high risk group in terms of health status in any society. Evaluation of the morbidity profile will have implications for providing health care for the elderly population and its costs. The health of the aged is a public health issue and needs to be addressed. More than 75% of the elderly people are residing in rural areas; the geriatric health care should be addressed by primary health care.³

MATERIALS AND METHODS

A community based Cross sectional study conducted during the period of December 2010 to June 2011. In the first stage by stratified random selection method twenty two villages were selected in the Trichy district of Tamilnadu,

RESULTS

Table.1: Demographic Distribution of study group

Parameters	No of subjects	%
Male	309	52.1
Females	285	47.9
Mean age	68.6±7.8	-
Illiterates	416	70.1
Just literate	55	9.3
Educated up to primary level	40	6.7
Secondary school and above	83	13.9

Among the 594 elderly persons, 498 (83.9%) were affected by one or more diseases. Prevalence of morbidity among elderly males and females was 240 (77.6%) and 258 (90.9%) respectively. This difference was found to be statistically significant ($\chi^2 = 12.95$,

one of the South Indian state. In the second stage by simple Random sampling method twenty seven elderly persons who were aged 60 years and above willing to participate were selected from each of the selected villages. The minimum Sample size of 552 was calculated by using the formula $4pq/d^2$ and 7% of assuming non-response error 39, a total of calculated was 591, finally a total of 594 individuals were studied. Institutional ethical committee clearance was obtained prior to conduct the study. From this selected study sample data were collected regarding age, sex, current morbidity, chronic morbidity with the help of closed ended personal interview questionnaire which was prepared by us and pre tested. Data was analyzed by Chi-square test and Z test, at 95% confidence interval; p value less than 0.05 was considered significant, SPSS Version 12 Statistical Software was used to analyze the data.

$df=1$, at 95% Level $p < 0.001$). The average number of diseases per person was 3.34; among men and women it was 2.96 and 3.90 respectively. Details of morbidity by different systems have been provided in table 2.

Table.2: Distribution of morbidity among Elderly Population

Diseases	Male		Female		Total		OR	2	p value
	No.	%	No.	%	No.	%			
Ocular	201	65.0	221	77.5	422	71.0	0.55	7.39	<0.01 [#]
Cardiovascular	141	45.6	151	52.9	292	49.1	0.76	2.01	>0.05 [*]
Musculoskeletal	84	27.1	149	52.2	233	39.2	0.34	27.30	<0.001 [#]
Mental Illness	43	13.9	97	34.0	140	23.5	0.25	27.62	<0.001 [#]
Gastrointestinal	75	24.2	65	22.8	140	23.5	1.08	0.12	>0.05 [*]
Ear	58	18.7	79	27.7	137	23.0	0.59	4.91	<0.05 [#]
Respiratory	45	14.5	32	11.2	77	12.9	1.35	1.01	>0.05 [*]
Genitourinary	19	6.1%	9	3.1	28	4.7	2.06	2.13	>0.05 [*]
Female reproductive tract	--	-	6	2.1	6	1.0	--	--	--
Neurological	15	4.8	7	2.4	22	3.7	2.08	1.86	>0.05 [*]
Diabetes	15	4.8	7	2.4	22	3.7	2.08	1.86	>0.05 [*]
Skin	9	2.9	16	5.6	25	4.2	0.57	1.31	>0.05 [*]
Anaemia	45	14.5	59	20.7	106	17.8	0.67	2.41	>0.05 [*]
Other Health Problems	24	7.7	29	10.1	53	8.9	0.76	0.61	>0.05 [*]

Significant, * Not significant

Most common morbidity among elderly was ocular diseases 422 (71%). Most common ocular diseases were cataract (152, 36%) and refractive error (85, 20.3%). Others include diseases of lacrimal apparatus (19, 4.6%), pterygium (17, 4.1%), corneal scar (7, 1.7%) and acute keratitis or corneal ulcer (7, 1.7%). Among women, Cataract (87, 57%) and diseases of lacrimal apparatus (12, 62.1%) were more common, while refractive error (48, 59.2%) and corneal scar (5, 71.4%) were more common among men. Mean Systolic Blood Pressure (SBP) among elderly was 135.4±22.8 mm of Hg; males 134.2±21.9 mm of Hg and females 136.6±23.7 mm of Hg. Statistically there was no significant difference

between the means ($Z = -1.07$, $P > 0.05$, Not significant, at 95% level). Mean Diastolic Blood Pressure (DBP) among elderly persons was 77.5 ± 12.2 mm of Hg; males 77.7 ± 11.9 mm of Hg and females 77.2 ± 12.5 mm of Hg. Statistically there was no significant difference between the means ($Z = 0.42$, $P > 0.05$, Not significant at 95% level). In total 266 (44.7%) elderly had systolic hypertension; men 136 (44.0%) women 130 (45.6%) statistically there was no significant ($p > 0.05$) difference between them, details of the Cardiovascular diseases and details of Hypertension has been provided in the table 3.

Table.3: Cardiovascular Diseases among Elderly and Classification of Hypertension According to JNC VII.

Blood Pressure (mm Hg)	Male		Female		Total	
	No.	%	No.	%	No.	%
Ischemic Heart Disease	6	1.94	19	6.67	25	4.21
Congestive Heart Failure	0	0.00	2	0.70	2	0.34
Hypertension	136	44.01	130	45.61	266	44.78
Normal *SBP <120 & **DBP <80	100	16.84	85	14.31	185	31.14
Pre Hypertension SBP 120-139 & or DBP 80-89	74	12.46	69	11.62	143	24.07
Stage I Hypertension SBP 140-159 & or DBP 90-99	85	14.31	63	10.61	148	24.92
Stage II Hypertension SBP 160 & or DBP 100	50	8.42	68	11.45	118	19.87
Total	309	52.02	285	47.98	594	100.00

($\chi^2 = 4.44$, $DF=3$, $p>0.05$ Not significant). * SBP= Systolic Blood Pressure, ** DBP= Diastolic Blood Pressure.

Of the 594 elderly, 76 (12.8%) suffered with respiratory system disorders. The elderly were affected with upper respiratory tract infection (AURTI), chronic obstructive pulmonary disease, pulmonary tuberculosis and asthma, 26 (4.4%), 27 (4.6%), 4 (0.7%) and 19 (3.2%) respectively. A higher proportion of males 86 (14.5%) were found to be affected by respiratory diseases compared to females 23 (11.3%), it was not statistically significant ($p>0.05$). Among the 594 elderly persons 138 (23.3%) were affected by ear diseases; 58 (42.1%) were men and 80 (57.8%) were women.

11 (1.8%) of which suffering from reduced hearing. Wax in the ear was found among 10 (1.7%) subjects. Higher percentage of women 69 (24.3%) were suffering from reduced hearing compared to men 46 (14.9%). Locomotor problems were observed in 233 (39.3%) elderly; women 149 (52.3%) and men 84 (27.2%) suffering from musculoskeletal problems. Arthritis of various joints 114 (19.2%), backache 57 (9.6%) and kyphosis 55 (9.3%) among the elderly. All the musculoskeletal problems, arthritis, backache, kyphosis and neck pain were more common

among women. Of the 594 elderly, 97 (23.6%) were affected by gastrointestinal diseases; men and women 52 (24.3%) and 45 (22.8%) respectively, the difference was not significant ($p>0.05$). Most common gastrointestinal disease was dyspepsia 62 (15.1%) followed by constipation 13 (3.2%), haemorrhoids 11 (2.7%) and diarrhoea 5 (1.2%), three (0.7%) were affected by hernia. Dyspepsia was more common among females 36 (18.3%) than males 26 (12.2%); while constipation, hemorrhoids and Hernia were more common among men 9 (4.2%), 10 (4.7%) and 3 (1.4%) respectively. Among 594 elderly subjects, 27 (4.5%) were suffering from genitourinary problems. 10 (1.7%) each complained of difficulty in micturition and incontinence, while 7 (1.2%) complained of increased frequency of urination. More men 19 (6.2%) were affected by genitourinary problems compared to women 9 (3.2%) but the difference was not statistically significant ($p>0.05$). Difficulty in micturition was common in males 10 (3.3%), incontinence was common in females 7 (2.5%). Out of the 285 females, 3 (1.1%) were affected by uterine prolaps. Only 23 (3.9%) were suffering from

neurological disorders, among this 16 (69.8%) were men and 7 (30.2%) were women, but the difference was not statistically significant ($p>0.05$). 14 (4.5%) men and 7 (2.5%) women were affected by paralysis or paresis and one (0.2%) was suffering from Parkinsonism. Skin diseases affected 25 (4.3%) of elderly, among this 14 (61.1%) were females and 11 (38.9%) were males, but it was not significant ($p>0.05$). Nearly 17 (2.8%) of the elderly were suffering from dermatitis and 5 (0.8%) with vitiligo. Among the 594 elderly persons, 140 (23.6%) suffered with mental illness; of which women were 98 (70.0%) and men were 42 (30.0%) ($p<0.001$). Depression was present in 117 (19.7%). It was significantly higher among women, 87 (30.6%) compared to men, 31 (10.0%) ($p<0.001$). 13 (2.2%) and 10 (1.7%) elderly persons were suffering from anxiety disorder and dementia respectively. Overall 24 (4.2%) of the study subjects were affected by diabetes mellitus. Nearly 16 (5.2%) of elderly men and 7 (2.5%) of elderly women were affected by diabetes mellitus. Of the total elderly subjects vitamin deficiencies, fever and dental caries were found to be 25 (4.2%), 17 (2.8%) and 12 (2.1%) respectively. Higher proportion of females were suffering from fever, 10 (3.5%) and vitamin deficiency, 15 (5.3%) compared to males 10 (3.2%) and 7 (2.2%) respectively.

DISCUSSION

In the present study 59.6% of the elderly were found in the age group 60 to 69 years, with males and females contributing 57.0% and 62.4% respectively. Similar studies conducted by Anjali and Aarti,⁴ Rajan⁵ and Ansan Geriatric cohort study in South Korea⁶ reported similar age distribution. The sex ratio was found to be 921 females per 1000 males in the present study, the finding was quite lesser than the findings of the National Family Health Survey- III (2005-2006)⁷ wherein the sex ratio of the elderly population was 1078 females per 1000 males. Most of the (83.9%) elderly persons were affected by one or more morbidities. Prevalence of morbidity

among elderly males and females was 77.6% and 90.9% respectively. Prevalence of morbidity varied between 78 to 88% in various studies across the world^{6,9 & 10} Similar to the present study, a significant difference in the prevalence of disease between elderly men and women was found in studies of Goswami A et al¹¹ and Youssef RM.¹² The average number of illnesses per person was 3.29 among the elderly; males and females it was 2.91 and 3.70 respectively. In other similar studies by Joshi et al,⁸ Party et al,¹³ and Dey et al¹⁴ the mean number of morbidities reported from 2.5 to 6.1.

Most common ocular diseases affecting the elderly were cataract and refractive error, 36% and 20.3% respectively. Cataract and diseases of lacrimal apparatus were more common among women, while refractive errors and corneal scars were more common among men. Purty et al¹³ study found 32.1% of elderly persons were suffering from cataract and 24.6% from refractive errors, comparable to the present study. In a study by Prakash et al¹⁵ observed similar findings like the present study; Mean SBP (Systolic Blood Pressure) among the elderly was 135.4 ± 22.8 mm of Hg; men and women was 134.2 ± 21.9 mmHg and 136.6 ± 23.7 mm Hg, respectively. In a multi centric study carried out by the hypertension study group¹⁶ and Mitra et al¹⁷ mean SBP among elderly men and women were 142 ± 25 and 145 ± 27 , and 126.9 & 129.8 mm Hg, respectively; In a study by Garg et al¹⁸ mean SBP among aged persons was 123.0 ± 3.65 mm of Hg, lower compared to the present study. Mean Diastolic Blood Pressure (DBP) among elderly persons was 77.5 ± 12.2 mm of Hg; males and females 77.7 ± 11.9 mm of Hg and 77.2 ± 12.5 mm of Hg respectively. Mitra et al¹⁷ found that the mean DBP among elderly men and women was 76.8 and 78.3 mm of Hg respectively, similar to the present study. In another study by Garg et al¹⁸ mean DBP was 81.5 ± 3.64 mm of Hg, little higher compared to present study. In this study a total of 33.0% elderly had systolic hypertension; men 44.0% women

45.6%. In a study by Chou et al¹⁹ reported only 2% of the elderly persons suffered systolic hypertension (SH), lower compared to the present study. Nearly half of the elderly persons were affected by cardiovascular diseases, more of females (53%) compared to males (45.6%). Most common cardiovascular disease of the elderly was hypertension 45% and 4% were suffering from ischemic heart disease. In other studies of Joshi et al⁸ and Prakash et al¹⁵ reported the prevalence of hypertension was 49% & 48%.

In this current study 39.2% of the elderly; women 52.3% and men 27.1% were suffering from musculoskeletal problems. Arthritis of various joints was present in 19.2%, followed by backache in 9.7% and kyphosis in 9.3. Kishore et al²⁰ were observed that 40% and 36.8% of the elderly were affected by locomotor problems.

Worldwide estimates 9.6% men and 18.0% women aged 60 years and above were affected by symptomatic osteoarthritis.²¹

Around 13% of elderly persons were suffering from diseases of the respiratory system. More men 15% than women 11% were affected. Mittra et al¹⁷ found 8.4% bronchitis and 2% asthma among elderly. In this study pulmonary tuberculosis was only 0.7% whereas Garg et al¹⁸ and Dey et al¹⁴ found it in 2.4% and 2.8% of elderly respectively. Nearly 23% of elderly persons were affected by ear problems. Lal et al²² and Joshi et al⁸ found that 20% and 19% of the aged persons, respectively, were affected by hearing problems. This study noticed that 23.6% of the elderly were affected by gastrointestinal diseases; men and women 24.3% and 22.8% respectively. The most common gastrointestinal diseases among elderly were dyspepsia (15.1%), constipation (3.2%), hemorrhoids (2.7%), diarrhea (1.2%) and hernia (0.7%). The prevalence of gastrointestinal diseases varied from 5% to over 50% in various studies.^{3, 13, 15,}

²⁰ &²² Such variations might be due to different food habits, lifestyles and environmental conditions. Mittra et al¹⁷

reported diarrhea in 1.7% and enteritis in 1% of the elderly.

Around 5% of the elderly subjects were suffering from genitourinary problems. Purty et al¹³ and Medhi et al²³ found urinary symptoms among 5.6% and 5.1% of the elderly persons respectively. Of all the females 1% were affected by uterine. In a study by Raj et al²⁴ diseases of the female genital tract were found among 2.7% of the women, similar to the present study. Only 4% of the elderly persons were suffering from neurological disorders; men 4.5% and women 2.5%, were affected by paralysis/paresis. Similar observations were made by Gourie et al.²⁵ and Medhi et al.²³ Skin diseases were present among 4% of elderly persons, among 3% were suffering from dermatitis. More commonly females (6%) were affected. In studies of Mittra¹⁷ and Raj B²⁴ skin diseases were found among 3% and 2.4% of elderly persons respectively. Prevalence of Mental illness was 23.6% among the elderly persons; women 34.1% and men 14.0% ($p < 0.001$). Dube et al²⁶ and Premarajan²⁷ found psychiatric morbidity of 22.34% and 17.3% respectively. In the present study the prevalence of depression was 19.7%. It was significantly higher among women (30.5%) compared to men (9.8%) ($p < 0.001$). In studies of Muller et al²⁸ and Ramachandran et al²⁹ Depression was observed among 22% and 24% of study subjects respectively. Overall 4% of the study subjects were affected by diabetes mellitus. Nearly 5% of elderly men and 2.5% of elderly women were affected by diabetes mellitus. Garg et al¹⁸ and Joshi et al⁸ reported the prevalence of diabetes mellitus as 4.2% and 5.5% among elderly. Vitamin deficiencies, fever and dental caries were found among 4%, 3% and 2% of elderly persons respectively. In Mittra et al¹⁷ and Raj et al²⁴ avitaminosis and other deficiency diseases were found between 5 and 6.7% of elderly persons. Garg et al¹⁸ found dental caries among 2.1% of the elderly persons.

CONCLUSION

Over the past two decades, India's health programs and policies have been focusing on population stabilization, maternal and child health, and disease control. However, current status of the elderly people in India introduce to a new set of medical, socio-cultural, and economic problems that would arise if the initiative has not taken in this direction by the policy makers hence this data will enhance understanding of the health status and patterns of health problems among elderly Indians it will help to prepare appropriate intervention strategies. The health of the aged is a public health issue and needs to be addressed through primary health care, for that every medical officer has to undergo training in geriatric health care. There should be separate geriatric clinics in both private as well as government hospitals to deal with the problems faced by the elderly. The need of the hour is to set up geriatric wards that would in the district hospitals fulfill the specific needs of the geriatric population. Separate Geriatric OPD services it should provide screening services as well as curative and rehabilitative services and convalescent homes to provide long-term care. In the medical education also a separate Sub-specialty Gerontology has to be started at the earliest possible time to address the geriatric people. Community Based Health Insurance system for elderly people has to be developed to support them financially.

Conflict of Interest: None declared

REFERENCES

1. United Nations; Economic and social affairs. Population division. WorldPopulation prospects, the 2010 Revision: United Nations; New York. 2011. Pp 30-32. http://esa.un.org/unpd/wpp/documentation/pdf/WPP2010_Volume-I_Comprehensive-Tables.pdf
2. Hobson W. Modern Trends in Geriatrics. Butterworths Medical Publications. 1956;2:1-3.
3. Gopal K Ingle and Anita Nath. Geriatric Health in India: Concerns and Solutions. Indian J Community Med. 2008; 33(4): 214–218.
4. Anjali R, Aarti K. Living conditions of Elderly in India: An overview based on nationwide data. Ind Jr of Geront. 2006; 20: 250-63.
5. Rajan S I. Centre for Enquiry into Health and Allied Themes. Population Ageing and Health in India.2006. Available from <http://www.cehat.org/humanrights/rajan.pdf>.
6. Eun-kyung W, Changsu H, Sangmee AJ, Min KP, Sungsoo K, Eunkyung K, et al. Morbidity and related factors among elderly people in South Korea: results from the Ansan Geriatric (AGE) cohort study. BMC Public Health. 2007; 7:10.
7. National Family Health Survey, India. NFHS-3 Tamilnadu Publications. 2005 available from http://www.rchiips.org/nfhs/NFHS-3%20Data/TamilNadu_report.pdf
8. Joshi K, Kumar R, Avasthi A. Morbidity profile and its relationship with disability and psychological distress among elderly people in Northern India. Int Jr of Epid. 2003;32:978-987
9. Fuchs Z, Blumstein T, Novikov I, Walter GA, Lyanders M, Gindin J, et al., Morbidity, co morbidity and their association with disability among community-dwelling oldest-old in Israel. J Gerontol A Biol Sci Med Sci. 1998;53:447-55.
10. Wolff JL, Starfield B, Anderson G: Prevalence, expenditures, and complications of multiple chronic conditions in the elderly. Arch Intern Med. 2002;162:2269-76.
11. Goswami A, Reddaiah VP, Kapoor SK, Singh B, Dey AB, Dwivedi SN, et al., Health

- problems and health seeking behavior of the rural aged. *IND Jr of Geront*, 2005;19 (2): 163-80.
12. Youssef RM. Comprehensive health assessment of senior citizens in Al-Karak governorate, Jordan. *East Medit Hlth Jr*. 2005;7 (3): 334-48.
 13. Purty A J, Bazroy J, Kar M, Vasudevan K, Veliath A, Panda P. Morbidity Pattern among the Elderly population in the Rural Area of Tamilnadu, India. *Turk Jr Med Sci*. 2006;36: 45-50.
 14. Dey AB, Soneja S, Nagarkar KM, Jhingan HP. Evaluation of the health and functional status of older Indians as a prelude to the development of a health programme. *Nat. Med. Jr. Ind.* 2001;14 (3):135-8.
 15. Prakash R, Choudhary SK, Singh US. A study of morbidity pattern among geriatric population in an urban area of Udaipur Rajasthan. *Ind Jr. Com. Med*. 2004;29 (1): 35-40.
 16. Hypertension study group. Prevalence, awareness, treatment and control of hypertension among the elderly in Bangladesh and India: a multi centric study. *Bul. W.H.O*, 2001;79(6): 490-500.
 17. Mittra R.N, Prasad B.G, Jain V.C, Jain P.C. Health status of the aged in an urban community in India. *Geriatrics*. 1972;27(10): 114-121.
 18. Garg B.S, Gupta S.C, Mishra V.N, Singh R.B. A Geriatric study of an Urban area. *Ind Jr. Pub Hlth*. 1982;27(2): 77-85.
 19. Chou P, Chen CH, Chen HH, Chang MS. Epidemiology of isolated systolic hypertension in Pu-Lui Taiwan. *International Journal of Cardiology* 1992;35(2): 219-26.
 20. Kishore S, Juyal R, Semwal J, Chandraa R. Morbidity profile of elderly persons . *JK science*; 2007;9(2):87-89.
 21. Woolf AD, Pflieger B. Burden of major musculoskeletal conditions. *Bul WHO*. 2003; 81(9): 646-56.
 22. Lal S, Mohan B, Punia M.S. Health and social status of senior citizens in rural areas. *The Ind Jr Com Hlth*. 1997; 9(3):10-17.
 23. Medhi GK, Hazarika NC, Borah PK, Mahanta J. Health Problems and Disability of Elderly Individuals in two population groups from same geographical location. *JAPI*. 2006; 54: 539-544.
 24. Raj B, Prasad B.G. Health status of the aged in India: A study in three villages. *Geriatrics*. 1970; 25(6): 142-58.
 25. Gourie DM, Gururaj G, Satishchandra P, Subbakrishna DK. Prevalence of neurological disorders in Bangalore, India: a community-based study with a comparison between urban and rural areas. *Neuroepidemiology*. 2004; 23(6): 261-68.
 26. Dube KC. Study of prevalence and bio-social variables in mental illness in a rural and urban community in Uttar Pradesh, India. *Acta Psychiatr Scand*. 1970; 46: 327-32.
 27. Premarajan KC, Danababu M, Chandrasekar R. Prevalence of psychiatric morbidity in an urban community of Pondicherry. *Ind Jr Psy*. 1993; 35: 99-102.
 28. Muller TT, Meins W, Manecke S. Psychiatric disorder in the elderly and psychosocial background. A study of geriatric in patients. *Psychiatr Prax*. 1999; 26: 267-72.
 30. Ramachandran V, Menon S M, Ramamurthi P. Psychiatric disorders in subjects aged over fifty. *Ind Jr Psy*. 1979;22: 193-98.