Original Research Article

MORBIDITY PROFILE AND DISABILITY PATTERN AMONG ELDERLY IN A RURAL AREA OF KOLLAM, KERALA

Catherine Simon[1], Jeffy Binu[2]

[1]Associate Professor, Department of Community Medicine, Azeezia Institute of Medical Sciences and Research, Meeyannoor P.O. Kollam, Kerala, India.
[2]Assistant Professor in Statistics, Department of Community Medicine, Azeezia Institute of Medical Sciences and Research, Meeyannoor P.O. Kollam, Kerala, India.

Abstract

Background: Population ageing is an emerging concern worldwide. In Kerala, the growth rate of elderly population is higher than elsewhere in India. Multiple non-communicable diseases are indicative of deteriorating health and disability problems, but very few studies have dealt with this issue in Kerala. This study was undertaken to assess the morbidity and disability pattern of the elderly and their associated factors in rural Kerala. **Materials and Methods:** A community-based cross-sectional study was conducted during June – December 2023 among 194 elderly respondents in Adichanalloor Panchayat in Kollam. Multi-stage sampling technique was used. In the 1st stage, one ward of the panchayat, and in 2nd stage, participants from the list of elderly in this ward, were selected by simple random sampling. A pre-tested structured questionnaire on socio-demography, morbidity and disability (Barthel) was used to collect data by face-to-face interview of elderly residents through house-to-house visits. **Result:** Mean age of respondents was 69.27+7.24 years. Females constituted 113 (58.2%) of respondents. Reported morbidity and treatment compliance were 97.9%, and 96.8% respectively. Main morbidities were visual problems (74.2%), hypertension (62.4%), oral disease (50.5%), diabetes (45.9%), joint-pain (42.8%) and falls (31.4%). Disability prevalence was 40.7%, mainly affecting locomotor activities. Determinants of disability were age, female sex, low education, joint-pain, falls, gastrointestinal and renal diseases. **Conclusion:** Despite a very high morbidity (97.9%) in this study population, the prevalence of disability was relatively low (40.7%), due to their high treatment compliance (96.4%). Majority had locomotor disability, affecting mobility, transfers and climbing stairs. Regular health education to control morbidity and physiotherapy sessions to maintain locomotor independence are recommended.

INTRODUCTION

An 'elderly' is defined as a person who is aged 60 years and above and the phenomenon of elderly population growing faster than the general population is known as population ageing.[1] Declining fertility and increasing longevity have resulted in higher proportion of elderly population world-wide. From 1 billion in 2020, the global elderly population is predicted to increase to 1.4 billion in 2030 and to reach 2.1 billion in 2050.[2,3] Although ageing partly reflects the longer and generally healthier lives of individuals, it is simultaneously associated with chronic non-communicable diseases (NCDs) and disability that render the elderly more vulnerable and dependent.[2] Disability can jeopardize their quality of life and is an important health indicator having significant social impact with long-term institutionalization and medical care.[3,4]

Developing countries such as India, have poor track records of equitable distribution of health care and poor penetration of health services especially in urban slums and rural communities.[5] The prevalence of morbidity in the elderly and its relation to functional limitations is therefore an important health issue in India, where the majority of elders are outside the social safety net, facing inequity in economic and health-related fields and also emotional insecurity, thus posing a challenge to an already overburdened societal system.[6,7]

Kerala has the distinction of having the highest proportion of elderly in India, (one in eight persons), a life expectancy higher than the national average, and an old age dependency ratio of 19.6 % which is higher than elsewhere (14.2%) in the country, in

158

International Journal of Academic Medicine and Pharmacy (www.academicmed.org)
ISSN (O): 2687-5365; ISSN (P): 2753-6556

addition to a higher female old age dependency in Kerala.[8] Increase in the life expectancy leads to the emergence of multiple chronic NCDs, which constitute the most recurrent and cost-entailing health problems among the elderly.[4] Due to migration of youth seeking employment abroad, the traditional support and care given to the elderly, are no longer assured under current nuclear family set-up, where the elderly have no role to play, leading to a strain in the care of the elderly, thus highlighting the importance of their care in Kerala.[9]

According to WHO estimates, the prevalence of functional disability is approximately 10% and 15% in developed and developing countries respectively. Functional disability is defined as an acquired difficulty to carry out simple daily activities or complicated tasks required for independent living.[10] There are limited studies on the health status of the elderly, especially in rural community settings in Kerala. In order to keep pace with the rapidly emerging demographic transition in Kerala, there is a greater need to look into their health problems and functional disability periodically. It is against this background that this study was conducted with the following objectives:

1. To assess the prevalence and pattern of morbidity and disability among the elderly in rural Kerala.
2. To determine the factors that are significantly associated with disability in this population.

MATERIALS AND METHODS

Study design and Study setting: This was a community-based, cross-sectional study conducted among elderly residents of Ward 19 in Adichanalloor Panchayat in a rural area of Kollam district in Kerala.

Study population: Study population comprised of elderly residents aged 60 years and above, belonging to Adichanalloor Panchayat, in the rural field practice area of a tertiary teaching hospital. Adichanaloor panchayat has 20 wards, with a total population of 33,638 persons (48.3% males and 51.7% females) residing in 8,302 households.[11] The population per ward ranged from 1500 to 2000, with an average of 350 to 400 elderly persons. There were 1657 persons in the selected ward (ward 19) with 796 (41.8%) males and 861 (58.2%) females, including 265 (16%) elderly persons. comprising 128 males and 137 females.

Study duration: Data collection was conducted over a seven months period from June 2023 to December 2023.

Sample-size: The sample size n was calculated to be 194, using the formula $n=4pq/d^2$ as for a cross-sectional study, and taking the prevalence of any one morbidity among the elderly as 34.1% [6] with an allowable error of 20% at 95% Confidence Interval (CI).

Sampling method: Participants were recruited by multi-stage sampling technique. In the 1st stage, one

ward of Adichanalloor Panchayat (ward 19) was selected by simple random technique, using the lottery method. In the 2nd stage, 194 participants were selected by simple random sampling from the list of elderly persons in ward 19, by house-to-house visits, starting from a randomly chosen household.

Inclusion Criteria
Elderly residents 60 years and above, in ward 19 of Adichanalloor Panchayat, and willing to participate in the study.

Exclusion Criteria
Elderly persons, not residing in ward 19 or not present at home, even after two repeated visits.

Data Collection methods: After obtaining the written informed consent of respondents, data was collected by the principal investigator and ASHA worker of ward 19 via face-to-face interview, using a pre-tested structured questionnaire to obtain information on socio-demography, morbidity and disability status. Regular monitoring visits were carried out by the principal investigator to review protocol adherence and to verify completeness of the questionnaire form. The questionnaire was translated from English to Malayalam (regional language) and then back-translated to English to ensure generalizability.

Recording of morbidity: Self-reported information on ailments such as hypertension, diabetes, arthritis, falls, visual and hearing impairment, dyslipidemia, cancer, respiratory, cardiovascular, cerebrovascular, gastrointestinal, thyroid, renal and oral diseases was obtained along with evidence from medical records, discharge summaries or medications to assess morbidity. Blood pressure was measured by the principal investigator.

Recording of Disability: Disability was assessed using the 10 item Barthel Index scale. The scores ranged from zero (total dependence) to 100 (total independence) per participant. A Barthel score of less than 100 indicates a functional disability. A patient scoring 100 in Barthel's Index (BI) has no disabilities and is continent, feeds, dresses, gets out of bed and from chair, bathes, walks at least a block, can ascend and descend stairs by himself / herself. In case of unclear verbal responses, the study subjects were asked to demonstrate some ADLs, for verification. In case of persons incapable of giving information by themselves, it was obtained from family or caregivers.

Grading of disability: The ADLs were graded by the Barthel Disability Score, indicating the severity of disability. Based on observation of each ADL (0=unable, 1=needs some help, 2=independent), each item score is multiplied by 5 and added to obtain each participant's Barthel's disability score on a 0-100 point scale. These scores are categorized into 0-20, 21-60, 61-90 or 91-99 points, indicating total, severe, moderate or slight dependence respectively.

Outcome Measures
Primary: Prevalence of Morbidity and Disability
Secondary: Associated risk factors of Disability

159

International Journal of Academic Medicine and Pharmacy (www.academicmed.org)
ISSN (O): 2687-5365; ISSN (P): 2753-6556

Data entry and Statistical analysis: Data was entered into MS excel and analysed using Statistical Package for Social Sciences (SPSS) Version 20. Quantitative variables with normal distribution were expressed as mean and standard deviation while categorical variables were described in frequency and percentage, with 95% confidence limits. The association between disability (dependent variable) with socio-demographic and morbidity factors (independent variables), was assessed using Odds Ratio (OR) and Ch-square tests in the Univariate Analysis. Binary Logistic Regression analysis was applied to study the determinants of disability using Adjusted Odd's Ratio (AOR) at corresponding 95% CI with p-value<0.05 considered as statistically significant.

Ethical considerations: Ethical clearance was obtained from the Institutional Ethics Committee of the tertiary teaching hospital in Kollam (No.AEC/REV/2023/32) dated 03/06/2023. An Information sheet regarding study details, data collection and confidentiality was given to each participant and relevant details of the study were explained to them. A signed written informed consent was obtained from eligible and willing respondents. The principal investigator's contact phone number was given to the respondents for use, in case of any query or doubt.

RESULTS

Socio-demography: In the current study among 194 elderly respondents, the mean age was 69.27 ± 7.24 years. There were 81 (41.8%) males and 113 (58.2%) females. 55.7% of the participants were educated up to secondary /high school. Most of them (97.4%) are currently unemployed but receiving a monthly government pension of Rs. 1600. About 53.6% of respondents belonged to the lower socio-economic class as per B.G Prasad Scale.[14] 99% of the participants were married.

Majority (78.9%) were Hindus. Substance use (either alcohol, tobacco or both) was reported by 36 study subjects [Table 1].

Morbidity profile: Overall prevalence of morbidity was 97.4%, of which only 10 (5.3%) had single morbidity, while the majority 180 (94.7%) reported multi-morbidity (having > 2 diseases). There were 64 (33%) persons with 1-3 diseases, 90 (47.4%) with 4 - 6 diseases and 36 (18.9%) respondents had ≥ 7 diseases [Figure 1].

Morbidity types: Diseases reported were diabetes, hypertension, joint pain, diseases of respiratory, gastro-intestinal, renal, oral, cardiovascular and cerebro-vascular systems, cancers, hypothyroidism poor hearing, poor vision, dyslipidemia and falls. Poor vision 144 (74.2%) was the most common morbidity, followed by hypertension in 121 (62.4%), oral disease in 98 (50.5%), type 2 diabetes in 89 (45.9%) and joint pain in 83 (42.8%) [Figure 2].

Disability profile: Functional limitation, (Barthel Index of basic ADLs) was reported by 79 40.7%. The most common was locomotor problems due to musculo-skeletal disorders and involving walking, climbing stairs and transfers. As per Barthel Index grading, there were 2 (1%) fully bed-ridden and totally dependent persons, while 7 (3.6%) were severely dependent, followed by 59 (30.4%) who were moderately dependent and 11 (5.7%) were slightly dependant [Figure 3].

Disability categories: Difficulty in climbing stairs was the major disability seen among 73 (37.6%) in this study, followed by bowel incontinence in 33 (17.0%), and mobility problems (walking) in 32 (16.5%) participants. Other disabilities involved difficulty to transfer in 24 (12.4%) individuals and bladder incontinence in 21 (10.8%) persons. Prevalence of functional limitation in bathing, grooming, dressing, self-feeding, and toilet use was comparatively less [Figure 4].

Table 1: Socio-demographic characteristics of study participants (n= 194).

Characteristics	Categories	Frequency	Percentage (%)
Socio-demographic factors			
Age in years Mean age $\pm$ SD: 69.27 ± 7.24	60 - 69	114	58.8%
	70 - 79	59	30.4%
	80 and above	21	10.8%
Gender	Males	81	41.8%
	Females	113	58.2%
Education	Illiterate / Primary school	64	33.0%
	Sec/high school / Predegree	108	55.7%
	Degree / PG / Ph.D	22	11.3%
Occupation	Unemployed / on pension	189	97.4%
	Yes	5	2.6%
Socio-economic status [14] (SES) BG Prasad (2023)	Low= lower + lower middle ($\leq$ Rs.2728)	104	53.6%
	Middle = middle + upper middle (Rs.2729 – Rs.9097)	27	13.9%
	Upper ($\geq$ Rs.9098)	63	32.5%
Marital status	Single	2	1.0%
	Married	192	99.0%
Stay with whom	Alone	13	6.7%
	With family	181	93.3%
Religion	Hindu	153	78.9%
	Muslim	24	12.4%
	Christian	17	8.7%

160

International Journal of Academic Medicine and Pharmacy (www.academicmed.org)
ISSN (O): 2687-5365; ISSN (P): 2753-6556

Habits				
Sleep	Normal		114	58.8%
	Less		80	41.2%
Substance use	No		158	81.4%
	Yes		36	18.6%
Types of substance use	Alcohol and Tobacco		7	3.6%
	Alcohol alone		10	5.2%
	Tobacco alone		19	9.8%

Table 2: Univariate Analysis: Association of Disability with Socio-demographic factors among study participants (n = 194)

Socio-demographic variables		Disability		Total	x^2 test values	P value
		No	Yes			
Age group	60 - 69 yrs	75	39	114	11.114	0.0001
	70 - 79 yrs	36	23	59		
	> 80 yrs	4	17	21		
Sex	Male	57	24	81	7.087	0.008
	Female	58	55	113		
Education	Primary class up to 8th standard	30	34	64	9.049	0.011
	Secondary class to pre-degree	67	41	108		
	Degree / PG / PhD	18	4	22		
Occupation	Without job / On pension	111	78	189	0.912	0.317
	With job	4	1	5		
SES class (Income in Rupees)	Low = lower + lower middle ($\leq$ Rs. 2728)	57	47	104	2.28	0.319
	Middle = middle + upper middle (Rs. 2729-Rs.9097)	16	11	27		
	Upper ($\geq$ Rs. 9098)	42	21	63		
Marital status	Single	2	0	2	1.388	0.147
	Married	113	79	192		
Addiction	Yes	13	23	36	0.389	0.533
	No	66	92	158		
Sleep	Less	35	45	80	0.517	0.472
	Normal	44	70	114		

Table 3: Logistic Regression Analysis: Socio-demographic determinants of disability among study participants (n = 194)

Independent variable	Adjusted Odds Ratio	95% CI for Odds Ratio		P value
		Lower	Upper	
Age group(ref: $\geq$ 70 years)	2.218	1.390	3.539	0.001
Sex (ref: females)	2.465	1.297	4.684	0.006
Education (ref: primary education)	2.247	1.337	3.774	0.002

Table 4: Univariate Analysis: Association of Disability with type of Morbidity among study participants (n=194)

Morbidity		Disability		Total	Odds ratio	x^2 test values	P value
		Yes	No				
Diabetes	Yes	41	48	89	1.51	1.946	0.163
	No	38	67	105			
Joint pain	Yes	49	34	83	3.89	20.157	0.0001
	No	30	81	111			
Hypertension	Yes	60	61	121	2.8	10.469	0.001
	No	19	54	73			
Poor vision	Yes	62	82	144	1.47	1.260	0.262
	No	17	33	50			
Poor hearing	Yes	16	14	30	1.83	2.338	0.126
	No	63	101	164			
Respiratory disease	Yes	30	21	51	2.74	9.392	0.002
	No	49	94	143			
Heart disease	Yes	29	15	44	3.87	14.955	0.0001
	No	50	100	150			
Dyslipidemia	Yes	23	21	44	1.84	3.145	0.076
	No	56	94	150			
Cerebro-vascular disease	Yes	12	4	16	4.97	8.488	0.004
	No	67	111	178			
Cancer	Yes	4	3	7	1.99	0.811	0.373
	No	75	112	187			
Renal disease	Yes	20	7	27	5.23	14.453	0.0001
	No	59	108	167			
History of fall	Yes	40	21	61	4.59	22.765	0.0001
	No	39	94	133			
Gastro-intestinal disease	Yes	29	16	45	3.59	13.659	0.0001
	No	50	99	149			

Oral disease	Yes	52	46	98	2.89	12.492	0.0001
	No	27	69	96			
Hypothyroidism	Yes	8	16	24	0.7	0.619	0.431
	No	71	99	170			

Table 5: Binary Logistic Regression Analysis: Determinants of Disability by Morbidity types among study participants (n=194)

Morbidity	Adjusted odds ratio	95% CI for odds ratio		P value
		Lower	Upper	
Joint pain	2.954	1.420	6.146	0.004
Hypertension	2.039	0.952	4.364	0.067
Respiratory disease	1.933	0.855	4.373	0.113
Heart disease	2.042	0.837	4.984	0.117
Cerebro-vascular disease	2.488	0.639	9.681	0.189
Renal disease	3.483	1.139	10.654	0.029
Fall	4.258	1.939	9.348	0.0001
Gastro-intestinal disease	2.964	1.225	7.169	0.016
Oral disease	1.582	0.763	3.280	0.217
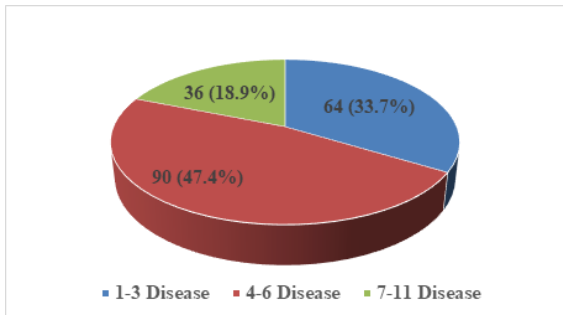
Figure 1: Morbidity pattern by number of morbidities per study participant (n=194)
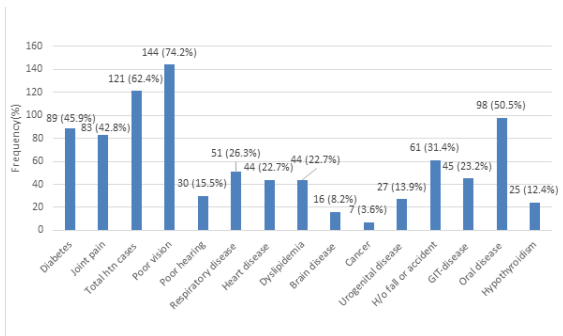
Figure 2: Prevalence and pattern of morbidity by types among study participants (n=194)
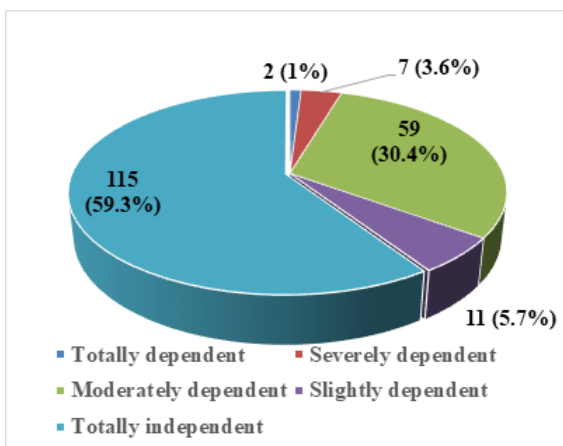

Figure 3: Prevalence and pattern of disability by Grading among study participants. (n= 194)

In the Univariate analysis, the socio-demographic variables that showed statistically significant association with disability were increasing age (p < 0.001), female gender (p < 0.05) and low level of education (p< 0.001) [Table 2]. They remained significant as independent determinants of disability (p< 0.001) in the Binary logistic regression analysis [Table 3].

Types of morbidity significantly associated with disability in the univariate analysis, were joint pain (p<0.0001), respiratory disease (p<0.002), hypertension (p<0.001), heart disease (p<0.0001) gastro-intestinal disorder (p<0.0001), renal disease (p<0.0001), h/o fall (p<0.0001), cerebro-vascular disorder (p<0.004) and oral disease (p< 0.0001) [Table 4].

Types of morbidity that were independent predictors of disability, in the binary logistic regression analysis, in this study (p<0.05), are joint pain [AOR=2.954 (CI: 1.420–6.146)], renal problem [AOR=3.483 (CI: 1.139–10.654), history of fall [AOR = 4.258 (1.939–9.348)], and GIT disease [AOR=2.964 (CI: 1.225–7.169) [Table 5].
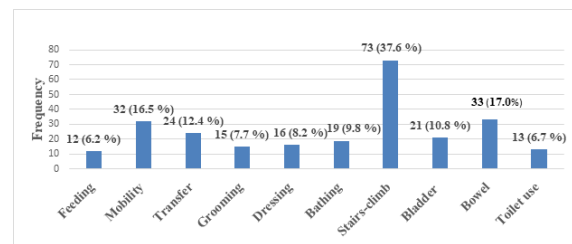

Figure 4: Prevalence and pattern of Disability by types of Barthel ADLs among study participants (n= 194)

DISCUSSION

The current study was conducted with the aim of assessing the prevalence and pattern of morbidity and disability (Barthel's ADLs) among elderly residents in a rural area of Kollam district in Kerala and also to determine the factors associated with disability.

Morbidity: The overall prevalence of self-reported morbidity among the elderly in this study was

162

97.9%. High morbidity prevalence had been reported in several studies among the elderly in India, such as 99.6% in Vishakapattanam,[15] 97.5% in Uttarakhand,[16] 91.7% in Odisha,[17] and 89.2% in Kerala.[6] In the current study, multi-morbidity[4] was reported by an overwhelming majority of 180 (94.8%) respondents. This has become a frequently encountered phenomenon across all levels of healthcare practice and any chronic morbidity makes the elderly significantly more vulnerable to disabilities.[9]

In the present study, single morbidity was reported by 10 (5.3%), 2 morbidities by 26 (13.4%), while 158 (81.4%) persons reported having >3 diseases. In comparison, the rural Kerala study,[6] reported a single morbidity in 34.1%, two morbidities in 24%, and >3 diseases in 31.1% of participants. Another elderly study conducted in seven states of India,[2] revealed that the overall single-morbidity prevalence was 34%, and the state-wise single morbidity was highest (33.65%) in Kerala, while the overall multi-morbidity prevalence in India and Kerala was 23.6%, and 42.02% respectively, followed by Punjab (35.78%), Maharashtra (23.48%) and West Bengal (23.15%). A systematic review[18] of morbidity among elderly South Asians in India and Bangladesh, showed wide variations in the prevalence of multi-morbidity ranging from 24.1% to 83% with an overall multi-morbidity prevalence of 32.1% in India and 59.2% in Kerala study,[19] which is higher in Kerala than elsewhere in India.

Wide variations in the prevalence of morbidity are attributed to various factors, such as different study methodologies adopted, diverse socio-demography of elderly respondents, (namely diverse age groups, gender, type of families, literacy levels, socio-economic situations), different lifestyles, disability assessment tools used, differing healthcare facilities available, family support and social security.

In our study, the most common morbidity was poor vision, affecting 144 (74.2%) respondents of whom, refractive errors (68.7%) and cataract (29.2%) was reported. This was followed by hypertension in 121 (62.4%), oral disease in 98 (50.5%), type 2 diabetes in 89 (45.9%), joint pain in 83 (42.8%) and GIT diseases in 45 (23.2%) and renal diseases in 27 (13.9%) respondents. These figures are higher than that in the Kerala study,[6] in which the most common morbidities reported were hypertension (37.7%), diabetes (36.5%), visual problems(30.5%), joint pains (30.2%) and GIT disease (5.4%), while in the systematic review,[18] the leading ailments were hypertension, arthritis, diabetes, cardiac problems and skin diseases. A rural Tamil Nadu study among elderly,[19] reported visual problems, mainly cataract (68%) as the most common morbidity (57%) followed by joint pain (43.9%), oral complaints (42%), hypertension (14%), heart disease (9%) and diabetes (8.1%). In our study, the prevalence of fall was high, affecting 61 (31%) participants, while it was 4% in a Pondicherry study.20 Globally, falls are a major public health problem, and the elderly suffer the greatest number of fatal falls.[18] A fall by itself is not a diagnosis but is a symptom of multiple underlying diseases, among the elderly and is well-known to lead to greater perceived ill-health and morbidity, resulting in a fear of impending fall and great distress.[20,21]

Disability: In the current study, the prevalence of functional disability (Barthel's basic ADLs) was 40.72%, affecting 79 participants. The commonest disability was locomotor difficulty due to musculoskeletal problems, resulting in difficulty in climbing stairs in 73 (37.6%), walking on level ground in 32 (16.5%), and transferring self from one position to the other in 24 (12.4%) participants. According to types and grades of disabilities in this study, two persons (1%) were totally bed-ridden and fully dependent, 7 (3.6%), 59 (30.4%) and 11 (5.7%) participants had mild, moderate and severe functional limitations respectively, while 115 respondents had no disability. In comparison, the overall prevalence of functional limitations was 34.1% (57) in the rural Kerala study,6, in which there were 42, 12 and 3 persons with mild, moderate and severe functional limitations respectively, while 110 participants had none.

Disability assessment studies among the elderly in different regions of India, using similar study tools (Barthel's basic ADLs), have revealed markedly varying results, ranging from 20.9% in urban slum Chennai,[22] 21.4% in Haryana,[23] 22.4% in urban Kerala,[24] 30.7% in central Kerala study,[25] 43.7% in North-East India,[26] and 46.84% in rural Tamil Nadu.[27] In another study in Haryana,[28] disability was 46.8% (using WHODAS)26 and 87.5% (using Barthel). This variation in the prevalence of disability is due to differing socio-demography, lifestyle and socio-economic backgrounds of elderly respondents.

Disability and Socio-demography: Both in the univariate and logistic regression analysis of this study, the association between socio-demographic variables (age, female gender and lower levels of education) and disability status remained statistically significant (p< 0.001), confirming that they are independent determinants of disability.

As seen in this study, **advancing age** has been established as a highly significant risk factor for disability in most studies.[6,22-28] An increase in life expectancy among the aged has not translated into healthier lives. Higher disability rates among older people reflect an accumulation of health risks across a lifespan of disease, injury and chronic illness.[29]

Gender-wise, in this study, the higher prevalence of musculoskeletal disease among women as compared to men, have led to a greater locomotor disability, (namely climbing stairs, mobility and transfers) in women, and this association between gender and disability was significant. This may be due to the fact that women are more likely to report limitations, and seek greater assistance. Women bear a higher brunt of deficiencies as they comprise the majority of both care-recipients and caregivers

163

International Journal of Academic Medicine and Pharmacy (www.academicmed.org)
ISSN (O): 2687-5365; ISSN (P): 2753-6556

(paid/ unpaid), have less access to healthcare services, and face adverse life events with less resources.[22,23,26,28,30] **Higher levels of education** have a strong effect in lowering disabilities, as seen in several studies,[20,22,28] probably due to enhanced awareness and better use of assistive devices**,** and more knowledgeable of methods to overcome disabilities, thus conferring a significant protection against developing disability.

Disability and Morbidity types: In the univariate analysis of this study, the morbidity types that were significantly associated with disability at (p<0.0001) are joint pain (OR=3.89), hypertension (OR=2.8), heart disease(OR=3.87), GIT disorders (OR=3.59) renal diseases (OR=5.23), fall (OR=4.59), and oral diseases (OR=2.89), while cerebrovascular disorders (OR=4.97), and respiratory diseases (OR=2.74) are significantly associated with disability at (p=0.004) and (p=0.002) respectively.

In the **binary logistic regression analysis,** the morbidity types that remained statistically significant as independent determinants of disability among the elderly in this study were musculoskeletal/joint disorders [AOR 2.954 (95%CI:1.420–6.146),p=0.004], renal disease [AOR 3.483 (CI:1.139–10.654),p=0.029], fall [AOR 4;258 (CI:1.939–9.348),p=0.0001], and GIT diseases [AOR 2.964 (CI:1.225–7.169),p=0.016].

Musculoskeletal disorders (arthritis and osteoporosis are known to cause significant locomotor disability in the elderly due to ageing / degenerative changes resulting in restricted mobility and inability to lead an independent life in society.[21-22,24-25,30]

A statistically significant association between disability and GIT disorders,[5,20,24,31] such as Gastro-esophageal reflux disease (GERD) and Peptic ulcer disease (PUD), may be explained on the basis of intestinal mucosal inflammation with progression of age, leading to decreased GIT motility, resulting in constipation and further disability. Similarly renal disease was also found to be significantly associated with disability, probably by virtue of urinary problems, resulting in urinary incontinence and greater disability.[19,21,24,31] A history of fall in the rural elderly have been attributed to poor living and working conditions along with risk factors such as age, female sex, use of cane on floor tiles, multi-morbidity, use of multiple medications and unhealthy lifestyles, leading to higher dependency, greater perceived ill- health and morbidity, fear of impending fall, fractures, further immobilization, greater disability and distress.[20,31,34] It has been established that co-occurrence of NCDs with disabilities pose a considerably higher risk of mortality compared to those not suffering from either morbidity or disability.[35]

Limitations: This was a cross-sectional study, with inherent limitations in establishing causality. Self-reported morbidity data may have led to some recall bias.

CONCLUSION

A high prevalence of self-reported morbidity (97.9%), along with a high proportion of elderly population (>16%) in this rural community, point to an emerging public health problem that calls for prompt and appropriate remedial action at the primary healthcare level. The relatively lower prevalence of disability (40.72%) may be attributed to the high level of treatment compliance (96.4%) reported among the participants. Regular health awareness, follow-up and physiotherapy sessions to control morbidity and maintain locomotor independence are recommended.

REFERENCES

1. NSO (2021), Elderly in India, National Statistical Office, Ministry of Statistics & Programme Implementation, Government of India, New Delhi, 2021. http://mospi.nic.in/sites/default/files/publication_reports/ElderlyinIndia_2016.pdf.
2. Himanshu H, Talukda H.B. Demography India. Prevalence of Multimorbidity (Chronic NCDS) and Associated Determinants Among Elderly in India. ISSN:0970-454X Sp. Issue January 2017, pp: 69-76
3. United Nations (UN) 2015, World Population Ageing (WPA) 2015. http://www.un.org/en/development/desa/population/theme/ageing/WPA2015.shtml
4. Agrawal A. Disability among the elder population of India: A public health concern. J Med Soc 2016;30:15-9.
5. MacMahon S. Multimorbidity: A Priority for Global Health Research. Chapter 2. Definition of multimorbidity and associated terminology: Multimorbidity vs. Comorbidity. The Academy of Medical Sciences (2018). p. 19.
6. Das RA, Kumar SG, Roy G. Morbidity pattern and its relation to functional limitations among old age rural population in Kerala, India. J Family Med Prim Care 2017;6:301-4
7. Alam, Moneer, James, K.S., Gridhar, G., Sathyanarayana, K.M., et al. (2012). "Report on the Status of Elderly in Select States of India, 2011", United Nations Population Fund (India), http://india.unfpa.org/drive/AgeingReport_2012._Building a Knowledge Base on Population Ageing in India December 2013. The Status of Elderly in Kerala, 2011.
8. Registrar General of India (2014) Sample Registration System Statistical Report 2014, Office of Registrar General & Census Commissioner New Delhi, India. Retrieved on 24th April 2023 from http://www.censusindia.gov.in/vital_statistics/SRS_Report_2014/7.%20Chap% 203- Fertility%20Indicators-2014-U.pdf.

164

International Journal of Academic Medicine and Pharmacy (www.academicmed.org)
ISSN (O): 2687-5365; ISSN (P): 2753-6556

9. Rajan SL, Shajan A, Sunitha S.(2020) Ageing and Elderly Care in Kerala. China Report: 56(3),354-373.https://doi.org/10.1177/0009445520930393

10. Alves LC, Leite IC, Machado CJ. The concept and measurement of functional disabilityin the elderly population: a literature review, Aug 2008. Public Health Science13;(4):1199-207

11. Panchayat level statistics – 2011 Kollam district, Dept of Economics and Statistics, Thiruvananthapuram, Government of Kerala. www.ecostat.kerala.gov.in.

12. WHO. International Classification of Functioning, Disability and Health (ICF). Available from: http://www.who.int/classifications/icf/en/. [Last accessed on 2023, Jul 23].

13. Mahoney FI, Barthel D. "Functional evaluation: the Barthel Index." Maryland State Medical Journal 1965;14:56-61. PMID: 14258950.

14. Mahantshetty S, Singh J, Dhandapani S, Updated Modified BG Prasad Classification for October 2023. Natl J Community Med Jan 2024:15(1);89-90.DOI;10.55489/njcm.150120243515

15. Polisetty S, Seepana M. Morbidity profile of elderly individuals in urban Visakhapatnam. Int J Community Med Public Health 2017;4:2558-63

16. Usha P, Kishore S, Singh M, et al.: A study of morbidity profile among geriatric population in Uttarakhand: A community based cross-sectional study. J Family Med Prim Care. 2020, 9:3677-81. 10.4103/jfmpc.jfmpc_256_20

17. Sahu PR, Pradhan SK, Munda A, Padhan SC, Behera RR, Sahu LK, Panda SC. Morbidity Pattern Among Elderly in an Urban Area of Burla, Odisha. Cureus. 2023 Apr 6;15(4):e37189. doi: 10.7759/cureus.37189. PMID: 37159760; PMCID: PMC10163363

18. Pati S, Swain S, Hussain MA, Akker HM, Metsemakers J, Knottnerus JA, et al. Prevalence and outcomes of multi-morbidity in South Asia: a systematic review. BMJ Open 2015;5:e007235. doi:10.1136/bmjopen-2014- 007235

19. Purty JA, Joy B, Kar M, Vasudevan K, Zacharia P. Morbidity Pattern Among the Elderly Population in the Rural Area of Tamil Nadu, India, Turkish Journal of Medical Sciences, 2006, 36; (1): Article 7. Available at: https://journals.tubitak.gov.tr/medical/vol36/iss1/7

20. Sudarshan BP, Chethan TK. Morbidity pattern among the elderly population in the rural area of Pondicherry: a cross sectional study. Int J Community Med Public Health 2016;3:414-8

21. Pitchai P, Dedhia HB, Bandhari N, Krishnan D, D'Souza NRJ, Bellara JN, Prevalence, risk factors, circumstances for falls and level of functional independence among geriatric population - A descriptive study 2019: 63; (1):21-26

22. Ravi J, Kuzhali S, Ramamoorthy P. Prevalence of disability among the elderly people in an urban slum of Chennai - A cross-sectional study. J Family Med Prim Care. 2022 Dec;11(12):7763-7768. doi: 10.4103/jfmpc.jfmpc_1022_22. Epub 2023 Jan 17. PMID: 36994067; PMCID: PMC10041033.

23. Khan ZA, Singh C, Khan T. Correlates of physical disability in the elderly population of Rural North India (Haryana). J Family Community Med. 2018 Sep-Dec;25(3):199-204. doi: 10.4103/jfcm.JFCM_160_17. PMID: 30220851; PMCID: PMC6130166.

24. Pillai, A. S., Francis, P. T., Kartha, N., & Mathew, M. M. (2021). An assessment of functional limitations and its relation to morbidity pattern among the elderly residing in urban area, Kerala, India. International Journal Of Community Medicine And Public Health, 2022 January; 9(1), 116–120. https://doi.org/10.18203/2394-6040.ijcmph20214809

25. Baskar B.P., Lucas, A., A, Devi, G., & Philip S. et al (2023). Dependency and associated factors among elderly in central Kerala. International Journal Of Community Medicine And Public Health, October 2023, 10(10), 3625–3630. https://doi.org/10.18203/2394-6040.ijcmph20233091

26. Medhi GK, Visi V, Bora PJ, Sarma J, Borah P, Mahanta J, Bhattacharyya H, Pala S. A Community-Based Study on Functional Disability and Its Associated Factors Among Elderly Individuals in a Rural Setting in Northeastern India. Cureus. 2021 Feb 12;13(2):e13309. doi: 10.7759/cureus.13309. PMID: 33732564; PMCID: PMC7955953.

27. Sowmiya K, Kumar P, Nagarani N. A Study on Prevalence and Correlates of Functional disability among the elderly in rural Tamilnadu. Int J Med Res Rev [Internet]. 2015May31 [cited 2024Mar.30];3(4):430-5.Available https://ijmrr.medresearch.in/index.php/ijmrr/article/view/255

28. Ramadass S, Rai SK, Gupta SK, Kant S, Wadhwa S, Sood M. et al. Prevalence of disability and its association with socio-demographic factors and quality of life in a rural adult population of northern India, The National Medical Journal of India. 2018, vol. 31, no. 5,

29. World Health Organization (WHO) and World Bank. (2011). World Report on Disability 2011, Geneva: WHO.

30. Murtagh KN, Hubert HB. Gender differences in physical disability among an elderly cohort. Am J Public Health. 2004 Aug;94(8):1406-11. doi: 10.2105/ajph.94.8.1406. PMID: 15284051; PMCID: PMC1448463.

31. Joshi K, Kumar R, Avasthi A. Morbidity profile and its relationship with disability and psychological distress among elderly people in Northern India. Int J Epidemiol2003;32:978–987 DOI: 10.1093/ije/dyg204

32. Zhang H, Zhao Y, Wei F, Mo Han, Chen J, Peng S. Prevalence and Risk factors for Fallamong Rural Elderly: A County-based Cross-Sectional Survey. Hindawi International Journal of Clinical Practice Volume 2022, Article ID 8042915, 8pages https://doi.org/10.1155/2022/8042915.

33. Biswas, I.; Adebusoye, B.; Chattopadhyay, K. Health Consequences of Falls among Older Adults in India: A Systematic Review and Meta-Analysis. Geriatrics 2023, 8, 43. https://doi.org/10.3390/ geriatrics8020043

34. Joseph A, Kumar D, Bagavandas M, A Review of Epidemiology of Fall among Elderly in India. Indian J Community Med.2019 Apr-Jun;44(2): 166-168.doi10.4103/ijcm.IJCM_201_18. PMCID:PMC662525,PMID:31333298

35. Veena S. Kulkarni, Vani S. Kulkarni, and Raghav Gaiha (2018) Aging, disability and disease in India. GDI Working Paper 2018-030. Manchester: The University of Manchester.

165