Research Article

Morbidity and functional disability among elderly in rural and urban areas of Shimoga, Karnataka: A cross-sectional study

Nandini C[1], Mangala Belur[2]

[1]Department of Community Medicine, Subbaiah Institute of Medical Sciences, Shimoga, Karnataka, India, [2]Department of Community Medicine, Gadag Institute of Medical Sciences, Gadag, Karnataka, India

Correspondence to: Mangala Belur, E-mail: mangala.260488@gmail.com

Received: November 12, 2019; **Accepted:** December 02, 2019

ABSTRACT

Background: India has acquired the label of "an ageing nation" as per the classification of the United Nations. Functional disability or activities of daily living is the routine activities that people do every day without needing assistance. **Objectives:** The objectives of the study were (i) to characterize the morbidity among the elderly in rural and urban field practice areas of Shimoga Institute of Medical Sciences, Shimoga. (ii) To assess the functional disability among elderly in rural and urban field practice areas of Shimoga Institute of Medical Sciences, Shimoga. **Materials and Methods:** A cross-sectional study was conducted to assess the morbidity and functional disability among elderly in rural and urban field practice areas of Shimoga Institute of Medical Sciences, Shivamogga. A total of 210 participants each in urban and rural areas were studied. Data were collected by doing house-to-house visits after informed consent with questionnaire. The analysis was done using SPSS version 21 software. **Results:** The more prevalent morbidity among urban elderly was musculoskeletal problem (62.4%), followed by visual problems (59.5%). In rural elderly, the most frequent health problem was hypertension (31.4%), diabetes (25.7%) followed by musculoskeletal problem (21.4%). The prevalence of functional disability among rural study population was 20.48% and urban area was 7.14%. **Conclusion:** Prevalence of morbidity and functional disability was high among elderly in rural and urban areas. Hence, there is a need for implementation of comprehensive care including imparting health education and promoting a healthy lifestyle by creating awareness among elderly.

KEY WORDS: Elderly; Functional Disability; Morbidity

INTRODUCTION

Old age is an incurable disease.[1] According to Census 2011, nearly 104 million elderly persons are living in India, 53 million females and 51 million males.[2] India has thus acquired the label of "an ageing nation" as per the classification of the United Nations.[3] The speed at which the population is aging is causing serious concern in all countries of the world. The three areas where the impact is being felt the most are health, economy, and social areas.[4]

Elderly people suffer from both communicable as well as noncommunicable diseases.[3]

Functional disability or activities of daily living (ADL) is the routine activities that people do every day without needing assistance.[5] Driven by a combination of increasing average life expectancy and decreasing birth rates, this "longevity revolution" will result in ever-increasing numbers of persons over 80 years of age among whom functional disability is most prevalent.[6]

In this context, the present study was aimed to estimate the burden of functional disability and morbidity among elderly

Access this article online	
Website: http://www.ijmsph.com	**Quick Response code**
DOI: 10.5455/ijmsph.2020.1132502122019	

persons in a rural and urban field practice area of Shimoga Institute of Medical Sciences, Shivamogga.

Objectives of the Study

The objectives of the study were as follows:

- To characterize the morbidity among the elderly in rural and urban field practice areas of Shimoga Institute of Medical Sciences, Shimoga
- To assess the functional disability among elderly in rural and urban field practice areas of Shimoga Institute of Medical Sciences, Shimoga.

MATERIALS AND METHODS

A cross-sectional study was conducted to assess the morbidity and functional disability among elderly in rural and urban field practice areas of Shimoga Institute of Medical Sciences, Shivamogga, after taking permission from Institutional Ethics Committee.

Statistics

Considering the prevalence of morbidity to be 85% among elderly people at 5% precision, sample size is calculated using the formula $4pq/d^2$, where p is prevalence, q is (1-p), and d is precision. It is estimated to be 204, rounded off to 210. Hence, 210 participants in urban field and 210 participants in rural field will be studied and analyzed.

Multistage random sampling was done to get sample size of 204, which was rounded off to 210. Hence, 210 participants each in urban and rural areas were studied. Data were collected by doing house-to-house visits after informed consent with semi-structured, pre-designed, and pre-tested questionnaire. The analysis was done using SPSS version 21 software. Proportions and frequencies were calculated; Chi-square statistical test was used to analyze the association between variables.

Tools for the Study

Morbidity

Chronic and acute diseases that elders perceived to be suffering from at the time of interview were recorded. The International Classification of Diseases 10 classification was used for classifying the morbidities.[7]

Functional disability

The Katz Index of Independence in ADL,[8] commonly referred to as the Katz ADL, is the most appropriate instrument to assess functional status as a measurement of the client's ability to perform ADL independently. The index ranks adequacy of performance in the six functions of bathing, dressing, toileting, transferring, continence, and feeding. Clients are scored yes/no for independence in each of the six functions. A score of six indicates full function, four indicates moderate impairment, and two or less indicates severe functional impairment.

Total score

A score of six indicates full function, four indicates moderate impairment, and two or less indicates severe functional impairment.

RESULTS

Sociodemographic Characteristics of Elderly Study Subjects

Among study subjects, majority in both rural and urban groups belonged to age group of 60–65 years (60% [rural] and 52.4% [urban]) followed by 66–70 years (25.7% [rural] and 23.8% [urban]). The proportion of females among the elderly population was 53.3% (112/210) in rural and 54.8% (115/210) in urban areas compared to males 46.7% (98/210) and 45.2% (95/210), respectively, in rural and urban areas. Of 210 elderly, each in rural and urban areas majority of the elderly belong to Hindu religion 70 and 81%, respectively.

The socioeconomic status of the study population was classified according to the modified BG Prasad classification. About half of the study population in rural area belong to Class 1 (47.14%) and 35.7% in urban area, followed by Class 2 (21.4%) in rural, Class 3 (47.5%) in urban areas, and Class 4 (21.4%) in rural area compared to urban (14.3%).

Morbidity Characteristics of Elderly Study Subjects in Rural and Urban Areas

Prevalence of morbidity among study subjects

A large number of subjects were suffering from illness among urban 200/210 (95.2%) and rural 138/210 (65.7%). More women (56.5% rural and 54% urban) had morbidity than men (43.5% rural and 46% urban). No statistical difference was found between males and females in rural ($\chi^2 = 0.200$, df = 1, $P = 1.644$) and urban ($\chi^2 = 0.321$, df = 1, $P = 0.984$). Furthermore, a significant association was not found between rural and urban areas for suffering from illness/morbidity [Figure 1].

The more prevalent morbidity among urban elderly was musculoskeletal problem 131/210 (62.4%), followed by visual problems 125/210 (59.5%), hypertension 115/210 (54.8%), diabetes mellitus 78/210 (37.1%), constipation 47/210 (22.41%), respiratory problems 39/210 (18.54%), hearing problems 38/210 (18.1%), and skin problems 36/210 (17.14%) [Table 1].

In rural elderly, the most frequent health problem was hypertension 66/210 (31.4%), diabetes 54/210 (25.7%), musculoskeletal problem 45/210 (21.4%), visual 42/210 (20%), and respiratory problems 42/210 (20%).

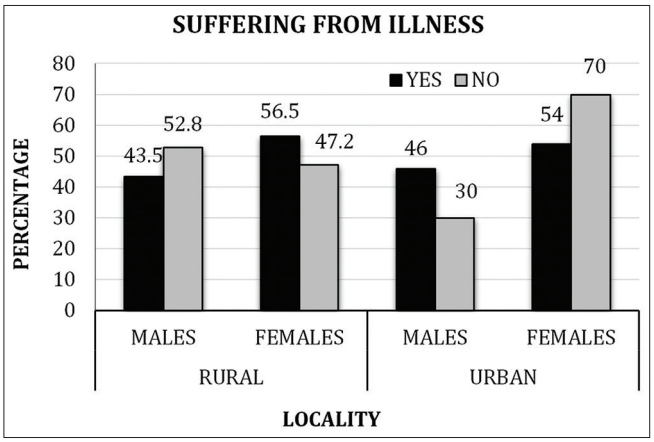

Figure 1: Prevalence of morbidity among study subjects in rural and urban areas

The morbidity was more among urban elderly compared to rural counterparts. Higher proportion of women suffered from musculoskeletal problem in urban (64%) and rural (55.6%), hypertension (53% urban and 57.6% rural), diabetes (56.4% urban, 83.3% rural), and respiratory problems was slightly higher among males both in rural and urban areas, but the respiratory problems were more prevalent in rural than urban area [Table 1].

As shown in Table 2, the prevalence of functional disability (moderate and severe functional impairment) among the rural study population was 20.48% (43/210) and urban area was 7.14% (15/210). It was less among men compared to women in rural areas. In urban areas functional disability was more among males compared to females.

From Table 3, it was observed that functional disability was positively and significantly associated with visual problem, joint problem, dental problem, hypertension, diabetes mellitus, depression, and cognitive impairment in rural areas while in urban area visual problem, joint problem, dental

Table 1: Distribution of morbidity patterns of elderly study subjects (ICD 10)

System involved (ICD 10)	Residence							*P*-value
	Urban (*n*=210)				Rural (*n*=210)			
	Male (*n*=95) (%)	Female (*n*=115) (%)	Total (100%)	*P*-value	Male (*n*=98) (%)	Female (*n*=112) (%)	Total (100%)	
Diseases of the eye and adnexa	68 (54.4)	57 (45.6)	125	0.001*	12 (28.6)	30 (71.4)	42	0.01*
Endocrine, nutritional, and metabolic diseases								
Hypertension (self-reported)	54 (47)	61 (53)	115	0.582	28 (42.4)	38 (57.6)	66	0.404
Diabetes (self-reported)	34 (43.6)	44 (56.4)	78	0.712	9 (16.7)	45 (83.3)	54	0.001*
Diseases of circulatory system (ischemic heart disease)	10 (66.7)	5 (33.3)	15	0.084	0 (0)	0 (0)	0	0
Diseases of oral cavity and salivary glands	10 (41.7)	14 (58.3)	24	0.70	6 (100)	0 (0)	6	0.008*
Diseases of musculoskeletal system	47 (35.9)	84 (64.1)	131	0.001*	20 (44.4)	25 (55.6)	45	0.736
Diseases of digestive system								
Constipation	24 (51.1)	23 (48.9)	47	0.362	3 (33.3)	6 (66.7)	9	0.412
Gastritis	15 (75)	5 (25)	20	0.005*	0 (0)	6 (100)	6	0.020*
Diseases of respiratory system (asthma/chronic obstructive pulmonary disease/breathing problem)	20 (51.3)	19 (48.7)	39	0.401	32 (76.2)	10 (23.8)	42	0.001*
Diseases of skin and subcutaneous tissue	13 (36.1)	23 (63.9)	36	0.227	0 (0)	3 (100)	3	0.103
Diseases of the ear and mastoid process	29 (76.3)	9 (23.7)	38	0.001*	0 (0)	3 (100)	3	0.103
Diseases of genitourinary system	9 (64.3)	5 (35.7)	14	0.138	3 (50)	3 (50)	6	0.868
Diseases of nervous system								
Mental behavior disorders	0 (0)	10 (100)	10	0.003*	0 (0)	0 (0)	0	0
Headache	0 (0)	4 (100)	4	0.06	0 (0)	9 (100)	9	0.004*

Figures in parenthesis indicate row percentage. *Indicates *P*<0.05. ICD: International Classification of Diseases

Table 2: Prevalence of functional disability among study subjects in urban and rural areas

Functional disability	Residence							
	Rural				Urban			
	Male (%)	Female (%)	Total (100%)	*P*-value	Male	Female	Total	*P*-value (100%)
Full function	84 (50)	84 (50)	168	χ^2=9.519, df=2, *P*=0.009*	85 (43.6)	110 (56.4)	195	χ^2=6.350, df=2, *P*=0.042*
Moderate impairment	11 (28.2)	28 (71.8)	40		5 (50)	5 (50)	10	
Severe functional impairment	3 (100)	0 (0)	3		5 (100)	0 (0)	5	

Figures in parenthesis indicate row percentages. *Indicates *P*<0.05

Table 3: Association of morbidities among study subjects with functional disability in urban and rural areas

Morbidity	Functional disability					
	Rural			Urban		
	Yes (%)	*n* (%)	*P*-value	Yes (%)	*n* (%)	*P*-value
Visual problem	21 (50)	21 (12.5)	0.001*	15 (100)	110 (56.4)	0.001*
Joint problems	15 (35.7)	30 (17.9)	0.012*	15 (100)	116 (59.5)	0.002*
Dental problems	6 (14.3)	0 (0)	0.001*	5 (33.3)	19 (9.7)	0.006*
Hypertension	24 (57.1)	42 (25)	0.001*	15 (100)	100 (51.3)	0.001*
Diabetes mellitus	21 (50)	33 (19.6)	0.001*	5 (33.3)	73 (37.4)	0.751
Asthma/chronic obstructive pulmonary disease	12 (28.6)	30 (17.9)	0.121	0 (0)	39 (20)	0.055
Cognitive impairment	24 (57.1)	24 (14.3)	0.001*	11 (73.3)	100 (51.3)	0.09
Depression	33 (78.6)	45 (26.8)	0.001*	15 (100)	80 (41)	0.001*

Figures in parenthesis indicate percentages. *Indicates *P*<0.05

problem, hypertension, and depression were significantly associated.

DISCUSSION

A large number of subjects were suffering from illness among urban 200 (95.2%) and rural 138 (65.7%). More women (56.5% rural and 54% urban) had morbidity than men (43.5% rural and 46% urban). The more prevalent morbidity among urban elderly was musculoskeletal problem (62.4%), followed by visual problems (59.5%), hypertension (54.8%), diabetes mellitus (37.1%), constipation (22.41%), respiratory problems (18.54%), hearing problems (18.1%), and skin problems (17.14%). In rural elderly, the most frequent health problem was hypertension (31.4%), diabetes (25.7%), musculoskeletal problem (21.4%), visual (20%), and respiratory problems (20%).

Similar results were obtained from study by Banerjee *et al*.,[9] Sunder *et al*.,[10] Munshi *et al.*,[11] and Prakash *et al.*,[12] in India.

In urban areas hearing problem, joint problem, dental problem, hypertension, diabetes, skin problem, asthma/chronic obstructive pulmonary disease were significantly associated with socioeconomic status ($P < 0.05$) similar to results by Jain *et al*.,[13] in which diabetes, chronic bronchitis, piles, and skin diseases were significantly associated with socioeconomic status in urban area. Bharati *et al.*[14] showed that significant association exists between diabetes mellitus and per capita income.

In our present study, the prevalence of functional disability (moderate and severe functional impairment) among the rural study population was 20.48% (43/210) and urban area was 7.14 % (15/210). It was less among men compared to women in rural areas. In urban areas functional disability was more among males compared to females. Results are comparable to the study by Gupta *et al*.[15] in which prevalence of functional disability was 37.4%, more among women (38.8%) compared to men (35.9%).

Strengths

- Community-based study
- Both urban and rural areas were included in the study.

Limitations

- Smaller sample size
- Shorter study duration.

CONCLUSION

The result of our study concludes that the more prevalent morbidity among urban elderly was musculoskeletal

problem 131/210 (62.4%), followed by visual problems 125/210 (59.5%) and among rural elderly hypertension 66/210 (31.4%), diabetes 54/210 (25.7%) followed by musculoskeletal problem 45/210 (21.4%) was prevalent. The prevalence of depression in rural elderly was established to be 60/210 (28.6%), while in urban elderly, it was 85/210 (40.5%). The prevalence of functional disability among rural study population was 20.48% (43/210) and urban area was 7.14% (15/210).

REFERENCES

1. Park K. Concepts of health and disease. In: Textbook of Preventive and Social Medicine. 24th ed. India: Banarsidas Bhanot Publications; 2018.
2. Elderly in India-Ministry of Statistics and Programme Implementation. Available from: http://www.mospi.nic.in/sites/default/files/publication_reports/ElderlyinIndia_2016.pdf. [Last accessed on 2018 May 13].
3. Prefeasibility Report for Setting up a District Geriatric Care Centre. Available from: http://www.idd.kar.nic.in>docs>64.gcc. [Last accessed on 2018 May 25].
4. Gupta P, Ghai OP. Textbook of Preventive and Social Medicine. 2nd ed. New Delhi: CBS Publishers; 2007. p. 674-6.
5. Activity of Daily Living (ADL) Definition Investopedia. Available from: http://www.investopedia.com>terms>adlA. [Last accessed on 2017 May 25].
6. Wallace RB, Kohatsu N. Maxcy-Rosenau-Last Public Health and Preventive Medicine. 15th ed. New York: McGraw-Hill, Medical; 2008.
7. WHO/International Classification of Diseases-World Health Organization. Available from: http://www.who.int>classifications>icd. [Last accessed on 2016 Jan 02].
8. Wallace M, Shelkey M. Katz Index of Independence in Activities of Daily Living (ADL). New York: University College of Nursing; 2007.
9. Banerjee A, Nikumb V, Thakur R. Health problems among the elderly: A cross-sectional study. Ann Med Health Sci Res 2013;3:19.
10. Sunder L, Chadha SL, Bhatia PC. A study on senior citizens in rural areas health for the millions. Health Millions 1999;25:18-20.
11. Munshi YI, Iqbal M, Rafique H, Ahmad Z. Geriatric morbidity pattern and depression in relation to family support in aged population of Kashmir Valley. Internet J Geriatr Gerontol 2008;4:14-6.
12. Prakash R, Choudhary SK, Singh US. A study of morbidity pattern among geriatric population in an urban area of Udaipur, Rajasthan. Indian J Community Med 2004;29:35-40.
13. Jain S, Kaware AC, Doibale MK, Shaikh S, Radhey BK, Mathurkar MP. Morbidity pattern among geriatric population in urban field practice area of district of Maharashtra: A cross sectional study. Int J Community Med Public Health 2016;3:523-9.
14. Bharati DR, Pal R, Rekha R, Yamuna TV, Kar S, Radjou AN. Ageing in Puducherry, South India: An overview of morbidity profile. J Pharm Bioallied Sci 2011;3:537-42.
15. Gupta S, Gupta P, Mani K, Rai S, Nongkynrih B. Functional disability among elderly persons in rural area of Haryana. Indian J public health 2014;58:11.

How to cite this article: Nandini C, Belur M. Morbidity and functional disability among elderly in rural and urban areas of Shimoga, Karnataka: A cross-sectional study. Int J Med Sci Public Health 2020;9(2):151-155.

Source of Support: Nil, **Conflicts of Interest:** None declared.