ORIGINAL RESEARCH ARTICLE
pISSN 0976 3325 | eISSN 2229 6816
Open Access Article
www.njcmindia.org
DOI: 10.5455/njcm.20210709064840

Morbidity Pattern among the Geriatric Population in an Urban Area of Davangere, Karnataka

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ABSTRACT

Background: According to census 2011 the elderly population aged 60 years and above accounts for 8% of the total population and is projected to rise to 12.4% by the year 2026. The elderly are one of the most vulnerable and high-risk groups in terms of health status and hence their health-related problems need to be assessed and addressed accordingly.

Objective: To study the morbidity pattern among the geriatric population in the urban field practice area of JJM Medical college Davangere.

Methods: It was a community based cross sectional study which was conducted in the urban field practice area of JJM Medical College Davangere. The total study subjects were 440 individuals aged 60 years and above. Data was collected using a predesigned, pre-tested and semi- structured questionnaire. Data was analyzed by using MS Excel and Open-Epi Info software version 2.2.

Results: The study revealed that the some of the common morbidities among the geriatric subjects were the disorders of the musculoskeletal system (71.4%), eye and adnexa (49.7%), oral cavity (32.9%), endocrine, nutritional and metabolic disorders (32.9%) etc.

Conclusion: In this study a significant association was found between some of the morbidities and socio demographic determinants like age, occupation and religion.

Key words: Geriatric, urban, slum, chronic, morbidity

INTRODUCTION

Geriatrics or clinical gerontology is the term used for the care of the aged.[1] The United Nations uses 60 years and above to refer to older people; the same is also used by demographers.[2] Theelderly are classified in to 3 groups: Young old, Old – old and Oldest old.[3]

The Indian population has increased from 361 million in 1951 to 1.027 billion in 2001 and further to 1.21 billion in 2011. Simultaneously, the number of older people has increased from 19 million (i.e., 4 percent of the total population) to 77 million and further to roughly 93 million (i.e., 7.5 percent of the total) during the same time span.[4]

Ageing is a process of decline in biological functions affecting most physical systems.[5] The following systems are affected by ageing: Atrophy of the Taste Buds and Loss of teeth, changes in the gastrointestinal tract, respiratory system, kidney and genitourinary System, Urinary Bladder, Cardiovascular System, muscular system, brain and bones.[6]

In India, the elderly people suffer from dual medical problems, i.e., communicable and noncommunicable diseases. There is also impairment of special sensory functions like vision and hearing. A decline in im-

How to cite this article: Ruchi Dhar, Vidya GS, Kashyap R. Morbidity Pattern among the Geriatric Population in an Urban Area of Davangere, Karnataka. Natl J Community Med 2021;12(8):230-235. DOI: 10.5455/njcm.20210709064840

Financial Support: None declared **Conflict of Interest:** None declared

Date of Submission: 19-07-2021; **Date of Acceptance**: 11-08-2021; **Date of Publication**: 31-08-2021

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munity and age-related physiological changes leads to an increased burden of communicable diseases in the elderly. A report by Indian Council of Medical Research (ICMR) on the chronic morbidity profile in the elderly, states that hearing impairment is the most common morbidity followed by visual impairment. However, different studies show varied results in morbidity pattern.[7]

Major chronic conditions affecting older people worldwide[8] are cardiovascular diseases (such as coronary heart disease), diabetes mellitus, hypertension, stroke, cancer, chronic obstructive pulmonary disease, musculoskeletal conditions (such as arthritis and osteoporosis), mental health conditions (mostly dementia and depression) and blindness and visual impairment.

The rise in proportion of the elderly persons is resulting in an increase in the economically non-productive dependent individuals. This coupled with rapidly increasing urbanization has resulted in the non-productive elderly population in rural areas being left with very little of social and economic support. This has also led to an increase in the morbidities of both physical and mental health due to social isolation.[9] With this context, the present research was undertaken to study the morbidity pattern of the elderly residing in the urban field practice area of JJM Medical college, Davangere.

MATERIALS AND METHODS

A community based cross sectional study was carried out for a period of 1 year from 1st December 2015 to 30th November 2016, for which ethical clearance was taken from the institutional ethics committee. The sample size was estimated using the formula $n = 4pq/L^2$. The prevalence of morbidity, "p" among elderly persons was taken as 50%. "L", which is the permissible error in the estimate of p was set at 10%. Using the above-mentioned statistical formula which considers 95% confidence limits and a non-response rate of 10%, the sample size was estimated to be 440. A community based cross sectional study was conducted in the urban field practice area of JJM Medical College Davangere. The Urban field practice area has a total population of 16,943 and there are 12 areas in urban field practice area of JJM Medical College Davangere.

The Study was conducted by probability proportionate sampling. The sample size for each area was derived from the formula:

$$n_1 = \frac{\text{Population in each area}}{\text{Total Population}} \text{X Sample Size}$$

Example 1st area has a population of 1374, so n_1 = 1374*440/16943=36.

Therefore 36 elderly subjects were selected by house to house visit from 1st area. Same procedure was applied for other areas until the desired sample size of 440 was reached.

After establishing rapport with the family, and explaining the data collection procedure in the local language an informed verbal consent was obtained from each individual and data was collected using a Predesigned, semi structured questionnaire by Interview method. The questionnaire comprised of the following information: socio-demographic data of the study subjects and information regarding the morbidity pattern. If there were more than one elderly subjects in the same household, then all were included.

The socio-economic status of the study subjects was classified according the table given below:

Table 1: Socio-economic status (SES): As per modified BG Prasad Classification[9]

Socio-economic status	Prasad's classification 1961 (Per capita income in Rupees per month)	Modified BG Prasad classification- updated for May 2016 ((per capita income in Rupees per month)
I	100 and above	6261 and above
II	50-99	3099-6260
III	30-49	1835-3098
IV	15-29	949-1834
V	Below 15	<948

The study subjects were asked about any history of illness (communicable or non-communicable) which they were suffering from. Upon a positive response, the subjects were further asked to specify the type(s) and duration of morbidities that they were suffering from, e.g., heart disease, diabetes, gastrointestinal diseases, respiratory disease etc. Some were unable to understand or answer questions due to illness. In such cases, help was sought from the family members. Based on the self-reported symptoms, information from hospital records and clinical examination, the prevalence of different morbidities among the study subjects was assessed.

Statistical analysis: The data was analysed by descriptive statistics. Chi-square test and Fisher's exact test was used to find out the association between two attributes and $p<0.05$ was considered to be statistically significant.

RESULTS

Table 2 shows 440 subjects were taken up for the present study, out of which majority (61.5%), were in the age group of 60-69 years and 59% subjects were males. The distribution of the study subjects according to socio-demographic characteristics showed that 57.3% were Muslims, 51.1% were unemployed and 49% belonged to Class IV Socio Economic Status (Modified BG Prasad classification)

Table 3 shows that in the present study the majority of the subjects (71.4%) suffered from disorders of the musculoskeletal system followed by 49.7%, who suffered from the diseases of the eye and adnexa,

6.6% suffered from the diseases of the genitourinary system and only 2.5% suffered from the diseases of the nervous system.

Table 4 shows that the disease of the eye and adnexa increase with increasing age and are more common in individuals above 80 years of age (71.4%) compared to individuals in the age group of 60-69 years (46.1%) and 70-79 years (51.5%). This difference was found to be statistically significant. Significant association was also found between increasing age and diseases of the oral cavity and ear. (Table 2)

Table 5 shows that in our study the disorders of the digestive system were more common among Muslims (23.8%) compared to Hindus (14.4%), this difference was found to be statistically significant. Also, the disorders of the respiratory system were more common among Muslims (26.9%) compared to Hindus (17.6%). This difference was also found to be statistically significant. (Table 3)

Table 6 shows that musculoskeletal disorders were more common among the subjects who are employed (79.5%) compared to those who are not employed (63.5%) and this difference was found to be statistically significant. A significant association was also seen between the disorders of the skin and subcutaneous tissue, 17.6% subjects who are employed suffered from the disease of the skin and subcutaneous tissue compared to 8.8% who were unemployed. The diseases of the nervous system were more common among those who were unemployed (4%) compared to those who were employed (0.93%), this difference was also statistically significant.

Table 2: Distribution of study subjects according to Socio demographic profile (n=440)

Characteristic	Frequency (%)
Age (years)	
60-69	271 (61.5)
70-79	134 (30.5)
80 years and above	35 (8)
Gender	
Males	260 (59)
Females	180 (41)
Religion	
Hindu	188 (42.7)
Muslim	252 (57.3)
Occupation	
Semi-professional	2 (0.5)
Skilled worker	45 (10.2)
Semi-skilled worker	68 (15.5)
Unskilled worker	100 (22.7)
Unemployed	225 (51.1)
Socio- economic status*	
Class I	0 (0)
Class II	56 (13)
Class III	115 (26)
Class IV	215 (49)
Class V	54 (12)

***(Modified BG Prasad classification)**

Table 3: Distribution of morbidity pattern of the study subjects based on ICD 10 classification of diseases [10]

System involved ICD 10	Males (n=260) (%)	Females (n=180) (%)	Total (n=440) (%)
Diseases of musculoskeletal system (M00 – M99)	184 (70.7)	130 (72.2)	314 (71.4)
Diseases of the eye and adnexa (H00 – H59)	139 (53.4)	80 (44.4)	219 (49.7)
Diseases of oral cavity& salivary glands (K00 – K14)	90 (34.6)	64 (35.5)	154 (35)
Endocrine, nutritional & metabolic diseases (E00 – E90)	70 (26.9)	75 (41.7)	145 (32.9)
Diseases of circulatory system (I00 – I99)	64 (24.6)	73 (40.5)	137 (31.1)
Diseases of respiratory system (J00 – J99)	64 (24.6)	37 (20.6)	101 (23)
Diseases of digestive system (K00 – K93)	57 (21.9)	30 (16.6)	87 (19.8)
Diseases of skin & subcutaneous tissue (L00 – L99)	38 (14.6)	20 (11.1)	58 (13.2)
Diseases of the ear and mastoid process (H60 –H95)	39 (15)	18 (10)	57 (13)
Diseases of genitourinary system (N00 – N99)	22 (8.5)	7 (3.9)	29 (6.6)
Diseases of nervous system (G00 – G99)	6 (2.3)	5 (2.8)	11 (2.5)

Note: Total number could not be given as many subjects had multiple disorders

Table 4: Association between morbidity pattern of the study subjects and their age group

System involved	60-69Yrs (n = 271)	70-79Yrs (n = 134)	≥80Yrs (n = 35)	Total (n = 440)	X^2 value	df	P value
Musculoskeletal System	195 (72)	94 (70)	25 (71.0)	314 (71.4)	0.143	2	0.930
Eye & adnexa	125 (46.1)	69 (51.5)	25 (71.4)	219 (49.7)	8.166	2	0.016
Oral cavity & salivary gland	56 (20.7)	68 (50.7)	30 (85.7)	154 (35.0)	78.65	2	< 0.0001
Endocrine, nutritional & metabolic diseases	91 (33.5)	47 (35)	7 (20.0)	145 (32.9)	2.97	2	0.225
Circulatory system	87 (32.1)	40 (29.8)	10 (28.5)	137 (31.1)	0.328	2	0.848
Respiratory system	64 (23.6)	31 (23.1)	6 (17.1)	101 (23)	0.738	2	0.691
Digestive system	52 (19.1)	28 (21.0)	7 (20.0)	87 (19.1)	0.166	2	0. 920
Skin and subcutaneous tissue	43 (15.9)	13 (9.7)	2 (5.7)	58 (13.2)	4.831	2	0.089
Ear & mastoid process	27 (9.9)	20 (14.9)	10 (28.5)	57 (13)	10.18	2	0.006
Genitourinary system	20 (7.4)	8 (5.9)	1 (2.9)	29 (6.6)	1.151	2	0.562
Nervous system	5 (1.8)	4 (2.9)	2 (5.7)	11 (2.5)			0.418#

*Figure in parenthesis indicates percentage; ** Multiple responses; # Fisher's exact test

Table 5: Association between morbidity pattern of the study subjects and their religion

System involved	Hindu (n=188)	Muslim (n=252)	Total (n=440)	X^2 value	df	P value
Musculoskeletal system	138 (73)	176 (69.8)	314 (71.4)	0.668	1	0.413
Eye and adnexa	100 (53.1)	119 (47.2)	219 (49.7)	1.535	1	0.215
Oral cavity& salivary glands	73 (38.8)	81 (32.1)	154 (35)	2.11	1	0.145
Endocrine, nutritional & metabolic diseases	53 (28.19)	92 (36.5)	145 (32.9)	3.371	1	0.066
circulatory system	58 (26.9)	79 (35.1)	137 (31.1)	3.393	1	0.065
Respiratory system	33 (17.6)	68 (26.9)	101 (22.9)	5.415	1	**0.019**
Digestive system	27 (14.4)	60 (23.8)	87 (19.8)	6.059	1	**0.013**
Skin subcutaneous tissue	31 (16.4)	27 (10.7)	58 (13.2)	3.138	1	0.0765
Ear and mastoid process	28 (14.9)	29 (11.5)	57 (12.9)	1.095	1	0.297
Genitourinary system	16 (8.5)	13 (5.2)	29 (6.6)	1.965	1	0.161
Nervous system	4 (2.1)	7 (2.8)	11(2.5)			0.764#

*Figure in parenthesis indicates percentage; ** Multiple responses # Fisher's exact test

Table 6: Association between morbidity pattern of the study subjects and their occupation

System involved	Employed (n=215)	Unemployed (n=225)	Total (n=440)	X^2 value	df	P value
Musculoskeletal system	171 (79.5)	143 (63.5)	314 (71.4)	X^2 =13.74	1	**0.0002**
Eye and adnexa	108 (50.2)	111(49.3)	219(49.7)	0.035	1	0.850
Oral cavity& salivary glands	76 (35.3)	78 (34.7)	154 (35)	0.022	1	0.880
Endocrine, nutritional & metabolic disease	75 (34.8)	70 (31.1)	145 (32.9)	0.708	1	0.400
circulatory system	58 (26.9)	79 (35.1)	137 (31.1)	3.393	1	0.065
Respiratory system	49 (22.7)	52 (23.1)	101 (23)	0.006	1	0.9363
Digestive system	45 (21)	42 (18.7)	87 (19.8)	0.125	1	0.723
Skin, subcutaneous tissue	38 (17.6)	20 (8.8)	58 (13.2)	7.41	1	**0.006**
Ear and mastoid process	31 (14.4)	26 (11.5)	57 (13)	0.799	1	0.371
Genitourinary system	16 (7.4)	13 (5.7)	29 (6.6)	0.494	1	0.481
Nervous system	2 (0.93)	9 (4)	11 (2.5)	4.25	1	**0.039**

*Figures in parenthesis indicate percentage; ** Multiple responses

DISCUSSION

The most common cause of health problems in the old aged people is chronic diseases. Most of these problems can be prevented or delayed by engaging in healthy behaviours. Even in the advanced years of life, physical activity and good nutrition can have effective benefits on health and well-being. Many health problems of old age can be effectively managed; if they are detected early enough.

In the present study, Out of 440 study subjects majority, 162(36.8%) were in the age group of 60-64 Years followed by 109 (24.7%) in the age group of 65-69 Years, 99 (22.5%) in the age group of 70-74 Years and 8% were more than or equal to 80 years of age. This was similar to a study conducted by Prakash Boraingaiah et al [11] in which majority of the elderly (34.6%) belong to age group 60-64 years followed by age group 75 years and above (25.9%).

In our study it was found that the majority of the study subjects 51.1% were unemployed followed by 22.7% who were unskilled workers, 15.5% were semi-skilled workers and about 10.5% were skilled workers. These findings were similar to a study done by Rajat Das Gupta et al[12] in which 48.1% of the study subjects were not working.

In our study majority of the subjects, 49% belonged to Class IV Socioeconomic status, followed by 26% who belonged to class III and 13% who belonged to class II (according to Modified BG Prasad Classification 2016). Similar findings were found in a study conducted by Sribas Goswami and Manjari Sahai [13] in which majority of the study subjects belonged to class IV socio economic status.

In the present study it was found that the majority of the subjects suffered from the disorders of the musculoskeletal system (71.4%), eye and adnexa (49.7%), oral cavity (31.1%), respiratory system (22.9%), digestive system (19.8%), disease of the skin (13.2%), ear (13%), genitourinary system (6.6%), nervous system (2.5%).Similar findings were seen in a study done by Rajashree Bhat et al,[14] in which most common morbidity of elderly was the problems of loco-motor system (48.6%), followed by vision (42.7%) CVS disorders (34.4%), respiratory system (20.2%), and disease of ear (17.9%). In this study though the prevalence of loco-motor system disorders (48.6%) was highest compared to other disorders it was lesser compared to our study (71.4%). In a study done by L Subedhi and RB Sah[15] it was found that 44% had eye problems, 43% had gastrointestinal problems, 33% had CVS problems and 23% had ENT problems. In this study the prevalence of gastrointestinal disorders was much higher compared to our study.

In spite of the fact that the majority of the subjects (51%) in our study were unemployed, the musculoskeletal system was the most commonly affected, which could be attributed to age related degenerative changes.

It is observed that the disease of the eye and adnexa increased with increasing age and were more common in individuals above 80 years of age (71.4%). The disease of the oral cavity were also more common in the subjects aged 80 years and above (85.7%) and 28.5% subjects aged 80 years and above suffered from disease of the ear. A significant association was found between age and these morbidities. Similar results were found in a study done by Swapnil Jain et al [16] in which cataract, hearing impairment and dental problems were significantly associated with the age of the study subjects. Similar findings were also observed in the studies done by Shraddha K et al[17] and JP Singh et al [18]

The type of occupation that an individual is involved in has a major bearing on the health. Since we have studied the geriatric age group a vast majority of our subjects were unemployed. Hence we have tied to draw a comparison of morbidities between the employed and unemployed subjects. In our study a significant association was found between occupation and the disorders of the musculoskeletal system, skin and the nervous system. Disorders of the musculoskeletal system were more common among employed subjects (79.5%) compared to unemployed (63.5%). 17.6% subjects who were employed suffered from the disease of the skin and subcutaneous tissue compared to 8.8% who were unemployed. Diseases of the nervous system were more common among those who were unemployed (4%) compared to those who were employed (0.93%). As is evident from the above association musculoskeletal system could be more affected due to the fact that the majority of our study subjects are involved in unskilled work which involves physical labour and in turn affects the musculoskeletal system.

A study done by Kakkar R et al[19] found that there was a significant association between the employment status and the morbidities of the CVS, arthritis and cataract. CVS morbidity was more common among those not working (16.4%) compared to those working (3.6%). Arthritis was also more common among those who were not working (21.2%) compared to those working (5.5%) and cataract was also more common among those not working (17.5%) compared to those working (5.5%).

In our study it was observed that there was a significant association between religion and disorders of the digestive system and respiratory system. The disorders of the digestive system were more common among Muslims (23.8%) compared to Hindus (14.4%). Also, the disorders of the respiratory system were more common among Muslims (26.9%) compared to Hindus (17.6%). In a study conducted by Mrinal Ranjan Srivastav et al[20] it was found that there was significant association between religion and the morbidities of the genitourinary system in the urban areas. The problems of the genitourinary system were more common among Hindus (26%) compared to Muslims (9.6%).

CONCLUSION AND RECOMMENDATIONS

As our study shows the prevalence of multiple morbidities among the geriatric population there is need to provide health education to the geriatric people regarding the common health problems associated with ageing and also preventive care.

Acknowledgement: Authors acknowledge study participants for their co-operation in the study.

Ethical approval: The study was approved by the Institutional Ethics Committee, JJMMC, Davangere.

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