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Research Article *Volume 2 | Issue 1*

KOS Journal of Public Health and Integrated Medicine
https://kelvinpublishers.com/journals/public-health-and-integrated-medicine.php

Disability in Geriatric People and its Association with Sociodemographic Factors Among Elderly Persons of Urban and Rural Areas

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Received: April 06, 2026 **Accepted:** May 08, 2026; **Published:** May 11, 2026

Citation: Rajiv DL, et al. (2026) Disability in Geriatric People and its Association with Sociodemographic Factors Among Elderly Persons of Urban and Rural Areas. *KOS J Pub Health Int Med.* 2(1): 1-6.

1. Abstract

Background: The study examines the prevalence of disability among geriatric populations in urban and rural areas, addressing the associated sociodemographic factors. With the elderly population growing rapidly, understanding disability patterns and their determinants is crucial for healthcare planning and intervention strategies.

Aims and objectives: The aim of the study is to evaluate disability among geriatric individuals residing in urban and rural areas of Surat. The primary objectives include assessing disability prevalence in both settings and comparing sociodemographic factors influencing geriatric disability. Secondary objectives involve examining differences in disability prevalence between urban and rural populations and identifying intervention strategies tailored to their needs.

Methodology: A cross-sectional study design was employed, with a sample size determined based on population demographics. Geriatric individuals from urban and rural areas were included, with assessments conducted using standardized tools. Sociodemographic factors were collected and analysed for their association with disability prevalence.

Results: The study found varying disability prevalence rates between urban and rural geriatric populations, with differences observed in sociodemographic factors impacting disability. Factors such as age, sex, education level, and socioeconomic status were found to influence disability prevalence differently in urban and rural settings.

Conclusion: Disability among geriatric individuals in urban and rural areas presents distinct patterns, influenced by sociodemographic factors unique to each setting. Effective intervention strategies should consider these differences to provide tailored support and improve the quality of life for elderly populations.

2. Keywords:

Geriatric population, disability, urban, rural, sociodemographic factors, prevalence, intervention strategies.

3. Introduction

3.1. Background

Elderly population is the fastest growing age segment worldwide due to increasing life expectancy and associated population ageing [1].

Disability is associated with increasing age and an increase in the burden of chronic health ailments in the elderly.

Consequently, there is the need to prioritize preventive, promotive, curative, and rehabilitative services for the geriatric population [2]. Disability can adversely affect the quality of life of elderly and is a significant health indicator that has heavy social, economic and health care implications [2].

Disability assessment in context of geropsychiatry can be a part of routine evaluation during comprehensive assessment for detecting existing decline in functional abilities, planning and monitoring therapeutic interventions, and need for social welfare schemes [1].

In logistic regression analysis, adjusted by sociodemographic factors and the number of chronic conditions, we found a higher number of geriatric conditions, and a higher number of chronic conditions were associated with ADL dependencies. In a model adjusted for sociodemographic factors and the type of chronic conditions, we found that a higher number of geriatric conditions and heart disease, stroke, and bone or joint disorder were positively associated with ADL dependencies.

The odds of ADL dependencies increased with impaired cognition, impaired vision, impaired hearing, and major depressive disorder. Impaired cognition, incontinence, impaired vision and major depressive disorder were positively associated with dressing, bathing, eating, transferring, and toileting dependency. In addition, impaired hearing was associated with transferring and toileting dependency. More than half of older adults in India had at least one geriatric condition. The prevalence of geriatric conditions was as high as the prevalence of chronic conditions, which in some cases were associated with disability. Geriatric conditions should be included in health care management [3].

Although many studies have examined risk factors for functional disability among community-living older persons, the relative importance of a broad range of geriatric impairments (including those in muscle strength, physical capacity, cognition, vision, hearing and psychological status) and chronic diseases has not been well-defined [4].

The factors that impact aging in a person include:
- Diet.
- Alcohol consumption.
- Stress.
- Exercise.
- Medication.
- Smoking.
- Disease.
- Financial security.
- Social support.
- Person's attitude and outlook.

The activities of daily living (ADL) score are a widely used index to establish the degree of independence from any help in everyday life situations. Measuring ADL accurately is time-consuming and costly. This paper presents a framework to approximate ADL via variables usually collected in comprehensive geriatric assessments. We show that the selected variables serve as good indicators in explaining the physical disabilities of older patients [5].(5)

The high prevalence of functional disability in older persons, with its attendant increased use of healthcare services and need for formal and informal care, is one of the most pressing public health problems facing our healthcare system. Currently, there are over 7 million chronically disabled older Americans. The additional cost of medical and long-term care for newly disabled older Americans is estimated to be $26 billion per year. Furthermore, older persons repeatedly identify maintenance of functional independence as a critical determinant of quality of life [4].

Functional impairment is defined as difficulty performing, or requiring the assistance of another person to perform, one or more of the following Activities of Daily Living [6].

Functional impairments and cognitive and affective problems are particularly prevalent among older patients, and can be improved with early recognition and treatment. Physicians who care for older adults should be able to recognize functional, cognitive, and affective impairment among their patients to enable appropriate management or referral. Information and tools are now available for all physicians to rapidly and accurately identify clinically important impairments among older patients. Completing brief assessment of older patients requires effective use of a broad range medical interviewing skills. Application of a few simple interviewing techniques will substantially enhance the amount and accuracy of information obtained in speaking with older person [6].

The prevalence of clinically significant cognitive impairment is roughly 3% among persons 65-years of age or older, and doubles in prevalence every 5 years reaching 40- 50% among persons 90 years of age or older. Most patients with dementia do not complain of memory loss or even volunteer symptoms of cognitive impairment unless specifically questioned [6].

Approximately 75% of persons over age 75 limit their activities due to functional impairment each year; 40% experience restricted activity in two consecutive months. Almost 50% of people 85 years of age and older require assistance in one or more ADL. As many as 25% of older community-dwelling adults have at least one impairment in IADLs. Among patient admitted to general medical hospital units, 40% have at least one ADL impairment, 65% have one or more IADL impairments, and 30% have mobility impairment [6].

One to two out of every five older inpatients suffer from depression. Depression lowers patients' quality of life and contributes to poor adherence. Major and minor depression are treatable conditions in elderly patients, with response rates comparable to those in younger population [6].

Elderly people in rural areas present good quality of life/health in the cognitive aspect, access to services, goods, habits, but awareness must be constant due to their weakness [7].

3.1.1. Aims and objectives of the study

3. 1.1.1. Aim: Aim is to evaluate disability in urban and rural geriatric people in Surat.

3. 1.1.2. Objectives:

Primary Objective:

• To find out disability in geriatric people in urban area
• To find out disability in geriatric people in rural area

Secondary Objective:

- Disability comparison between urban and rural geriatric people
- To find out how Sociodemographic factors affecting geriatrics

3.2. Study Gap

- While the literature review provides valuable insights into the prevalence of disability among geriatric populations in both urban and rural settings, there are several gaps that need to be addressed:
- Limited Comparative Studies: Although some studies have compared disability prevalence between urban and rural areas, there is still a need for more comprehensive comparative studies to understand the differences in disability prevalence and associated factors between these two settings.
- Socioeconomic Factors: While some studies have explored the association between disability and sociodemographic factors, there is a lack of consensus on the specific socioeconomic factors that contribute to disability in urban and rural geriatric populations.
- Intervention Strategies: Existing literature highlights the importance of lifestyle modifications and affordable health services in improving the quality of life for elderly individuals, but there is a need for more research on effective intervention strategies tailored to the specific needs of urban and rural geriatric populations.

4. Methodology

3.1. Study design

Cross sectional survey type research is conducted.

4.2. Sample size

Type I error = 0.05
Expected proportion in population = 0.20
Absolute error precision = 0.05
Sample size = 225

4.3. Study Population

Geriatric people in selected geographic area of Surat city or near Surat city.

4.4. Inclusion and exclusion criteria

4.4.1. Inclusion Criteria:

- Age above 65 years.
- Both male and female residing Surat city or near Surat city
- Able to communicate and understand
- With a stable medical condition

4.4.2. Exclusion criteria:

- Unstable cardiac condition
- Elderly who are not willing to give consent
- Bed ridden person

4.5. Sampling method

Stratified Sampling method was used.

4.6. Study duration

Total duration of the study was from October, 2023 to April, 2024.

3.7. Study setting

Different zone of Surat city and village near Surat city.

3.8. Outcome measures

The adult self-administered version of the World Health Organization Disability Assessment Schedule 2.0 (WHODAS 2.0) is a 36-item measure that assesses disability in adults age 18 years and older. It assesses disability across six domains, including understanding and communicating, getting around, self-care, getting along with people, life activities (i.e., household, work, and/or school activities), and participation in society.

3.9. Procedure

After getting the ethical certificate from Indian Ethical Committee of The Sarvajanik College of Physiotherapy.

We went to different villages near the Surat for rural elderly and then we conventionally select participants and take a written consent form from participants.

We will screen participants for selection criteria and then explain objective about the research and explain the socio-demographic factors and WHODAS 2.0 Scale then will similarly go for the Urban population and select the participants from different area of Surat. After Data Collection will enter the data in SPSS software and Excel software for further analysis.

5. Statistical Analysis and Results

This chapter presents the details of the analysis of the data collected and interpretation of the result obtained in the present study conducted. This chapter is divided into two sections. The first section deals with data analysis and statistical techniques used in the research.

Second section deals with the descriptive and inferential statistics of the study data. It explains the basic characteristic of the sample population, frequency distribution and descriptive analysis. It shows the difference of level of disability in urban and rural population further it presents the association between dependent and independent variables.

4.1. Data analysis

In the present study data were collected from two hundred twenty-five elderly from the community in Surat and villages near Surat in which 120 elderly is residing in urban area and 105 elderly is residing in rural area. Descriptive statistics was done for Age, gender, occupation, BMI, family, diagnosis and level of education. Regression models were used to attain the study objectives with WHODAS score as dependent variable and independent variables represented Age, BMI, Level of education, vision, gender, spouse and hearing. ANOVA was done to get the information about the relationship between dependant and independent variables. The coefficients were done in urban and rural population and is presented in the table 1 and 3.

Table 1: Frequency distribution of different variables.

Independent Variables	Dependent Variable
Age	WHODAS score
BMI	
Level of education	
Vision	
Gender	
Spouse	
Hearing	

4.2. Results

In this section of chapter, the results of descriptive and inferential statistics are explained.

Table 2: Shows frequency distribution of different variables such as; Gender, Occupation, Education, Family and Diagnosis in urban and rural population.

Variables		Frequency (%)		
		Urban	Rural	Total
Gender	Male	66(55)	60(57)	126(56)
	Female	54(45)	45(42)	99(44)
Occupation	Housewife	40(33)	30(28)	70(31)
	Job	27(22)	12(11)	39(17)
	Business	24(20)	8(7)	32(14)
	Other	17(14)	29(27)	46(20)
	None	12(10)	26(24)	38(16)
Education	Illiterate	46(38)	64(60)	110(48)
	Primary level	26(21)	27(25)	53(23)
	Above primary level	48(40)	14(13)	62(27)
Family	Joint	82(68)	76(72)	158(70)
	Nuclear	38(31)	29(27)	67(29)
Diagnosis	Musculoskeletal	34(28)	33(31)	67(29)
	Systemic	47(39)	22(20)	69(30)
	Others	12(10)	8(7)	20(8)
	None	27(22)	42(40)	69(30)

Table3: Descriptive statistics of Age, Weight, Years of Education and Income (N = 225).

	Minimum	Maximum	Mean	SD
Age	61	90	70.92	4.86
Weight	44	102	69.2	10.65
Years of education	0	17	4.5	5.18
Income	0	75000	591.11	5477.38

Table 4: Descriptive statistics of Age and BMI of Urban and Rural population.

	Population	N	Mean	SD	Std. Error Mean
Age	Urban	120	70.89	5.06	0.46
	Rural	105	70.97	4.65	0.45
BMI	Urban	120	27.4	4.74	0.43
	Rural	105	26.55	3.32	0.32

Table 5: Descriptive statistics of WHODAS Score of Urban and Rural Population.

Population		N	Minimum	Maximum	Mean	SD
Urban	WHODAS score	120	32	114	50.2	13.6
Rural	WHODAS score	105	33	96	56.54	13.37

Table 6: Descriptive statistics of Urban population (N = 120).

Domains	Minimum	Maximum	Mean	SD
Understanding & Communication	6	18	8.7	2.8
Getting Around	5	45	10.42	4.85
Self-Care	4	17	5.58	2.57
Getting Along with People	5	14	6.07	1.67
Life Activities	4	18	6.73	2.52
Participation in Society	8	36	12.68	3.89

Table 7: Descriptive statistics of Rural population (N = 105).

Domains	Minimum	Maximum	Mean	SD
Understanding & Communication	6	18	9.4	3.24
Getting Around	5	20	11.61	3.5
Self-Care	4	12	5.59	2.03
Getting Along with People	5	12	6.38	1.66
Life Activities	4	16	8.15	2.71
Participation in Society	8	28	15.39	4.91

Table 6 and 7 shows descriptive statistics of Urban and Rural population based on WHODAS Domains respectively. It shows the minimum and maximum values as well as the mean and standard deviation of it.

Table8: Descriptive statistics of Average score of all Domain of Urban population (N = 120).

Domains	Minimum	Maximum	Mean	SD
Understanding & Communication	1.2	3.6	1.74	0.56
Getting Around	1	9	2.08	0.97
Self-Care	0.8	3.4	1.11	0.51
Getting Along with People	1	2.8	1.21	0.33
Life Activities-House hold				
Participation in Society				
WHODAS Score	0	0.35	0.01	0.05

Table 9: Descriptive statistics of Average score of all Domain of Rural population (N = 105).

Domains	Minimum	Maximum	Mean	SD
Understanding & Communication	1.2	3.6	1.88	0.64
Getting Around	1	4	2.32	0.7
Self-Care	0.8	2.4	1.11	0.4
Getting Along with People	1	2.4	1.27	0.33
Life Activities-House hold				
Participation in Society				
WHODAS Score	0	0	0	0

Table 8 and 9 shows descriptive statistics of average score of WHODAS Domains of Urban and Rural population respectively. It shows the minimum and maximum values as well as the mean and standard deviation of it.

Table 10: Inferential statistics of WHODAS Total of Urban and Rural population (N = 225).

		t-test for Equality of Means				
		t	Sig. (2-tailed)	Mean Difference	95% Confidence Interval	
					Lower	Upper
WHODAS score	Equal variances assumed	3.51	0.001	-6.34	9.89	2.78
	Equal variances not assumed	3.51	0.001	-6.34	9.89	2.79

Table 10 shows the significant between the groups, indicating that they have different means. The difference was -6.34 with

a 95% confidence interval ranging from -9.90 to -2.79.

Table 11: Regression analysis with all independent variable of Urban population.

R	R Square	Adjusted R Square	Std. Error of the Estimate
.475[a]	.22	.17	12.34

Table 12: ANOVA[a].

	Sum of Squares	df	Mean Square	F	Sig.
Regression	4977.99	7	711.14	4.66	.000[b]
Residual	17063.20	112	152.35		

Shows the relationship between the dependant and independent variable of urban population.

Table 13: The regression Coefficientsa of urban population.

	Unstandardized Coefficients		t	Sig.
	B	Std. Error		
Age	0.87	0.22	3.79	0
Spouse	-4.78	2.89	-1.65	0.1
Gender	-1.5	2.31	-0.64	0.51
BMI	0.54	0.25	2.16	0.03
Level of Education	4.3	1.35	3.16	0.002
Hearing	-1.39	2.76	-0.5	0.61
Vision	3.47	2.43	1.42	0.15

Shows Age, BMI and Level of education showed significant effect of outcome.

Table 14: Regression analysis with all independent variable of Rural population.

R	R Square	R Square Adjusted	Std. Error of the Estimate
.465[a]	0.21	0.16	12.26

Table 15: ANOVA[a].

	Sum of Squares	df	Mean Square	F	Sig.
Regression	4026.98	7	575.28	3.82	.001[b]
Residual	14591.1	97	150.42		

Shows the relationship between the dependant and independent variable of rural population.

Table 16: The regression Coefficientsa of rural population.

	Unstandardized Coefficients		t	Sig.
	B	Std. Error		
Age	1.19	0.26	4.46	0
Spouse	4.77	2.6	1.83	0.06
Gender	2.09	2.53	0.82	0.41
BMI	0	0.38	-0.02	0.98
Level of Education	2.5	1.84	1.36	0.17
Hearing	-5.22	3	-1.73	0.08
Vision	-1.76	2.57	-0.68	0.49

Shows Age, BMI and Level of education showed significant effect of outcome.

6. Discussion

The result shows coefficients table that provides valuable insights into the factors significantly influencing disability score. Age, BMI, and Level of Education emerge as significant predictors, with p-values indicating statistical significance ($p < 0.05$).

Age: Age emerges as the most influential factor affecting disability score, as evidenced by its highly significant coefficient ($p < .001$). This finding underscores the profound impact of aging on functional abilities and highlights the need for targeted interventions to address age-related functional decline. As individuals age, they may experience declines in physical strength, mobility, and cognitive function, leading to increased functional limitations and disability. Healthcare providers and policymakers must recognize the unique challenges faced by aging populations and develop strategies to promote healthy aging and maintain functional independence.

BMI: Body Mass Index (BMI) demonstrates a significant but relatively minor effect on disability score. The negative coefficient suggests a slight inverse relationship between BMI and functional disability, although the effect size appears to be small. Further research is needed to explore the underlying mechanisms driving this association and to identify potential confounding variables. Obesity-related health issues, such as cardiovascular disease, diabetes, and musculoskeletal problems, may contribute to functional limitations and disability. Interventions aimed at promoting healthy weight management and preventing obesity-related health conditions are essential for improving functional outcomes and overall quality of life.

Level of Education: Higher levels of education are associated with increased disability scores, indicating greater functional disability. This unexpected finding may reflect various socio-economic factors, including access to healthcare resources, occupational opportunities, and lifestyle choices. Individuals with higher levels of education may face unique challenges related to their occupations, lifestyles, and socio-economic status, which could impact their functional abilities. Addressing socio-economic disparities and promoting health literacy are essential for mitigating the impact of education on functional disability and promoting health equity across diverse populations.

Group Comparison on WHODAS score: The independent samples t-test conducted to compare the means of two groups on WHODAS score yields significant results. The Levene's test confirms the equality of variances assumption, allowing for a valid comparison of means. The significant difference observed between the two groups ($p < .001$) underscores the disparities in functional outcomes and highlights the need for targeted interventions to address these differences.

The negative mean difference of -6.34286 suggests that the first group exhibits lower mean WHODAS scores compared to the second group, indicating better functional abilities among individuals in the first group. Understanding the characteristics and determinants of these groups is essential for developing tailored interventions and promoting health equity. Factors such as socio-economic status, access to healthcare, and lifestyle behaviours may contribute to differences in functional outcomes between groups.

Interventions aimed at addressing these factors and promoting healthy behaviours can help reduce disparities in functional disability and improve overall health outcomes.

The analysis of the WHODAS scores indicates a higher mean score in the rural population compared to the urban one, implying potentially greater disability or impairment in rural areas.

7. Conclusion

In conclusion, Age, BMI, and Level of Education emerge as significant predictors of WHODAS score, highlighting the complex interplay of demographic, health-related, and socio-economic factors in shaping functional outcomes. The group comparison analysis underscores the importance of addressing disparities in functional disability to promote health equity and improve overall quality of life. By understanding the underlying determinants of functional disability, policymakers, healthcare providers, and researchers can develop targeted interventions to enhance functional independence and well-being across diverse populations.

7.1. Gap Fulfilment

- The proposed study aims to address the above-mentioned gaps in the literature through the following strategies:
- Comprehensive Comparative Analysis: By conducting a cross-sectional survey in both urban and rural areas of Surat, the study will provide a comprehensive comparative analysis of disability prevalence and associated factors among geriatric populations.
- Exploration of Socioeconomic Factors: The study will examine a wide range of sociodemographic factors, including gender, occupation, education, income, and family structure, to identify the socioeconomic determinants of disability in both urban and rural settings.
- Tailored Intervention Strategies: Based on the findings of the study, tailored intervention strategies will be developed to address the specific needs of urban and rural geriatric populations, with a focus on promoting healthy lifestyles, improving access to healthcare services, and enhancing social support networks.
- By addressing these gaps, the proposed study aims to contribute to the existing literature on disability among geriatric populations and inform public health policies and interventions aimed at improving the quality of life for elderly individuals in both urban and rural areas.

8. Limitations

It is important to acknowledge the limitations of the analysis conducted. The coefficients table provides valuable insights into the predictors of WHODAS score, but it may not capture all relevant variables influencing functional disability. Additionally, the group comparison analysis is limited by the characteristics of the compared groups and the potential presence of confounding variables.

9. Future Recommendations

Future research should explore additional factors contributing to functional disability, such as comorbid health conditions, social support networks, and environmental factors. Longitudinal studies can provide valuable insights into the trajectories of functional decline and the effectiveness of interventions aimed at preserving functional independence over time.

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