Original Article

BODY MASS INDEX AND COMMON GERIATRIC HEALTH PROBLEMS AMONG ELDERLY RETIRED ARMED FORCES PERSONNEL

Md Nasirul Haque Khan[1], Md Iqbal Kabir[2], Fatema Zerin Khan[3]

ABSTRACT

Background: Aging is universal and it is inescapable. Health problems of elderly people are a global emerging issue. Body mass index (BMI) is a test often used to help medical professionals to assess nutritional status along with overall fitness and risk for disease in elderly. This study was conducted to assess the BMI and common geriatric health problems among elderly retired armed forces personnel.

Methods*:* This cross-sectional study was conducted among purposively selected 226 elderly retired armed forces personnel in both outpatient and inpatient departments of the Combined Military Hospital (CMH), Dhaka Cantonment from July 2018 to June 2019. The study aimed to assess the association between BMI and common geriatric health problems. A questionnaire comprising of all the variables of interest were developed and used for data collection by face to face interview. Data were also collected by physical measurement and reviewing medical documents of the participants.

Results: Among the participants, majority (32.3%) had BMI ≥25, 31.9% had 23-24.9, 30.1% had 18.5-22.9 and 5.8% had <18.5 BMI group. Average number of morbidities per participant was 2.59. Out of all, 20.5% had hypertension, 13.7% had heart disease, 13.1% had diabetes, 12.5% had respiratory disease, 8.4% had dental disease, 7.5% had cataract, 7.5% had prostate enlargement, 5.8% had cancer, 5.6% had arthritis and 5.5% had ear disease. Association of BMI of participants with hypertension, heart disease was found statistically significant (p<0.05). No significant association was found with diabetes and respiratory disease (p<0.05).

Conclusion: Nutritional status of the elderly should be emphasized for prevention and control of health problems in retired armed forces elderly; for that BMI could be crucial indicator.

_____

1. *Deputy Commandant & CI, AFMI, Dhaka Cantonment, Dhaka*
2. *Professor & Director, Planning and Research, DGHS, Mohakhali, Dhaka*
3. *Commanding Officer, 71, Field Ambulance, Jashore Cantonment, Jashore*

 Correspondence:

Col Md Nasirul Haque Khan, Dy Comdt & CI
AFMI, Dhaka Cantonment;
e-mail: nasirbd726@yahoo.com;

INTRODUCTION

Aging is defined as a biological process with time dependent irreversible changes leading to progressive loss of functional capacity after the point of maturity.[1] So, ageing is an evitable biological and socialization process that starts at birth and ends at death. The organic process of ageing is called senescence, Study of these physical and psychological changes which are incident to old age is called gerontology and the care of the aged is called clinical gerontology or geriatrics.[2] The term elderly means the persons in the general group of people whose common characteristics are of advanced age. It includes old people, seniors, senior citizens, older adults, the elderly and elders. Elderly comprise the later part of life; the period of life after youth and middle age with references to deterioration. When old age begins, cannot be universally defined because it shifts according to the context. World Health Organization has agreed that 60 plus years may be usually denoted as old age and also recognized that the developing world often defines old age not by years, but by roles, loss of previous roles, or inability to make active contribution to society. Most developed Western countries set the age of 60 to 65 for retirement and old age social programs eligibility. Furthermore, the fact that life expectancy beyond 80 has become widespread and shifted the definition of old age. Gerontologists have recognized the diversity of old

age by defining sub-groups. They distinguished elderly as the young old (60 to 69), the middle old (70 to 79), and the very old (80 and above).[3] In the context of Bangladesh, people aged 60 years or above are considered as elderly. [4]

Except Africa all the countries of the world will have nearly a quarter or more of their populations at ages 60 and above by 2050. At present, two thirds of the world's older persons live in the developing regions, where their numbers are growing faster than in the developed regions. In 2050, it is expected that nearly 8 in 10 of the world's older persons will be living in the developing regions.[5] By 2030 about one sixth of the world's population will be aged over 60 years. Older people are the fastest growing population group in the world. Populations are aging most rapidly in developing countries. By 2030 Europe will be the oldest region with older people constituting 24% of the total population. The oldest country will be Japan (31%). Seven of the ten countries with largest populations in the world will be from developing countries. These countries are China, India, Brazil, Indonesia, Pakistan, Mexico and Bangladesh. The rate of increase of elderly populations is 5 times higher in developing countries than in many western countries. By 2025 India along with four other Asian countries (Bangladesh, Nepal, Pakistan and Myanmar) will account for about 17% of the world's total elderly population.[6] Bangladesh is the eighth largest and one of the most densely populated countries. As per United Nation, in 2017, population of Bangladesh was 164,320,556 with density 1266 persons per kilometer square - 2.19% of the total world population is located in this country. Bangladesh is currently undergoing a demographic transition and the proportion of the population 60 years and older is rapidly increasing in this country. Bangladesh's elderly population is one of the largest in the world in terms of absolute numbers. At present, Bangladesh is in top twelve developing countries and not an exception from the global phenomenon of demographic aging. As per report shown by Bangladesh Bureau of Statistics (BBS) Life expectancy trend is increasing by 0.60% every year. In 2017, the average life expectancy is 71.52 in Bangladesh whereas it was 67.7 years in 2010, 70.4 was in 2013. The increase in elderly population in Bangladesh during the period 1990-2025 is projected to be much faster (219%) than that of European countries such as Sweden (33%), UK (45%) or Germany (66%). As a result, day by day, aged people are increasing substantially and posing increasing number of medical and social problems. [7] On November 17, 2013, the cabinet of Bangladesh government has approved the 'National Policy on Older Persons" in line with United Nation's policy addressing their issues of social support, health and wellbeing. Cabinet, at the same time had declared the country's people aged 60 years or above as senior citizen. [8]

It is reported that around 95% of the elderly people in Bangladesh had experienced health problems among them mostly had multiple health problems. They mostly suffer from weakness, failing eyesight, hearing loss, high pressure, diabetes, heart diseases and other old age-related illness including dementia and Alzheimer diseases etc.

METHODS

This cross-sectional descriptive study was conducted in both outpatient and inpatient departments at CMH, Dhaka Cantonment during the period of July 2018 to June 2019. The study population comprised of retired Armed Forces Personnel aged 60 years and over reporting sick in CMH Dhaka, involving both outpatient and admitted patients during the time of data collection period. Total 226 elderly retired Armed Forces personnel were enrolled. During data collection, purposive type of non-probability sampling technique was used. Data were collected through a structured questionnaire and document review. Check list was prepared for physical measurements included height and weight of the participants. Measuring tape was used to measure individual's body height without foot wear and any head gear, taking in centimeter to the exact point of height (the nearest to 0.1 cm). Body weight was measured with a portable electronic weighing scale and noted in kilogram. After each interview, completeness and consistency of the questionnaires were checked. The data were thoroughly edited through checking and rechecking for quality control. Coding, editing, cleaning and categorization were done as required. Collected data were then transferred to master table as per the specific objectives and key variables. Data analysis was done by computer with the help of "Statistical Package for Social Science" (SPSS Software, Version 20.0). Descriptive statistics like frequency, distribution, mean, median, mode, range, standard deviation etc. were calculated by SPSS program. For inferential statistics non parametric test, Chi-square test (χ^2) was done to find out association between different variables. Fisher's exact test was done where more than 25% cells had count less than 5. Data were presented in the form of tables, graphs and charts etc. as per requirement. Informed consent of the patients was taken, both verbal and written, before data collection. Their privacy regarding personal as well as disease related information was maintained strictly.

RESULTS
Table I shows BMI classification according to WHO and Asia Pacific guidelines. Out of total respondents, majority 73(32.3%) were found to the BMI group 25 and above followed by 72(31.9%) were found in 23- 24.9 BMI group, 68 (30.1%) were belonged to the group 18.5-22.9 BMI and 13(5.8%) were found to BMI below 18.5 group. The mean BMI of the respondents were 24.07 with standard deviation (SD) ± 4.034.

Table I: Distribution of respondents by BMI (n=226)

BMI (Nutritional status)	Frequency	%
< 18.5 (Underweight)	13	5.8
18.5-22.9 (Normal)	68	30.1
23-24.9 (Over weight)	72	31.9
25 and above (Obese)	73	32.3
Total	**226**	**100.0**

Table II shows total 226 respondents had 586 diseases. Average number of morbidities per respondent was 2.59. Out of 226 respondents, 120 (20.5%) had hypertension, 80(13.7%) had heart disease, 77(13.1%) had diabetes, 73(12.5%) had respiratory disease, 49 (8.4%) had dental disease, 44(7.5%) had cataract, 44(7.5%) had prostate enlargement, 34(5.8%) had cancer, 33(5.6%) had arthritis and 32(5.5%) had ear disease.

Table II: Distribution of respondents by common health problems (n=226)

Common health problems	Frequency	%
Hypertension	120	20.5
Arthritis	33	5.6
Heart diseases	80	13.7
Cancer	34	5.8
Respiratory diseases	73	12.5
Diabetes	77	13.1
Cataract	44	7.5
Prostate enlargement	44	7.5
Ear disease	32	5.5
Dental disease	49	8.4
Total	**586**	**100.0**

Table III shows different BMI group of respondents on development of hypertension was found statistically

significant (p < 0.05).

Table III: Association between hypertension and BMI of respondents (n=226)

BMI of respondents	Hypertension		Total
	Yes	No	
<18.5 (Underweight)	3	10	13
	(1.3%)	(4.4%)	(5.8%)
18.5-22.9 (Normal)	33	35	68
	(14.6%)	(15.5%)	(30.1%)
23-24.9 (Over weight)	24	38	34
	(10.6%)	(16.8%)	(15.0%)
25 and above (Obese)	20	46	27
	(8.8%)	(20.4%)	(11.9%)
Total	73	120	106
	(32.3%)	(53.1%)	(46.9%)
Test of significance:	χ^2=8.160, df=3, p=0.043(p< 0.05)		

Table IV shows to detect the influence of different BMI group on development of heart disease; Chi-square test was done and was found statistically significant (p< 0.05).

Table IV: Association between heart disease and BMI of respondents (n=226)

BMI of respondents	Heart disease		Total
	Yes	No	
<18.5 (Underweight)	4	9	13
	(1.8%)	(4.0%)	(5.8%)
18.5-22.9 (Normal)	12	56	68
	(5.3%)	(24.8%)	(30.1%)
23-24.9 (Over weight)	35	37	72
	(15.5%)	(16.4%)	(31.9%)
25 and above (Obese)	29	44	73
	(12.8%)	(19.5%)	(32.3%)
Total	80	146	226
	(35.4%)	(64.6%)	(100.0%)
Test of significance	χ^2=15.586, df=3, p=0.001(p <0.05)		

Table V shows different BMI group of respondents on development of respiratory disease was not statistically significant (p< 0.05).

Table V: Association between respiratory disease and BMI of respondents (n=226)

BMI of respondents	Respiratory disease		Total
	Yes	No	
<18.5 (Underweight)	5 (2.2%)	8 (3.5%)	13 (5.8%)
18.5-22.9 (Normal)	24 (10.6%)	44 (19.5%)	68 (30.1%)
23-24.9 (Over weight)	24 (10.6%)	48 (21.2%)	72 (31.9%)
25 and above (Obese)	20 (8.8%)	53 (23.5%)	73 (32.3%)
Total	73 (32.3%)	153 (67.7%)	226 (100.0%)
Test of significance:	$\chi2$=1.342, df=3, p=0.719 (p> 0.05)		

Table VI shows the different BMI group of respondents on development of diabetes was statistically not significant (p< 0.05).

Table VI: Association between diabetes and BMI of respondents (n=226)

BMI of respondents	Diabetes		Total
	Yes	No	
<18.5 (Underweight)	2 (0.9%)	11 (4.9%)	13 (5.8%)
18.5-22.9 (Normal)	21 (9.3%)	47 (20.8%)	68 (30.1%)
23-24.9 (Over weight)	29 (12.8%)	43 (19.0%)	72 (31.9%)
25 and above (Obese)	25 (11.1%)	48 (21.2%)	73 (32.3%)
Total	77 (34.1%)	149 (65.9%)	226 (100.0%)
Test of significance	$\chi2$=3.564, df=3, p=0.312 (p< 0.05)		

DISCUSSION

Ageing is defined as a biological process with time dependent irreversible changes leading to progressive loss of functional capacity after the point of maturity[1]. According to the UN definition, elderly people are those people whose age is 60 years and above. World Health Organization has agreed that 60 plus years may be usually denoted as old age[3]. In the context of Bangladesh, people aged 60 years or above are considered as elderly[4]. Bangladesh has a total population of more than 15 million of whom 6.90% are aged 60 years and over.[9] It is projected to increase to 8% in 2020 and 17% by 2050.[10]

BMI is a calculation used to determine the level of body fat in some cases it can help a doctor determine overall fitness and risk of developing chronic diseases. Out of total respondents, majority 32.3% were found to the BMI group 25 and above (Obese) followed by 31.9% were found in 23-24.9 BMI group (Over weight), 30.1% were belonged to the group 18.5-22.9 BMI (Normal) and 5.8% were found to BMI below 18.5 group (Underweight). The mean BMI of the respondents were 24.07 with SD±4.034. In the present study it was found that, the association between hypertension, heart disease and BMI was found statistically significant (p < 0.05). A cross-sectional study was conducted by Thakur R P *et al.,* on health problem among the elderly in both the urban and rural in Pune, India and found that 20.4% had BMI below 18.5, while 26.1% had BMI above 25.[11] Another study was conducted by Chauhan P *et al.,* to study the morbidity pattern among elderly in a rural area of India and showed that 43.8% of the elderly were normal, 14.1% were overweight and 25.2% were obese and 16.9% of the elderly were found underweight.[12] In a similar study in India it was found that the mean BMI was 19.02 kg/m^2 and below 18 kg/m^2 in 49.61% of the study population.[13] The findings of this study differed with other studies, it might be due to physical inactivity, dietary, age and hereditary factor.

Among the all respondents 49.6% had the habit of regular physical exercise and 50.4% did not the habit of regular physical exercise. The study does not accord with the study findings of Reeves M J *et al.,* where the prevalence of regular physical activity was found 22.2%.[14] In this aspect, present study differed from that study, might be due to change of study place and health awareness. Sedentary behavior is an important risk factor for chronic disease morbidity and mortality in aging. However, there is a limited amount of information on the type and amount of activity needed to promote optimal health and function in older people. Pietro L D *et al.,* undertook a literature review of large population-based studies of physical activity

in older people and there is encouraging evidence that moderate levels of physical activity may provide protection from certain chronic diseases. Additionally, substantial health effects can be accrued independent of the fitness effects achieved through sustained vigorous activity. Thus, regular participation (i.e., 30 minutes/day on most days of the week) in activities of moderate intensity (such as walking, climbing stairs, biking, or yard work/gardening), which increase accumulated daily energy expenditure and maintain muscular strength, but may not be of sufficient intensity for improving fitness, should be encouraged in older adults.[15] Physical activity is important in the prevention of functional decline and increased survival, reduced incidence of falls and fractures, and has various cardiovascular health benefits. Apart from prevention of diseases, exercise also has an important role in improving function in some chronic diseases such as heart failure or chronic obstructive pulmonary disease.[16] Present study revealed that the association between heart disease and regular physical exercise was statistically significant (p< 0.05).

CONCLUSION

BMI is important and it is widely regarded that chances of having a longer and healthier life are improved by having a healthy BMI. Still, it is not the only factor for doctor to consider and not completely reliable assessment for every body type.

REFERENCES

1. Farah S, Karim M, Khatun UHS. Health problems of the elderly population in some selected urban slums of Dhaka city. J Bangladesh Coll Phys Surg 2015; 33(4): 202-206.
2. Park K. Park's textbook of preventive and social medicine. 24th ed. Jabalpur, India: Banarasi Bhanot Publishers; 2017.631.
3. Forman D, Berman A, McCabe C, Baim D, Wei J. PTCA in the elderly: The "young-old" versus the "old-old". Journal of the American Geriatrics Society 1992; 40(1): 19-22.
4. Doubova SV, Perez-Cuevas R, Espinosa-Alarcon P, Flore-Hernandez S. Social network types and functional dependency in older adults in Mexico. BMC Pub Health 2010; 10(104):104.
5. United Nations. World Population Ageing 2017. Available at: http://www.un.org/en/development/desa/populat

ion/publications/pdf/ageing/WPA2017_Highlights.pdf [Accessed 3 Jan. 2017].

6. United Nations. Department of economic and social affairs, population division (2012). World Population Prospects: The 2012 revision.

7. Hossain MR. Aging in Bangladesh and its population projection. Pakistan journal of social science 2005; 3(1): 62-67.

8. Kabir R, Kabir M, Uddin MSG, Ferdous N. Elderly population growth in Bangladesh: Preparedness in public and private sectors. IOSR Journal of Humanities and Social Science 2016; 21(8): 58-73.

9. BBS. Population census 2011.Preliminary report. Bangladesh Bureau of Statistics (BBS), Ministry of Planning, Dhaka, Bangladesh.2012.

10. Bangladesh Bureau of Statistics. Population census 2011: National report (Provisional). Dhaka: Ministry of Planning, Bangladesh. 2015; 12(4):36-40.

11. Thakur RP, Banerjee A, Nikumb VB. Health problems among the elderly: A cross-sectional study. Ann Med Health Sci Res 2013;3(1):19-25.

12. Chauhan P, Chandrashekar V. A study on morbidity pattern among the geriatric people of Venkatachalem village, Nellore District, AP. Indian Journal of Community Medicine 2013;1(2):48-53.

13. Purty AJ, Bazroy J, Kar M, Vasudevan K, Veliath A, Panda P. Morbidity pattern among the elderly population in the rural area of Tamil Nadu, India. Turk J Med Sci 2006;36:45-50.

14. Reeves MJ, Rafferty A P. Healthy lifestyle characteristic among adults in the United States, 2000. Arch Intern Med.2005; 165:854-857.

15. Pietro LD. Physical activity in aging: Changes in patterns and their relationship to health and function. Journal of Gerontology Series 2001;56A: 13-22.

16. Woo J. Relationships among diet, physical activity and other lifestyle factors and debilitating diseases in the elderly. European Journal of Clinical Nutrition 2000;54(3): 143-147.