

## **Gender differential in active ageing level: the case of older persons in a setting of Bangladesh**

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### **Abstract:**

**Background:** Active ageing policy concept can bring changes in existing strategies for the wellbeing of older persons and their societal status. Studies on active ageing are necessary to identify the determinant factors with their indicators for developing policies and programs regarding the population ageing. But there exists scarce of studies for identifying determinant factors and their indicators related to active ageing in Bangladesh. This study aims to measure active ageing level with the determinants and its gender differential based on the Active Ageing model developed by the World Health Organization.

**Materials and Methods:** Survey data (n= 700 older persons), gathered from a project organized at the Department of Population Science and Human Resource Development, University of Rajshahi, were used in this study. Exploratory factor analysis (EFA) has been used to identify the determinant factors and an active ageing index has been constructed by using the weighted index formula. Chi-square with the post hoc method has been applied to explore the gender differential of the active ageing level.

**Results:** The study found six determinant factors and overall active ageing level is in a lower stance. Results discovered that, in general, active ageing level of male older persons is significantly higher than females. A comprehensive analysis of gender differential in active ageing level showed no significant difference for male and female in the lower category of the active ageing level.

**Conclusion:** With proper identification of active ageing indicators, necessary steps can be implemented for improving wellbeing of older persons in Bangladesh. As overall active ageing level (AAL) for older persons is low, therefore, emphasize should be initiated to both genders for enhancing active ageing. Future study on measuring AAL should use more indicator variables based on World Health Organization's active ageing model and health related indicator variables should be collected by appropriate medical screening test (s). Moreover, for cost effective policy formulation and priority component selection for improving active ageing, relationship between AAL and indicator variables should be investigated.

**Key Word:** Active ageing, Activities of Daily Living, Bangladesh, Exploratory factor analysis, Older person.

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### **I. INTRODUCTION**

Population ageing is considered as the triumph as well as the burden of the fastest growing country rather a rigid enhancement of the duration of life in chronological aspects of life course [1,2]. In the 21<sup>st</sup> century, population ageing becomes a larger share of the total population where some evidence illustrates a faster rate of population ageing in developing countries compared to the developed countries [3]. Evidentially, Bangladesh is not free from this growing bane event [3–6]. The increase in the elderly population in Bangladesh is expected to be high in both absolute and relative terms. As the eighth largest densely populated country of the third world, Bangladesh has started to experience the emerging issue of population ageing [7] as a result of a faster increase in the number of elderly populations aged 60 and above due to the demographic transition. The total older persons were increased in Bangladesh from 1.9 million in 1974 to 10.4 million in 2010 [8]. It is also estimated that 7.4% of its population is elderly in the last census and projected to increase sharply around 20% in 2050 and

25% in 2070 [8,9]. The increase in the elderly population in Bangladesh during the period 1990 to 2025 is projected faster (219%) than any European countries[10].

The demographic transition as a result of fertility and mortality variation in Bangladesh is increasing the average life expectancy at older ages [11]. Besides, the quality of life of people, specifically ageing population, has been improved due to modernized and accessible health or medical facilities to all kind of people and awareness of the chronic disease[12]. Therefore, the life expectancy of old age population is also increasing, i.e., the average life expectancy of birth is increased from 45.38 years in 1960 to around 72.72 years in 2019 [13,14] and the female have a higher score than male [15]. As a result, the structure of the population pyramid undergoes a gradual decline from the present condition.

As well the family structure is also breaking down into nuclear type due to lack of social and welfare systems, conversion the values of urban and industrialization[16]. Traditional family care and care index show the cost of the long-term care burden associated with the change in population age structure that contributes to population ageing without traditional kin support[3]. Contemporarily, non-communicable diseases, morbidity and comorbidity are highly prevalent among the older generation that varied by gender. Therefore, the estimated cost of older healthcare is higher than any other ages[17,18]. Besides, the socio-economic context and health policies for the older population were different regarding the needs, resources and provided facilities of healthcare and health-policies in high-income countries to low-income countries[10]. Marital status, social support for women by their children and spouse, socioeconomic factors and educational attainment were important determinant for old-age mortality in Bangladesh [19]. But most of the policymakers concerned more on a reproductive and young adult to precise the country's growth and economy but older population remain ignored in the shadow.

As the policy framework, active ageing is a revised concept of the multifaced theories of ageing[20–22]. In the late '50s, active ageing conceptualized as the activities and significant role of elderly in the society[23] and developed to the non-traditional paradigm of delay in functional declines associated with the subjective wellbeing[24] and potential involvement in the socio-cultural affairs[20]. Theoretically, the active ageing concept is developed to utilize the older population in the socioeconomic aspects in familial and societal sectors by their direct involvement[20,22,25]functional engagement that enhances their life as well [24]. These studies effectively simplified and formalized the concept of active ageing. Meanwhile, World Health Organization developed the active ageing concept at the policy level for developing countries as “the process of optimizing opportunities for health, participation and security to enhance the quality of life as people age.” [2]. In this regard, active termed as the continuous involvement in socioeconomic, cultural and national affairs whereas the quality of life is their life-long perspectives [26,27]. This definition shifts the concept of active ageing from a narrow range to a broad range as it shifts from a need-based approach to a rights-based approach [28].

This concept has developed to coherently tie together deeply the fragmented policy domains. It emphasizes the need for action across multiple sectors and has the goal of ensuring the resourceful contribution of the older population to their familial and socioeconomic sectors[29]. However, active ageing can be determined by seven latent or unobserved factors including cross-cutting determinants i.e., gender and culture[2]. Studies of Haque et al., (2016) and Paul et al., (2012) identified the diversified active ageing factors and scores for different cultural perspectives. They also showed that gender is very crucial in different policy-making contexts[30–32]. World health organization also support this policy concept must be identified by cultural diversity [2]. We have formulated our study hypothesis based on the cultural diversification of the active ageing- that the active ageing and its factors in cultural perspectives of Bangladesh might not similar to the factors identified in the World Health Organization active ageing policy concept [2]. This research was, therefore, undertaken to assess the factors of active ageing by defining the factors with latent characteristics and estimate the level of active ageing in Bangladeshi cultural settings under the hypothesis. Gender differentials of active ageing have also been assessed in this study. So forth, it is expected that the result of the study will help to better understand the active ageing status for designing policies and programs for the older people in Bangladesh.

## II. MATERIAL AND METHODS

This quantitative study was carried out on older persons of Rajshahi city corporation, Bangladesh. A total of 700 older persons (both male and females) of aged  $\geq 60$  years were included in this study.

**Data:** This study used survey data from a project entitled ‘Aspects of Active Ageing for Older Persons at Rajshahi City in Bangladesh’ conducted at the Department of Population Science and Human Resource Development, University of Rajshahi. The data collection procedure followed the close-ended questionnaire and household survey method. The survey of the project collected data from 700 older persons (aged 60 years and more) residing at randomly selected five administrative wards of Rajshahi city corporation area in Bangladesh.

**Methods:** For satisfying the study objectives, exploratory factor analysis (EFA) was implemented to discover the factor structure of active ageing. Use of EFA for normal factor model is helpful to comprehend the underlying factors that represented by indicator variables. EFA helps to differentiate the indicator variables by finding a correlational relationship among those variables into a single representative factor. Therefore, the underlying determinant factors of active ageing were selected and represented as the hypothetical WHO's active ageing model (See Table 1). Furthermore, the given constructs can be used as the basis of estimating the level of active ageing.

Table 1. Active ageing determinant factors and their corresponding indicator variables

Determinant Factors	Indicator variables
<b>Health and social service</b>	Health promotion and disease prevention, Curative Services, Long term care, Mental health services
<b>Behavioural determinants</b>	Tobacco use or Smoking, Physical Activity, Healthy eating, Oral health, Alcohol, Medication
<b>Social environment</b>	Social support, Violence and abuse, Education
<b>Personal factors</b>	Biology and genetics, psychological factors
<b>Physical environment</b>	Friendly environment, Safe housing, Falls, Clean water, clean air and safe foods(Absence of pollution)
<b>Economic determinants</b>	Wage or Income, Social security, Work

*Source:* World Health Organization. Active ageing: A policy framework; 2002. a Contribution of the World Health Organization (WHO) to the Second United Nations World Assembly on Ageing.

**Factor analysis for active ageing:** Factor analysis aims to reveal any latent variables that cause manifest variables covary. It helps to find a set of observed variables lies in unobserved factors concerning on a specific factor structure which can explain the relationship among observed variables [33,34] where the factors share a common variance [35,36], a large number of observed variables are described into a small number of factors based on the common interest. As the determinant factors of WHO active ageing model are correlated, an Exploratory factor analysis using the Principal Axis Factoring (PAF) with Promax rotation technique (the technique that concerned on the correlation among the variables) has been used to construct the factors regarding the underlying variables. KMO and Bartlett test reveals the significance of the factor analysis [37]. For obtaining the factor structure of the determinants of active ageing, exploratory factor analysis was used.

**Selection of Variables:** According to the WHO model, several determinants have their influences on active ageing and these determinants should be evaluated and understood carefully for measuring and developing the policies of active ageing [2,31]. The cross-cutting determinants of AA i.e., gender and culture should be unveiled for better results. According to the model, several variables are selected for the study to evaluate the active ageing status in Bangladesh to find out the determinant factors which are unobserved and need to validate for a different perspective. Due to the same administrative area for this study, it also assumed that the cultural variation of active ageing is insignificant. Total 38 observed variables were selected according to the theoretical framework of WHO's active ageing model and some proxy variables were chosen which are given along with their coding in table 2.

Table 2. Selected indicator variables (coding) for finding the factor structure of active ageing

Selected variables	Coding
<b>Age category</b>	1= 80 and above; 2= 75 to 79 ; 3= 70 to 74; 4= 65 to 69; 5= 60 to 64
<b>Physical condition</b>	0= Worst; 1=Bad; 3= Medium; 4=Good; 5=Very good
<b>Disease</b>	0= Yes; 1= No
<b>Marital condition</b>	1= Widow; 2= Divorce; 3= Separation; 4= Unmarried; 5= Married
<b>Smoking</b>	0=Yes; 1= No
<b>Exercise</b>	0=No; 1= Yes
<b>Vision</b>	0=Not clear; 1= Yes
<b>Hearing</b>	0=Not clear; 1= Yes
<b>Falls</b>	0=Yes; 1= No
<b>Social Help</b>	0=Yes; 1= No
<b>Happiness level</b>	1= Less Happy; 2= Happy; 3= Happier; 4=Happiest
<b>No. of disease</b>	0= Two or more disease; 1= One disease; 2= No disease

<b>Taking medicine</b>	0=Yes; 1=No
<b>Work</b>	0= No;1=Yes
<b>Income</b>	0= No;1=Yes
<b>Satisfaction with income</b>	0= No;1=Yes
<b>Savings</b>	0= No;1=Yes
<b>Involvement with elderly organization</b>	0= No;1=Yes
<b>Social group participation</b>	0= No;1=Yes
<b>Educational status</b>	0= No Education; 1= Primary Education; 2= Secondary Education; 3=Higher Secondary Education; 4= Graduate/ Tertiary Education
<b>Physical pain</b>	1= An extreme amount; 2= Very Much; 3= A moderate amount; 4= A little; 5= Not at all
<b>Satisfaction with sleep</b>	1= Very Dissatisfied; 2=Dissatisfied; 3= Neither satisfied nor dissatisfied; 4= Satisfied; 5= Very Satisfied
<b>Working ability</b>	1= Very Dissatisfied; 2=Dissatisfied; 3= Neither satisfied nor dissatisfied; 4= Satisfied; 5= Very Satisfied
<b>Concentration in work</b>	1= Not at all; 2= A little; 3= A moderate amount; 4= Very Much; 5= An extreme amount
<b>Ability of moving body</b>	1= Not at all; 2= A little; 3= A moderate amount; 4= Very Much; 5= An extreme amount
<b>Enjoying life</b>	1= Very poor; 2= Poor; 3= Neither poor nor good; 4= Good; 5= Very Good
<b>Satisfaction with personal life</b>	1= Very Dissatisfied; 2= Dissatisfied; 3 Neither satisfied nor dissatisfied; 4= Satisfied; 5= Very Satisfied
<b>Satisfaction with married life</b>	1= Very Dissatisfied; 2= Dissatisfied; 3 Neither satisfied nor dissatisfied; 4= Satisfied; 5= Very Satisfied
<b>Satisfaction with support from friends</b>	1= Very Dissatisfied; 2= Dissatisfied; 3 Neither satisfied nor dissatisfied; 4= Satisfied; 5= Very Satisfied
<b>Feeling Safety</b>	1= Not at all; 2= A little; 3= A moderate amount; 4= Very Much; 5= An extreme amount
<b>Negative Feeling</b>	1= An extreme amount; 2 Very Much; 3 A moderate amount; 4= A little; 5= Not at all
<b>Enough money to remove scarcity</b>	1= Not at all; 2= A little; 3= A moderate amount; 4= Very Much; 5= An extreme amount
<b>Satisfaction with living place</b>	1= Very Dissatisfied; 2= Dissatisfied; 3= Neither satisfied nor dissatisfied; 4= Satisfied; 5= Very Satisfied
<b>Satisfaction with health services</b>	1= Very Dissatisfied; 2= Dissatisfied; 3 Neither satisfied nor dissatisfied; 4= Satisfied; 5= Very Satisfied
<b>Perception on healthy environment</b>	1= Very poor; 2= Poor; 3= Neither poor nor good; 4= Good; 5= Very Good
<b>Meaningful life</b>	1= Very Dissatisfied; 2= Dissatisfied; 3 Neither satisfied nor dissatisfied; 4= Satisfied; 5= Very Satisfied
<b>Activities of Daily Living (ADL) index</b>	0= Severe (0); 1= Moderately Severe (1-8); 2=Moderately Independent (9-17); 3=Independent (18)
<b>Physical ability</b>	1= Not at all; 2= A little; 3= Moderately; 4= Mostly; 5= Completely

**Operationalization of Variables:** Explanation of variables can help to contextualize the research topic. Brief description or coding explanation of Basic ADL (activities in daily living) index which is not easily understandable and it is explained below.

**Basic ADL (activities in daily living) index:** Many studies on the health of older persons on quality of life of older persons usually assess functional disability (limitations of doing independent activities for everyday living). Everyday living tasks are divided into two groups such as activities in daily living (ADLs)- basic activities of hygiene and personal care[38], and instrumental activities in daily living (IADL)- basic activities necessary for living in the community[39]. Considering daily activities of the study sample in the context of the study area, basic ADL index has been included six (06) basic ADL items (eating, bathing, wearing clothes, bending down, walking and heavy lifting) and three (03) IADL items (step-up ladder/stair, using a rickshaw or van, changing money or managing finances). All nine (09) items have been coded according to Barthel original coding for ADL index (as cited by Lewis and Shaw, 2006) as 0= can not do, 1= can do by the help of someone/aid, 2= can do by self/without help. Then all the scores, for every individual, were added which possibly ranges from 0 to 18. Depending on the total score of nine items basic ADL index is created that indicate the physical functional limitations of the older people. Some studies categorized the basic ADL index (formed from the total score) as three or more categories depending on the severity of dependence [40,41].

**Calculation of level of active ageing:** Factor analysis helps to find out the structure of observed variables into unobserved factors and index can be measured from those factors. A modified approach of factor analysis has used to establish the composite index. The methodology has been used in several studies [30,31] to formulate an index of active ageing. This weighted method defines a specific weight to each indicator variable and the index is assigned a specific value to the level of active ageing. The factor specific indexes can be calculated by the following formula [30].

$$\text{Index of } F_i, f_i = \frac{[\text{Score of } F_i - \text{Min}(\text{Score of } F_i)]}{[\text{Max}(\text{Score of } F_i - \text{Min}(\text{Score of } F_i))]}$$

Where  $F_i = i^{\text{th}}$  factor

$$\text{Score of } F_i = \sum_{j=1}^m \text{Standardized value of indicator } j \text{ of } F_i * w_{ji} \quad i=1,2, \dots, n$$

$w_{ji}$ = weight of indicator  $j$  in factor  $i$

Now by combining all factor indices, an active ageing level can be calculated by the following formula

$$AAL = \frac{\sum_{i=1}^k f_i v_i}{\sum_{i=1}^k v_i} \quad \text{where } v_i = \frac{\lambda_i}{\sum_{i=1}^k \lambda_i} \quad \text{and} \quad \sum_{i=1}^k \frac{v_i}{\sum_{i=1}^k v_i} = 1$$

Here,  $k$  is the number of factors obtained  $f_i$  is an index of  $F_i$ ;  $v_i$  is the proportion of variance explained by  $F_i$ , and  $\lambda_i$  is Eigenvalue of  $F_i$ .

**The differential of the level of active ageing:** Gender differential in the level of active ageing is evaluated by the independent sample t-test and chi-square method. A post hoc method of chi-square is also used to find the sources of the gender variation of the differences. The formula used the Fisher exact approach in testing the independence to overcome the asymptotical limitation as p-value relies on the marginal row and column total and the cell size. For each cell, the alpha value is divided by the total number of cells ( $r \times c$ ) and this Bonferroni adjustment is used for multiple comparisons for the number of cells in the contingency table that is large and the cell size is relatively small [42].

### III. RESULT

The factors are constituted by different size of indicator variables. The exploratory factor analysis produced a structural pattern of 27 indicator variables depending on the communalities and factor loadings (see table 3) from 38 hypothesized indicators. The KMO test (0.889) and Bartlett sphericity ( $p < 0.001$ ) show significant sampling adequacy. Total six factors were extracted that explained 62.74% of the total variation.

**Table 3.** Obtained factors (with loading) of active ageing

Variables	Factor					
	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5	Factor 6
Working ability	0.863					
Concentration in work	0.778					
Ability to moving body	0.739					
Physical ability	0.714					
Physical pain	0.708					

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Enjoying life	0.637					
Age category	0.618					
ADL index	0.564					
Physical condition	0.546					
Meaningful life	0.477					
Satisfaction with personal life	0.762					
Satisfaction with support from friends	0.694					
Satisfaction with married life	0.604					
Satisfaction with living place	0.471					
Satisfaction with health service	0.454					
Perception on healthy environment	0.428					
Disease	0.972					
Number of diseases	0.811					
Taking medicine	0.674					
Savings				0.628		
Satisfaction with income				0.624		
Enough money to remove scarcity				0.621		
Educational status				0.568		
Income				0.826		
Work				0.688		
Social group participation						0.647
Involvement with elderly organization						0.596
<b>Eigen values</b>	7.866	2.587	2.284	1.718	1.375	1.109
<b>% of variation explained (62.737)</b>	29.134	9.582	8.458	6.362	5.093	4.108

KMO Measure of Sampling Adequacy= .889, Chi-square significant at  $p < 0.001$

Extraction Method: Principal Axis Factoring. Rotation Method: Promax with Kaiser Normalization.

From the pattern of the factor structure and related indicator variables of each factor, these are labeled as “**Personal condition**”, “**Satisfaction status**”, “**Disease and medication**”, “**Savings and education**”, “**Economic activity**”, and “**Social participation**” respectively. Most of the variation is explained by the first factor (Personal condition) which is about 29.134 per cent followed by Satisfaction status, Disease and medication, savings and education, Economic determinants and Social participation are explained about 9.562, 8.45, 6.362, 5.093 and 4.108 per cent of total variation respectively.

The average of AAL is 45.50 with a standard deviation 14.38158. The AAL has been grouped into four categories by percentile distribution for further analysis (especially association). the levels of active ageing (AAL) for every individualis obtained and categorised as Lower, Moderate, Upper Moderate and Upper category with ascending order of the scores of AAL.

**Table 4.**Level of active ageing of older persons according to gender at Rajshahi city in Bangladesh

Gender	Level of active ageing (AAL)					Overall Mean (SD)	t= 5.853, df = 698 p<0.001
	Lower Mean (SD)	Moderate Mean (SD)	Upper Moderate Mean (SD)	Upper Mean (SD)	Overall Mean (SD)		
Female	26.94 (6.32)	40.31 (2.82)	49.83 (2.73)	61.80 (5.34)	<b>42.05 (12.34)</b>		
Male	27.57 (5.16)	40.07 (2.95)	50.61 (2.87)	65.07 (6.66)	<b>48.30 (15.31)</b>		
Both	27.26 (5.75)	40.21 (2.87)	50.25 (2.83)	64.27 (6.50)	45.50 (14.38)		

**Gender differential in the level of active ageing**

Following independent sample t test for female and male and Chi-square test, a post hoc chi-square test was also used to identify the differences in the micro-level. An independent sample t statistic reveals the mean difference between male and female elderly in Bangladesh. The results of independent sample t-test (see table 4) shows a significant difference of level of active ageing in male and female (t=5.853; df= 698;  $p < 0.001$ ) where the mean of the active ageing level of male (48.30) is higher than female (42.05) elderly.

The table (see table 5) illustrates the average value of the level of active ageing for both male and female is almost same except at the upper level of active ageing. Comparatively the higher average score of males (65.07) than the females (61.80) can be observed in the upper level of active ageing. The result manifests that there is a significant association ( $\chi^2=45.579$ ,  $df=3$ ,  $p<0.05$ ) between gender and levels of active ageing. In post hoc exact p-value indicates a significant difference between the observed and expected value for male in case of both moderate level (-25.50) and upper level (35.50) of active ageing and reverse can be seen for female, e.g., the difference between the observed and expected value is significant for moderate level (25.50) and upper level (-35.50) of active ageing. So, in the upper level of the active ageing, males are more likely to be active and the reverse situation has happened in case of a moderate level of active ageing for female.

**Table 5.** Association between the level of active ageing and gender of older persons

Gender		Level of active ageing				$\chi^2$ (df) p value
		Lower	Moderate	Upper Moderate	Upper	
Male	N	89	71	94	132	45.579 (3) 0.001
	Expected N	96.5	96.5	96.5	96.5	
	Residual	-7.50	-25.50	-2.50	35.50	
	Exact p-value <sup>1</sup>	0.219178	0.000010	0.725648	0.000000	
Female	N	86	104	81	43	45.579 (3) 0.001
	Expected N	78.5	78.5	78.5	78.5	
	Residual	7.50	25.50	2.50	-35.50	
	Exact p-value <sup>1</sup>	0.219178	0.000010	0.725648	0.000000	

Note: at 5% level of significance ( $\alpha= 0.05$ )

<sup>1</sup> indicates from post hoc

#### IV. DISCUSSION

The results of the factor analysis construct a model consisting of the similar number of factors as hypothesized in the World Health Organization but the factors along with the underlying indicators have illustrated a deviation from the actual WHO-2002 model. In the case of social determinant and all the others endured a rearrangement that leads to six factors, not like the original ones without social participation, personal determinants and disease and medication.

Personal characteristics are very important for the level of active ageing. The working ability of human is working concentration and physical ability to do any kind of work for each other. Personal characteristics of these indicators have a large impact on active ageing such as age, enjoyable and meaningful life, ADL (activities of daily living) index; because all of these indicators can manifest an overview of capabilities to execute and manipulate these activities of the older people. Their satisfaction including speculation of the family and themselves, friends and neighbors, colleagues and partners, their living places and services in the study shown a large impact on the active ageing. Level of satisfaction sometimes motivates themselves to be active because evidence shows that having congenial living arrangements with the desirable relationship that includes safe zone utilizing service and support for the partner to control over their issues impacted in a meaningful role [43] and the higher frequency of gathering with family and friends also affects them too [44]. Multi-morbidity is very common among older persons and that is linked to advancing age. Having a disease and the number of diseases has very large factor scores that indicated highly effective and essential indicator variables in the construction of the disease and medication factor.

Women are more prone to the disease and multi-morbid specifically who are widow, and have different health problems, and underprivileged for care, that is why they grew negativity on self and subjective well-being. Education can bring changes in later life too as it affects self-perceived health status and functional ability [44]. Job satisfaction along with its income satisfaction is also related to removing scarcity from their daily needs. Savings is a very important indicator variable in this case. Educated older have satisfaction with their income and they generate savings for future security and non-dependency in later life.

The overall active ageing level that obtained from the analysis is very low and ranges in between 10 to 85 (the value) as compared with the other countries i.e., Thailand [30,31], Portugal and other EU countries [32,45]. For promoting active ageing, the focus should be given to the indicator variables of the determinant factors. Possible reasons of being such lower level of active ageing are societal backwardness, lack of awareness about the health and disease, rate of illiteracy, self-awareness and psycho-social demands, urbanization and industrialization results in a tendency of constructing nuclear family and attitudes of avoidance of the older

people in the community. Laws and policies on older people are not strictly implemented for several reasons and there needs a proper nationwide survey covering the whole picture of the older people in the country.

The European policy framework of active ageing is gender blind [20]. But with a few exceptions, WHO reported that difference in life expectancies at birth, high prevalence of non-communicable diseases, mental health and disorders by gender has an immense impact on their ageing well [46]. Daily activity is affected by the nature of gender and perception of gender differences [47]. Mean AAL of male older persons is higher than female.

A biological distinction of elder and the gender effects has an impact on the active ageing. The gender differential indicates the higher active ageing level in male than female and both needs further improvement (as the overall AAL is not high). Moreover, health and socio-economic status of a woman have an impact on subjective wellbeing regarding controlling the gender differences in widowhood [48]. Living with a spouse creates a vibe on supporting each other that helps to reduce mortality for old men and women. Role of gender in this regard plays a significant role. Biological and social differences between men and women may signify the level of active ageing.

Our result shows the gender difference is significant which is also support the previous studies in Thailand and EU countries [31,45]. In all the cases women are more vulnerable than men. Steinmayr (2020) identified the physical, subjective wellbeing, financial and life-long learning dimensions that are lower to the women than men [45]. On the other hand, Haque (2016) identified the health and indicators of subjective wellbeing that can influence in the active ageing differences [31]. In Bangladesh, older women are getting more vulnerable than older men and they generally depend on their counterparts or siblings more than older men. So, their activities may be retained. Sometimes cultural barriers of the society in developing countries like Bangladesh also involved in restraining women to actively act in their dailies. The trend of early dependency on a male member of the family affects their views of regular activities. Moreover, level based active ageing shows a significant difference in the moderate and upper level of active ageing among the male and female older which put more emphasis into the overall gender difference of active ageing level. More specifically, higher differences in the upper level of active ageing among all other active ageing level indicate that female older persons are more vulnerable or remain less active compare to male older persons at the upper level of active ageing. This is due to the gender inequalities in older age during the life-course perspectives- for example, Steinmayr [45] indicated women are discriminated in the early and late labour market [49], high risk of poverty [50], lower healthy life-expectancies compared to the increased life expectancy [51] and health-related sufferings [52,53]. All these discriminations have also prevailed in the Bangladeshi context.

This study is an initial step for the older persons to show the procedure of finding active ageing level in Bangladesh and a gender difference. Exploratory factor analysis is not enough, and a confirmatory analysis is required to confirm the model by representing the whole country.

## V. CONCLUSION

Bangladesh already encountered the impact of population ageing and raised challenges in economic, social, political and administrative sectors for a rising proportion of the older persons. Concept of active ageing, in this case, is an intricate and remarkable initiation for policy development in different detached perspectives and contexts.

To research on insight of prevailing active ageing situation of older persons and its associated determinant factors in a city of Bangladesh, this study aimed to find determinant factors and level of active ageing of older persons including its gender differential. Factor structure of active ageing using the sample of both gender identified six determinant factors. Those six determinant factors of active ageing for older persons are: Personal condition, satisfaction status, disease and medication, savings and education, economic activity, and social participation. Overall AAL for male elderly was higher than female elderly.

Study results indicated a low level of active ageing for different determinant factors with their indicators. Moreover, the active ageing level is lower among the females in all bands (lower, moderate, upper moderate and upper) of active ageing level and difference is statistically significant in the upper band. Also, the study discussed the possible reasons for the lower level of active ageing scores. Therefore, careful surveillance on older people, more specifically older women, their needs and opportunities are suggested to improve their level of active ageing and help to reflect the policy agenda of the country to contend such challenges. On the other hand, future study on measuring AAL should use more indicator variables based on World Health Organization's active ageing model and health related indicator variables should collect by appropriate medical screening test (s). Moreover, for cost effective policy formulation and priority component selection for improving active ageing, relationship between AAL and indicator variables should be investigated.



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