

# Individual-Level Active Aging Index and Quality of Life of Older People: A Population-Based Survey in Tehran

## Abstract

**Background:** Iran is one of the fastest ageing countries in the world. The model of Active Ageing (AA) could be a strategy contributing in addressing the problem of population ageing in Iran. This study measured the status of AA in Iran and examined its associations with the health-related quality of life of older people. **Methods:** A quantitative cross-sectional survey of a random sample of 623 people aged 55 + years resident in Tehran was conducted. In total, 590 people responded. The AA was measured using the Active Ageing Index (AAI) questionnaire and the health-related quality of life was measured using SF-36 questionnaire. Associations between the domains and the overall AAI scores with the quality of life were examined by MANCOVA analysis in four models using the STATA software. **Results:** The score of overall AAI was calculated at 26.8 (men 33.9 vs. women 20.6) out of 100. We found a stronger association of the AAI with the physical component than the mental component of the SF-36. Generally the 1<sup>st</sup> (employment) and the 2<sup>nd</sup> (participation in society) domains of the AAI showed little or no association with SF-36, but there was an association between the 3<sup>rd</sup> domain (enabling environment for active ageing) and the SF-36 and a particularly strong associations with the 4<sup>th</sup> domain (independent, healthy and secure living capacity). **Conclusions:** Iranian elderly, particularly women, are experiencing relatively inactive life, which negatively influence on their health-related quality of life. To improve the AAI status in Iran, some aspects including “enabling environment” and “independent, healthy and secure living capacity” need special attention.

**Keywords:** Aged, healthy aging, Iran, quality of life

## Introduction

Iran is one of the fastest ageing countries in the world, as a result of experiencing an exceptionally fast fertility transition and considerable improvements in life expectancy.<sup>[1,2]</sup> Following the demographic transition in Iran, a radical transformation in the age structure of the population is occurring, with an increase in the population's mean and median age. It is projected by the United Nations that the percentage of older people aged 60 or over in Iran which was 8.2 in 2015 will be reached to 31.2% by 2050.<sup>[3,4]</sup> Although population ageing is a global phenomenon, it is taking place in a much shorter period in Iran than in most of other countries.<sup>[5]</sup> The rapid pace of population ageing in Iran means that it will have less time to adjust to these challenges. So providing a pension system for those who lack other resources, maintaining and extending the currently

limited social security represent a major challenge for a yet unprepared community.<sup>[6,7]</sup>

The strategy which could greatly contribute in addressing the problem of population ageing in Iran is the strategy of “Active Ageing” (AA), making older people more active and independent.<sup>[8]</sup> The AA refers to a situation where people participate in the formal labor market, engage in unpaid productive activities, and live healthy, independent and secure lives as they age.<sup>[8]</sup> World Health Organization (WHO) defined AA as “... the process of optimizing opportunities for health, participation, and security in order to enhance quality of life (QoL) as people age”.<sup>[9]</sup> According to this definition, AA is a multidimensional concept, comprising three main components as «participation», «security» and «health» that help people to remain active and independent despite getting older. The *participation* component includes learning through live and working with or without

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payment. The *security* aimed for ensuring the protection, safety and dignity of older people with emphasis on the social, financial and physical security rights and needs of people as they age and the *health* focuses on achieving and maintaining physical and mental health along life.<sup>[10]</sup> The status of AA among older people was measured in this study using Active Ageing Index (AAI), which is a tool, developed by Zaidi A in 2012, to enable policymakers to devise evidence-informed strategies in dealing with the challenges of population ageing.<sup>[11]</sup> It is also stated that one of the main goals of AAI is acting as a useful tool to improve the QoL of older adults.<sup>[8,12]</sup> Further inform is available in the Methods section.

Health related quality of life (HRQoL) is a subdivision of QoL, and most commonly refers to people's experience of their global health.<sup>[13]</sup> HRQoL is a multi-dimensional concept that encompasses physical, mental, emotional and social functioning domains.<sup>[14,15]</sup> An important aim of research into HRQoL in this age group is to enable older people to maintain their mobility, independence, their active contribution to society, and to respond effectively to the challenges of older age and in general bring an active aging for them.<sup>[16]</sup> It is hoped that having an active life and improvements in AAI of the countries could play a key role in improvements of HRQoL of older populations.<sup>[17]</sup>

Despite the importance of population ageing in Iran and its potential challenges particularly in near future, the extent of active and reproductive life among older people of Iran is not yet determined. There are only a few studies in Iran in the topic of AA but none of them has measured it as the concept with the mentioned definition at the individual level or only measured some aspects of activity or was qualitative studies.<sup>[18-21]</sup>

In this study, firstly, we aimed to measure the status of AA at the individual-level (not at the community level), for the first time. The results of the AAI in Tehran are compared with the other countries to identify the differences and discuss on the possible justification. Secondly, HRQoL and socio-demographic characteristics of older people of Tehran are measured and described. Finally, associations between participants' overall and domain-specific scores of AAI with their HRQoL scores were examined, controlling for the effects of covariates. It is hypothesized that having a higher AAI score would be associated with better HRQoL. It is hoped that the results of this study would help to better understanding of facilitators and barriers for the Iranian older population to experience an active life, with the aim of improving or preserving QoL in rapidly growing older population of Iran.

## Methods

### Study design and data collection

A quantitative cross-sectional survey of a random sample of 623 people aged 55 + years resident in the capital city

of Tehran was conducted. This age border was selected based on the indicators defined in the original AAI. The sample size was calculated based on an alpha level of 0.05 and power of 80% using an expected odds ratio (OR) of 2 and 10% non-response and a design effect of 1.5, based on the results from earlier studies.<sup>[6,17]</sup> Multistage stratified cluster sampling strategy was adopted in order to ensure representation of people from neighborhoods of different socio-economic status. Tehran city consists of 22 municipal districts and each of which includes dozens of neighbourhoods. Firstly, three districts were chosen from areas of different socioeconomic status based on the information from municipality of Tehran city. Then, one neighborhood from each district was randomly selected. As here was no sampling frame from which to draw the sample, we initially obtained the raphly number of all people aged 55 + resident in the selected neighbourhoods from the manicipality. Then, the number of samples in each neighborhood was calculated using probability proportionate to size allocation method within neighbourhoods. Study samples were then selected in each neighbourhood, through systematic random sampling method, so that one out of every 10 houses randomly selected based on the municipal blocks maps. Of the selected houses it was asked whether any people aged 55 or more are living there and if so he/she would like to participate. Then the data were collected using a structured multi-sectional questionnaire administered to respondents through face-to-face interviews conducted at their homes, if agreed. In total, 590 people out of 623 pre-defined sample size responded (response rate 94%). Those older people who were not living in their own house or their relatives households such as those admitted in nursing homes, or hospitals, etc., were restricted from this study. Ethical approval for the study was received from the ethical committee of the Tehran University of Medical Sciences (Ethics number: IR.TUMS.SPH.REC.1397.4974.).

### Study variables and measurement

The status of AA (the main exposure variable) among older people of Tehran, was measured by the original AAI questionnaire. This index constructed of 22 individual indicators that are disaggregated by sex and grouped into 4 domains including "Employment", "Participation in society", "Independent, healthy and secure living capacity" and "Enabling environment for active ageing" [Figure 1- appendix].<sup>[11]</sup> We intentionally used exactly the same questions and also the same method for weighting and scoring the AAI indicators and domains,<sup>[22]</sup> available in the original AAI, as developed by Zaidi,<sup>[11]</sup> which is also available in the appendix of the AAI website<sup>1</sup>, to be able to make our results comparable with the data from other countries using the same index. A translation to Farsi and then a back translation was made by two bilingual experts, with authorization from who developed the original AAI (Zaidi). For face and content validity

1 <https://statswiki.unece.org/display/AAI/Active+Ageing+Index+Home>

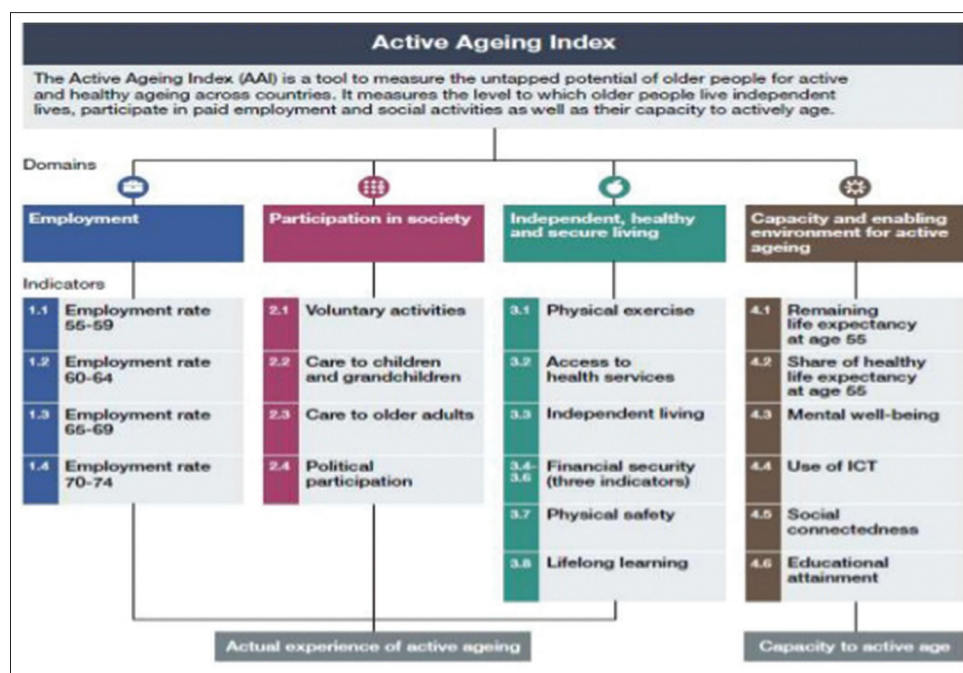


Figure 1: The original Active Ageing index, including the domains and indicators

evaluation, we received the comments from 5 experts and minor amendments were performed in the questionnaires. For reliability assessment, 10 older people were completed the questionnaire twice within two weeks interval and there was 85% consistency. The AAI questionnaire included 46 items to measure 22 indicators.

The HRQoL of older people (the outcome variable) was measured using the Iranian version of 36-item Short Form Health Survey (SF-36). The psychometric properties of the Iranian SF-36 are well documented.<sup>[23]</sup> The SF-36 includes 8 subscales and scores range from zero to 100 for each subscale with higher scores indicating a better condition. In addition, socio-demographic characteristics of older people including age, gender, income, marital status, family size and education were measured by study questionnaire, for both description reason and also as covariates to be controlled in statistical analysis. “Family size” variable we created by adding up the number of close relatives of the participant including living spouse, children, grandchildren, siblings and parents.

### Data analysis and modeling strategy

The data were analyzed using descriptive and analytical approaches. *Spearman Correlation Analysis* was used to check the correlations among exposure and outcome variables. In order to examine the associations between the domains and the score of overall AAI with the HRQoL of older people, a specific type of regression analysis, *Multivariable Analyze of Covariance (MANCOVA analysis)*, was used, because the outcome variables in this study were PCS and MCS scores, which were correlated with each other. The analyses were performed using four models; in *Model*

*1*, crude analysis was conducted to check the association of each independent variable (domains and overall score of the AAI) with the PCS and the MCS scores separately. As the overall AAI score was calculated by its four domains, separate models were then used for associations of domains and the overall score of the AAI with the outcomes. In *Model 2*, first the crude associations of domains and then in *Model 3* associations with adjusting the effects of covariates were used. Finally, in *Model 4*, the associations of the overall AAI score with the PCS and MCS scores adjusted for the effects of covariates were examined. All the analyses were conducted using STATA software version 14.

### Results

In this study, 590 people participated, of which, 297 were men and 293 women. The mean (SD) age was 64.9 (9.4) years and 78% of participants were married. The mean (SD) of family size of participants were 13.7 (7.9) people, but 13% were living alone, 27% with their spouse, 51% with both spouse and children and others had other living arrangements. 28% were illiterate, 34% had just primary education and only 9% had higher education (university level). Most of the participants (59%) reported to have very low or low income and 37% described themselves as being poorer than average of residents of Tehran.

The result of the AAI of the participants, including the scores of domains and indicators (raw and weighted) is shown in Table 1. The score of overall AAI was calculated at 26.8, of which 9.5 belonged to the first domain, 7.5 to the second domain, 4.1 to the third domain and 5.7 to the last domain.

**Table 1: Domains, indicators and overall scores of AAI (raw and weighted) of people 55+ years old in Tehran-2018**

Domains	Indicators	Indicator Score (%)			Indicator weight within domain	Weighted Indicator Score			Domain Score	Domain weight	Weighted Domain Score
		Total	Male	Female		Total	Male	Female			
1. Employment	1.1 Employment rate 55-59	37.5	65.7	19.8	25	9.4	14.4	4.9	Total: 27.2, M: 45.2, F: 10.4	35	Total: 9.5, M: 15.8, F: 3.6
	1.2 Employment rate 60-64	24.5	44.0	6.6	25	6.1	11.0	1.6			
	1.3 Employment rate 65-69	24.5	39.3	8.6	25	6.1	9.8	2.1			
	1.4 Employment rate 70-74	22.5	32.0	6.6	25	5.6	8.0	1.6			
2. Participation in society	2.1 Voluntary work (aged 55+)	31.0	38.3	23.5	25	7.7	9.6	5.9	Total: 21.4, M: 23.2, F: 21.0	35	Total: 7.5, M: 8.1, F: 7.3
	2.2 Care to children (aged 55+)	34.4	30.9	37.8	25	8.6	7.7	9.4			
	2.3 Care to older adults (aged 55+)	12.5	11.7	13.3	30	3.7	3.5	4.0			
	2.4 Political participation (aged 55+)	6.9	8.0	5.8	20	1.4	2.4	1.7			
3. Independent, healthy and secure living	3.1 Physical exercise (aged 55+)	49.6	57.5	41.6	10	5.0	5.7	4.2	Total: 41.4, M: 41.7, F: 41.2	10	Total: 4.1, M: 4.2, F: 4.1
	3.2 Access to health and dental care (aged 55+)	26.5	21.0	32.0	20	5.3	4.2	6.4			
	3.3 Independent living (aged 75+)	44.8	42.8	48.3	20	9.0	8.5	9.7			
	3.4 Relative median income (aged 65+)	55.0	60.0	50.0	10	5.5	6.0	5.0			
	3.5 No poverty risk (aged 65+)	50.0	60.0	40.0	10	5.0	6.0	4.0			
	3.6 No material deprivation (aged 65+)	22.9	23.6	22.2	10	2.3	2.4	2.2			
	3.7 Physical safety (aged 55+)	76.1	73.4	78.8	10	7.6	7.3	7.9			
	3.8 Lifelong learning (aged 55-74)	16.9	15.8	17.9	10	1.7	1.6	1.8			
4. Capacity and enabling environment for active ageing	4.1 Life expectancy at age 55	24.2	23.6	24.7	33	8.0	7.8	8.1	Total: 28.7, M: 29.2, F: 28.2	20	Total: 5.7, M: 5.8, F: 5.6
	4.2 Share of healthy life expectancy at age 55	13.9	13.2	14.5	23	3.2	3.0	3.3			
	4.3 Mental well-being (aged 55+)	42.8	42.7	43.0	17	7.2	7.3	7.3			
	4.4 Use of ICT (aged 55-74)	34.6	36.6	32.8	7	2.4	2.5	2.3			
	4.5 Social connectedness (aged 55+)	45.2	47.1	43.3	7	5.9	6.1	5.6			
	4.6 Educational attainment (aged 55+)	29.0	35.4	23.2	13	2.0	2.5	1.6			
Overall score of AAI									100	Total: 26.8, M: 33.9, F: 20.6	

The results of the HRQoL scores of participants including its domains are shown in Table 2. On average, the participants had slightly better scores in the MCS than the PCS (55.8 vs 52.7). Bodily pain gained the highest score (66.1) and role physical had the lowest score (40.3). Men had higher HRQoL status compared to women particularly in the PCS (PCS 55.1 vs. 50.3 and MCS 56.8 vs. 54.9) [Table 2].

To test the main hypothesis of this study, analyses were conducted once for the PCS and again for the MCS scores. As shown in Table 3, in crude analysis, all the domains (except participation in society) and the overall AAI score showed significant associations with the PCS score. In the second model, a significant negative association with the second domain but significant positive associations with other domains were found with the PCS. This indicates that with controlling the effects of each other, being employed but less participation in society and having independent life and living in an enabling environment are associated with higher scores of the PCS. When the analysis of the second model were also controlled for the effects of covariates in Model 3, the directions of associations remained the same as the second model, but

the size of effects attenuated slightly in all the domains. The third model was repeated in Model 4, but with the overall AAI score rather than the domains. The result indicated a significant positive association of the AAI score and the PCS, controlling for the effects of covariates. The results also indicated that being older is strongly associated with poor PCS score, but no significant associations were found with other covariates [Table 3].

The same set of analyses, as presented in Table 3, were repeated for the associations between the overall AAI and domains scores with the MCS and results are shown in Table 4. In crude analyses, significant positive associations were found between domains 3 and 4 and the overall AAI score with the MCS score, with the highest effect of the fourth domain (coefficient = 0.80,  $P < 0.0001$ ). In Model 2, again only the domains of 3 and 4 showed significant positive associations with the MCS, controlling for the effects of each other, but with slightly lower effect size that model 1. When the second model was repeated and effects of covariates were controlled for in Model 3, only the domain 4 still remained significantly associated with the MCS score (coefficient = 0.50,  $P < 0.0001$ ). In the last model,

**Table 2: Mean (SD) of scales and summary scores of HRQoL of people 55+ years old in Tehran (measured by the SF-36)-2018**

Scales	All (n=590)		Men (n=297)		Women (n=293)	
	Means	SD	Means	SD	Means	SD
Physical functioning (PF)	57.9	30.0	60.1	30.4	55.7	29.4
Role physical (RP)	40.3	42.7	44.1	42.8	36.4	42.3
Bodily pain (BP)	66.1	22.9	68.2	21.7	63.9	23.8
General health (GH)	46.6	16.1	47.9	14.5	45.1	17.5
Physical Component Summary (PCS)	52.7	23.2	55.1	22.8	50.3	23.4
Vitality (VT)	57.1	15.8	57.1	14.1	57.1	17.4
Social functioning (SF)	63.6	21.9	65.8	20.2	61.3	23.3
Role emotional (RE)	45.9	43.6	47.3	42.4	44.4	44.7
Mental health (MH)	56.8	16.4	56.9	14.3	56.8	18.3
Mental Component Summary (MCS)	55.8	19.8	56.8	18.2	54.9	21.4

**Table 3: Associations between domains and overall scores of AAI and PCS scores using MANCOVA analysis**

PCS	Coefficient (P)			
	Model 1- Crude analysis	Model 2- Association with domains	Model 3- Association with domains + covariates	Model 4- Association with overall AAI + covariates
Employment	0.05 (0.01)	0.05 (0.003)	0.04 (0.01)	-
Participation in society	- 0.03 (0.43)	- 0.07 (0.03)	- 0.02 (0.51)	-
Independent, healthy and secure living	0.37 (0.000)	0.23 (0.000)	0.13 (0.02)	-
Capacity and enabling environment	0.80 (0.000)	0.73 (0.000)	0.50 (0.000)	-
Overall AAI score	0.19 (0.000)			0.14 (0.005)
Age (older)	-	-	- 0.37 (0.001)	- 0.45 (0.000)
Gender (women)	-	-	- 1.11 (0.58)	0.11 (0.97)
Income (poor)	-	-	- 3.68 (0.05)	- 3.54 (0.08)
Marital stat (married)	-	-	1.75 (0.44)	0.57 (0.81)
Family size (larger)	-	-	- 0.13 (0.25)	- 0.15 (0.23)
Education (illiterate)	-	-	0.04 (0.98)	- 3.16 (0.12)

**Table 4: Associations between domains and overall scores of AAI and MCS scores using MANCOVA analysis**

MCS	Coefficient (P)			
	Model 1- Crude analysis	Model 2- Association with domains	Model 3- Association with domains + covariates	Model 4- Association with overall AAI + covariates
Employment	0.02 (0.26)	0.01 (0.38)	- 0.003 (0.86)	-
Participation in society	0.008 (0.80)	- 0.02 (0.36)	- 0.03 (0.29)	-
Independent, healthy and secure living	0.26 (0.000)	0.10 (0.02)	0.06 (0.26)	-
Capacity and enabling environment	0.75 (0.000)	0.72 (0.000)	0.45 (0.000)	-
Overall AAI score	0.14 (0.001)			0.02 (0.61)
Age (older)	-	-	- 0.19 (0.07)	- 0.26 (0.01)
Gender (women)	-	-	- 0.90 (0.63)	0.28 (0.88)
Income (poor)	-	-	- 4.68 (0.01)	- 4.46 (0.01)
Marital stat (married)	-	-	1.17 (0.58)	- 0.11 (0.95)
Family size (larger)	-	-	- 0.17 (0.12)	- 0.19 (0.10)
Education (illiterate)	-	-	- 0.60 (0.74)	- 3.40 (0.07)

where the associations between overall AAI scores and the MCS scores was tested, no significant association was found. At the same model, however, being older and poor found to be significantly associated with lower MCS score but no other association was found with gender, education, marital status and family size [Table 4].

## Discussion

Population ageing has a profound impact on societies particularly in labor market, health care, social security etc. The eventual goal of AA is to enhance the QoL of older people and to guaranty the development of societies, through maximizing older people's participation in society

and their contribution to the economy and the policy of AA is intended to improve both individual QoL and societal welfare.<sup>[12,24]</sup> However, the results of this study highlighted an overall relatively poor AAI score of older people in Iran [Table 1]. In comparison with the overall AAI and its domain-specific scores of the EU-28 countries in 2018,<sup>[25]</sup> the overall AAI score and the third and fourth domains of the AAI in Iran are considerably poorer, but is doing slightly better in the second domain and almost the same with the first domain of average of the EU-28 countries [Figure 2].<sup>[25]</sup>

With regard to the first domain, there is considerable variation among Iranian men and women, mostly because of men's breadwinner role in family; 45% of men versus only 10% of women and in total 27.2% of people aged 55 + are employed. This rate is almost the same as the average of the EU-28 countries. The difference of this indicator in the age range of 55-59 is much higher than the other age groups, attributable to the retirement age in Iran, which is 60. However, it seems that many of the retired men (44%) back to work and continue to be economically active, most probably because of very low retirement pension in the economic crisis condition of the country. As shown in Table 1, almost one third of older men aged 70-74 years old in Tehran reported to be still employed and continue working. There is an evidence that many of the unemployed older people reported that they need to work and earn money, but there is no job for them available.<sup>[26]</sup> The above statistics and explanations probably justifies the results of this study shown in Tables 3 and 4 indicating no significant association between the 1<sup>st</sup> domain of the AAI and MSC and a moderate association between it and the PCS. This is while 35% of the whole weight of the index is made by only the 1<sup>st</sup> domain, which perhaps needs to be modified in the Iranian context.

The average score of the second domain were higher than the average of the EU-28 countries, mainly in the indicators of "care to children" and "voluntary work". A part of this could be cultural, but this also may reflect an increasing proportion of young women who recently are working outside and leave their children with their parents. It also may reflect a poor economic status of many families who are not able to get professional help for their elderly or children such as nursery and thus older people may have to contribute higher to help their families.<sup>[6]</sup> Possibly that is the reason why the direction of associations of this domain with both MCS and PCS, although not statistically significant, were negative, indicating a higher participation was associated with poorer quality of life [Tables 3 and 4]. Therefore, the weight of this domain, which is again 35% in the original AAI, also needs to be modified for older people of Iran.

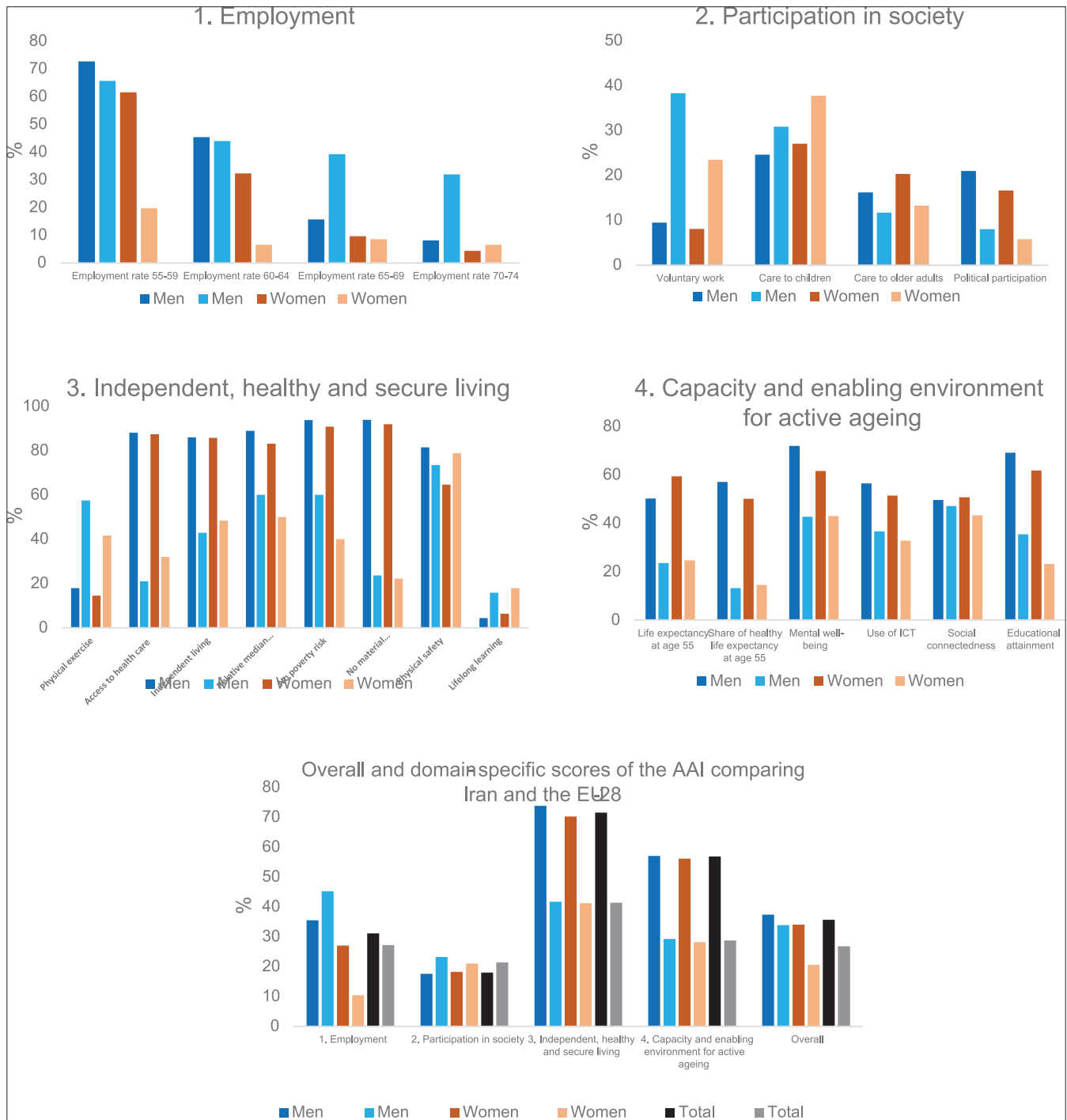
However, the 3<sup>rd</sup> and the 4<sup>th</sup> domains of the AAI were considerably behind than the average of the world. This is

while, the highest effect on HRQoL in both physical and mental components with the strongest evidence observed by the 4<sup>th</sup> domain and also the PCS score and the 3<sup>rd</sup> domain, while they share only 20% and 10% of the overall weight of the AAI score, respectively. This result suggests a need to paying an especial attention by policymakers to the 4<sup>th</sup> domain and then to the 3<sup>rd</sup> domain of the AAI to make the life of future older people of Iran more active and independent. Also it is probably required to increase the weight of these domains compared to the first two domains of the overall AAI score.

The analyses on the associations between the AAI and its specific-domain scores with the component scores of HRQoL highlighted generally a stronger association with the PCS than the MCS and the overall AAI score was only associated with the PCS [Tables 3 and 4], which is justifiable. In order to have an active life in the community, it seems that physical functioning ability and physical health of older people is a key prerequisite, while it is relatively less imperative for measures of mental health in general.

As the AAI is a rather new instrument, there is little study on that. Also, most of those that examined the association of the AA with the QoL used different measures such as "loneliness", "happiness", and "life satisfaction", as measures of the QoL.<sup>[12,27]</sup> The study of Frolova and Malanina<sup>[27]</sup> indicated that increasing the score of the AAI in Russia, was correlated with lower loneliness, higher happiness, and higher life satisfaction. Similarly, the study of Nunes<sup>[12]</sup> found that the overall AAI, and its 1<sup>st</sup>, 2<sup>nd</sup> and 4<sup>th</sup> domains were positively associated with the QoL indicators including life satisfaction and happy feelings. The AAI was also strongly correlated with life satisfaction as measured by the European Quality of Life Survey.<sup>[22]</sup> Associations were also found between the AAI and Quality of Life Synthetic Index in Spain.<sup>[28]</sup> However, in the study of Donno and colleagues in Italy,<sup>[29]</sup> they found relationship only between the third domain of the AAI and the QoL, as measured by the CASP index, for both men and women. This study suggested to the UN to evaluate the possibility of increasing the explicit weight for the third domain. Another study concluded that the first domain (employment), despite having a significant position in the index, did not show a relationship with QoL. According to this study, putting significance on employment leads to overestimation of the position of countries, which despite considerable employment rate of older adults are behind other countries in other indicators.<sup>[30]</sup> Therefore, there is an inconsistency between the results of the existing literature and further studies are required for understanding the likely effects of the context in this issue.

The results of this study, as the first study in Iran measuring the AAI at the individual level, is valuable. However,



**Figure 2: The AAI overall, dimensions and indicators status in Tehran and comparison with the EU28 countries -2018. Source: the data of this study and \* The figures of the EU-28 countries are made based on the AAI project data, which is available in the website of this project. According to this website, any use of the information of this project is free, subject to giving a reference and URL of the project**

the main weakness of this study is its cross-sectional design. Additionally, the results of this study may not be generalizable to whole older people of Iran, Therefore, the next survey should be conducted at the national level. Another recommendation is to conducting a qualitative study using unstructured interviews with older people and other relevant policymakers to first understand whether the concept of the AA differs in the context of Iran.

In conclusion, the results of this study indicated Iranian older people compared to their European age-mate in the overall AAI score and in the 3<sup>rd</sup> and 4<sup>th</sup> domains had considerably lower scores. It is important to consider that, while the 1<sup>st</sup> and 2<sup>nd</sup> domains with little or no association with the HRQoL, each comprises 35% of the overall score, the 4<sup>th</sup> and 3<sup>rd</sup> domains with a strong association with the HRQoL, altogether comprise only 30% of the overall score

of the AAI. Consequently it is suggested to policymakers to pay a special attention to improve the capacity and enabling environment for active ageing and then to provide better conditions for older people's independence, healthy and secure living, if they have a real intention to make the future ageing population of Iran active and the economy of the country progressive. Additionally, the results of this study strongly suggest a considerable modification in the indicators and weights of the domains of the original AAI for the Iranian context.

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### Conflicts of interest

There are no conflicts of interest.

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