Chronic morbidity, self-perceived health, and its impact on stress among elderly persons, Kerala

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ABSTRACT

Background: Demographic aging, unplanned urbanization, and unhealthy lifestyles are the major contributors for the changing pattern of disease in recent years. In the developing world, understanding the patterns of morbidity and their mental health are critical mainly among elderly population. Kerala's aging population has a significant role in public health. This study aims to describe the perceived physical and mental health, self-reported prevalence of chronic diseases of the elderly in Kerala. **Objectives:** The aim of this study was to assess the perceptions of physical and mental health and self-reported chronic morbidities among of geriatric population in Kerala and to assess the impact of physical and mental health and self-reported chronic morbidities on stress among of geriatric population in Kerala. **Materials and Methods:** A community-based cross-sectional study among elderly through telephonic interviews using pre-tested semi structured Pro forma and perceived stress scale (PSS) used to assess the stress among the elderly. **Results:** Diabetes and hypertension were the common chronic disease morbidity among elderly in Kerala with a prevalence rate of 44.3–38.3%, respectively. Physical health and mental health were perceived as "good" by 44–51.8%, respectively, and as "very good" by 10.3–22%. Perceived stress was moderate for 60.3% according to PSS. Chronic morbidities have a significant association with stress among elderly. **Conclusion:** Elderly in Kerala perceive their physical and mental as good even though chronic morbidities significantly affect stress.

KEY WORDS: Elderly; Perceived Stress Scale; Mental Health; Stress; Chronic Morbidity

INTRODUCTION

Demographic aging, unplanned urbanization, and unhealthy lifestyles are the major contributors for the changing pattern of disease in recent years.[1] India's elderly population in 2011 census was contributing to 8.2% of the total population, which was 6.7% in 1991 and projected to increase to 10.7% by the year 2021 and 20% in 2050.[2] The demographic transition of Kerala outpaces the rest of the country by 25 years, with the largest population of elderly, constituting 13% of the state's population.[3] India's life expectancy has increased from 32 years in 1947 to 68 years in 2011. Increasing life expectancy gives not only more life years but also health problems like the risk of chronic disease conditions such as diabetes, heart disease, cancer, and arthritis. Similarly, psychological stress associated can be detrimental when it persists for a long period, causing changes in emotional behavior, social function, intellectual processes, in spiritual beliefs, and causing suffering, which makes communication less effective and contribute to the development of disease.[4] The term "Healthy aging" put forth by the WHO, as a process of developing and maintaining the functional ability by including not only physical and mental health, but also social well-being, enables optimal well-being in older age.[5]

MATERIALS AND METHODS

A community-based cross-sectional study among individuals who were 60 years of age and above residing in 14 districts

Kerala was included in the study and persons who are ill, aphasia, and loss of hearing and those who are affected with loss of memory were excluded from the study. Ethical clearance was obtained from Sree Gokulam Medical College and Research Foundation, Institutional Ethics Committee before the study. Data were collected through telephonic interviews using pre-tested semi structured Pro forma from December 2019 to January 2020, between 10 am and 5 pm. Data were collected through the medical students who were assigned maximum of ten participants each, which included their family members, neighbors, and relatives known to them and duplication of data/participants was ensured by collecting mobile numbers of the participants and randomly cross-checked the same. Informed consent was taken by introducing the content of the study and the importance and usefulness of their participation, along with explaining how the information will be used, and an estimate of the interview's length of 15 min. Pre-testing of the interview protocol was done before state-wide as a pilot study. This helped to determine the most logical and smooth-flowing order of the questions. It also identified wording issues that needed to be addressed for clarity and enhanced the integrity of the data. It also shed light on the amount of time it would take to conduct the interview, which was one of the first question be asked by potential participants. Translation from English to Malayalam (Local Language) and back translation was done with the help of independent language experts. Questions in both languages were included in the final Pro forma for ease of administration. Sociodemographic information (age, gender, education, marital status, living arrangements, source of income, and number of family members), history of chronic medical illness existing for more than 1 year of duration, perceived physical, and mental health was collected from the study participants ensuring complete confidentiality. Perceived stress scale[6] developed by Cohen *et al.* and has been demonstrated to have satisfactory internal consistency and construct validity.[6] This schedule contains ten items. Among the ten items, six items – 1, 2, 3, 6, 9, and 10 are negatively worded and four items – 4, 5, 7, and 8 are positively worded. When computing the total score, the four positive items were reversely coded and then added to the six negative items and hence that a higher total score denotes greater perceived stress. The schedule was pretested by applying to a population similar to the study population, the data of which were not included in the study.[7] The sample size was calculated using the formula for cross sectional study. Self-reported morbidity prevalence in the pilot study was 30%. The margin of error considered as 10% of the prevalence. Hence, the minimum required sample size calculated was 933 and was approximated to 1000. Small effects may matter greatly on a population level, so a large sample was taken to allow for meaningful results and 1011 individuals responded to the survey and data were collected in Google forms. Descriptive statistical measures like percentage were used for qualitative data and quantitative data were expressed as mean and standard deviation. Data were represented in tables and graphs as relevant. SPSS Version 22 software was used for statistical analysis. Appropriate statistical tests were used for finding association and expressed statistically at $P < 0.05$.

RESULTS

The prevalence of the aging population is increasing not only in developed countries but also in developing countries like India. A demographic transition has been accompanied by changes in society and the economy.[8] Elderly people are highly prone to psychological stress due to the aging of the brain, problems associated with physical health, socioeconomic factors such as a breakdown of the family support systems, and a decrease in economic independence. All these factors are interlinked for a poor quality of life among elderly.

Among a total of 1011 participants in the present study, it was found that 715 (70.7%) individuals belonged to the age group of 60–69 years, 229 (22.7%) belonged to 70–79 years, and 67 (6.6%) belonged to 80 years and above with Mean ± SD of 68.2 ± 6.89 years. Nearly 511 (50.5%) of study participants were female, and about 681 (67.4%) belonged to Hindu religion. About 713 (70.5%) were currently married and 315 (3.2%) of individuals were graduates. Regarding the living arrangements of elderly, about 466 (46.1%) are staying with spouse and children and 393 (38.9%) had pension as source of income [Table 1].

Prevalence of chronic morbidities was 739 (73.1%) among elderly and diabetes mellitus was present in 447 (44.3%), and 388 (38.3%) had hypertension. Osteoarthritis was present in 122 (12%) of elderly followed by heart diseases 112 (11.1%). Cancer was reported by 26 (2.57%) mental illness (depression) 27 (2.67%), asthma (1.68%), and 74 (7.23%) had other chronic morbidities. Among the 447 having diabetes, 271 (26.8%) had comorbid cardiovascular disease and 176 (17.4%) had only diabetes as chronic morbidity. Coexistence of multiple chronic illness was prevalent among 107 (10.6%) and 635 (62.9%) had less than or equal to two chronic illness [Table 2].

Perception of physical health among the elderly was "very good" among 125 (10.3%) and "good" among 445 (44%), whereas 372 (36.7%) and 89 (8.8%) felt they had an "average" and "very bad" physical health. Perception of mental health among the elderly was "very good" among 223 (22%) and "good" among 524 (51.8%) whereas 230 (22%) and 34 (3.3%) felt that they had an "average", and "very bad" mental health [Table 3].

Perceived stress score was calculated (Mean 14.92, SD 5.31) and classified as low, moderate, and high and about 380 (37.6%) elderly felt that they had low stress level, whereas

Table 1: Sociodemographic characteristics of the study population

Variables	Categories	Frequency (%)*
Age (years)	60–69 (young old)	715 (70.7)
	70–79 (old-old)	229 (22.7)
	≥80 (oldest old)	67 (6.6)
Gender	Male	486 (48.1)
	Female	511 (50.5)
	Do not want to reveal	14 (1.4)
Religion	Hindu	681 (67.4)
	Christian	183 (18.1)
	Muslim	94 (9.3)
	I do not believe in God	15 (1.5)
	I do not want to comment	37 (3.7)
	Others	1 (0.1)
Education	No school education	31 (3.1)
	Few years of school education	225 (22.3)
	Up to 12 years of schooling	277 (27.4)
	Graduate	315 (31.2)
	Postgraduate	163 (16.1)
Marital status	Currently married	713 (70.5)
	Widow/widower	271 (26.8)
	Never married	27 (2.7)
Living arrangement	Staying alone	47 (4.6)
	Staying with spouse	237 (23.4)
	Staying with spouse and children	466 (46.1)
	Staying with children	234 (23.1)
	Staying with relatives/siblings	18 (1.8)
	Others	9 (0.9)
Number of members in the family	1	42 (4.2)
	2	188 (18.6)
	3–5	573 (56.7)
	>5	208 (20.6)
Income	Salary only	57 (5.6)
	Pension only	393 (38.9)
	Support from children	171 (16.9)
	Other sources	82 (8.1)
	More than one source	244 (24.1)
	No income	64 (6.4)

*Numbers in parenthesis are percentages

610 (60.3%) felt that they had moderate stress. Only 21 (2.1%) perceived that they had high stress [Figure 1].

Table 2: Prevalence of chronic morbidity among elderly population

Chronic morbidity	Frequency (%)*	95% Confidence limits
Any chronic morbidity	739 (73.1)	70.28–75.74
No chronic morbidity	272 (26.90)	24.26–29.72
Diabetes	448 (44.31)	41.28–47.39
HTN	388 (38.38)	35.43–41.41
Heart disease	112 (11.08)	9.289–13.16
Arthritis	122 (12.07)	10.2–14.22
Cancer	26 (2.57)	1.761–3.741
Amnestic disorders	18 (1.78)	1.129–2.797
Mental illness, depression	24 (2.37)	1.6–3.51
Asthma	17 (1.68)	1.05–2.68
Others	74 (7.32)	5.87–9.1

*Numbers in parenthesis are percentages; HTN: Hypertension

Table 3: Perceived physical and mental health and perceived stress among the study participants

	Perceived stress scale (%)		Total	Chi-square, *P**
	Low	Moderate to high		
Perceived physical health				
Very bad/bad	11 (12.4)	78 (87.6)	89	40.490, *P*<0.0001
Average	127 (34.1)	245 (65.9)	372	
Good	186 (41.8)	259 (58.2)	445	
Very good	56 (53.3)	49 (46.7)	105	
Perceived mental health				
Very bad/bad	5 (14.7)	29 (85.3)	34	59.196,*P*<0.0001
Average	53 (23.0)	177 (77)	230	
Good	198 (37.8)	326 (62.2)	524	
Very good	124 (55.6)	99 (44.4)	223	
Total	380	631	1011	

*P value from Pearson's Chi-square test/Fisher's exact test when appropriate. Numbers in parenthesis are percentages

Majority of the elderly preferred Allopathy 929 (91.9%) and among them almost half 499 (49.4%) preferred visiting the private health sector and 430 (42.5%) preferred government health sector. Ayurveda and homeopathy were preferred by 41 (4.1%) and 34 (3.4%) and only 7 (0.7%) preferred other allied medicines.

The increasing number of comorbid conditions decreased the perception of good physical and mental health which was significantly associated with stress among elderly (*P* < 0.001) [Table 2]. Binary logistic regression also showed that decreased physical health, mental health, and having increased number of chronic illnesses caused increase in

stress levels of the elderly persons with adjusted OR 0.791, (95% confidence interval [CI] 0.629–0.995), 0.51 (95% CI 0.404–0.65), and 1.39, (95% CI 1.12–1.73) [Table 4].

DISCUSSION

Prevalence of chronic morbidities was 739 (73.1%) among elderly. Perception of physical health was "average" in 372 (36.7%) and "very bad" among 89 (8.8%) of elderly, whereas 230 (22%) and 34 (3.3%) perceived that they had an "average," and "very bad" mental health. Perceived stress score was calculated, where 380 (37.6%) elderly felt that they had low stress level, whereas 610 (60.3%) felt that they had moderate stress. Only 21 (2.1%) perceived that they had high stress. It was seen that as there was decrease in physical and mental health, number of comorbid conditions increased the stress among elderly.

In 2014, Kuh *et al.* defined healthy biological aging according to the principle of "survival to old age," "delay in the onset of chronic diseases and disabilities," and "optimal functioning for the maximal time period." They also suggested that continued social participation, such as through voluntary or paid work, physical activities, or keeping in touch with friends or relatives, is important for the older adults to have an active and meaningful later life because the social environment that we inhabit across our
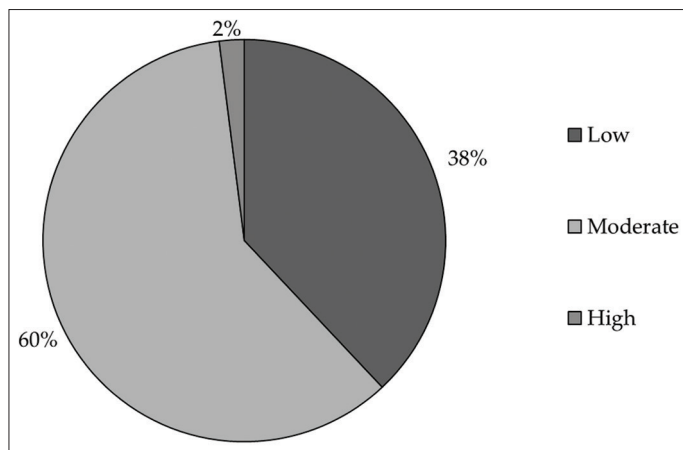
Figure 1: Perceived stress level among the study population (perceived stress scale score)

Table 4: Factors associated with perceived stress level among elderly

Variables	Adjusted OR*	95% CI	*P*
Perceived physical health	0.791	0.629–0.995	0.045
Perceived mental health	0.512	0.404–0.649	<0.001
Number of chronic illnesses	1.391	1.19–1.729	0.003

*OR: Odd's ratio got from logistic regression; CI: Confidence interval

lives determines the aging process.[9] All the above factors played an important role in the present study where even though there were chronic morbid conditions among elderly, most of them perceived their physical and mental as "good" which was due to the fact that they stay with their spouse and children, most received pension, making them independent, and have a good social life. The study by Kanungo *et al.* at showed the self-perceived morbidity to be 17.28% for respiratory, gastrointestinal 13.48%, and musculoskeletal system 6.25%, respectively, and non-communicable diseases (NCD's) were 50.92–34.02% opted qualified practitioner from private sector and only 12.82% by qualified practitioner from Government sector,[1] whereas, in the present study, most common ailments were diabetes 44.3%, hypertension 38.3%, and arthritis 12% and almost 49.4% seek private health sector and 42.5% opted government health sector. The prevalence of type 2 diabetes was found to be 27.11% (95%CI 23–31.22) and age standardized prevalence of diabetes was 20% among adults (30+) in Kerala in a study published by Jose *et al.* in 2013.[10] Another study by Zachariah *et al.* found that prevalence of hypertension in Thiruvananthapuram corporation was 54.5% (men 56.3%, women 52.3%) compared to 38.3% in our study.[11] In a study on self-perceived health status in older adults by Fernandez-Martinez *et al.*,[12] young old and better off respondents were more likely to have a positive self-perceived health status similar to the present study where stress increased with age. Having no chronic conditions, independence in performing daily living activities and lower level of depression was also associated with positive self-perceived health status which was similar to this study, where a decrease in the number of comorbid conditions was found to reduce the stress level. The mean stress score of the participants was 14.92 with a standard deviation of 5.31 which was lesser than study by Mani *et al.*, where mean stress score of the participants was 19.66 with a standard deviation of 7.37. High stress scores were found in only 2.1% of the study participants compared to 18% in Mani *et al.*[7] Whereas in our study nearly 63% had moderate or high levels of stress. Haseen *et al.*, in his study on self-perception of health among elderly, have reported a significant association between poor perception of health and sex, marital status, and coliving with spouse[13] which was similar to this study where those living with spouse and children had lesser stress score.

The major strength of this study is Kerala which has incredibly good health indicators and health-care infrastructure which enabled good care of elderly. NCD program of National Health Mission had been successfully implemented in Kerala to ensure acceptable accessible and affordable treatment of NCDs. Role of primary care facilities and field level functionaries like Accredited Social Health Activist was well appreciated and lead to increased compliance to treatment offered for chronic morbidities especially NCD's.[14] This has led to increased quality of life and lesser stress among the elderly in Kerala. The limitation of the study was that

the participants were mostly young olds as they were more willing to participate in a survey delivered through telephonic interviews. Morbidities such as memory issues and mental illness were less likely to be reported. Perceptions of health and stress also could be influenced by the age of the participants. Multiple interviewers and self-reported morbidities without verification were another limitation of this study.

CONCLUSION

Healthy aging and longevity are signs of development and majority of geriatric population in Kerala perceive their physical health and mental health as good and their perceived stress was moderate in 60% of the elderly. High prevalence of diabetes, hypertension, and other comorbidities were attributed to the increased stress.

Fast-growing elderly population proportion, increased life expectancy, and chronic morbidities, are to be considered while planning interventions for healthy aging.

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