

## **Prevalence of Mild-Cognitive-Impairment and Depression among Elderly Clients in Selected Wards of Baraha Municipality: A Cross-Sectional Study**

Nirmala Pradhan<sup>1</sup>, Baikuntha Raj Adhikari<sup>2</sup>, Sami Lama<sup>1</sup>, Sharmila Shrestha<sup>3</sup>, Rambha Sigdel<sup>3</sup>

<sup>1</sup>Psychiatric Nursing Department, <sup>2</sup>Psychiatry Department, <sup>3</sup>Community Health Nursing Department; BP Koirala Institute of Health Sciences, Dharan, Nepal

### **Abstract**

**Introduction:** Mild-Cognitive-Impairment (MCI) is an intermediate state between normal cognitive ageing and dementia. Identification of MCI is thought to be crucial to early intervention.

**Objectives:** To assess Mild-Cognitive-Impairment and Depression among elderly clients and to find out the associations between Mild-Cognitive-Impairment and Depression and socio-demographic variables.

**Methods:** A descriptive, cross-sectional study design was adopted. A total of 115 elderly clients who fulfilled the selection criteria were enrolled using purposive sampling technique. Montreal Cognitive Assessment (MoCA) and Geriatric Depression Scale were used with Interview technique. Those elderly clients were selected from the 2 wards of Baraha Municipality.

**Results:** Majority of the subjects (68.7%) were from between 60-70 years. More of the elderly clients were females (54.8%). Maximum (81.7%) were illiterate. About 35.7% had the history of medical and psychiatric illness. From the total sample, 39.1% had issues with memory. In case of Montreal Cognitive Assessment (MoCA), 93.0% was screened with Mild-Cognitive-Impairment. And, 60.9% of the elderly clients were screened as Depression. With regard to the associations between mild cognitive impairment and selected demographic variables, significant associations were found with gender, education level, marital status and previous history of medical/ psychiatric history. The correlation between MoCA score and geriatric depression score showed a negative relationship.

**Conclusion:** Many elderly people in a community have Mild-Cognitive-Impairment and Depression. This study added evidence on prevalence of Mild-Cognitive-Impairment and Depression among geriatric clients in a community-dwelling.

**Keywords:** Depression, Geriatric, Mild Cognitive Impairment

### **Introduction**

Ageing and the health transition in low- and middle-income countries are responsible for an unprecedented increase in the prevalence and societal impact of non-communicable diseases like mild cognitive impairment, dementia. With the world population ageing, the number of dementia patients worldwide will be increasing rapidly by 2040. However, the rates of increase

will not be uniform; the numbers in developed countries will increase by 100% by 2040 but by more than 300% in Asian and South American countries.<sup>1</sup> Memory loss is one of the most common complaints arising in consultations with elderly people, being reported by 25% to 50% of these individuals.

Mild Cognitive Impairment (MCI) is commonly referred to as the amnesic type which requires a subjective complaint of memory loss, impairment on a memory test after correction for age and education, preserved general

### **Address for correspondence**

Nirmala Pradhan, Associate Professor  
Department of Psychiatric Nursing  
BP Koirala Institute of Health Sciences, Dharan  
Email: neeru.213@gmail.com

cognitive functioning, intact activities of daily living and absence of dementia.<sup>2</sup>

The exact cause of MCI is unknown, but it is believed to be a heterogeneous condition of numerous causes. Memory impairment may be due to underlying depression, neuroticism, anxiety, fatigue, stress, chronic pain, sleep disorder, substance abuse, and adverse effects of medications or serious medical conditions.<sup>3</sup>

Depression is primarily a mood disorder, but it can also be viewed as a cognitive disorder for many older adults. In community samples, the co-occurrence of depression and cognitive impairment doubles every 5 years after the age of 70 years, and they are estimated to co-occur among at least 25% of persons older than 85 years.<sup>4</sup> One of the clinical implications of the co-occurrence of depression and cognitive impairment is that there is a higher risk of adverse outcomes for physical health, functional status, and mortality than from each condition alone.<sup>5</sup> Moreover, research suggests that depression in late life may be a prodromal symptom of Alzheimer disease or a risk factor for dementia in general.<sup>6</sup>

Cognitive impairment and depression are often seen as co-morbid conditions and major mental health problems affecting older people.<sup>7</sup> The worldwide prevalence of late-life depression was estimated to range from 3% to 30% and depression may significantly affect the quality of life.<sup>8</sup> Studies have revealed that in community-dwelling and institutionalized elderly people, the prevalence of depression was 9% and 25%, respectively.<sup>9</sup> Several studies showed that the prevalence rate of depression in elderly Chinese people ranged from 4% to

26.5%.<sup>10</sup> Clinicians often fail to diagnose and treat depression in elderly people.

Estimating the population prevalence of mild cognitive impairment (MCI) in low income country like Nepal is a public health priority as rapid demographic ageing is predicted to result in a large majority of people residing in our country being at risk of dementia and cognitive decline. If so, this will have significant implications with regard to social support and future health care costs, especially as systems are not in place to cope with increased neurodegenerative disease and health resources at present are already extremely limited. In our country, as family is expected to be the primary source of care going forward, also in Asian populations, knowing the wide occurrence of mild cognitive impairment and depression is, therefore, of great salience and importance.

### **Objectives**

The objectives of the study were:

- To assess the prevalence of Mild-Cognitive-Impairment and Depression;
- To find out the association between the Mild-Cognitive-Impairment, Depression and the selected socio-demographic variables and
- To assess the correlation between Mild-Cognitive-Impairment and Depression among elderly clients.

### **Materials and Methods**

#### **Research Design:**

A descriptive cross-sectional research design was adopted in this study.

#### **Setting:**

This study was carried out in ward No. 3 and 4 of Baraha Municipality, which lies in the eastern part of Nepal. These wards were selected

randomly and as per the feasibility of the researchers.

**Participants:**

The study participants were all elderly clients who were at the age of 60 years and above. After considering the eligibility criteria and using purposive sampling technique, a total of 115 elderly clients were enrolled.

**Sample size:**

The sample size estimated was 115. The basis of the sample size estimation was extracted from a study done by Blake J. Lawrence, Natalie Gasson and Andrea M. Loftus in Australia on Prevalence and subtypes of mild cognitive impairment in Parkinsons' disease.<sup>11</sup> The prevalence was 64%. Taking this prevalence rate for the estimation of the sample size and applying the formula  $4pq/L^2$

Where,  $p = 64\%$

$$q = 36$$

$$L = 15\% \text{ of } p$$

$$= 15 \times 64/100$$

$$= 9.6$$

$$n = 4pq/L^2$$

$$= 4 \times 64 \times 36 = 9216/ 92.16 = 100$$

$$(9.6)^2$$

Adding 15% of non-response = 15

$$15+100= 115$$

**Research Instrument:**

It consisted of three sections, section A was related to socio-demographic profile, Section B was MoCA (Montreal Cognitive Assessment) which is a rapid screening instrument for mild cognitive dysfunction. It assesses different cognitive domains: attention and concentration, executive functions, memory, language, visuoconstructional skills, conceptual thinking, calculations and orientation. It takes 10 mins. The possible score is 30, a score of 26 or above

is considered normal. This instrument is standardized where its reliability is  $\alpha = 0.82$ . Section C is Geriatric Depression Scale which is again a screening tool for depression among geriatric population. It is a standardized tool. This tool was translated in Nepali version by Risal A, E Giri, O Shrestha, S Manadhar, D Kunwar, R Amatya<sup>12</sup> and the same version was adopted in this study. The reliability of the tool was  $\alpha = 0.79$ . It is a self-administered questionnaire and consists of 15 items. The patient has to give the responses in Yes/ No form where the statements are in both negative and positive format. Reversed scoring is done for negative items. A score of 0-5 is normal. A score of greater than 5 suggests depression.

**Results**

**Socio-demographic profile:**

In regard to the socio-demographic profile, 68.7% of the elderly clients were in between the age group of 60-70 years with the mean and SD (68.23  $\pm$  7.51). Maximum were female respondents, i.e. 54.8%. Majority of the clients (81.7%) were not formally educated and 95.7% were Hindu by religion. Most of the elderly clients in this study (53%) were from Brahmin/ Chettri ethnicity. Sixty-seven percentages of the elderly clients were previously farmers by occupation. Maximum (87%) of the elderly clients were from joint family type. About 35.7% of the elderly clients reported the history of medical/ psychiatric illnesses in the family. On further enquiry, 19.5% were of psychiatric illnesses and 80.49% diagnosed as medical conditions. About 32.2% of the elderly clients reported the use of their regular medications. Nearly two fifths of the elderly clients (39.1%) acknowledged that they had experienced issues with their memories.

**Montreal Cognitive Assessment (MoCA) Score**  
 From the total sample, majority of the elderly clients 93% were screened with Mild-Cognitive-Impairment [Shown in Table 1].

**Table 1: Montreal Cognitive Assessment (MoCA) Score (n= 115)**

Levels	Frequency (%)
Normal	8 (7.0)
Mild-Cognitive-Impairment	107 (93.0)

**Geriatric Depression Score**

In case of geriatric depression, 60.9% were screened with depression [Shown in Table 2].

**Table 2: Geriatric Depression Score (n= 115)**

Levels	Frequency (%)
Normal	45 (39.1)
Depression	70 (60.9)

**Comparison of scores between Mild-Cognitive-Impairment and Geriatric Depression**

In this section, the scores of above two variables with the selected demographic variables such as age, gender, educational level, marital status and issues with the memory were compared. In age,

**Table 3: Comparison of scores of Mild-Cognitive-Impairment and Geriatric depression with regard to the socio-demographic profile (n= 115)**

Socio-demographic Variables	MoCA		Geriatric Depression	
	Mild-Cognitive-Impairment	Normal	No Depression	Depression
	Frequency (%)	Frequency (%)	Frequency (%)	Frequency (%)
<b>Age</b>				
60-70 years	74 (93.7)	5 (6.3)	32 (40.5)	47 (59.5)
71-80 years	33 (41.8)	3 (3.8)	13 (16.5)	23 (29.1)
	Mean & SD (68.23± 7.51)			
<b>Gender</b>				
Male	44 (38.3)	8 (7.0)	20 (17.4)	32 (27.8)
Female	63 (54.8)	-	25 (21.7)	38 (33.0)

93.7% belonged to age 60-70 years were screened with Mild-Cognitive-Impairment. While, 59.5% of the elderly clients who belonged to the same age group were screened with Depression.

In regard to gender, females showed higher range of scores in case of both Mild-Cognitive-Impairment and Depression which was 54.8% and 33% respectively. Similarly, in educational levels, no formal education groups reported higher scores in case of both Mild-Cognitive-Impairment and Depression which were 78.3% and 52.2%.

Likewise, in case of marital status, married elderly clients' score was higher as compared to the widow/ widower/ single in both cases of Mild-Cognitive-Impairment and geriatric depression which accounted to be 90.1% and 56.3% respectively.

Finally, in regard to the issues experienced by the elderly clients in memory, 49.4% were screened with Mild-Cognitive-Impairment while only 26.6% were screened with geriatric depression. [Shown in table 3]

<b>Educational Level</b>				
No formal Education	90 (78.3)	4 (3.5)	34 (29.6)	60 (52.2)
Formal	17 (14.8)	4 (3.5)	11 (9.6)	10 (8.7)
<b>Marital Status</b>				
Married	64 (90.1)	7 (9.9)	31 (43.7)	40 (56.3)
Widow/Widower/Single	43 (97.7)	1 (2.3)	14 (31.8)	30 (68.2)
<b>Have you ever felt that you have been experiencing issues with your memory</b>				
Yes	39 (49.4)	6 (7.6)	24 (30.4)	21 (26.6)
No	68 (86.1)	2 (2.5)	21 (26.6)	49 (62.0)

**Association between Mild Cognitive Impairment (MoCA) and socio-demographic variables:**

A significant association was found with only three variables which were educational level, history of medical/psychiatric illnesses in their family and their feeling that they had ever experienced any issues with their memory.

**Association between geriatric depression and socio-demographic variables**

A significant association was found with only one variable which was on: ‘have you ever felt that you have been experiencing issues with your memory?’

**Correlation between Mild-Cognitive-Impairment (MoCA) score and Geriatric depression score:**

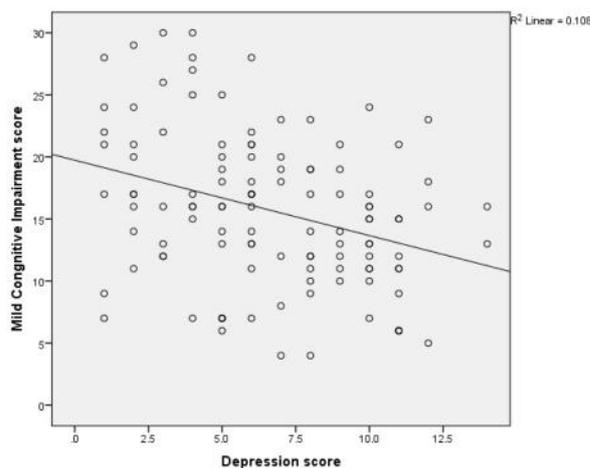
The correlation result showed a significant negative correlation between Mild-Cognitive-Impairment and Geriatric Depression Scores. This meant as when the score of Mild-Cognitive-Impairment increases the score of geriatric depression decreases [Shown in Table 4].

**Discussion**

This present study is a cross sectional study which was conducted to evaluate the prevalence of Mild-Cognitive-Impairment and Depression

**Table 4: Correlation between Mild-Cognitive-Impairment (MoCA) scores and Geriatric depression score**

Scores	Mean ± SD	‘r’ Value	‘P’ Value
MoCA	15.71 ± 6.101	- 0.32	0.01
Geriatric Depression	6.63 ± 3.297		



**Figure 1: Correlation between Mild-Cognitive-Impairment and Geriatric Depression Scores**

among the population of 60 years and older who were dwelling in Baraha Municipality, eastern Nepal.

*Socio-demographic profile:*

***Age and Gender:***

In this study, majority of the elderly clients 68.7% were from the age group of 60-70 years. This finding is supported by a study conducted by Kumar N<sup>13</sup> where the maximum of the elderly clients (61.78%) were from the age group of 60-65 years old. In regard to gender, 54.8% represented were females. This finding corresponds to the study of Alcibiades E. Villarreal, Shantal Grajales, where majority of the subjects were female 66%.<sup>14</sup> Similarly, another supporting study by Mohan D, Iype T, Varghese S, Mohan A and Mohan, also found that the majority of the samples represented were females (62%).<sup>15</sup> A study conducted in Kavre district, Nepal on geriatric depression also supported our findings where more than half of them were females (54.2%).<sup>16</sup>

***Educational status and Previous Occupation of the elderly clients:***

In regard to the educational status, 81.7% of the elderly clients were illiterate or had no formal education. This finding is sustained with the study of Kumar N, Sudhakar TP in India, where majority 67.1% of the elderly clients were illiterate.<sup>17</sup> A study conducted in B. P. Koirala Institute of Health Sciences, OPD of Psychiatry also supported the finding of the present study.<sup>18</sup> These similarities in findings may be because both the countries Nepal and India do not consider education to be of prime importance in elderly groups and that can be the reason for not given much emphasis on it.

The majority of the elderly clients' previous occupation was farming while the least represented homemaker was only 19%. These present findings were contradicted by the study

of Mohan D, Iype T, Varghese S, Mohan A and Mohan M<sup>15</sup> where majority of the subjects were pensioner (29%) while homemaker accounted of only 28%. While on the contrary, a study by Nepal S et al. in eastern region of Nepal, revealed majority of the older clients which is 37.6% were farming by occupation and least were housewives accounted to be only 1.4%.<sup>19</sup>

***Issues with memory complaints:***

In our study, 39% reported with their memory complaints and this is congruent with the findings of Bista A and Joshi S which was conducted in Kathmandu.<sup>20</sup> Another similar finding was reported from Saudi Arabia<sup>21</sup> which supported our finding with 37.4% with the issues with their memory.

***Mild Cognitive Impairment:***

The overall prevalence was 93% and this is the significant finding of this study. This finding is contradicted by the study conducted by Mohan D, Iype T, Varghese S, Mohan A and Mohan M where only 26% were found to be prevalence of Mild-Cognitive-Impairment.<sup>15</sup> Another contradicting finding by Genaro G. Ortiz, Elva D, Maria E. Flores in Mexico, found the prevalence rate to be only 13.8%.<sup>22</sup> These differences may be because of differences in lifestyles and educational background.

When looking into the prevalence of Mild-Cognitive-Impairment gender wise, higher prevalent was found in women which is almost 55% out of the total prevalence percentage rate. This finding is supported by the study of Mohan D, Iype T, Varghese S, Mohan A and Mohan M where 60.4% were women.<sup>15</sup>

***Geriatric Depression:***

Similarly, in regard with the prevalence of geriatric depression, it was 60% in our study.

This finding was contradicted with the study of Villarreal AE, Grajales S, Lopez L, Gabrielle B, where only 18% was found to be depressed.<sup>14</sup> Another study by Giri M also found the prevalence rate of 24.3% in China.<sup>13</sup> A contradicting finding to the present study was that only 29.7% of the geriatric reported of depression which was conducted in Kathmandu by Chalise HN and Laxmi Rai S.<sup>23</sup> On the contrary, a study done by Nepal S, Sapkota N, Kumar R, Deo BK, Mishra S reported that depression was the most common psychiatric diagnosis among geriatric population.<sup>19</sup>

In associative result, significant associations were found between education level and Mild-Cognitive-Impairment score. This finding was supported by the study done by Sengupta P in India, where significant association was found with the illiterate and Mild-Cognitive-

Impairment.<sup>24</sup> From this, we can understand how education level can impact on the mental health status of the population of the community.

### Conclusion

Previous studies have shown that in late life, co-existence of depression and cognitive impairment may contribute to an elderly person's vulnerability. This study has also added evidence on prevalence of mild cognitive impairment and depression among geriatric clients in a community-dwelling. Prevalence of Mild-Cognitive-Impairment in Nepal using Montreal Cognitive Assessment (MoCA) were in the upper range compared to the remaining developed countries. The high rate of risk factors for cognitive impairment in eastern Nepal is contributing to this finding.

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