Can healthy life style predict successful aging among Iranian older adults?

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Abstract

 Background: Successful aging is a prominent and worldwide theme in gerontology. However, until recently, only few studies were conducted about successful aging in Iran. This study examined whether a healthy lifestyle could predict successful aging among older Iranians.

Methods: This cross sectional and descriptive study included 975 older Iranians who were selected through a multistage cluster-quota method from the health centers of Shiraz, Iran. A 5-part questionnaire, including demographic characteristics, the Seniors' Healthy Lifestyle, Barthel Index, the Diner Life Satisfaction and Quality of Life, was used to collect the data. A logistic regression analysis was used in data analysis; data were analyzed using SPSS 21; and significance level was set at α = 0.05.

Results: The prevalence of successful aging among older Iranians was calculated at 24.0%. Results of multiple logistic regression analysis revealed that age (95% CI = 1.129- 1.702 and OR = 1.352), gender (95% CI = 0.412-0.764 and OR = 0.687), education level (95% CI = 1.443 – 1.699 and OR = 1.454), job (95% CI = 1.063-1.413 and OR = 1.185), monthly income (95% CI = 1.355-4.055 and OR = 2.272), insurance (95% CI = 0.344-0.842 and OR = 0.540), source of income (95% CI = 1.014-1.298 and OR = 1.145), and healthy lifestyle (95% CI = 0.772 - 0.858 and OR = 0.814) were predictors for successful aging.

Conclusion: Findings indicated that successful agers were mostly younger men, with higher education level and monthly income, who had insurance and a job and a healthy lifestyle. Thus, to age successfully, one must maintain and improve healthy lifestyle to prolong one's health.

Keywords: Healthy lifestyle, Prevalence, Successful aging

Introduction

Aging populations pose a challenge in both developed and developing countries (1). The pace of aging population

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↑*What is "already known" in this topic:*
Successful aging is a worldwide concept in gerontology. Rowe and Kahn's (1997) model provides one of the most popular frameworks used in the previous researches in this area. Rowe and Kahn stated that successful aging involved 3 main factors, including being free of disability or disease, having high cognitive and physical abilities, and being active in social interactions. Furthermore, healthy lifestyle plays an important role in the prevention and control of age-related diseases. However, the association between healthy lifestyle on successful aging has not been well considered in the literature.

→*What this article adds:*
Rapid growth in the number of older population suggests the need to investigate the prevalence and correlated factors of successful aging. To date, little has been known about successful aging in Iran. Thus, this study aimed to identify the prevalence of successful aging and its correlates among Iranian elderly.

around the globe is growing rapidly (2). Recently, approximately there were 600 million seniors aged 60 years and older worldwide, which is expected to increase up to 2 billion in 2050. Two thirds of these people live in developed countries, and their number will reach up to 75% in 2025 (3), Iran is no exception. The latest census indicates that the aging population in Iran has increased 1.1% from 8.2% in 2011 to 9.3% in 2016 (4).

The progress of medical sciences in the middle of the twentieth century led to a relative increase in life span worldwide and accelerated the growth of the aging population (5). Although aging is not a disease, those who are old are more susceptible to diseases and disability due to various age-related deterioration as compared to younger people. Therefore, across the life span, being old is a time period when elderly health care needs are more consideration (6). In the aging process, some factors such as loss of spouse and friends, missing children, losing a job, poverty, and losing identity may significantly affect the senior's health (7). Thus, the increasing growth in the number of elders creates significant concerns, specifically in relation to their health (8).

Nongenetic factors, particularly lifestyle, play an important role in the development of age-related diseases and aging health (9). A healthy lifestyle is an effective and modifiable factor in the seniors' health promotion (10, 11). It leads to a reduction in the risk of illnesses and early death (12). Healthy lifestyle includes good nutrition, healthy eating, regular physical activity, stress management, no smoking, and protective activities against the development of health issues (13). However, it was believed that the reduction of physical activity is inevitable by advancing age. In contrast, recent studies have shown that even most of the disabled seniors are able to maintain their physical activity according to their abilities and should avoid inactivity (14-16). Thus, as the cohort has aged, it is important to find the role of healthy lifestyle on successful aging.

Successful aging has been defined in a variety of ways. Rowe and Kahn's model provides one of the frameworks most used in previous research. This particular model suggested a pyramid consisting of 3 important criteria for successful aging: absence of disease and disease related disability, good cognition and physical functional capacity, and active social engagement (17, 18). However, this model fails to address the implications of the fact that the aging process does include those with disability and diseases and a disease-free older age is unrealistic (17).

Rapid growth in the number of Iranian elders and increasing burden of chronic diseases suggest the need to investigate the well-being of this population. As the number of elders increases, concern on how to age successfully is becoming an issue that needs to be addressed. To date, no empirical information has been published on successful aging of Iranian seniors in the literature. Thus, the present study aimed to operationalize the concept and describe the prevalence of successful aging and its correlates among a sample of Iranian elderly.

Methods
This cross sectional study was conducted among seniors aged 60 years and older residing in Shiraz, Iran. A multi-stage sampling technique was used to obtain a representative sample. Institutional Review Board approval was obtained for this study.

For this sampling method, Shiraz, with the population of 1.5 million, was divided into 10 municipality zones. Then, 3 health centers were randomly selected from 5 to 6 health centers located in each of the zones. Seniors were recruited by simple random sampling from the list of the personal health folders of the respective health centers. Contact information for elderly people was extracted from the folders, and they were then called and invited to come to the respected health centers at a certain time if they were willing to participate in the study. We informed the seniors about the aims and procedures of the study by a telephone call.

By considering 11% prevalence of successful aging (p=0.11) that was extracted from results of Gwee et al (19), and by considering alpha level = 0.05 and degree of precision equal to 0.02, the total sample size was calculated at 976. The number of participants was selected based on the distribution of the elderly population in each cluster. Inclusion criteria were age ≥ 60 years, ability to communicate orally, and volunteering to participate in the study. Old people with severe physical, mental, and cognitive diseases with diagnosis of Alzheimer and severe depression were excluded from the study. From the approximately 1150 eligible elderly people, 975 (84.78%) completed the questionnaires and participated in this study.

Informed consent was reviewed with each participant in a private room at the health center. After consent was received, a face-to-face interview was conducted from June 2014 to February of 2015 by 6 trained and qualified assessors. Each interview took approximately 40 minutes. Data collected at the interview were from 5 structured questionnaires: a demographic questionnaire, the Barthel Index of Activities of Daily Living, Diener's life satisfaction scale, the SF 36 questionnaire, and the healthy lifestyle questionnaire. Participants were given short rest periods during the interview because there were many questionnaires to be filled out. To do so, the participants blood pressure was taken.

The demographic questionnaire consisted of 7 questions that included age, gender, education level, marital status, job, income resources, history of chronic illnesses, and insurance status.

The Barthel Index
The Barthel Index of Activities of Daily Living (ADL) was introduced by Dorothea Barthel in 1955 (20). This questionnaire consists of 10 items regarding ADLs, feeding, grooming, bathing, dressing, bowel and bladder control, toilet use, ambulation, transfers, and stair climbing. The total score ranges from 0 to 100, with the higher scores representing the better ability to perform ADL. The scores between 0-20 represent total dependence for ADLs, 21-60 severe dependency, 61-90 moderate dependency, 91-99 slight dependency, and 100 total independence (21). In the study conducted by Tagharrobi et al (22), the validity of this index was confirmed and its reliability was determined at 0.82, which was in the acceptable range.

Diener's Life Satisfaction

This scale was developed by Diener et al to measure life satisfaction (23). The scale has 5 Likert-type items measuring the cognitive component of subjective well-being with answers ranging from 1 (completely disagree) to 7 (completely agree). The participants were asked about how much they are satisfied with their lives and how much their real life is similar to their desires. The higher scores indicate better life satisfaction. Based on the obtained scores, life satisfaction was divided into 4 categories: extremely dissatisfied (5-9), dissatisfied (10-14), slightly dissatisfied (15-19), neutral (20), slightly satisfied (21-25), satisfied (26-30), and extremely satisfied (31-35) (24). Moltafet and Azarboun (25) confirmed the validity and reliability of this questionnaire. The Cronbach's Alpha was determined at 0.83.

SF36 questionnaire

The SF 36 was developed by Ware & Sherburne (26) and is used for assessing the quality of person's life and health. It consists of 36 items which are divided into 8 sections: (i) vitality, (ii) physical functioning, (iii) bodily pain, (iv) general health perceptions, (v) physical role functioning, (vi) emotional role functioning, (vii) social role functioning, and (viii) mental health. These 8 subscales can be combined into 2 summative components score of physical (PCS) and mental (MCS) health. The score for each of participants for each domain varied from 0 - 100, with the higher score indicating a better quality of life and health status; also, a mean score of 50 has been identified as a normative value for all domains and the questionnaire (27). The validity and reliability of this tool have been confirmed in Iranian people (28, 29), and the internal consistency of these 8 subscales was between 0.43 to 0.76. In addition, this questionnaire is able to discriminate the healthy from the unhealthy persons (30).

The seniors' lifestyle was measured by healthy lifestyle questionnaire that was prepared by Eshaghi et al (11). This questionnaire consists of 46 questions that are grouped into 5 subscales: exercise, nutrition, prevention, stress management, and social and interpersonal relationships. The validity and reliability of this questionnaire was high (Cronbach's alpha = 0.76). The higher score indicates a better lifestyle and the total score is classified into 3 groups: undesirable lifestyle (scores: 42-98), medium lifestyle (99-155), and ideal lifestyle (156-211) (11).

In the present study, successful aging is defined as a multidimensional construct based on the theory of Row and Khan (31). Successful agers are those with no major chronic disease, such as cancer, heart problem, diabetes, stroke, hypertension, and chronic lung disease, no physical functioning difficulty, good cognitive functioning, active engagement with life with no dementia, good perceived quality of life, and satisfaction with life (5, 16). The scores from the 4 scales of Barthel Index of Activities of Daily Living Diener's Life Satisfaction, the SF 36, and the Healthy Lifestyle questionnaire were matched to indicate successful aging.

The data were analyzed using Statistical Package for the Social Sciences (SPSS) version 21 (SPSS®; IBM; USA) for Windows. Descriptive statistics were conducted, including frequency, percent, means, and standard deviations (SD) for quantity data. All data were assessed for normal distribution by Kolmogorov-Smirnov test. A multivariate logistic regression analysis was conducted to identify the sociodemographic and healthy lifestyle factors associated with successful aging. Significance level was set at α = 0.05.

Results

A total of 975 community-dwelling seniors were included in the present study, of whom 53% were women (n=520) and 47% were men (n=455). The mean age of the sample was 66.9±23.7, with a range between 60 and 97 years (Table 1). More than half of the respondents (n=568, 58.3%) were illiterate and more than half (n=682, 69.9%)

Table 1. Demographic characteristics of participants (n = 975)

Variable		n	%
Age (years)	60-69	606	62.20
	70-80	274	28.10
	> 80	95	9.70
Education level	Illiterate	568	58.30
	Primary and secondary	240	24.60
	High School	117	12.00
	College Education	50	5.10
Marital status	Married	682	69.90
	Single	26	2.70
	Divorced	14	1.40
	Widow	251	25.70
Employment status	Unemployed	152	15.60
	Employed	154	15.80
	Retired	269	27.60
	Housewife	400	41.00
Source of income	Children	195	20.00
	Pension	415	42.60
	Charity	69	7.10
	Other resources	294	30.20
Insurance	Yes	865	88.70
	No	110	11.30
Successful ager	Yes	236	24.00
	No	739	76.00

were married. Retirement income was the source of income for 42.6% (n=415) of the Participants.

The prevalence of successful aging (having independence in activities of daily living, life satisfaction, and high quality of life) among Iranian seniors was calculated at 24% (n=236). The mean scores of the 4 instruments indicated a very good quality of life, fairly independent in basic activities of daily living, low life satisfaction, and the medium healthy lifestyle of the respondents (Table 2).

Findings from the multivariate logistic regression analysis revealed that age (95% CI = 1.129-1.702 and OR = 1.352), gender (95% CI = 0.412- 0.764 and OR= 0.687), education level (95% CI = 1.443-1.699 and OR = 1.454), job (95% CI = 1.063-1.413 and OR = 1.185), income resource (95% CI = 1.014-1.298 and OR = 1.145), insurance status (95% CI = 0.344-0.842 and OR = 0.540) and monthly income (95% CI = 1.355-4.055 and OR = 2.272) were predictors of successful aging (Table 3). This indicates that successful agers were more likely to be males in a younger age group, with higher education level and monthly income, insurance, and job. The results also showed that healthy lifestyle (95% CI = 0.772 - 0.858 and OR = 0.814) is a predictor of successful aging. All parameters of the lifestyle including social and interpersonal relationships (95% CI = 1.067-1.166 and OR=1.115), stress management (95% CI = 1.099-1.266 OR=1.180), healthy nutrition (95% CI = 1.049-1.152 and OR = 1.099), prevention (95% CI = 1.024-1.190) and OR = 1.104) and physical activity, exercise, recreation and fun (95% CI = 0.840-0.975 and OR = 0.908) were predictors of and related to successful aging (all p<0.001).

Discussion

This study was designed to determine the sociodemographic and lifestyle predictors of successful aging among older Iranians. The present study indicated that only one fourth of the seniors were classified as successful agers. Since previous studies applied different criteria to define successful aging, the wide range of successful aging prevalence has been reported (31-34). However, similar to our study, the rate of successful agers was low in studies that used multidimensional criteria to define successful aging.

Findings in the present study also indicated that the mean score of seniors' life satisfaction was lower as compared to a previous local study reported by Alipour et al (35). The differences could be related to the economic status and the income level of the respondents in our study which affected their life satisfaction. Most of the seniors were below the poverty line. Also, most participants in this study had high independence level and this may have a significant impact on the improvement of their quality of life, as the ability to function independently is an important factor in the quality of life among the seniors (36, 37).

Regarding the sociodemographic predictors of successful

Table 2. The descriptive data of quantitative variables

	Mean	SD	Minimum	Maximum	Median
Level of independence	95.00	18.78	90	100	94
Life satisfaction	22.04	6.69	5	35	22
Quality of life	96.23	8.28	20	100	96
Lifestyle	128.10	14.10	77	211	128

Table 3. Adjusted odds ratio (OR) estimates of different variables on successful aging

Variables		Odds ratio (OR)	(CI)	p
Gender	Male	1.000	-	-
	Female	0.687	0.412 – 0.764	0.007
Education level	Illiterate	1.000	-	-
	Primary and secondary	1.855	1.325 – 2.597	<0.001
	High school	2.435	1.506 – 3.938	<0.001
	College education	2.094	1.091 – 4.020	0.026
Marital status	Married	1.000	-	-
	Single	0.686	0.291 – 1.590	0.373
	Divorced	0.096	0.012 – 0.778	0.028
	Widowed	0.825	0.585 – 1.163	0.273
	Unemployed	1.000	-	-
Job	Housewife	1.847	1.100 – 3.099	0.020
	Retired	1.432	1.063 – 1.413	0.010
	Free Jobs	1.834	1.074 – 3.130	0.026
Monthly income	Under Poverty Line	1.000	-	-
	Upper Poverty Line	2.044	1.181 – 3.537	0.011
Insurance	No	1.000	-	-
	Yes	0.642	0.344 – 0.842	0.007
Source of income	Children	1.000	1.000	1.000
	Charity	0.464	0.228 – 0.944	0.034
	Pension	1.753	1.147 – 2.680	0.010
	Other Resources	1.360	1.864 – 2.140	0.030
Age		1.022	1.002 – 1.042	0.004
Prevention		1.104	1.024 – 1.190	<0.01
Physical activity		0.908	0.840 – 0.975	<0.001
Healthy nutrition		1.099	1.049 – 1.152	<0.001
Stress management		1.180	1.099 – 1.266	<0.001
Social and interpersonal relations		1.115	1.067 – 1.166	<0.001
Lifestyle		0.814	0.722 – 0.858	<0.001

aging, this study was similar to previous studies (38, 39) that indicated that successful aging in Iranian older adults was related to age, gender, educational attainment, monthly income, income resource, job, and insurance. As expected and consistent with some studies (7, 38-40), increasing age was related to lower successful aging. This result may be related to increasing the level of dependency by advancing age (41). Our results was similar to those of Zahmatkeshan et al (42) who showed elderly men had a higher quality of life and were more likely to be successful agers. This finding may be attributed to the cultural factors. In our society, elderly men have a better social position compared to elderly women. On the other hand, elderly women are financially dependent on their husbands and they are more likely to live in poverty as compared to elderly men. Again, these factors could decrease life satisfaction and quality of life, and older women tend to be less successful. This study also found that successful aging was related to higher educational status and monthly income. This result can be explained by the fact that higher education levels provide better occupational opportunities and more financial security during old age. Furthermore, a higher level of educational attainment brings better psychological function (efficacy, happiness) (43) and optimal health behaviors (44). Increased awareness of seniors with higher education increases the probability of successful aging (45). In the present study, having a job was also found to be an effective factor for successful aging. Older people need to have a job due to low retirement income and the excessive expenses of this period of life. The lack of adequate income may increase the rate of dependency of the seniors and could reduce their self-esteem and life satisfaction as well as life quality (46).

Health insurance was another effective factor in successful aging. The results of this study showed those seniors who had social or private insurance services were more likely to be successful ager. Incidentally, Shoaei and Nejati (47) reported that social security is an important income source for the retired seniors in the United States and other developed countries. Without this source of income, two thirds of seniors will be under the poverty line. In Iran, non-governmental organizations (NGOs) play a key role in empowerment of seniors to demand their basic health needs from the government.

The results of the logistic regression model showed that healthy lifestyle prevention, such as healthy nutrition, physical activity, social relationships, and stress management, were predictors of successful aging. In this regards, Lewis (48) found that successful aging is making a conscious decision to have a healthy lifestyle and promoting drugs and alcohol avoidance. As such, Sabia et al (49) showed that people who engaged in healthy behaviors (never smoking, moderate consumption of alcohol, engaging in some physical activity and eating fruits and vegetables daily) during midlife had greater odds of successful aging during a 16-year follow-up.

Regarding prevention component, as chronic conditions had a negative relationship with successful aging (18, 50-52), the prevention of these conditions is considered to be

an important factor for successful aging. Furthermore, nutrition is essential for improving the quality of life of seniors (53). Regarding physical activity, Adams-Fryatt (54) reported that engaging in regular physical activity can result in dramatic physical, mental, and social benefits for seniors. These improvements increase the quality of life, and the probability of being successful ager. In this regard, American Sports Medical College and the American Heart Association in their statement recommended that engaging in a regular exercise program for 30 minutes per day is an essential factor for successful aging (54). Furthermore, the emotionally supportive atmosphere at group exercise training programs and the positive impact of social participation cannot be underestimated.

In the present study, social relationships were related to successful aging. It seems that good social relationship is related to successful aging. Aghanouri et al (55) showed that social relationship was an effective factor in seniors' quality of life. Most of the seniors in the present study had reduced the number of their superficial relationships and increased their deep relationships. In other words, the seniors reduced the quantity of their social network but increased the quality of the relationships.

The present study was subjected to a few limitations which may provide an avenue for future studies. The first limitation of this study was that all data were collected using the self-reporting method. The second limitation was the cross sectional design of the study, which might have limited its ability to show the causal relationship among studied variables. Furthermore, the study was conducted among community-dwelling older adults, which may limit the generalization of the results to other older people or institutionalized older adults. Another limitation was that those elderly persons who were too ill to participate were not invited into the study.

Conclusion
Our findings provided the baseline information on successful aging among older Iranians. Results of this study showed that successful agers were more likely to be younger, men, with a higher education level and household income, and having income resources, insurance and job. Furthermore, all dimensions of the lifestyle were predictors of successful aging. Successful aging is multifaceted construct and we did not assess all its effective and predictive factors. Thus, other factors such as spiritual or cognitive health should be evaluated in future studies.

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Conflict of Interests
The authors declare that they have no competing interests.

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