Quality of Life Among Geriatric Population Living with Functional Disabilities in Urban Slum Dwellers of Kolkata, India

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A B S T R A C T

Introduction: Population aging globally impacts individuals, families, communities, and societies. Longer life spans result in an increasing elderly population, leading to the 21st century being known as the century of the elderly. Disability, stemming from health conditions and surroundings, presents challenges necessitating interventions against environmental and social barriers. This study aims to examine the correlation between disability and quality of life (QOL) among elderly individuals living in Kolkata slums.

Methodology: The observational study focused on the 100 geriatric populations in Dhapa slums using systematic random sampling. Data was collected using the Lawton Brody IADL Scale, and QOL assessment using WHOQOL-BREF.

Results: Majority of the participants were male (64%) and from the general caste (63%). Disability prevalence was 28%. Better QOL scores were observed in males, younger age groups, married individuals and non-diabetics. The physical health domain had the highest QOL score. Literate individuals and those without hypertension or diabetes had higher QOL.

Conclusion: India's aging population poses challenges for society and the economy. The study identified factors impacting disability and QOL in the elderly. Improving psychological care, awareness of government schemes, education, and targeted policies can enhance elderly quality of life.

Keywords: Geriatric population, Quality of Life, IADL, WHOQOL-BREF

A R T I C L E   I N F O

INTRODUCTION

The ageing population is a prominent global trend of the 21st century, impacting individuals, families, communities, and societies. As life expectancy increases, there will be a higher proportion of elderly people in the future, leading to public, media and policy attention. The 21st century is regarded as the century of elderly persons and the 22nd century is expected to witness the 'ageing of the aged' phenomenon.[1] The WHO defines disability as restrictions on an individual's participation, limitations in activities, and impairments caused by the interplay of their health condition and personal or environmental factors.[2] Overcoming challenges faced by people with disabilities requires addressing the complex interaction between an individual's body and society. Interventions aimed at removing social and environmental barriers are necessary.[3] Based on their level of functional capacity, elderly individuals with disabilities can be categorized into three groups, ranging from those who can manage daily activities with the assistance of mechanical devices to those who require high levels of care.

Around 600 million people worldwide live with disabilities, with 80% of them in low-income countries, where obtaining health and rehabilitation services is difficult. Ageing can result in reduced physical endurance and immunity, making the elderly more vulnerable to illnesses and dependency. Reduced functional capacity is linked to a higher need for care and greater functional dependence.[4] The ability to perform self-care, self-maintenance and physical activity is crucial for an elderly individual's functionality.[5] The census data has demonstrated a steady increase in the proportion of older people from 7.7% of the total population in 2001 to 10.1% in 2021, which is estimated to reach 300.96 million by 2051.[6] Data provided by the United Nations has shown that more than 46% of the global elderly populations live with disabilities.[7] Previous studies conducted across various countries have shown that the prevalence of limitations in activities of daily living (ADL) among the elderly ranges from 17.3% to 34.6%, while limitations in instrumental activities of daily living (IADL) range from 35.75% to 59.3%.[8-11] The physical dependence of an elderly person on others for daily activities can negatively impact their mental health and self-esteem, resulting in social isolation, feelings of neglect by family members, and reduced quality of life.

This study aims to investigate the correlation between functional disability and QOL, while also analyzing the collective impact of fundamental demographic characteristics, health-related details and functional disability on the QOL of elderly individuals residing in the slums of Kolkata.

METHODOLOGY

A community based descriptive observational study cross-sectional in design was conducted among geriatric population at Dhapa under the jurisdiction of Borough VII, ward 57, Kolkata Municipal Corporation (KMC) which is the Urban Field Practice Area of Community Medicine Department, Calcutta National Medical College, Kolkata from January to March, 2020.

Inclusion criteria: Geriatric population living in the slum for more than three years and gave consent to participate were included in the study.

Exclusion criteria: Severely ill and difficult to communicate persons were excluded from the study.

Considering 49.6% prevalence (p) of geriatric people with full/partial disability in urban area of West Bengal[12] with confidence interval at 95% and allowable error (L) of 10%, the sample size (n) was calculated as 100 using the formula $n = z^2 pq/L^2$ where $z = 1.96$, $q = (1-p)$.

After getting permission from Institutional ethics Committee (Approval letter no – EC/CNMC/254, dated – 20.01.2020) and informed consent from study subjects was taken and data was collected with the help of pre-designed, pre-tested and semi-structured schedule for general information; Lawton Brody Instrumental Activities of Daily Living (IADL) Scale[13] for disability and WHOQOL-BREF[14] for assessing quality of life (QOL) by one-to-one interview method. It was seen that 407 geriatric persons were residing in urban field practice area as per family health care records. To collect data systematic random sampling method was followed. The first study subject was selected randomly from first four study population. Then every fourth one was included who were fulfilling the inclusion and exclusion criteria. If a study subject found absent on the day of data collection, then the next one was included.

Working definitions:

Age category - Three age categories. Age group 60-69 years -Young old or 'not so old', Age group 70-79 years – 'Old old', Age group 80 years and over – 'older old' or 'very old'.[15]

Socio-economic Class - according to Modified B G Prasad Socio Economic scale, 2020.[16]

Classification of blood pressure (in mm of Hg)[17] - <120/<80 - Normal, SBP in between 110-139 & DBP in between 80-89 were considered as Pre-hypertensive and SBP ≥ 140 & DBP ≥90 was considered as hypertensive.

Classification of diabetes (in mg/dl)[18] – Normal (Fasting - 70-99, PPBS<140); Impaired glucose tolerance (Fasting – 100-125, PPBS – 140-199); Diabetic (Fasting≥126, PPBS≥200).

Lawton Brody Instrumental Activities of daily living scale (IADL) questionnaire containing 8 questions

for assessment of 8 domains of function in the study subjects. (Ability to use telephone, shopping, food preparation, house-keeping, laundry, mode of transportation, responsibility for own medication, ability to handle finances). IADL are more complex task that involve decision making and greater interaction with the environment. A summary score of 0-7 for women and 0-4 for men were considered as functionally disable.[19]

WHOQOL-BREF[14] questionnaire is a subset of 26 items taken from WHOQOL-100 for assessment of quality of life in physical domain, psychological domain, social-relationship domain and environmental domain. It contains five Likert style response scales: "very poor to very good" (evaluation scale), "very dissatisfied to very satisfied" (evaluation scale), "none to extremely" (intensity scale), "none to complete" (capacity scale) and "never to always" (frequency scale). Each domain is made up of questions for which the scores vary between one and five. The mean score in each domain indicates the individual's perception of their satisfaction with each aspect of their life, relating it with quality of life. The higher the score, the better this is perceived to be. Each domain raw score is converted to a 0-100 scale using the formula of transformed scale.

Transformed score = [(actual raw score – lowest possible raw score)/possible raw score range] × 100.

This transformation converts the lowest and highest possible scores to 0 and 100 respectively. The scores between these values represent the percentage of the total possible raw score achieved.

Statistical analysis: Data entry and analysis were done in SPSS (v16). Frequency distribution tables were used for descriptive statistics. Chi square test, uni-variate and multi-variate logistic regression were used and level of significance was considered as 5%.

RESULTS

The study was conducted among 100 geriatric populations in slum of Ward 57 under Borough VII, Kolkata Municipal Corporation. Among the study populations 64% was male, 63% belonged to general caste, 38% were Muslims and 43% were in the age group of old to very old. Mean age of male geriatric populations was 69.03±6.31 years and that of female it was 68.28±7.11 years. About 14% of populations were unmarried or widow(er) and 12% were illiterate. Presently 41% study subjects were working gracefully and 34% were belonging to lower-middle to lower socio-economic class. Among the study subjects 47% were pre-hypertensive or hypertensive and 30% were pre-diabetic or diabetic. (Table 1)

While assessing disability according to IADL scoring system it as found that 28% of total geriatric population were disabled. No disabled study populations

were found in presently working group. Disability was more among the females, older age group, persons living without spouse, Muslims, lower socio-economic group and non-diabetic persons. (Table 2)

Quality of Life (QOL) was assessed in four different domains i.e., Physical Health Domain, Environmental Domain, Psychological Domain and Social Relationship Domain. The mean score of QOL among disabled persons in four domains were 62.96±2.35, 60.00±2.09, 61.96. ±2.91 and 62.32±3.72 respectively. Significant difference in QOL score were found in all four domains (p<0.05). (Table 3)

QOL in physical health domain was significantly better among male gender, young old age group, married persons, unemployed group, upper socio-economic group and non-diabetic persons. In case of environmental domain, it was found that female gender, other caste, old-very old age group, literate persons and non-diabetic group were better than the counterpart. Psychological domain was significantly influenced by male gender, young old age group, married persons, unemployment and non-hypertensive group. Similarly in social relationship domain male gender, general caste, young old age group, married persons, Hindu religion, illiteracy, unemployment and pre-hypertensive group had better QOL than the others. (Table 4)

Table 1: Distribution of study population according to socio-demographic and other variables (N=100)

Variable	Participants (n=100)
Gender	
Male	64 %
Female	36 %
Caste	
General	63 %
Others	37 %
Age Group (Years)	
60-69 (Young old)	57 %
70-79 (Old to very old)	43 %
Marital Status	
Married	86 %
Widow/Widower/ Unmarried	14 %
Religion	
Hinduism	62 %
Islam	38 %
Educational Status	
Illiterate	12 %
Literate	88 %
Employment	
Unemployed	59 %
Employed	41 %
Socio-economic Status	
Upper to Upper middle	82 %
Lower middle to Lower	18 %
Hypertensive	
Non-hypertensive	53 %
Pre-hypertensive to hypertensive	47 %
Diabetic	
Non-diabetic	70 %
Pre-diabetic & Diabetic	30 %

Table No. 2: Distribution of study population according to socio-demographic and other variables with disability (N=100)

Variable	Disability		χ²	Df	P value
	Disable (n=28)	Not disable (n=72)			
Gender					
Male (n=64)	6 (9.4)	58 (90.6)	30.59	1	<0.001*
Female (n=36)	22 (61.1)	14 (38.9)			
Caste					
General (n=63)	17 (27.0)	46 (73.0)	0.087	1	0.768
Others (n=37)	11 (29.7)	26 (70.3)			
Age Group (Years)					
60-69 (Young old) (n=57)	4 (7.0)	53 (93.0)	28.949	1	<0.001*
70-79 (Old to very old) (n=43)	24 (55.8)	19 (44.2)			
Marital Status					
Married (n=86)	19 (22.1)	67 (77.9)	10.632	1	0.001*
Widow/Widower/Unmarried (n=14)	9 (64.3)	5 (35.7)			
Religion					
Hinduism (n=62)	11 (17.7)	51 (82.3)	8.516	1	0.004*
Islam (n=38)	17 (44.7)	21 (55.3)			
Educational Status					
Illiterate (n=12)	5 (41.7)	7 (58.3)	1.263	1	0.261
Literate (n=88)	23 (26.1)	65 (73.9)			
Socio-economic Status					
Upper to Upper middle (n=82)	17 (20.7)	65 (79.3)	11.938	1	0.001*
Lower middle to Lower (n=18)	11 (61.1)	7 (38.9)			
Hypertensive					
Non-hypertensive (n=53)	14 (29.8)	39 (73.6)	0.141	1	0.708
Pre-hypertensive to hypertensive (n=47)	14 (26.4)	33 (70.2)			
Diabetic					
Non-diabetic (n=70)	24 (34.3)	46 (65.7)	4.573	1	0.032*
Pre-diabetic & Diabetic (n=30)	4 (13.3)	26 (86.7)			

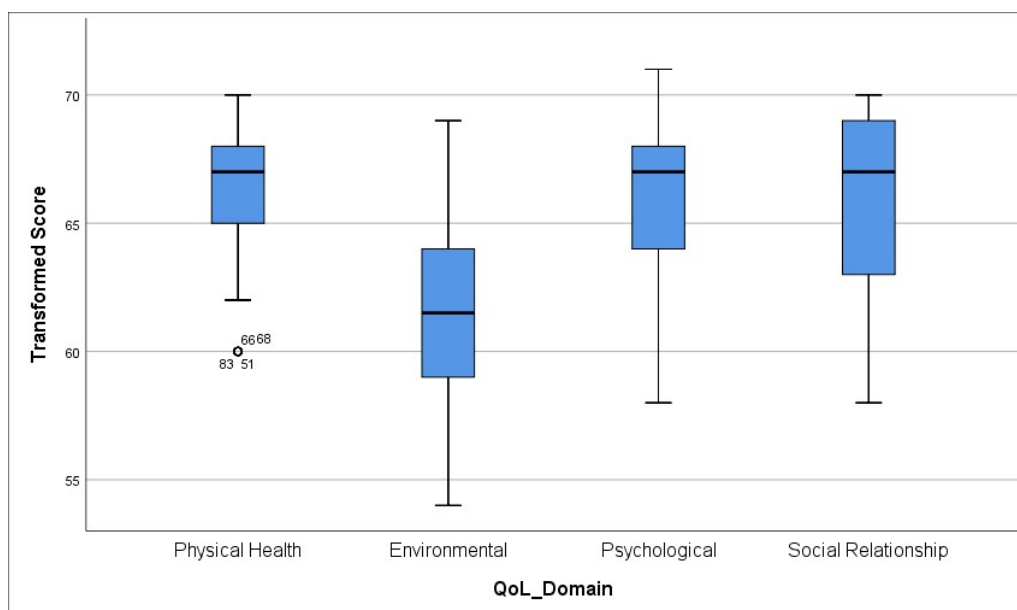*Significant at 95% confidence interval; #Yates' Correction applied when necessary

Diagram 1: Box-plot showing domain wise Quality of Life among geriatric population (n=100)

Table 3: Domain-wise distribution of Quality of Life according to disability (n=100)

Statistics	Physical Health		Environmental		Psychological		Social Relationship	
	Disable	Not disable	Disable	Not disable	Disable	Not disable	Disable	Not disable
Mean Score	62.96	67.24	60.00	61.89	61.96	67.21	62.32	66.68
SD	2.35	2.21	2.09	4.09	2.91	1.98	3.72	2.95
Mean Rank	2.55	62.15	35.93	56.17	19.71	62.47	26.0	60.03
Mann Whitney U	169.5		6000		146.0		322.0	
p value	<0.001*		0.002*		<0.001*		<0.001*	

*Significant at 95% confidence interval

Table 4: Association of different variables with domains of Quality of Life (n=100)

Variable	Physical Health		Environmental		Psychological		Social Relationship	
	Mean Rank	MWU#, p Value	Mean Rank	MWU#, p Value	Mean Rank	MWU#, p Value	Mean Rank	MWU#, p Value
Gender								
Male (n=64)	58.27	655.0	57.27	674.5	57.43	708.5	57.44	708.5
Female (n=36)	36.69	<0.001*	37.24	0.001*	38.18	0.001*	38.17	0.001*
Caste								
General (n=63)	46.74	928.5	41.15	576.5	51.13	1125.5	56.56	783.5
Others (n=37)	56.91	0.086	66.42	<0.001*	49.42	0.772	40.18	0.006*
Age Group (Years)								
60-69 (Young old) (n=57)	58.36	777.5	42.54	772.0	62.72	520.0	57.99	798.5
70-79 (Old to very old) (n=43)	46.08	0.002*	61.05	0.001*	34.3	<0.001*	40.57	0.003*
Marital Status								
Married (n=86)	56.34	100.0	49.01	473.5	55.59	164.5	54.94	220.5
Widow/Widower/Unmarried (n=14)	14.64	<0.001*	59.68	0.198	19.25	<0.001*	23.25	<0.001*
Religion								
Hinduism (n=62)	49.09	1090.5	47.27	978.0	53.81	972.5	56.86	783.5
Islam (n=38)	52.8	0.528	55.76	0.52	95.09	0.139	40.12	0.005*
Educational Status								
Illiterate (n=12)	51.95	460.0	48.21	326.5	55.68	424.5	53.32	279.5
Literate (n=88)	39.83	0.168	66.29	0.031*	41.88	0.266	29.79	0.008*
Employment								
Unemployed (n=59)	62.16	731.5	52.55	1125.5	62.99	697.5	68.24	482.0
Employed (n=41)	42.4	0.001*	49.08	0.553	41.82	<0.001*	38.17	<0.001*
Socio-economic Status								
Upper to Upper middle (n=66)	58.41	600.0	54.29	872.0	53.87	899.5	54.11	883.5
Lower middle to Lower (n=34)	35.15	0.05*	43.15	0.067	43.96	0.101	43.49	0.081
Hypertension								
Non-hypertensive (n=53)	47.73	1115.5	54.92	1011.5	43.87	934.0	42.16	853.5
Pre-hypertensive to hypertensive (n=47)	52.95	0.362	45.92	0.103	56.38	0.029*	53.90	0.006*
Diabetes								
Non-diabetic (n=70)	61.95	706.5	67.95	551.0	55.02	914.5	46.32	924.5
Pre-diabetic & Diabetic (n=30)	45.59	0.009*	43.37	<0.001*	48.56	0.301	52.29	0.342

#MWU = Mann Whitney U, *Significant at 95% confidence interval

DISCUSSION

The present community based cross-sectional epidemiological study was conducted at Dhapa, a slum area within urban field practice area of Community Medicine Department of Calcutta National Medical College, Kolkata. Among the 100 elderly individuals who were included in the study, majority 57% were in the age group of 60-69 years (young-old) which was very similar to another community based cross-sectional study conducted by Datta D[20] wherein the 60-69 years age group comprised of 57.9%. This similarity may be due to close geographic location of both the study areas and same ethnicity group. This study revealed that male's population was 64% whereas female was 36%. These findings are similar to study done by Mittal A[21] in Ambala district, Haryana where male constituted 70% and female constituted 30%. This is in conformity with the study by Datta D.[20] In this study majority of the study population were Hindus (62%) similar to the finding of the study conducted by Datta D[20] where Hindus constituted 83.1%. This similarity may be due to selection of study areas in Hindu dominated communities. This study revealed that 86% of the elderly subjects currently living with their spouse which is similar to another study done in an urban area of Mangalore of Dakshina Kannada district conducted by Devraj S[22]

where in majority (65.1%) of them were living with their spouse. In this study only 12% of the study population were illiterate whereas study done by Datta D[20] near about half of the population was illiterate (44.5%). In the present study, most of the study subjects belonged to Upper-middle class (82%) and no study subjects were in upper socio-economic class and the probable reason may be the slum study area. In a study conducted by Niranjan GV[23], it was noted that majority of the population (46.4%) belonged to lower-middle SES. According to Lawton's Instrumental Activities of Daily Living (IADL) scale, 28% of the total study population were disabled. But study conducted by Dolai MC[24] revealed a very higher prevalence of 83.9%. However, studies conducted outside India showed similar prevalence of disability in Malaysia by Loh KY[25] (33.5%) and in Southern Brazil by Duca GFD[26] (28.8%). Among the socio-demographic factors, older age group, female gender, widow(er), Muslim population, lower-middle & lower socio-economic class, non-diabetic population were found to be significantly associated with disability. These findings were similar with a community-based cross-sectional study conducted by Vaish K[27] In the present study, disability status of the study subjects had significant association with QOL in all four domains. Those who were having some disability had quality

of life worse than those who don't had disability. This funding was similar to study done by Dutta D[20] and by Kumar GS[28] in urban Puducherry. Study conducted outside India by Takemasa S[29], by SasugaY[30], by Ozcan A[31] and by Avolio M[32] in Italy, had found similar findings.

LIMITATIONS

The study's primary limitation was the inability to cross-check the disability score of the IADL scale through physical or clinical examinations.

CONCLUSION

The study found that approximately one-third of the geriatric population were disabled, with higher rates among females, older age groups, unmarried individuals, the Muslim community, lower socio-economic groups and non-diabetic individuals. There were no disabled individuals in the working group. Significant differences in quality of life (QOL) scores were observed across all four domains. In the physical health domain, QOL was significantly better among males, the younger old age group, married individuals, the unemployed, those from higher socio-economic backgrounds and non-diabetic individuals. In the environmental domain, females, individuals from other castes, the old-very old age group, literate individuals and non-diabetic individuals had better QOL compared to their counterparts. The psychological domain was significantly influenced by males, the younger old age group, married individuals, the unemployed and those without hypertension. Similarly, in the social relationship domain, males, individuals from the general caste, the younger old age group, married individuals, Hindus, illiterate individuals, the unemployed and those with pre-hypertension had better QOL compared to others.

RECOMMENDATIONS

The study findings suggest targeted interventions to improve quality of life (QOL) for disabled geriatric individuals, particularly among females, older age groups, and those in lower socio-economic groups. Additionally, interventions should address QOL disparities in various domains based on gender, age, marital status, employment, religion, caste and literacy status.

ACKNOWLEDGEMENT

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