The growth trend of never-married elderly population in Iran in the third millennium

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ABSTRACT

Background: Statistics show that the age of the Iranian population is advancing, and the marriage age is increasing as well. Clearly, an increase in the number of never-married older adults is expected. The aim of this descriptive, analytical study was to determine the growth trend of never-married older population and its association with education level in Iran. **Methods:** Based on the raw data collected from the Statistical Center of Iran, we studied the population of never-married older adults in the past 25 years and evaluated the growth pattern in different parts of Iran, using ArcGIS software. We also examined the association of singlehood in late life with education in men and women residing in rural and urban areas, using the Chi-square test in SPSS version 22. **Results:** A sharp increase was observed in the population of never-married older adults, particularly women, in the past 10 years. Women with formal education from urban and rural areas were more likely to be never married in late life ($\chi^2 = 10455.35$, $P < 0.001$ and $\chi^2 = 271.31$, $P < 0.001$, respectively). Older men with formal education from urban areas were more likely to be never married ($\chi^2 = 35.44$, $P < 0.001$), while men with formal education from rural areas were less likely to be never married ($\chi^2 = 179.13$, $P < 0.001$). **Conclusion:** The rate of increase in the population of never-married older women was much higher than the overall growth of older population. Women with formal education, particularly those with university and pre-university degrees, were more likely to be single in late life. It is strongly suggested to determine the causes and process of singlehood in old age in future research, including qualitative studies.

Keywords: Aging, demography, Iran, marriage, never married, older adults, population

Introduction

There are nearly 703 million people aged 65 years or above around the world. It is estimated that the elderly population will reach 1.5 billion by 2050. Globally, the share of the population aged 65 years or above is projected to rise from 6% in 1990 to 16% by 2050, that is, one in every six people will be 65 years or above by 2050 around the world,[1] most of whom will be residing in developing countries.[2]

Evidence shows that the population of never-married older adults is increasing. There has been a rise in the age of marriage, which shows that the number of never-married older adults will noticeably increase in the near future. According to statistics, in some countries, such as South Africa, Singapore, and Brazil, 9% to 16% of men and more than 10% of women, aged 65 years or above, will be never married by 2025.[3] A similar trend is emerging in the Iranian population. The proportion of older

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adults aged 60 years or above has increased from 7.2% in 2006 to 9.3% in 2016 in all populations, and it is predicted to rise to 10.5% by 2025 and 21.7% by 2050. The most recent census in 2016 indicated that there were 7.4 million people aged 60 years or above in Iran.[4,5]

Concurrently, the marriage age is increasing in different populations.[5] Several factors, such as psychological and social autonomy, self-sufficiency, and financial opportunities, are known to result in marriage postponement.[6] Although many studies have considered all unmarried people (i.e. widowed, divorced, and never married) as a single group, Cwikel *et al.* used a life course approach to human development and believed that an important event, such as marriage, earlier in life may have an impact on the individual's function in later life; therefore, never-married people may be different from others in their individual and social lives.[7] While other marital status groups can receive support from their spouse and children, never-married older adults may be a vulnerable group, exposed to isolation and loneliness.[3,8,9] The results of the study by Moudi *et al.* showed that single older adults had a lower level of quality of life.[10] There is some evidence indicating that never-married men and women have poorer physical capabilities than their married counterparts.[11] The study of William *et al.* reported that older participants who had never been married had lower physical health than married ones.[12] Never-married older adults might also have a higher risk of developing frailty[13] and are reported to be more likely to live alone.[8] On the other hand, in the study of Dreyer *et al.*, seniors living alone were 50% more likely to be admitted by emergency services and 40% more likely to be visited more than 12 times a year by a general physician.[14] It is reported that the rate of chronic diseases is higher among those older adults who live alone and that they need more primary care services.[15]

Both aging and singlehood can vastly influence different aspects of an individual's life. Subsequently, the increasing number of never-married older adults can influence the community. The aim of the current study was to illustrate the population growth trend of never-married older adults in the last 25 years and to determine their dispersion in different provinces of Iran. We also investigated the association of formal education with singlehood in older women and men, residing in urban and rural areas.

Methods

Based on the raw data available at the National Statistics Center of Iran, we evaluated the number of never-married men and women, aged 60 years or above, in four censuses conducted between 1996 (the last census in the second millennium) and 2016 and compared the results with the trend of growth in the general elderly population of women and men in the same censuses. We extracted the number of never-married elderly men and women in different areas and used ArcGIS software to illustrate their dispersion in different provinces of Iran. The sex ratio was also calculated in every province. We extracted the number of older women and men with a history of marriage (i.e. married, widowed, and divorced).

We also compared the formal education (literacy) of two elderly groups residing in urban and rural areas, using Chi-square test in SPSS version 22. Moreover, we described the level of education in literate never-married older men and women. This study was part of a PhD project approved by the ethics committee of University of Social Welfare and Rehabilitation Sciences on June 9, 2019 (Registration number: IR.USWR.REC.1398.014).

Results

In this study, we first extracted the number of never-married women and men, aged 60 years or above, in the last census conducted by the National Statistic Center of Iran. Based on the results, there were 68,457 never-married older adults in the 2016 census, consisting of 25,503 never-married older men and 42,954 never-married older women (59 male per 100 female). The population of never-married older men included 19,974 urban residents, 5489 rural residents, and 40 non-residents (nomadic lifestyle). On the other hand, the population of never-married older women included 34,839 urban residents, 8093 rural residents, and 22 non-residents (nomadic lifestyle).

Figure 1 shows the changes in the number of never-married older adults according to the last 25 censuses. Figure 2 presents the changes in the general population of older men and women between 1996 and 2016. Based on the findings, the population growth of never-married older adults, particularly older women, exceeded the overall growth of the elderly population. While the proportion of never-married older women to the total population of older women was 1.14%, only 0.69% of the older male population was never married.

The present findings indicated that the growth rate per 5 years (2011–2016) was 1.12 for men and 1.46 for women in the never-married elderly population. In the total elderly population, the corresponding rate was 1.21 for men and 1.19 for women, indicating the higher growth rate in the population of never-married older women. Plot 1 presents the proportion of never-married older adults (per 1000 older adults) in different provinces of Iran. The proportion was found to be higher in Tehran and some southern provinces. Bushehr accounted for the highest proportion, as well as the lowest sex ratio (34.4 male to 100 female). Based on the census conducted in 2016, 1.01% of men and 2.75% of women were never married in Bushehr. The corresponding proportions were 1.53% and 2.31% in the 2011 census, respectively.

To find the association between literacy and remaining single later in life, we determined the population of older adults with respect to literacy and marital status. Then, the Chi-square test was applied for evaluating older women and men in rural and urban areas. The results showed a significant association between singlehood in late life and having formal education in urban women ($\chi^2 = 10455.35$, $P < 0.001$). There was also a significant association between singlehood in late life and having formal education in rural women ($\chi^2 = 271.31$, $P < 0.001$). Therefore, it can be concluded that in both urban and rural female groups,

having formal education had a significant relationship with staying single later in life. However, this relationship was stronger in urban areas, that is, women with formal education were more likely to stay single later in life, particularly in urban areas.

Based on the findings, having formal education had a significant association with staying unmarried in older adult men in urban areas ($\chi^2 = 35.44$, $P < 0.001$). However, in rural older men, having formal education had a negative association with staying unmarried; in other words, educated older men were less likely to be never married ($\chi^2 = 179.13$, $P < 0.001$) [Table 1]. It can be concluded that older adults with formal education, who lived in urban areas, were more likely to stay single later in life. On the contrary, rural men with formal education were less likely to stay single later in life [Table 1].

As shown in Figure 3, never-married older women with university and pre-university education accounted for the highest proportion of the population of literate never-married older women (35% and 34%, respectively). However, this pattern was not compatible with the general level of education in older literate

women, most of whom had high school education (54%), and only 10% had university education [Figure 4].

Figures 5 and 6 show similar patterns in the education level of never-married older men compared with general older male population. On the other hand, a large proportion of literate older adults had primary school education (46%), while older men in the never-married group mostly had university and pre-university education (31% and 30%, respectively).

Overall, it can be concluded that the number and growth rate of never-married older women were considerably higher than men. In both sexes, the majority of never-married older adults had formal education. University and pre-university education were the most common education levels among never-married literate men and women.

Discussion

In this study, we investigated the population of never-married older adults from different aspects. To the best of our knowledge,
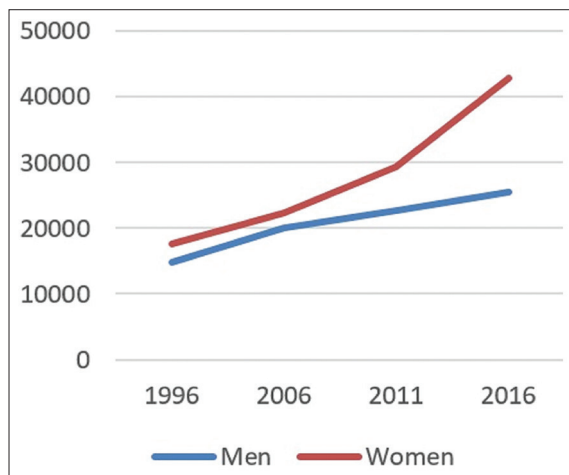

Figure 1: Never-married population of older men and women (60 years or above)
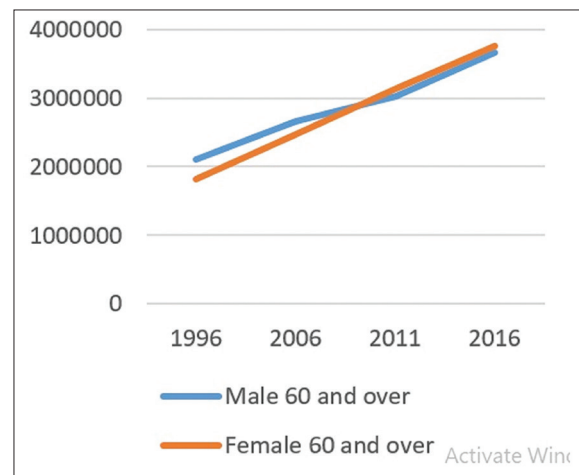

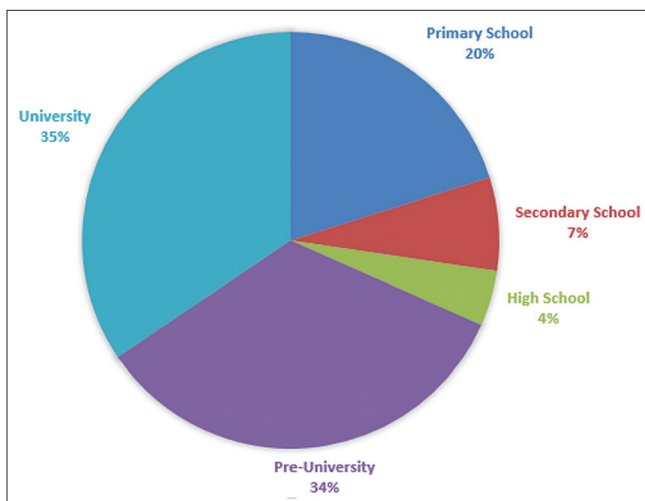Figure 2: Total population of older men and women (60 years or above)

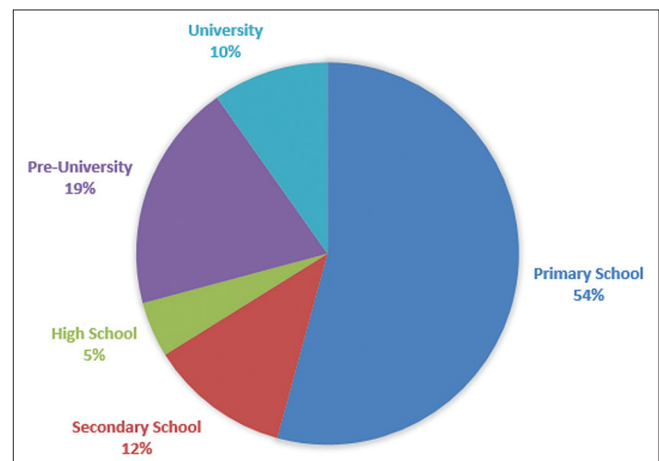Figure 3: Level of education in literate never-married older women

Figure 4: Level of education in the total population of literate older women

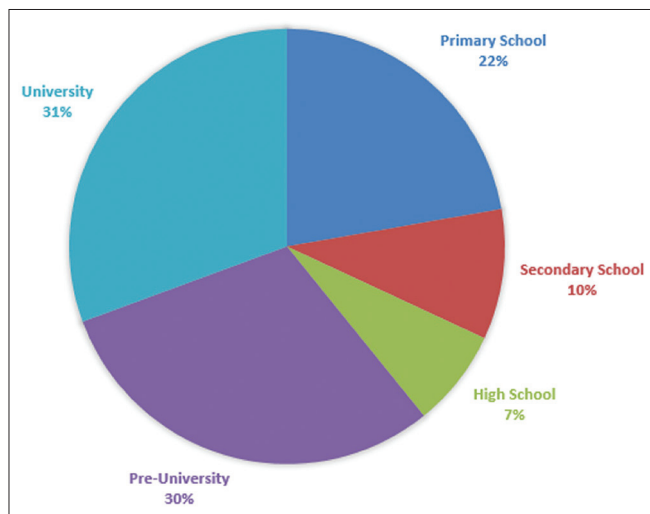| Table 1: Chi-square test for association of education and being never married						
		With formal education		Without formal education		Chi-square	*P*
		Ever married	Never married	Ever married	Never married		
women	Urban	1147484 97.9%	24509 2.1%	1518710 99.3%	10320 0.7%	10455.35	<0.001
	Rural	102253 98.8%	1236 1.2%	940452 99.3%	6850 0.7%	271.30	<0.001
Men	Urban	831001 99.2%	14221 0.8%	810296 99.3%	5732 0.7%	35.44	<0.001
	Rural	316970 99.6%	1298 0.4%	669089 99.4%	4183 0.6%	179.13	<0.001

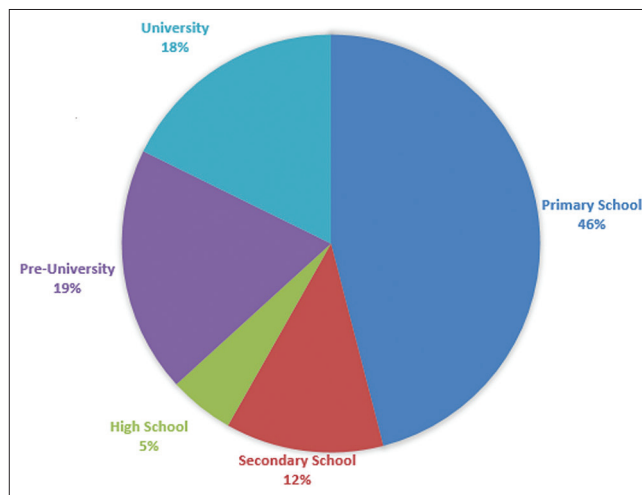**Figure 5:** Level of education in literate never-married older men

Figure 6: Level of education in the total population of literate older men

this is the first study addressing the demographics of this group of older adults in Iran. The findings indicated a large sex difference in the population of never-married older adults, that is, the female population was 1.7 times of the male population. Another noticeable finding of this study was related to the growth trend of never-married older adults, which was different from the overall pattern of aging population in Iran.

The results also indicated that the population of never-married older women is increasing faster than the male population. Women with formal education in urban and rural areas were more likely to stay single later in life, especially in rural areas. The same relationship was found for older men with formal education in urban areas; however, men with formal education in rural areas were less likely to be single later in life. The majority of literate never-married older men and women had university and colleague education, which was not compatible with the general pattern of education in literate older adults, most of whom had high school education.

Substantial evidence suggests that the number of never-married older adults is increasing around the world. It is estimated that in South Africa, 20% of women aged 65 years or above will not be married by 2025. In other countries, such as Mexico, Taiwan, Thailand, and Vietnam, the proportion of never-married older women has been estimated at 5% to 8%. This proportion for

men in the mentioned countries is estimated to reach 6%–7% by 2025.[3] Moreover, a study from Ireland showed that 13% of older men and 7% of older women were never married in 2012.[16]

Meanwhile, our findings indicated that both proportion and growth rate of the never-married elderly population were considerably higher in women, compared to men. This finding is not compatible with the overall growth rate of the elderly female population. One reason for this incompatibility can be postponement of marriage in Iranian women. In this regard, Torabi *et al.* reported that between 1980s and 2000s, the mean age of marriage increased in Iranian women by 3 years because of socioeconomic changes.[17] This pattern has been also found in younger cohorts of women. Rahimi *et al.* reported that in 1996, only 1.3% of women between 45 and 49 years were never married, while this proportion reached 2.2% in 2006 and 3.4% in 2011. They also reported that postponement of marriage after 40 years is increasing in younger generations.[18]

Evidence shows that the age gap between men and women relatively increases when a marriage takes place in older age. It means that men older than 60 years might marry women younger than 60 years, resulting in an imbalance in the number and proportion of never-married men and women.[19,20] This can be a reason for the difference in the sex pattern of the never-married population in our study. Traditionally, in Iran, women expect their
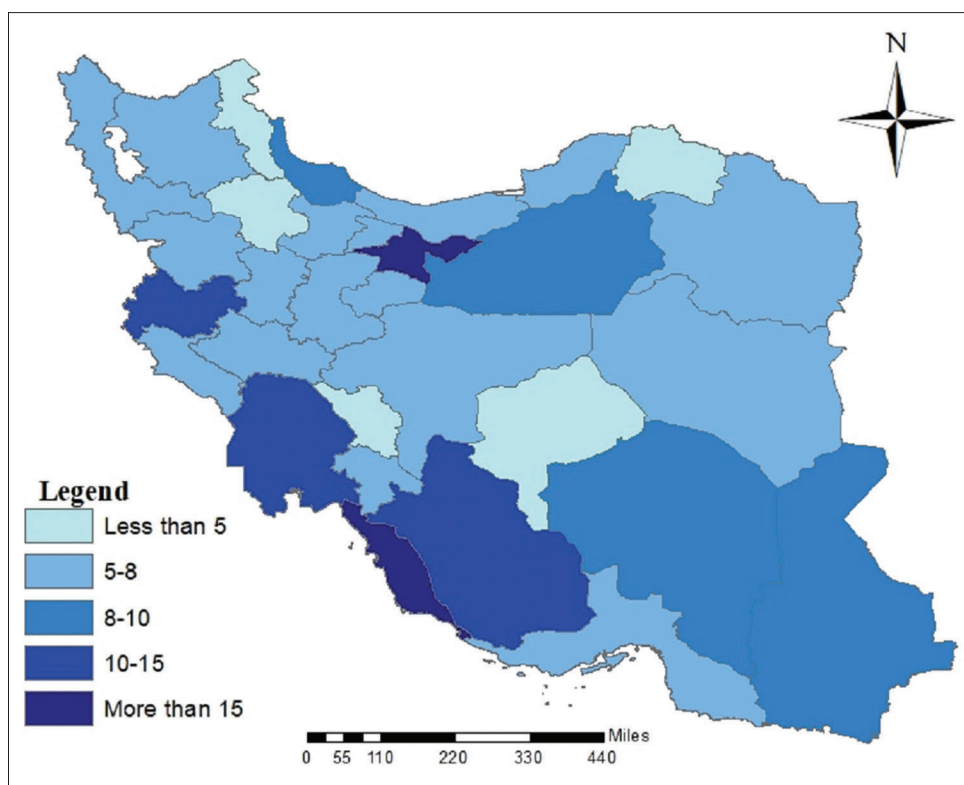
Plot 1: The proportion of never-married older adults per 1000 older adults

spouses to have similar or higher levels of education, and they do not normally marry men with lower levels of education. This, in fact, limits their options, resulting in a decrease in the rate of marriage among women with higher education.[21]

Our finding regarding the higher level of education in never-married older women is consistent with the many previous studies. In this regard, a cross-sectional study of data published in the "Older Cohort of the Australian Longitudinal Study on Women's Health" reported that never-married childless women had significantly higher levels of education.[7] The findings of another cross-sectional study on the data of 1400 interviews in the United States indicated that never-married older adults had higher levels of education than married individuals.[8] This association between education and singlehood cannot solidly explain a causative relationship, but theoretically, people who are engaged in education and work are more likely to stay single.[22]

Moreover, a study by Ward on 19,120 older adults indicated that women with higher education were more likely to stay single later in life. He argued that education is more important for never-married women, because they are not financially supported by their husbands; therefore, they need to spend more energy and resources on education and work to overcome financial obstacles.[23] On the other hand, there may be some stigmatization against educated women in some cultures, which can make their marriage more difficult. This can explain the higher proportion of never-married older women in rural areas, compared to their urban counterparts.

While having a formal education is statistically an advantage for the married male population in rural areas, it is not the same for men in urban areas. However, there may be some explanations for this finding. Lack of access, income, and consequently education is a reason for men to stay single. From a life-course perspective, if this insufficiency continues, the person is less likely to be married later in life.[6] The results of a study by Rahimi *et al.* also indicated that marriage postponement for women is related to the improvement of women's education. Limited access to education after marriage and the increased cost of marriage may also explain marriage postponement.[18]

There are some limitations in this study. First, we did not include the statistics related to non-respondent and non-resident (nomadic lifestyle) populations in our calculations of education level; however, we believe that these statistics were limited and did not affect our results and conclusions. Second, marriage normally takes place earlier in life. Therefore, the cultural conditions for older adults correspond to four or five decades ago when they were at the age of marriage. These conditions may be different for today's younger generations, who may have a different cultural attitude toward marriage. Therefore, it is not easy to predict the exact trend of singlehood in older adults in the future.

Conclusion

The number of never-married older adults is considerably increasing in Iran. This may be partly due to the overall

increase in the elderly population; however, it does not explain the sharp growth in the population of never-married older women. Women with formal education, who have university or pre-university education, were more likely to remain single later in life, especially in rural areas. The proportion of never-married older adults in some Iranian provinces such as Tehran and some southern ones is remarkably higher than others. This dispersion needs more detailed demographic investigation. As never-married older people might be a vulnerable group who receive less unformal support from their families, it is strongly recommended to investigate the cause and process of singlehood in old age in future research, including qualitative studies. Special attention should be paid to the social and healthcare needs of the growing population of never-married older adults.

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Nil.

Conflicts of interest

There are no conflicts of interest.

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