

Intrinsic Capacity of Older People in Panchkhal Municipality of Nepal: A cross-sectional study

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Citation

Shrestha L, Neupane R, Paudel L, Manandhar N. Intrinsic Capacity of Older People in Panchkhal Municipality of Nepal: A cross-sectional study. *Kathmandu Univ Med J.* 2024;88(4):447-52.

ABSTRACT

Background

With the global trend of rising ageing population, health care to the elderly needs special focus as absence of disease merely does not mean that older people are healthy and have full functional ability. So, WHO introduced intrinsic capacity to define healthy ageing.

Objective

To find the prevalence of decline in intrinsic capacity in older people of Panchkhal Municipality.

Method

A community based cross-sectional observational study was conducted in 5 simple randomly selected wards of Panchkhal Municipality of Nepal. Total sample sizes of 848 data were collected using proportionate convenience sampling. Data collection techniques were interview with observation using predesigned proforma containing WHO (Integrated Care for Older People-ICOPE) tool.

Result

The prevalence of decline in intrinsic capacity of older people in Panchkhal Municipality was 86.9%. The decline in individual domains was visual acuity 58.0 % followed by cognition 48.9%, locomotion 48.8%, hearing ability 38.6%, vitality 38.0% and psychology 28.5%. The mean age was 71.18 ± 8.769 years (60-100). The majority of older people were male 55.8%, Hindu 91.7%, had joint family 77.7% and illiterate 60.3%. There was significant moderate positive correlation of age with decline in locomotion ($r=0.469$, $p=0.029$), hearing ability ($r=0.312$, $p=0.032$), cognitive ability ($r=0.209$, $p=0.034$) and low negative correlation of age with vitality ($r=-0.161$, $p=0.035$), psychology ($r=-0.130$, $p=0.034$), visual acuity ($r=-0.126$, $p=0.034$).

Conclusion

There was a high prevalence of decline in intrinsic capacity of the older people from Panchkhal Municipality. Special and focused care is required for older people from the government along with implementation of WHO-Integrated Care for Older People-ICOPE tool in every healthcare setting to promote healthy ageing.

KEY WORDS

Capacity, Integrated care for older people (ICOPE), Intrinsic, Nepal

INTRODUCTION

Global population is aging rapidly, care to older people need special focus as absence of disease in them does not necessarily mean they have full functional ability and are healthy.¹ So, World Health Organization (WHO) in 2015 introduced term intrinsic capacity (IC) to help define healthy ageing.² To assess this, Integrated Care for Older People (ICOPE) guidelines and screening tool were developed by WHO in 2017.^{3,4} Intrinsic Capacity is tested on six domains under Cognition, Mobility, Vitality (Malnutrition), Sensory functions (Visual and Hearing) and Psychology (Emotion) using ICOPE screening tool. Decline in intrinsic capacity (DIC) is associated with increased risks of dependence and death.⁵ Older people with higher education, higher socioeconomic status, healthy food behaviors and active lifestyles are less likely to have decline in intrinsic capacity.⁶⁻¹⁰

ICOPE screening tool can even be used in home, community or primary care center without involvement of geriatricians or specialized care center. So, this can be used even in Lower to Middle Income Countries very cost effectively where health personnel's and health facilities are in suboptimal level.⁵ Also, it is found that care to older people by focusing on intrinsic capacity is more effective than focusing on specific chronic diseases.¹¹⁻¹³

There is a lack of focus on older people care in Nepal as evidenced by very few Geriatricians in Nepal. So, this study aims to identify the prevalence of older people with decline in intrinsic capacity.

METHODS

A community based cross-sectional study was conducted in 5 randomly selected wards (Ward No. 4, 5, 6, 10, 12) out of 13 wards of Panchkhal Municipality of Kavrepalanchowk District, Nepal. Data were collected from 5th May, 2023 to 6th June, 2023. Data collection tool contained a demographic profile and WHO ICOPE screening tool and data collection technique was interview with observation. Samples were selected proportionate to the number of households in each ward using random method of house selection.

Sample size was determined using the formula:

$$n = \frac{z^2pqN}{e^2(N-1) + z^2pq}$$

$p = 50\% = 0.50$ (assuming for maximum sample size)
 $q = 1 - p = 1 - 0.50 = 0.50$
 $Z = 1.96$ (for a 95% confidence interval)
 $E = \pm 0.03$
 $N = \text{Population size (estimated number of HHs) } 2400$
 $\text{Sample size} = 690$
 Considering 5% non-response rate, final sample size: 848

Data were collected from every household with an older person encountered during data collection. Inclusion criteria was older people of age ≥ 60 years of both sexes and older people with severe cognitive decline who were unable to understand and respond questions asked, those with severe chronic illness/debility like severe osteoarthritis, congestive heart failure, uncontrolled chronic obstructive pulmonary disease, malignant hypertension etc. were excluded from study. Data collectors were trained for two days using WHO ICOPE screening tool for data collection.

Any older person not able to recall three common words or not oriented to time (on asking full date today) and space (current location) were considered as having -cognitive decline and unable to rise five times from chair without using arm support in 14 sec were considered as having-limited mobility. People having loss of appetite or recent unintentional weight loss (more than three kg over three months) were considered as having- malnutrition. Persons unable to hear a whisper (whisper test from 60 cm) were considered as having hearing loss and any person having problem with eyes (difficulties in seeing far or reading or having eye disease under medical treatment like diabetes and hypertension) as having- visual impairment. Finally, persons with little interest or pleasure in doing things or feeling down, depressed or hopeless in the past two weeks were considered as having- depressive symptoms.

Ethical approval was obtained from the Institutional Review Committee, Nepalese Army Institute of Health Sciences (No. 851) in April, 2023. Written informed consent in local language was taken from each participant before data collection. The confidentiality of participants will be highly regarded and maintained. Only the data included in the main manuscript will be made available for the readers.

During data collection, households with older people were identified with help from the ward office and data were collected through individual household visits. During data collection, only one older people who can communicate well and youngest old from each household were taken even in households with multiple older people present.

After data collection, data were entered in Statistical Package for Social Science (SPSS) version 22 and analyzed. Continuous variables were expressed in terms of mean/standard deviation, median/inter quartile range. Categorical variables were expressed in terms of number and percentages. In data analysis, chi-square test was performed. Age was measured in ratio scale which was non normal distributed. Intrinsic capacity variables were measured in ordinal scale so Spearman's correlation was used to find the association between age and intrinsic capacity variables. The p value less than 0.05 was considered statistically significant.

RESULTS

A total sample of 848 data were collected from older people. The mean age was 71.18 ± 8.769 years (Range: 60-100 years). The majority of older people were male 55.8% and 48.9% were among 60-70 years age group. The majorities were living in a joint family 77.7% and 60% of them had spouses while two were not married till now. Most of the participants, 87.8% did not have formal education and majority of them 60.3% were illiterate with only 2.4% having higher secondary level education. The major ethnic group was Brahmin 42.5% followed by Danuwar 15.6% and Newar 13.4%. The major religion followed was Hindu 91.7% followed by Buddhist 5.3% with Muslim 0.1% and one Atheist 0.1% (Table 1).

Table 1. Demographic information of the respondents (n=848)

Demographic variable	Number of respondents	Percentage (%)	
Age (Years)	60-69	415	48.9
	70-79	275	32.5
	≥ 80	158	18.6
Sex	Male	473	55.8
	Female	375	44.2
Type of Family	Nuclear	189	22.3
	Joint	659	77.7
Marital Status	Married	509	60.0
	Widow	236	27.8
	Widower	101	11.9
	Unmarried	2	0.2
Level of Education	Illiterate	511	60.3
	Literate	233	27.5
	Primary	43	5.1
	Secondary	41	4.8
Ethnicity	Higher Secondary	20	2.4
	Brahmin	360	42.5
	Chhetri	93	11.0
	Newar	114	13.4
	Tamang	79	9.3
	Dalit	70	8.3
Religion	Danuwar	132	15.6
	Hindu	778	91.7
	Buddhist	45	5.3
	Christian	23	2.7
	Muslim	1	0.1
Atheists	1	0.1	

The overall decline in intrinsic capacity was 86.9% with maximum decline observed in visual acuity 58% followed by cognitive ability 48.9% and locomotion 48.8% (Table 2).

Disorientation to time or space was seen in 32.0% of females and even 46.1% of the females could not recall three common words. Almost half (48.5%) of illiterate

Table 2. Prevalence of decline in intrinsic capacity (n= 848)

Individual Domains of Intrinsic Capacity	Prevalence (%)
Cognitive Ability	48.9
Locomotion	48.8
Vitality	38
Hearing Ability	38.6
Visual Acuity	58
Psychology	28.5

people could not recall three common words and more than one third (37.3%) were disoriented to time and place. Limited mobility was found in 60.8% of females, 60.7% of literate peoples and 82.7% of older people > 71 years of age (Table 3).

There was loss of weight (more than or equal to 3 kg in 3 months) in 22.9% of females, 24.1% of illiterate people and 25.9% of people > 71 years. Loss of appetite was present in 30.3% of illiterate people and 49.0% of people > 71 years. Visual impairment was present in 58.5% of older people with secondary level of education and 50% of them with higher secondary level education along with 45.3% of > 71 years. Hearing loss was present in 44.5% of females, 44.6% of illiterate people and 53.8% of older people > 71 years (Table 4).

In the last two weeks, 28.57% of illiterate people had episodes of feeling down and even 25.04% of them had little interest in previously pleasurable activities. One atheist with 40% Buddhists also had episodes of feeling down. People > 71 years had episodes of feeling down and loss of interest in activities 29.46% and 27.08% respectively (Table 5).

There was significant correlation of age with intrinsic capacity. Moderate positive correlation was observed with limited mobility ($r=0.469$, $p=0.029$), hearing loss ($r=0.312$, $p=0.032$) and cognitive decline ($r=0.209$, $p=0.034$) and negative weak correlation was observed with malnutrition ($r=-0.161$, $p=0.035$), depressive symptoms ($r=-0.130$, $p=0.034$) and visual impairment ($r=-0.126$, $p=0.034$) (Table 6).

DISCUSSION

With increase in age, physical and mental functions decline. So, absence of identifiable disease does not merely mean that older people have full functional ability to be able to do what they have reason to value for.² Thus, care of elderly should not be focused only in disease but to their functional ability and it is better assessed by intrinsic capacity.¹⁴⁻¹⁶

The mean age participant of present study was 71.18 (± 8.769) years which is less than the finding of a descriptive cross-sectional study in Hong Kong by Leuyng et al. where it was 76.73 (± 7.25) years.¹⁷ This might be due to low life-expectancy of Nepal as compared to Hong Kong.^{18,19}

Table 3. Prevalence of decline in intrinsic capacity (n= 848)

Demographics variable		Cognitive Ability				Locomotion	
		Disorientated to time or place		Cannot recall three words		Cannot do chair rise test	
		n (%)	p -value	n(%)	p - value	n (%)	p - value
Sex	Male	133 (28.1)	0.220	183 (38.7)	0.029	229(48.4)	<0.001
	Female	120 (32.0)		173 (46.1)		228(60.8)	
Education	Illiterate	191 (37.4)	<0.001	248 (48.5)	<0.001	310 (60.7)	<0.001
	Literate	51 (21.9)		78 (33.5)		112 (48.1)	
	Primary	7 (16)		16 (37)		15 (35)	
	Secondary	1 (2)		8 (20)		15 (37)	
	Higher Secondary	3 (15)		6 (30)		5(25)	
Age	≤ 71	122 (23.8)	<0.001	169 (33.0)	<0.001	179(34.9)	<0.001
	> 72	131 (39.0)		187 (55.6)		278(82.7)	

Table 5. Comparison of Vitality, Visual Acuity, Hearing Ability with Age, Sex and Education (n=848)

Demographics Variable		Malnutrition (Vitality)				Visual Acuity		Hearing Ability	
		Weight loss 3kg in 3 months		Loss of appetite		Visual Impairment		Hearing loss	
		n (%)	p -value	n (%)	p -value	n (%)	p - value	n(%)	p -value
Sex	Male	105 (22.2)	0.799	115(24.3)	0.058	195 (41.2)	0.617	160(33.8)	<0.001
	Female	86 (22.9)		113(30.1)		161 (42.9)		167(44.5)	
Education	Illiterate	123 (24.1)	0.518	155(30.3)	0.033	195 (38.2)	0.034	228(44.6)	<0.001
	Literate	51 (21.9)		52(22.3)		109 (46.8)		72 (30.9)	
	Primary	8 (18.6)		12 (27.9)		18 (41.9)		11 (25.6)	
	Secondary	6 (15)		7 (17)		24 (58)		9 (22)	
	Higher Secondary	3 (15)		2 (10)		10 (50)		7 (35)	
Age	≤ 71	104(20.3)	0.057	112(23.8)	<0.001	232 (45.3)	0.015	146 (28.5)	<0.001
	>72	87(25.9)		116(49.0)		124 (39.0)		181 (53.9)	

Table 5. Comparison of psychological functions with demographic features (n= 848)

Demographics variable		Psychological Functions			
		Feeling Down/ Depressed		Little interest or Pleasure in activities	
		n(%)	p-value	n(%)	p-value
Sex	Male	108 (22.8)	0.198	94 (19.9)	0.148
	Female	100 (26.7)		90 (24.0)	
Type of Family	Nuclear	53 (28.0)	0.203	44 (23.3)	0.549
	Joint	155 (23.5)		140 (21.2)	
Marital Status	Married	115 (22.6)	0.300	107 (21.0)	0.377
	Widow	67 (28.4)		59 (25.0)	
	Widower	26 (25.7)		18 (17.8)	
	Unmarried	0		0	
Education	Illiterate	146 (28.6)	0.015	128 (25.0)	0.05
	Literate	44 (18.9)		36 (15.5)	
	Primary	9 (21)		8 (19)	
	Secondary	7 (17)		9 (22)	
	Higher Secondary	2 (10)		3 (15)	

Ethnicity	Brahmin	72 (20.0)	0.061	78 (21.7)	0.869
	Chhetri	27 (29.0)		19 (20.4)	
	Newar	26 (31.9)		22 (15.3)	
	Tamang	26 (33)		16 (20)	
	Dalit	17 (24)		15 (21)	
	Danwar	40 (30.3)		34 (25.8)	
Religion	Hindu	188 (24.2)	0.006	173 (22.2)	0.549
	Buddhist	18 (40)		9 (20)	
	Christian	1 (4)		2 (9)	
	Muslim	0/1		0/1	
Age	Aethist	1/1		0/1	
	≤ 71	109 (21.3)	0.007	93 (18.2)	0.002
	>72	99 (29.5)		91 (27.1)	

The prevalence of decline in intrinsic capacity (86.9%) was higher than the findings of Leuyng et al. where it was 72.7%.¹⁷ The prevalence of decline in individual domains were cognition (48.9%), locomotion (48.8%), vision (58%), hearing capacity (38.6%), psychological well-being (28.5%), and vitality (38%) higher with compared to the findings of the descriptive cross-sectional study in Hong Kong by Leuyng et al. where these were 25.5%, 39.8%, 24.7%, 27.9%, 11.6% and 2.7% respectively.¹⁷ Also study done in China by Lina

Table 6. Correlation of Age with different domains of intrinsic capacity

Correlation of Age with domains of intrinsic capacity		Spearman correlation coefficient (r)	p-value
Cognitive decline	Disoriented to time and space	0.209	0.034
	Unable to recall three words	0.256	0.033
Limited mobility		0.469	0.029
Malnutrition	Weight loss	-0.090	0.035
	Loss of appetite	-0.161	0.035
Visual impairment		-0.126	0.034
Hearing loss		0.312	0.032
Depressive symptoms	Feeling depressed	-0.124	0.034
	Loss of interest	-0.130	0.034

et al. showed decline in the locomotion, cognition, vitality, sensory and psychological domains were 1039 (17.8%), 646 (11.1%), 735 (12.6%), 824 (14.2%) and 713 (12.2%), respectively.²³ This decline in this study is probably due to the majority of older people not gaining formal education or being illiterate. This is further supported by a cohort study by Si et al. which found that literate older person had significant higher intrinsic score as compared to illiterate older person.¹⁵ The study also showed that childhood environment, health and parental education had direct impact on intrinsic capacity at later life mostly in cognitive, sensory and psychological domains.¹⁵ Intrinsic Capacity decreased with increasing age, which is in accordance with the IC model and rationale that an individual's capacities will decline with aging.²⁴ On assessing the correlation of age with intrinsic capacity, present study found that with increase in age there is significant decline in locomotion, hearing ability and cognitive function which was similar to the findings of study done by Stolz et al.²⁰ Contrary to this study, the present study found that vitality, psychological symptoms and visual ability did not decline with age. The difference in visual ability might be due to higher

visual acuity required for young older peoples for reading newspaper, books with secondary or higher secondary level education requiring use of glasses in contrast to the majority of illiterate older people not requiring or using glass and thus complaining of visual difficulty.

The difference in psychological symptoms might be due to the fact that most older people living in joint families in Nepal are free of family burden with respect to decision making, economic aspects which are handled by their sons mainly and mostly spend their time by taking care of grandchildren.

A quasi-experimental study Lim et al. showed that healthy eating behaviors enhanced vitality and locomotion leading to increased functional ability among older and thus increase in intrinsic capacity suggesting that improper eating habits can cause decline in intrinsic capacity as seen by prevalence of decline in intrinsic capacity and prevalence of decline in locomotion and vitality in our study.^{6-10,21}

A cohort study by Travassoli et al. showed that large scale implementation ICOPE could be feasible in clinical practice showing that government of Nepal can implement ICOPE tool in clinical practice and promote healthy ageing.²² This study is cross-sectional. Future follow-up studies with a large population should be conducted to validate the WHO ICOPE screening tool as well as explore the longitudinal changes in Intrinsic capacity.

CONCLUSION

Only 13.1% of the older people from Panchkhal Municipality had optimal level of functioning in all domains of intrinsic capacity. This highlights that the healthy ageing of Nepalese population is very less. The family members need to take special and focused care required for older persons. The Nepal government has also need to increase the health facilities for older persons to improve the intrinsic capacity.

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