RESEARCH ARTICLE

Cognitive Impairment among Elderlies from an Urban Setting

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Abstract :

Background: Cognitive impairment is part of the normal aging process, though it can be stimulated by various environmental and comorbid conditions. Elderlies are required to be inspected for their cognitive wellbeing to diagnose any impairment early enough, that need to be taken care in order to prevent any unexpected consequences associated with cognitive impairment. **Materials and Methods:** This is a cross-sectional type of study conducted during the period of January to December, 2019 among 105 elderly people (≥ 60 years) in a selected area of Mohammadpur Thana of Dhaka district. The assessment of cognitive impairment was done by the Mini Mental State Exam (MMSE) screening tool. Ethics and quality control of data was maintained throughout the study period. **Results:** This cross-sectional study observed 105 respondents aged over 60 years among which 44 (41.90%) respondents were male and 61 (58.1%) respondents were female. Cognitive impairment was prevalent among 27.62% of the respondents. The study results have showed that, the level of cognitive impairment of the elderlies had a relationship with age, educational level, marital status and housing status which was statistically significant ($p<0.05$). **Conclusion:** Further large-scale studies are required to evaluate how these factors affect the cognitive status and to determine the scope of intervention to enhance the quality of life of the elderlies.

Keywords: Elderlies, Aging, Cognition, Cognitive impairment

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Introduction:

A significant determinant of quality of life is functional independence, which is greatly disrupted by intensification of cognitive declination in old age[1]. Although, cognitive impairment among elderlies, is part of the normal aging process, it also can be precipitated and aggravated by substantial environmental and comorbid conditions[2]. Cognitive functions are mental processes, that are essential to carry out daily activities independently, which encompasses, the acquirement and processing of information and knowledge, skill of coordinating, reasoning, decision making and memorizing[3]. Reduced aptitudes in these functional areas, make elderlies vulnerable by increasing dependency on others for their daily activities, which also increases the risks of developing other physical and mental debilities and can make the late period of life even more strenuous. The world is undergoing a dramatic upturn in life expectancy, as well as the stride in population ageing is way faster

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than ever before and this drift is hypothesized to be even more rapid in future[4]. It is anticipated that, global elderly population will be increased by 21% within next 50 years with an 140% increase in the developing countries[5,6]. Thus, gradually it is fetching towards a global challenge to bear out the growing prevalence of cognitive decline worldwide[7]. Regarding cognitive function, dementia is considered as one of the main diagnostic criterion, the prevalence of which has been estimated at about 25 million during the year of 2000, which represents [6]. 1% of the population aged 65 years or above[8]. Cognitive impairments not only make an elderly's daily life challenging, but also can pose serious threat to the overall health condition[9]. Study results are suggestive of the fact that, cognitive declination can significantly attribute to psychological distress and depression[10]. Early assessment and intervention can improve the health and wellbeing of an older individual; on the other hand, the worsening of the condition can impact on personal and familial circumstance and increase the healthcare cost. Moreover, in presence of social taboo as well as negligent care attainment regarding mental health, estimate suggests that, only 10% of the elderly who mandates for psychiatric treatment, ever receives the required intervention[11].

The risk factors associated with diminishing cognitive function can be speculated in the domains of socio-economic, behavioral and nutritional background. Other contributory factors such as co-morbid conditions, traumatic injury, head injury can also play significant role to worsen the condition. Understanding these background factors is necessary to evaluate the scopes of improvement and intervention that can improve the quality of life of elderly. Thus, the present study intended to observe the level of cognitive impairment among the elderlies living in an urban setting and factors concomitant with the condition.

Materials and Methods:

With a cross-sectional type of study design, the present study has been conducted during the period of January to December, 2019 among 105 elderly people (≥ 60 years) in a selected area of Mohammadpur Thana in Dhaka district.

The study has been carried out after availing the ethical approval from the Institutional Review Board (IRB) of National Institute of Preventive and Social Medicine (NIPSOM).

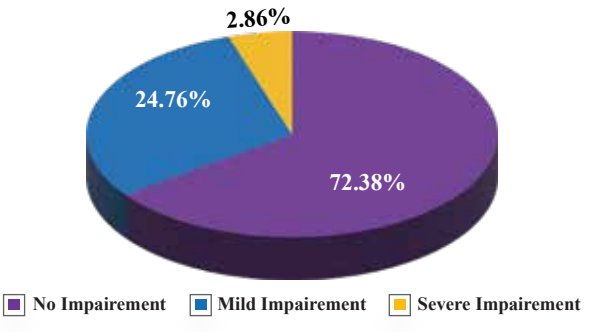
Data was collected through face-to-face interview in a semi-structured questionnaire following the attainment of informed written consent from the participants. Statistical analysis has been carried out with the use of IBM Software- Statistical package for Social Science (SPSS) version [25].

Mini Mental State Exam (MMSE) is a frequently used screening tool to assess cognitive declination in geriatric population, which has been used in this study to observe the level of cognitive impairment of the study participants[12].

Results :

In this study, 24.76% of the respondents showed mild cognitive impairment and 2.86% of the respondents showed severe cognitive impairment whereas, 66.30% respondents didn't exhibit any cognitive impairment (Figure I).

Figure I: Distribution of the respondents according to their level of cognitive impairement



Among the study subjects, cognitive impairment was dependent on their age, educational status, marital status and housing status ($p<0.05$), although the comorbid conditions and lifestyle attributes didn't show to impact the cognitive status according to this study, which may be explained by the small study sample and selection of study sample from a small study area. This study has observed that, the age group of 60 to 69 years constituted 19.70% of mildly cognitive impaired and 1.52% severely cognitive impaired respondents, whereas, age group of 70 to 79 years constituted 34.48% of mildly cognitive impaired respondents and age group of 80 to 90 years constituted 30.00% of mildly cognitive impaired and 1.52% severely cognitive impaired respondents ($p<0.05$). Regarding the educational status, the illiterate group of respondents showed to have highest percentage of mildly impaired (37.2%) and severely impaired (4.7%) respondents ($p<0.05$). Regarding the marital status not- married respondents found to be constituted more of the cognitive impaired respondents (mild impairment: 44.2% and severe impairment: 2.3%) than married group (mild impairment: 11.3% and severe impairment: 3.2%) ($p<0.05$). Respondents living in semi-concrete house constituted more percentage of cognitive impaired respondents (mild impairment: 47.6%) than who were living in the concrete-built houses (mild impairment: 19.0% and severe impairment: 3.6%) ($p<0.05$) (Table I).

Table I: Sociodemographic Attributes of Cognitive Impairment Among Elderlies

		No Cognitive Impairment (n1 =76)	Mild Cognitive Impairment (n2 = 26)	Severe Cognitive Impairment (n3 =3)	p- value
Age	60-69	52 (78.79%)	13 (19.70%)	1 (1.52%)	0.009
	70-79	19 (65.52%)	10 (34.48%)	0 (0.00%)	
	80-90	5 (50.00%)	3 (30.00%)	2 (20.00%)	
Gender	Male	35 (79.55%)	8 (18.18%)	1 (2.27%)	0.377
	Female	41 (67.21%)	18 (29.51%)	2 (3.28%)	
Educational status	Illiterate	25 (58.1%)	16 (37.2%)	2 (4.7%)	0.043
	Primary	9 (64.3%)	5 (35.7%)	0 (0.0%)	
	Secondary	14(73.7%)	5 (26.3%)	0(0.0%)	
	Higher secondary	5 (100.0%)	0 (0.0%)	0 (0.0%)	
	Graduation and above	23 (95.8%)	0 (0.0%)	1 (4.2%)	
Occupational status	Service holder	6 (75.0%)	2 (25.0%)	0 (0.0%)	0.517
	Businessman	9 (81.8%)	2 (18.2%)	0 (0.0%)	
	Day laborer	9 (75.0%)	3 (25.0%)	0 (0.0%)	
	Home maker	29 (80.6%)	5 (13.9%)	2 (5.6%)	
	Retired	76 (72.4%)	26 (24.8%)	3 (2.9%)	
Marital status	Married	53 (85.5%)	7 (11.3%)	2 (3.2%)	0.001
	Single	23 (53.5%)	19 (44.2%)	1 (2.3%)	
Monthly family income	8000-20000	18 (64.3%)	10 (35.7%)	0 (0.0%)	
	21000-50000	28 (71.8%)	8 (20.5%)	3 (7.7%)	

	51000-80000	19 (76.0%)	6 (24.0%)	0 (0.0%)	0.257
	81000-100000	11 (84.6%)	2 (15.4%)	0 (0.0%)	
	Nuclear	37 (72.5%)	13 (25.5%)	1 (2.0%)	
Type of	Joint	39 (72.2%)	13 (24.1%)	2 (3.7%)	0.86
family	1-4	40 (72.7%)	13 (23.6%)	2 (3.6%)	
	5-7	29 (74.4%)	9(23.1%)	1(2.6%)	
Number of	8-11	7 (63.6%)	4 (36.4%)	0 (0.0%)	0.869
family members	Concrete house	65 (77.4%)	16 (19.0%)	3 (3.6%)	
Housing status	Semi concrete house	11 (52.4%)	10 (47.6%)	0 (0.0%)	0.021

p value reached from chi-square test after adjusting with Fisher's exact

Among the co-morbid attributes, 31.5% of the hypertensive respondents showed mild cognitive impairment while 1.9% hypertensive respondents showed severe cognitive impairment. Among the diabetic respondents, 31.11% respondents showed mild cognitive impairment and 2.22% respondents showed severe cognitive impairment. Respondents who suffered from stroke among them 16.67% had mild cognitive impairment and 8.33% had severe cognitive impairment (Table II).

Table II: Comorbid Conditions and Cognitive Impairment Among Elderlies

		No Cognitive Impairment (n1 =76)	Mild Cognitive Impairment (n2 = 26)	Severe Cognitive Impairment (n3 =3)	p- value
Hypertension	**Yes**	36 (66.7%)	17 (31.5%)	1 (1.9%)	0.232
	No	40 (78.4%)	9 (17.6%)	2 (3.9%)	
Diabetic	**Yes**	30 (66.67%)	14 (31.11%)	1 (2.22%)	0.417
mellitus	**No**	46 (76.66%)	12 (20.0%)	2 (3.33%)	
	Yes	9 (75.0%%)	2 (16.67%)	1 (8.33%)	0.408
Stroke	**No**	67 (72.04%)	24 (25.81%)	2 (2.15%)	

p value reached from chi-square test after adjusting with Fisher's exact

In this study, among the overweight respondents, 30.3% of them showed to have mild cognitive impairment and 3.03% of them showed to have severe cognitive impairment. Among the obese respondents it has been observed that, 27.78% of them had mild cognitive impairment whereas, 2.78% had severe cognitive impairment. The fraction of respondents who used to do any sort of fitness activity found to be less prevalent with cognitive impairment (16.0%) than those who didn't do any fitness activities (31.2%). Among the tobacco consumers, 20.0% of them found to have mild cognitive impairment (Table III).

Table III: Lifestyle Attributes of Cognitive Impairment Among Elderlies

		No Cognitive Impairment (n1 =76)	Mild Cognitive Impairment (n2 = 26)	Severe Cognitive Impairment (n3 =3)	p-value
BMI	**Underweight**	5 (100.0%)	0 (0.0%)	0 (0.0%)	0.792
	Normal	24 (77.42%)	6 (19.35%)	1 (3.23%)	
	Overweight	22 (66.67%)	10 (30.3%)	1 (3.03%)	
	Obese	25 (69.44%)	10 (27.78%)	1 (2.78%)	
Fitness or recreational activities	**Yes**	21 (84.0%)	3 (12.0%)	1 (4.0%)	0.232
	No	55 (68.8%)	23 (28.7%)	2 (2.5%)	
Consumption of tobacco	**Yes**	16 (80.0%)	4(20.0%)	0(0.0%)	0.128
	No	20 (54.1%)	15 (40.5%)	2 (5.4%)	

p value reached from chi-square test after adjusting with Fisher's exact

Discussion :

This study has observed that, among the study participants, 27.62% showed to have cognitive impairment, majority of whom exhibited mild cognitive impairment (24.76%). Mild Cognitive Impairment (MCI) is the primary stage when there the conversion from normal state to age dependent cognitive alteration initiates, which may be presented as newly developed dementia[13]. The study results have showed that, among the socio-demographic attributes, the level of cognitive impairment of the elderlies was dependent on the age, educational level, marital status and housing status ($p<0.05$). The cognitive impairment found to be increasing with the association with age, decreasing with the association with the level of education ($p<0.05$). Cognitive impairment was more prevalent among the respondents whose marital status was single and who were living in the semi-concrete house. In the study by Hossain et al., they found that, 24.76% of the study respondents had cognitive impairment among whom, 21.6% had mild to moderate cognitive impairment and 6.3% had severe cognitive impairment which corresponds with our study findings[14]. Other studies have showed that, cognitive declination found to be increased with age[15–18]. In the study by Sherina et al., they found that, cognitive impairment among elderlies was significantly higher among the age group of above 70 years. In their study, female respondents were significantly more affected. Also, the respondents whose marital status was single whether being unmarried, single or widowed, were significantly more prevalent with cognitive declination. Educational status was also a factor found to be associated with cognitive impairment in their study as they found, elderlies with lower level of education was more prevalent with cognitive impairment[2]. In the study by Soleimani et al., they found that the overall prevalence of cognitive impairment was 70.0% among the elderlies which was much higher than ours. In their research, among the elderlies, 37.0% had mild, 28.6% had moderate and 4.3% had severe cognitive impairment. They found that, female respondents and respondents aged more than 70 years were more affected[19]. In another study by Rashid et al., with the prevalence of 11%, cognitive impairment was linked with increasing age, being unmarried, living alone and being unemployed[20]. There are other studies, who found educational status to be a concerning factor for the baseline cognition level among elderlies[21,22]. This study didn't observe any significant difference of cognitive alteration among the groups with different lifestyle practices or among the groups existent with different co-morbid conditions. Although, lifestyle factors such as, regular exercise training stimulates physiological adaptations to improve physical performance, reduce chronic disease risk, and slow age-related cognitive decline[23].

Conclusion :

Cognitive impairment is common in older age group of people. Cognitive wellbeing and independence can facilitate the successful aging where the elderlies can be treasured as resources rather than subject of discontentment and burden to the family and society. According to the findings from this study, sociodemographic attributes were more important aspects to determine the cognitive wellbeing among elderlies. Among the sociodemographic variables, age, educational status, marital status and housing condition found to be significant attributes for the cognitive impairment among them. Early detection of cognitive impairment will help the patient and the family members to prepare and plan for the potential complications of this illness. To prevent undesirable consequences of cognitive impairment, it is important to detect the condition early and to imitate required treatment. Further large-scale study is recommended in order to evaluate the factors responsible for the aggravation of cognitive decline among elderlies in our country perspective.

References :

1. Cipriani G, Danti S, Picchi L, Nuti A, Fiorino MD, Cipriani G, et al. Daily functioning and dementia. Dementia & Neuropsychologia. 2020 Jun;14(2):93– 102.
2. Sherina MS, Rampal L, Mustaqim A. Cognitive impairment among the elderly in a rural community in Malaysia. Med J Malaysia. 2004 Jun;59(2):252–7.
3. Kiely KM. Cognitive Function. Encyclopedia of Quality of Life and Well- Being Research. 2014;974–8.
4. WHO. Ageing and health [Internet]. WHO webpage. 2016 [cited 2020 Feb 13]. Available from: https://www.who.int/news-room/fact-sheets/detail/ageing-and- health
5. National Institute on Aging. Why Population Aging Matters [Internet]. Rose Li Associates. 2007 [cited 2021 Apr 11]. Available from: https://roseliassociates.com/case-studies/pop-aging/
6. United Nations. World Population Prospects: The 2002 Revision Volume II: Sex and Age Distribution of Populations | Population Division [Internet]. 2003 [cited 2021 Apr 11]. Report No.: ST/ESA/SER.A/223. Available from: https://www.un.org/development/desa/pd/content/world-population-prospects-2002-revision-volume-ii-sex-and-age-distribution-populations
7. Langa KM. Cognitive Aging, Dementia, and the Future of an Aging Population [Internet]. Future Directions for the Demography of Aging: Proceedings of a Workshop. National Academies Press (US); 2018 [cited 2021 Apr 10]. Available from: https://www.ncbi.nlm.nih.gov/books/NBK513075/
8. Wimo A, Winblad B, Aguero-Torres H, von Strauss E. The magnitude of dementia occurrence in the world. Alzheimer Dis Assoc Disord. 2003 Jun;17(2):63–7.
9. CDC. Healthy Brain Initiative | Alzheimer's Disease and Healthy Aging | CDC [Internet]. [cited 2021 Apr 11]. Available from: https://www.cdc.gov/aging/healthybrain/
10. Kim BJ, Liu L, Cheung C, Ahn J. Effects of cognitive impairment and functional limitation on depressive symptoms among community-dwelling older Korean immigrants in the U.S. PLOS ONE. 2018 Mar 26;13(3):e0193092.
11. Lebowitz BD, Pearson JL, Schneider LS, Reynolds CF, Alexopoulos GS, Bruce ML, et al. Diagnosis and treatment of depression in late life. Consensus statement update. JAMA. 1997 Oct 8;278(14):1186–90.
12. Folstein MF, Folstein SE, McHugh PR. "Mini-mental state". A practical method for grading the cognitive state of patients for the clinician. J Psychiatr Res. 1975 Nov;12(3):189–98.
13. Petersen RC, Smith GE, Waring SC, Ivnik RJ, Tangalos EG, Kokmen E. Mild cognitive impairment: clinical characterization and outcome. Arch Neurol. 1999 Mar;56(3):303–8.
14 Hossain Z, Das JK, Fahim NF, Ali H, Khondoker M. Prevalence and predictors of cognitive impairment among the elderly in Bangladesh. J Public Health (Berl) [Internet]. 2021 May 5 [cited 2021 Jul 19]; Available from: https://-doi.org/10.1007/s10389-021-01569-z
15. Khan A, K A N, AM A. The prevalence of cognitive impairment and depression and their associated factors in an elderly population in two villages in Kedah, Malaysia. Malaysian Journal of Public Health Medicine. 2006 Jan 1;6:29–37.
16. Al-Jawad M, Rashid AK, Narayan KA. Prevalence of undetected cognitive impairment and depression in residents of an elderly care home. Med J Malaysia. 2007 Dec;62(5):375–9.
17. Melzer D, Ely M, Brayne C. Cognitive impairment in elderly people: population based estimate of the future in England, Scotland, and Wales. BMJ. 1997 Aug 23;315(7106):462.

18. Roberts RO, Geda YE, Knopman DS, Cha RH, Pankratz VS, Boeve BF, et al. The Mayo Clinic Study of Aging: design and sampling, participation, baseline measures and sample characteristics. Neuroepidemiology. 2008;30 (1): 58–69.
19. Soleimani R, Shokrgozar S, Fallahi M, Kafi H, Kiani M. An investigation into the prevalence of cognitive impairment and the performance of older adults in Guilan province. J Med Life. 2018;11(3):247–53.
20. Rashid AK, Azizah AM, Rohana S. Cognitive impairment among the elderly Malays living in rural Malaysia. Med J Malaysia. 2012 Apr;67(2):186–9.
21. Wilson RS, Hebert LE, Scherr PA, Barnes LL, Mendes de Leon CF, Evans DA. Educational attainment and cognitive decline in old age. Neurology. 2009 Feb 3;72(5):460–5.
22. Mouton CP, Espino DV. Health Screening in Older Women. AFP. 1999 Apr 1;59(7):1835.
23. Sherwood JJ, Inouye C, Webb SL, Zhou A, Anderson EA, Spink NS. Relationship between physical and cognitive performance in community dwelling, ethnically diverse older adults: a cross-sectional study. PeerJ [Internet]. 2019 Jan 7 [cited 2021 Apr 11];7. Available from: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6327882/