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Original Research Article

Physical health problems among the geriatric population in Perambalur municipality, Tamil Nadu: a community-based cross-sectional study

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ABSTRACT

Background: Aging is a complex process that occurs by an increase in cellular injury that occurs at the biological level over a period. These injuries lead to decline in the capacity of the individual due to a gradual reduction in physiological reserves. The objectives of the study were to estimate the prevalence of common physical health problems and to assess the effect of aging influencing them among the geriatric population.
Methods: A community-based cross-sectional study was conducted in 9 randomly selected wards among 400 elderly subjects of aged 60 years or above by using probability proportionate to size (PPS) sampling method in urban residents of Perambalur municipality, Perambalur district, Tamil Nadu using semi structured questionnaire. Data entry and analysis was done using SPSS version 16.0.
Results: The mean age of the study population was 71.28±7.85. Three-fourths of the study subjects were not doing any work and the majority of them (80%) was living with family members and looked after by their family members (88%). In our study, it was found that the most prevalent common physical health problem among the geriatric population was dental diseases (85.75%) followed by diseases of the locomotor system (81.75%). Almost 99% of the elderly have at least a single system involvement.
Conclusions: The preventive and rehabilitative services planned by the government have to be elder-friendly. To improve the health status of the elderly various health schemes, policies and programs can be designed based on the study findings.

Keywords: Aging, Physical health problems, Locomotor system, Dental diseases

INTRODUCTION

Aging is a normal complex physiological and irreversible process.[1] It is the product of certain structural and functional changes taking place in different parts of the body as the life progresses.[2] So there is a progressive decrease in the normal functioning of the body resulting in an increased burden of diseases affecting different systems.[3]

The number of people surviving into old age is greater than ever, and it is a trend affecting both developing and developed countries.[4] Elderly aged 65 and above constituted from 6.0 to 15.5% of the populations in Asia, Europe, and North America by the year 2000. These data are expected to rise to approximately 12 to 24.3% by 2030.[5] These demographic and epidemiological changes, coupled with rapid urbanization, modernization, globalization, and accompanying changes in risk factors and lifestyles, have increased the prominence of chronic conditions.[6] By 2011, the prevalence rate of at least one

recognizable chronic non-communicable diseases was 648 per 1000 elderly in India and 395 per 1000 elderly in Tamil Nadu.[7] It is the responsibility of the Government to plan effectively the Health Care Services for the elderly and prepare a possible implementation design relevant to the needs. The struggles associated with the aging of the population are that of the nonexistence of facilities for medical treatment and of providing financial and social support. Hence knowledge on the health status of this population is necessary for planning its healthcare facilities.[8]

With this setting, the present study was undertaken to estimate the prevalence of common physical health problems among the elderly population and to find out the effect of aging influencing them in the urban field practice area of Dhanalakshmi Srinivasan Medical College and Hospital in Perambalur district of Tamil Nadu.

Objectives

- To estimate the prevalence of common physical health problems among the elderly population.
- To assess the effect of aging influencing the common physical health problems among the study population.

METHODS

A community based cross-sectional study was done among urban residents of Perambalur municipality, Perambalur district, Tamil Nadu from July 2017 to June 2018 (1 year). Assuming the prevalence of common physical health problems of 50% and taking the allowable error of 5% with 95% confidence level, the sample size was calculated to be 400 using the formula $\{\frac{4pq}{d^2}\}$. There are 19 wards in the urban field practice area of DSMCH in Perambalur municipality covering a population of 36361. We decided to cover one third of the population. By simple random sampling, 8 wards were chosen randomly. The number of samples required from 8 wards was calculated by probability proportional to the size of wards.

400 elderly subjects aged 60 years and above of both sexes, equally i.e. 200 male subjects and 200 female subjects were selected for the study. The principal investigator reached the centre of ward e.g. junction road and chosen the direction of random sample selection. Then he visited every 3rd house in the clockwise direction till the required sample is obtained. If the house was door locked even after 3 visits, then the near most house was taken as a sample. If more than one elder was found with same-sex was in the same house the eldest one was chosen. If more than one elder was seen with different sex was in the same house both of them were taken as samples.

Selection criteria

All elderly aged 60 years and above in the field practice of urban health training centre: Dhanalakshmi Srinivasan Medical College and Hospital (Siruvachur), Perambalur. Permanent residents were included and terminally ill are excluded from the study.

Method of data collection

The study subjects were contacted through household visits in the study ward for data collection. In each household, the head of the family or any other responsible adult was contacted and the nature & purpose of the study were explained to him/her. Inquiries regarding the old age persons of that particular family were made i.e. a total number of old age persons present in that house, their age, and sex. Information regarding the age was cross-checked by asking children's age(s), relating to major events, verifying with the records like ration card, etc. if present. Where the subject was living alone or living with his/her spouse i.e. nuclear family, the nature and the purpose of the study was explained to the study subjects themselves. Informed consent was obtained before the study. Maximum of two persons were taken from one house as study subjects, giving first priority to the age and the next priority to the sex.

Study tool

The randomly selected elderly under this study was interviewed personally using a questionnaire which was developed to achieve the statistical objectives. This questionnaire was validated by experts and field tested in a pilot study among 10% of the study population before being used in the main study.

The pre-designed, pre-tested, semi-structured questionnaire consisted of two parts: The first part of the questionnaire contained questions relating to personal, family and socio-demographic characteristics (age, sex, level of education, marital status, occupation, income, living status etc). The second part of the questionnaire was regarding morbidity pattern, past medical history (respiratory, cardiovascular, musculoskeletal, neuro-logical, endocrine ailments etc.) for the majority of events. Those were cross verified by diagnosed and treatment records. Socio-economic status of the study subject was assessed using the modified Kuppuswamy classification. While assessing the socio-economic status, the family was taken as the unit instead of the individual i.e. the study subjects of the same family/house was given the same scoring.

Operational definition

Status in the family

The subjects were grouped into four categories based on their current status in the family. They are: Neglected,

Just looked after, Looked after well and Respected and consulted

i) *Neglected*: The subject was considered to be neglected by family members if he/she was living alone in spite of having children or grandchildren who have totally ignored the subject or not even giving any money or provisions.

ii) *Just looked after*: The subject was considered to be 'just looked after' by family members if they were providing food and shelter only or if the subject was living alone, providing some amount of money or provisions.

iii) *Looked after well*: The subject was considered to be 'looked after well' by the family members if they were providing health care and some pocket money for expenditure in addition to the basic care services.

iv. *Respected and consulted*: The subject was considered to be 'respected and consulted' if the subject himself/herself was the head of the family or if the head of the family or other family members used to discuss the family matters and issues with the subject, asking the subject to give his/her opinions, advice

Data analysis

The data was entered and compiled in a Microsoft Excel sheet. The analysis was done using SPSS software version 16.0. All qualitative variables are presented as frequencies and percentages. The prevalence rates are given in percentages. Pearson Chi-square test of significance was used to find the association between variables. Fisher exact of probability test was used when more than 20% of the expected cell value was <5. P value of <0.05 was considered as statistically significant.

Ethical consideration

The Ethical approval was obtained from the Institutional Ethics Committee of Human Subjects (IECHS), DSMCH. All the ethical morality adhered in the study. The collected data was used only for the proposed purpose of the study; the privacy and secrecy of participants were maintained all over the process as promised by the researchers. The researchers did not gather any forms of private identification such as address and social security numbers throughout the research work. The results obtained from the data collection were handled with privacy and the researchers will abandon entire data gathered after the article publication.

RESULTS

The study was conducted among 400 geriatric populations in the urban field practice area of DSMCH. The mean age of the study population was 71.28±7.85. The Table 1 shows that 48.75% of the study subjects were in the age group of 60 to 69 years and 33.75% of the participants were in the age group of 70 to 79 years. Only 17.50% belonged to ≥80 years of age. 200 Male and 200 Female subjects were selected equally for the study. In this study, male participants were higher than female in the age group of 70 to 79 years, whereas female participants were higher than male in other age groups. Majority of the elderly were found to be Hindus (93.5%), followed by Christian (4.75%) and Muslim (2.25%). Nearly half of the study participants were separated or widowed. Among them, female (68%) were higher than male (33.50%). More than three fourth of the elderly (77.50%) were not doing any work. About 62.75% of the geriatric population were literates and among them, female literates (80.50%) are higher than male (45%). It was observed that 57.75% belonged to the Middle class and 40.25% belonged to the lower class according to modified Kuppuswamy socio-economic status classification. In this study, 80.75%% of the elderly population was living with family members and only 2% were living alone without family support. It was observed that the majority of the geriatric population (87.75%) was taken care of by their family members while only 12.25% was neglected by their family. Male was respected and consulted more than female in our study population. This is represented in the following Table 1.

Table 1: Socio-demographic distribution of geriatric population.

Variables	Male (n=200)		Female (n=200)		Total (n=400)	
	N	%	N	%	N	%
Age (years)						
60-69	85	42.50	110	55.00	195	48.75
70-79	86	43.00	49	24.50	135	33.75
≥ 80	29	14.50	41	20.50	70	17.50
Religion						
Hindu	184	92.00	188	94.00	372	93.00
Christian	12	6.00	7	3.50	19	4.75
Muslim	4	2.00	5	2.50	9	2.25
Marital status						
Married	133	66.50	64	32.00	197	49.25
Widowed/separated	67	33.50	136	68.00	203	50.75

Continued.

Variables	Male (n=200)		Female (n=200)		Total (n=400)	
	N	%	N	%	N	%
Occupation						
Working	55	27.50	35	17.50	90	22.50
Not doing any work	145	72.50	165	82.50	310	77.50
Education						
Literate	90	45.00	161	80.50	251	62.75
Illiterate	110	55.00	39	19.50	149	37.25
Socio-economic status						
Upper class	7	3.50	1	0.50	8	2.00
Middle class	129	64.50	102	51.00	231	57.75
Lower class	64	32.00	97	48.50	161	40.25
Living arrangement						
Living alone	11	5.50	44	22.00	55	13.75
Living with family	181	90.50	142	71.00	323	80.75
Living with others	8	4.00	14	7.00	22	5.50
Status in the family						
Neglected	11	5.50	38	19.00	49	12.25
Just looked after	23	11.50	42	21.00	65	16.25
Looked after well	80	40.00	85	42.50	165	41.25
Respected and consulted	86	43.00	35	17.50	121	30.25

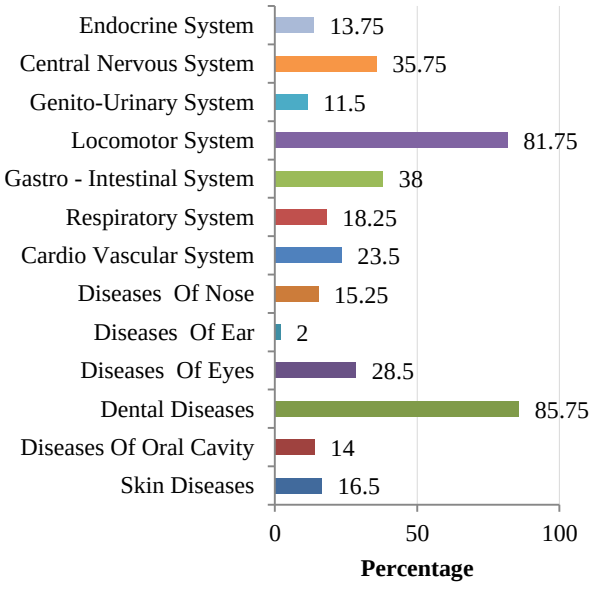

Figure 1: Frequency distribution of the study population according to physical health problems (n=400).

In our study, it was found that the most prevalent common physical health problem among the geriatric population was dental diseases (85.75%). It was followed by diseases of the locomotor system (81.75%). About one-third of the study population have gastrointestinal system (38%) and central nervous system involvement (35.75%). Nearly one-fourth of the geriatric population have diseases of eyes (28.5%) and cardio-vascular system involvement (23.5%). This is represented in the following Figure 1.

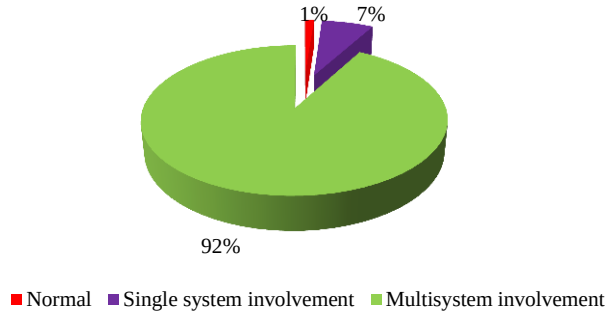

Figure 2: Distribution of study population according to the number of system involvement.

In our study, 98.8% of the elderly population reported one or more medical condition. The prevalence of multi-system involvement in our study subjects was 92% and 1.2% reported to be normal. This is represented in the following Figure 2.

In Table 2 the Chi-square test of significance was used to test the association between age and individual system involvement among the study population. Fisher exact test was used when more than 20% of the expected cell value was <5. In this study, it was observed that prevalence of skin diseases, diseases of eyes, nose and gastro-intestinal system were higher among the elderly of age group ≥80 years than other age groups and the difference was statistically significant by chi-square test ($p<0.05$). In the similar way prevalence of dental diseases and diseases of the locomotor system were higher among the elderly of age group ≥80 years than other age groups and the difference was statistically significant by Fisher's exact test ($p<0.05$). There was the difference in the

prevalence of diseases of the oral cavity, ear, cardiovascular system, respiratory system, genitourinary system, central nervous system and endocrine system with an increase in age among the elderly. But the difference between them was not statistically significant (p>0.05). This is represented in the following Table 2.

Table 2: Distribution of study participants according to age and common physical health problems.

Systems involved		60 - 69 years (n=195)	70 - 79 years (n=135)	≥80 years and above (n=70)	χ^2 value	P value
		N (%)	N (%)	N (%)		
Skin diseases	Yes	18 (9.2)	26 (19.3)	22 (31.4)	19.548	0.000
	No	177 (90.8)	109 (80.7)	48 (68.6)		
Diseases of oral cavity	Yes	26 (13.3)	18 (13.3)	12 (17.1)	0.696	0.706
	No	169 (86.7)	117 (86.7)	58 (82.9)		
Dental diseases	Yes	143 (73.3)	130 (96.3)	70 (100)	53.931*	0.000
	No	52 (26.7)	5 (3.7)	0 (0)		
Diseases of eyes	Yes	24 (12.3)	48 (35.6)	42 (60)	62.473	0.000
	No	171 (87.7)	87 (64.4)	28 (40)		
Diseases of ear	Yes	5 (2.6)	1 (0.7)	2 (2.9)	1.826*	0.452
	No	190 (97.4)	134 (99.3)	68 (97.1)		
Diseases of nose	Yes	25 (12.8)	18 (13.3)	18 (25.7)	7.205	0.027
	No	170 (87.2)	117 (86.7)	52 (74.3)		
Cardio vascular system	Yes	46 (23.6)	28 (20.7)	20 (28.6)	1.574	0.455
	No	149 (76.4)	107 (79.3)	50 (71.4)		
Respiratory system	Yes	27 (13.8)	28 (20.7)	18 (25.7)	5.710	0.058
	No	168 (86.2)	107 (79.3)	52 (74.3)		
Gastro intestinal system	Yes	64 (32.8)	50 (37.0)	38 (54.3)	10.154	0.006
	No	131 (67.2)	85 (63.0)	32 (45.7)		
Locomotor system	Yes	144 (73.8)	117 (86.7)	66 (94.3)	18.363*	0.000
	No	51 (26.2)	18 (13.3)	4 (5.7)		
Genito-urinary system	Yes	20 (10.3)	15 (11.1)	11 (15.7)	1.538	0.463
	No	175 (89.7)	120 (88.9)	59 (84.3)		
Central nervous system	Yes	70 (35.9)	53 (39.3)	30 (42.9)	1.144	0.564
	No	125 (64.1)	82 (60.7)	40 (57.1)		
Endocrine system	Yes	31 (15.9)	18 (13.3)	6 (8.6)	2.361	0.307
	No	164 (84.1)	117 (86.7)	64 (91.4)		

Note: *Fisher exact test was used when more than 20% of the expected cell value was <5.

DISCUSSION

The purpose of the study was to estimate the prevalence of common physical health problems and the effect of aging influencing them in the urban residents of Perambalur municipality, Perambalur district, Tamil Nadu. In our study it was observed that major fraction (48.75%) of the study subjects were in the age group of 60 to 69 years and this finding was found to be lower than the study done by Sanghamitra et al (54.9%) in West Bengal, Sowmiya et al in Mettupalayam (57.8%), Tamil Nadu and Lena et al in Udupi Taluk, Karnataka.[2,9,10] The reason might be that this study was done in the urban area whereas the other studies in rural settings. Female participants were higher than Male in the age group 60 to 70 years as seen in a study of Quality of life among elderly by Kumar et al.[11]

An equal number of male and female participants was selected for this study. A comparable study was done by Lena et al in Karnataka and Sharma et al in North India.[10,12] Most of them (93%) were found to be Hindus in our study and this finding was higher than the study done by Srinivasan et al in Bangalore and Lahariya et al in New Delhi.[13,14] This is due to the difference in selection of study area.

About 23.5% of the study subjects were working. This finding was higher than the study by Sherina et al in Malaysia and Sanghamitra et al in West Bengal.[9,15] The difference among the study subjects might be due to lower economic status and urban area of study. One-third of the study population were illiterates and comparable with Bhatia et al in Chandigarh.[16.] The reason might be low socioeconomic status and lack of knowledge regarding the importance of education in those periods. Half of the study participants were married and similar findings were seen in various studies in India.[2,17] Nearly 50% of the elderly were either separated or widowed and the reason might be early marriage in those days.

More than one-third of the study subjects belonged lower socioeconomic status and the comparable finding was seen in the study by Gopal et al in India and in Malaysia.[15] 80% of our elderly population was living with family members and comparable to various studies where 60% to 93% of elderly respondents lived with their families.[15,3,18]

Nearly 12% of the elderly were neglected by their family members. They felt they were ignored by family members because of their physical illness. 30% of the elderly were respected and consulted by the family members and lower than the study done in West Bengal.[9]

98.8% of the elderly population reported one or more medical condition. The reason might be due to decreased physiological reserves in the process of aging. The prevalence of morbidity among non-institutionalized older people in Spain was 95.3% and this study is comparable to our study.[5]

It was found that more than 85% of the elderly reported one or more medical condition from various studies in India.[13,18,19]

In our study, it was found that the common physical health problem among the geriatric population was dental diseases and diseases of the locomotor system. Dental diseases were found to be the commonest health problem among elderly in various studies in India.[18,19] Involvement of locomotor system as the commonest health problem among elderly was observed in various studies in India.[1,20] There was a statistically significant association between the effect of aging and skin and dental diseases, diseases of eyes, Nose, Gastro-intestinal system and locomotor system. This association was explained in various in India.[1,18,21]

The differences in morbidity can be partly explained by the differences in the racial and ethnic origin of the study population, and the prevailing socioeconomic differences among them. A possible source for biased reporting of medical conditions might arise from differential access and utilization of health care services by different segments of the population.

CONCLUSION

Our study concluded that majority of the geriatric population was looked after by their family members. In our study, it was found that the most prevalent common physical health problem among the geriatric population was dental diseases followed by diseases of the locomotor system. Almost 99% of the elderly have at least a single system involvement. There was a statistically significant association between aging and skin and dental diseases, diseases of eyes, nose, gastro-intestinal system and locomotor system. The preventive and rehabilitative services planned by the government have to be elder-friendly. The great challenge for public health over the coming decades lies in diagnosing and preventing the possible risks associated with morbidity. To improve the health status of the elderly various health schemes, policies and programs can be designed based on the study findings.

Recommendations

Although the process of aging, disorders, and disabilities of old age cannot be totally prevented, suitable measures can be taken that would retard this progress thereby leading to a longer period of health and thus preserving their quality of life. Living arrangement, financial position and wellbeing would undergo a change in old age. Therefore in-depth studies through a multi-disciplinary assessment of issues like socioeconomic problems, morbidity pattern, and quality of life and social security needs of the elderly should be done nationwide. The traditional role of respecting and caring elders should be reinforced at school level and interventions from the primary level. The experiences and expertise of the elderly should be utilized for the society. Policymakers should evaluate successful programmes for the elderly of other countries and adapt them to suit local conditions and economic viability. Separate processing schemes for the elderly should be organized to meet their needs of reduced mobility and safety precautions. Our "Womb to Tomb" social security policy should be strengthened.

Limitation

There may be a subjective bias introduced during the interview period. Underreporting of chronic diseases or subclinical cases is also another limitation because the study has taken into consideration only the diagnosed cases. There was also no measurement of disease severity or stage, which might predict mortality. Although we included several standard outcome variables in our analyses, many important outcome variables were not included e.g., mortality, mental illnesses like depression, quality of life for practical difficulties. In spite of these limitations, this community based cross-sectional study gives valuable information.

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