Health Promotion

# Status of the utilization of preventive care services and its associated socio-demographic factors among Iranian elderly

ROZITA MOHAMADI KHANGHAH[1], FERESHTEH BESHARATI[2], PARAND POURGHANE[3], BAHAREH GHOLAMI-CHABOKI[4]

[1] MSC Student of Geriatric Nursing, Zeynab (P.B.U.H) School of Nursing and Midwifery, Guilan University of Medical Sciences, Rasht, Iran; [2] Assistant Professor, PhD in Department of Nursing, Zeynab (P.B.U.H) School of Nursing and Midwifery, Guilan University of Medical Sciences, Rasht, Iran; [3] Associate Professor, PhD in Department of Nursing, Zeynab [P.B.U.H) School of Nursing and Midwifery, Guilan University of Medical Sciences, Rasht, Iran; [4] Assistant Professor, PHD in Cardiovascular Diseases Research Center, Guilan University of Medical Sciences, Rasht, Iran

Keywords

Preventive Measures • Aged • Demographic Factors

Summary

**Introduction**. *The growing population of the elderly, the rising costs of medical care and the low use of preventive services are three factors that highlight the importance of using preventive health care services in the Iranian population. This study aimed to determine the status of the use of preventive care services and its associated socio-demographic factors in the elderly referred to health centers.*

**Methods**. *In this analytical cross-sectional study, a number of 160 elderly people referred to health centers in East Guilan, Iran was selected by multi-stage cluster sampling. Data were obtained from May to September, 2021 using a questionnaire containing utilization of preventive care services (9 items) and socio-demographic characteristics.*

**Results**. *The highest and the lowest utilization rates of preventive care services among study participants were related to the blood pressure test (96.9%) and colonoscopy (17.5%), respectively. Multivariate analysis showed that only income had a significant association with performing fasting blood sugar test ($p = 0.004$), blood lipid test ($p = 0.004$), and blood pressure test ($p = 0.013$). Also, the associations between having an underlying disease and performing fasting blood sugar test ($p = 0.032$) and blood pressure test ($p = 0.002$), the association between gender and performing the bone mineral density test ($p < 0.001$), and the association between occupation and performing Pap-smear test ($p = 0.011$), were statistically significant.*

**Conclusions**. *The utilization rates of screening tests for most cancers, including gastrointestinal cancers, were low. Since, there were a significant association between income, disease, gender and occupation with the utilization of some preventive care services, considering them in health centers' preventive care program design might be useful.*

## Introduction

Population aging is a global challenge to the world's socio-economic development [1]. Over the last fifty years, socio-economic development, declining fertility followed by diminishing population growth and increasing life expectancy have led to significant changes for the structure of the world's population, so that the number of older people has increased significantly [2]. In 2016, the world's elderly population was about 639 million. Meanwhile, it has been predicted that the number of elderly people will reach about one billion and one hundred million in 2025 [3]. According to the reports provided by the statistics center of Iran in 2016, there are 4,871,518 elderly people in Iran, accounting for 6.1% of the total population [4]. It has been predicted that 20-25% of the Iranian population will be over 60 years of age in 2031 [5].

Although aging is not a disease and achieving old age should be considered as one of the major human advances, nevertheless, the elderly is at increased risk of many chronic diseases (Heart disease, Blood pressure, Diabetes, Arthritis, and Cancer) due to being in a certain area of life [6]. Chronic diseases can lead to hospitalization, long-term disability poor quality of life and death, and they can be a major factor in healthcare expenses [7]. The role of preventive care services has been emphasized in improving the health status of individuals and reducing the financial burden of treatment costs for chronic diseases in the elderly community [8]. Prevention can be considered as one of the most important strategies to achieve healthy and active aging [9, 10].

Use of preventive care has several benefits including, promoting healthy lifestyles, decreasing the chance of becoming disease, treating diseases in early stages, and preventing medical complications [10, 11].

Several studies have attempted to address the issue of low use of preventive care. However, little is known about the factors such as socio-economic inequalities including income, education, gender inequality, and their effect on the utilization of preventive care services [9, 12, 13].

 https://doi.org/10.15167/2421-4248/jpmh2023.64.2.1913

According to the studies conducted in European countries, there is evidence of inequality in the use of preventive care services in favor of groups with a higher socio-economic status [14, 15]. Another study found that women had a higher utilization rate of preventive care services than men [13].

Despite the importance of utilization of preventive care services for the elderly, there are currently few studies in Iran that have examined disease - specific preventive care services [16]. They have also paid little attention to socio-demographic inequalities in the use of preventive care services. Since, any planning for health requires the access of accurate and up-to-date information, it is essential to do studies to assess the utilization of preventive care services and its affecting factors on the Iranian elderly. Therefore, this study investigated the status of utilization of preventive care services and its associated socio-demographic factors on the elderly referred to comprehensive urban health centers in East Guilan.

## Materials and methods

### Study design and sampling

The present study was part of a larger analytical cross-sectional research conducted on people 60 years and older referred to the comprehensive health centers in East Guilan (in Northern Iran) between May and September 2021.

Inclusion criteria included age 60 years or older, having a health record in urban comprehensive health service centers, willingness and informed consent to participate in the study and the ability to answer the questionnaire through interviews, and exclusion criteria included obtaining less than 7 points in the short cognitive test (AMT) [17] and incomplete questionnaire.

The sample size was estimated based on this formula $[z^2_{1-\alpha/2} * p(1-p)]/d2$. Confidence interval was 95%, expected prevalence based on previous study was inserted as 0.28 [16]. The required precision of the estimate (d) was assumed to be 0.08. Then, the design effect of 1.2 and non-response error of 10% was inserted. Finally, 160 people were included in the study.

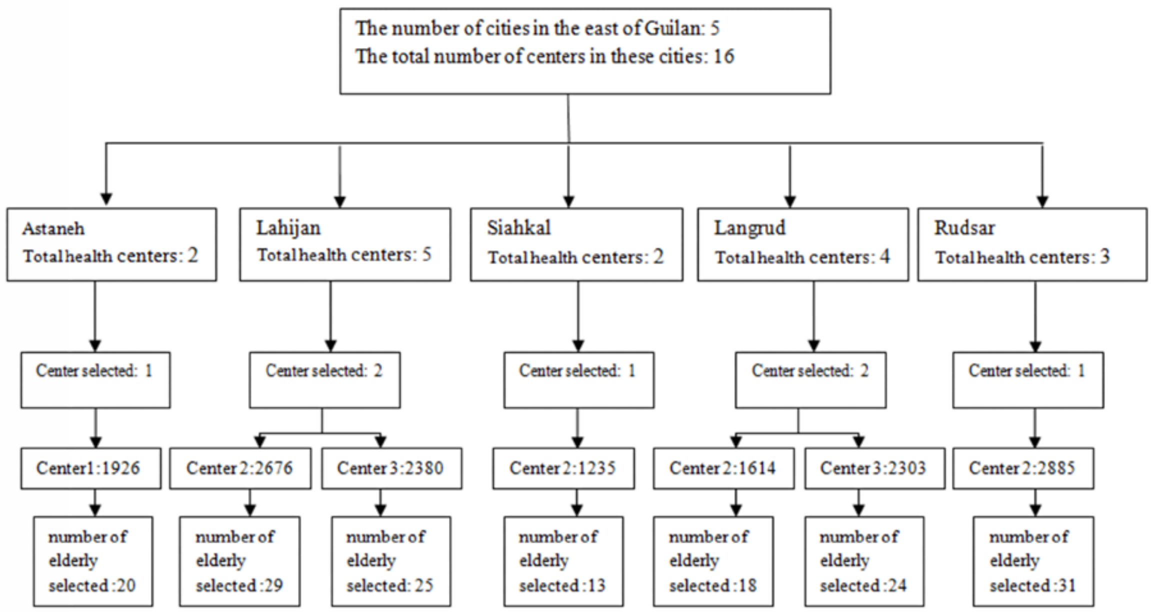
Participants were included in the study using multistage cluster sampling. First, each city of East Guilan (Astaneh, Lahijan, Rudsar, Siahkal, Langrud) was considered as a cluster. In the next stage, seven out of sixteen comprehensive urban health centers throughout the cities of East Guilan were selected randomly. Then, based on the available population information of each selected centers, the appropriate number of samples were randomly selected proportional to the population of each center according to the total size of the main sample (160 people) (Fig. 1).

### Measurements

The data collection instrument in this study included a questionnaire consisting of three parts. The first part included the participants' cognitive status test. In this instrument (Abbreviated Mental Test), each correct answer was given a score of 1 while an incorrect answer scored as 0, and the total score was calculated at the end (ranging between 0 and 10). The lower total score indicated a more severe cognitive impairment. In Iran, the validity and reliability of this test were confirmed by Foroughan et al. [18].

The second part included the socio-demographic characteristics of the participants, which included age, gender, marital status, education level, occupation, income, and history of underlying disease.

**Fig. 1.** Flow-chart of the sampling process and study subject selection.



The third part contained nine questions about the utilization of preventive care services, which included fasting blood sugar test, blood pressure test, blood lipid test, fecal occult blood test (over the last 1 year), bone mineral density test (over the last 1 year), prostate-specific antigen (PSA test) in men and mammography and pap-smear tests in women (over the past 5 years) and colonoscopy (over the past 10 years). If the elderly had done any of these tests, they were given a score of 1 otherwise they received a 0 score. They were also asked an open-ended question about the reason for not performing these tests. Content validity (CVI and CVR) of the questionnaire was assessed and approved by 10 members of the nursing and health education faculty members. Then the reliability of the instrument was assessed using the internal consistency method using 30 elderly people. An acceptable value of Cronbach's alpha coefficients was obtained ($\alpha > 0.7$). Due to the pandemic COVID-19, the data were gathered by telephone interview.

### Data analysis

Descriptive statistics (mean, standard deviation, frequency, and percentage) were used to describe the study population. For the initial review of the association between demographic variables (independent variables) and utilization of preventive care services, the Mann–Whitney, Chi-square, or Fisher's exact tests were used depending on the type of variables (bivariate analysis). Eventually, the significant variables in the bivariate analysis (associated with the utilization of preventive care services) were included in a multiple logistic regression model ($p < 0.05$). The data were analyzed using SPSS version 16.

## Results

The information of 160 elderly people (98 females and 62 males) was collected. Mean age and standard deviation of participants was 68.80 ± 6.69. The education level of half of the participants was less than a high school diploma. 124 participants (77.5%) were married and 95% (152) had insurance. Also, less than half of them were unemployed and had a middle income. 81.1% (131) of them had an underlying disease. In addition, the results showed that of the preventive care services, the utilization rate of blood pressure test (96.9%), blood lipid test (88.8%), and fasting blood sugar test (87.5%) were the highest, and the utilization rate of colonoscopy (17.5%), and fecal occult blood test (29.4%) were the lowest among the elderly in this research (Tab. I).

The results of Table II and Table III showed that there were statistically significant associations between the age of the elderly with the utilization of fasting blood sugar test ($p = 0.028$) and blood lipid test ($p = 0.025$). The mean age of people who performed blood sugar and blood lipid tests was higher than those who did not. Gender was significantly associated with performing the bone mineral density test ($p < 0.001$). That is, women were more likely to utilize a bone mineral density test than men. Education level, also, had a significant association with the mammography test ($p = 0.003$). People with a higher education level had a greater rate of mammography use than people with a lower education level. Also, there was a significant association between occupation status and utilizing the Pap-smear test ($p = 0.019$) and mammography ($p < 0.001$). People who were employed and retired had a higher utilization rate of Pap-smear test and mammography than unemployed people.

**Tab. I.** Demographics characteristics and status of the utilization of preventive care services of research participants (N = 160).

| Variable | | N | (%) | |
|---|---|---|---|---|
| Gender | Male | 62 | 61.3 | |
| | Female | 98 | 38.8 | |
| Education | Illiterate | 45 | 28.1 | |
| | Lower High school | 39 | 24.4 | |
| | High school | 45 | 28.1 | |
| | University | 31 | 19.4 | |
| Occupation | Unemployed | 76 | 47.5 | |
| | Employed | 21 | 13.1 | |
| | Retired | 63 | 39.4 | |
| Marital | Single | 2 | 1.3 | |
| | Married | 124 | 77.5 | |
| | Deceased wife | 2 | 1.3 | |
| | Divorced | 32 | 20 | |
| Insurance | Yes | 152 | 95 | |
| | No | 7 | 4.4 | |
| | Non-response | 1 | 0.6 | |
| Income | Low | 42 | 26.3 | |
| | Middle | 67 | 41.9 | |
| | High | 51 | 31.9 | |
| Disease | Yes | 130 | 81.1 | |
| | No | 30 | 18.9 | |
| Fasting blood sugar | Yes | 140 | 87.5 | |
| | No | 19 | 11.9 | |
| | Non-response | 1 | 0.6 | |
| Blood lipid test | Yes | 142 | 88.8 | |
| | No | 18 | 11.3 | |
| Fecal occult blood test | Yes | 47 | 29.4 | |
| | No | 113 | 70.6 | |
| Blood pressure test | Yes | 155 | 96.9 | |
| | No | 5 | 3.1 | |
| Bone density test | Yes | 67 | 41.9 | |
| | No | 93 | 58.1 | |
| Pap-smear test | Yes | 37 | 37.8 | |
| | No | 61 | 62.2 | |
| Mammography | Yes | 46 | 46.9 | |
| | No | 51 | 52 | |
| | Non-response | 1 | 1.1 | |
| Prostate-specific antigen | Yes | 40 | 64.5 | |
| | No | 22 | 35.5 | |
| Colonoscopy | Yes | 28 | 17.5 | |
| | No | 132 | 82.5 | |
| Age | Mean | SD | Min | Max |
| | 68.80 | 6.69 | 60 | 86 |

**Tab. II.** Utilization of preventive services (fasting blood sugar test, blood pressure control, fecal occult blood test, blood lipid test and, bone mineral density test) according to socio-demographic variables of research participants.

| Preventive care Variable | | Fasting blood sugar | | | Blood lipid test | | | Fecal occult blood test | | | Blood pressure | | | Bone density test | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Yes N (%) | No N (%) | P-value | Yes N (%) | No N (%) | P-value | Yes N (%) | No N (%) | P-value | Yes N (%) | No N (%) | P-value | Yes N (%) | No N (%) | P-value |
| Gender | Female | 87 (62.1) | 10 (52.6) | 0.425* | 88 (62) | 10 (55.6) | 0.599* | 33 (70.2) | 65 (57.5) | 0.133* | 96 (61.9) | 2 (40) | 0.376** | 56 (83.6) | 42 (45.2) | < 0.001* |
| | Male | 53 (37.9) | 9 (47.4) | | 54 (38) | 8 (44.4) | | 14 (29.8) | 48 (42.5) | | 59 (38.1) | 3 (60) | | 11 (16.4) | 51 (54.8) | |
| Education | Illiterate | 39 (27.8) | 5 (26.3) | 0.709** | 40 (28.2) | 5 (27.8) | 0.725** | 13 (27.7) | 32 (28.3) | 0.961* | 44 (28.4) | 1 (20) | 0.603** | 23 (34.3) | 22 (23.7) | 0.411* |
| | Lower High school | 33 (23.6) | 6 (31.6) | | 33 (23.2) | 6 (33.6) | | 12 (25.5) | 27 (23.9) | | 38 (24.5) | 1 (20) | | 13 (19.4) | 26 (28) | |
| | High school | 39 (27.9) | 6 (31.6) | | 40 (28.2) | 5 (27.8) | | 14 (29.8) | 31 (27.4) | | 42 (27.1) | 3 (60) | | 19 (28.4) | 26 (28) | |
| | University | 29 (20.7) | 2 (10.5) | | 29 (20.4) | 2 (11.1) | | 8 (17) | 23 (20.4) | | 31 (20) | 0 (0) | | 12 (17.9) | 19 (20.4) | |
| Marital | Single | 1 (0.7) | 1 (5.3) | 0.477* | 1 (0.7) | 1 (5.6) | 0.419* | 0 (0) | 2 (1.8) | 0.323* | 1 (0.6) | 1 (20) | 0.126* | 0 (0) | 2 (2.2) | 0.072* |
| | Married | 108 (77.1) | 15 (78.9) | | 110 (77.5) | 14 (77.8) | | 40 (85.1) | 84 (74.3) | | 121 (78.1) | 3 (60) | | 48 (71.6) | 76 (81.7) | |
| | Deceased wife | 29 (20.7) | 3 (15.8) | | 29 (20.4) | 3 (16.7) | | 6 (12.8) | 26 (23) | | 31 (20) | 1 (20) | | 17 (25.4) | 15 (16.1) | |
| | Divorced | 2 (1.4) | 0 (0) | | 2 (1.4) | 0 (0) | | 1 (2.1) | 1 (0.9) | | 2 (1.3) | 0 (0) | | 2 (3) | 0 (0) | |
| Occupation | Unemployed | 66 (47.1) | 9 (47.4) | 0.927* | 67 (47.2) | 9 (50) | 0.815* | 23 (48.9) | 53 (46.9) | 0.835* | 74 (47.7) | 2 (40) | 0.208** | 34 (50.7) | 42 (42.2) | 0.198* |
| | Employed | 18 (12.9) | 3 (15.8) | | 18 (12.7) | 3 (16.7) | | 7 (14.9) | 14 (12.4) | | 19 (12.3) | 2 (40) | | 5 (7.5) | 16 (17.2) | |
| | Retired | 56 (40) | 7 (36.8) | | 57 (40.1) | 6 (33.3) | | 17 (36.2) | 46 (40.7) | | 62 (40) | 1 (20) | | 28 (41.8) | 35 (37.6) | |
| Insurance | Yes | 133 (95.7) | 18 (94.7) | 1** | 135 (95.7) | 17 (94.4) | 0.576** | 46 (97.9) | 106 (94.6) | 0.675** | 125 (96.2) | 27 (93.1) | 1** | 61 (92.4) | 91 (97.8) | 0.128** |
| | No | 6 (4.3) | 1 (5.3) | | 6 (4.3) | 1 (5.6) | | 1 (2.1) | 6 (5.4) | | 5 (3.8) | 2 (6.9) | | 5 (7.6) | 2 (2.2) | |
| Income | Low | 33 (23.6) | 9 (47.4) | 0.028* | 33 (23.2) | 9 (50) | 0.024* | 13 (27.7) | 29 (25.7) | 0.761* | 38 (25.5) | 40 (80) | 0.011** | 12 (17.9) | 30 (32.3) | 0.101* |
| | Middle | 63 (45) | 3 (15.8) | | 64 (45.1) | 3 (16.7) | | 21 (44.7) | 46 (40.7) | | 67 (43.2) | 0 (0) | | 33 (49.3) | 34 (36.6) | |
| | High | 44 (31.4) | 7 (36.8) | | 45 (31.7) | 6 (33.3) | | 13 (27.7) | 38 (33.6) | | 50 (32.3) | 1 (20) | | 22 (32.8) | 29 (31.2) | |
| Disease | Yes | 118 (84.3) | 11 (57.9) | 0.011** | 119 (83.8) | 11 (61.1) | 0.047** | 39 (83) | 91 (80.5) | 0.718* | 129 (83.2) | 1 (20) | 0.005** | 58 (86.6) | 72 (77.4) | 0.144* |
| | No | 22 (15.7) | 8 (42.1) | | 23 (16.2) | 7 (38.9) | | 8 (17) | 22 (19.5) | | 26 (16.8) | 40 (80) | | 9 (13.4) | 21 (22.6) | |
| Age | 60-86 | Mean (SD) | Mean (SD) | P-value | Mean (SD) | Mean (SD) | P-value | Mean (SD) | Mean (SD) | P-value | Mean (SD) | Mean (SD) | P-value | Mean (SD) | Mean (SD) | P-value |
| | | 68.98 (6.52) | 66.26 (6.90) | 0.028 b | 68.94 (6.48) | 66.22 (7.10) | 0.025 b | 68.23 (6.80) | 68.81 (6.52) | 0.50 b | 68.84 (6.58) | 62.40 (2.88) | a | 68.88 (6.70) | 68.46 (6.54) | 0.693 b |

* P-value based on Chi-squared test; ** P-value base on Fisher's Exact test; [a] No statistics are computed because variable is a constant; [b] P-value based on Mann-Whitney U (age); Significant at 0.05 level.

**Tab. III.** Utilization of preventive services (PSA test, mammography, Pap-smear and colonoscopy) according to socio-demographic variables of research participants.

| Preventive care Variable | | Pap-smear test | | | Mammography | | | PSA | | | Colonoscopy | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Yes | No | P-value | Yes | No | P-value | Yes | No | P-value | Yes | No | P-value |
| | | N (%) | N (%) | | N (%) | N (%) | | N (%) | N (%) | | N (%) | N (%) | |
| Gender | Female | 37 (100) | 61 (100) | a | 46 (100) | 51 (100) | a | - | - | a | 16 (57.1) | 82 (62.1) | 0.623** |
| | Male | - | - | | - | - | | 40 (100) | 22 (100) | | 12 (42.9) | 50 (37.9) | |
| Education | Illiterate | 8 (21.6) | 23 (37.7) | 0.239* | 7 (15.2) | 24 (47.1) | 0.003* | 6 (15) | 8 (36.4) | 0.173** | 3 (10.7) | 42 (31.8) | 0.07* |
| | Lower High school | 10 (27) | 14 (23) | | 11 (23.9) | 12 (23.5) | | 12 (30) | 3 (13.6) | | 9 (32.1) | 30 (22.7) | |
| | High school | 12 (32.4) | 19 (31.1) | | 19 (41.3) | 12 (23.5) | | 8 (20) | 6 (27.3) | | 7 (25) | 38 (28.8) | |
| | University | 7 (18.9) | 5 (8.2) | | 9 (19.6) | 3 (5.9) | | 14 (35) | 5 (22.7) | | 9 (32.1) | 22 (16.7) | |
| Occupation | Unemployed | 17 (45.9) | 45 (73.8) | 0.019** | 20 (43.5) | 41 (80.4) | < 0.001** | 8 (20) | 6 (27.3) | 0.737* | 9 (32.1) | 67 (50.8) | 0.198* |
| | Employed | 3 (8.1) | 2 (3.3) | | 4 (8.7) | 1 (2) | | 10 (25) | 6 (27.3) | | 5 (17.9) | 16 (12.1) | |
| | Retired | 17 (45.9) | 14 (23) | | 22 (47.8) | 9 (17.6) | | 22 (55) | 10 (45.5) | | 14 (50) | 49 (37.1) | |
| Marital | Single | 1 (2.7) | 0 (0) | 0.208* | 0 (0) | 1 (2) | 0.048* | 0 (0) | 1 (4.5) | 0.194* | 1 (3.6) | 1 (0.8) | 0.436* |
| | Married | 28 (75.7) | 38 (62.3) | | 35 (76.1) | 31 (60.8) | | 39 (97.5) | 19 (86.4) | | 23 (82.1) | 101 (76.5) | |
| | Deceased wife | 8 (21.6) | 21 (34.4) | | 9 (19.6) | 19 (37.3) | | 1 (2.5) | 2 (9.1) | | 4 (14.3) | 28 (21.2) | |
| | Divorced | 0 (0) | 2 (3.3) | | 2 (4.3) | 0 (0) | | - | - | | 0 (0) | 2 (1.5) | |
| Insurance | Yes | 33 (89.2) | 57 (95) | 0.422** | 42 (91.3) | 47 (94) | 0.707** | 40 100)) | 22 (100) | - | 25 (89.3) | 127 (96.9) | 0.105** |
| | No | 4 (10.8) | 5 (3) | | 4 (8.7) | 3 (6) | | - | - | | 3 (10.7) | 4 (3.1) | |
| Income | Low | 8 (21.6) | 17 (27.9) | 0.789* | 8 (17.4) | 16 (31.4) | 0.095* | 9 (22.5) | 8 (36.4) | 0.244* | 7 (25) | 35 (26.5) | 0.355* |
| | Middle | 19 (51.4) | 29 (47.5) | | 22 (47.8) | 26 (51) | | 15 (37.5) | 4 (18.2) | | 9 (32.1) | 58 (43.9) | |
| | High | 10 (27) | 15 (24.6) | | 16 (34.8) | 9 (17.6) | | 16 (40) | 10 (45.5) | | 12 (42.9) | 39 (29.5) | |
| Disease | Yes | 29 (78.4) | 55 (90.2) | 0.106* | 37 (80.4) | 46 (90.2) | 0.172* | 31 (77.5) | 15 (68.2) | 0.422* | 24 (85.7) | 106 (80.3) | 0.505* |
| | No | 8 (21.6) | 6 (9.8) | | 9 (19.6) | 5 (9.8) | | 9 (22.5) | 7 (31.8) | | 4 (14.3) | 26 (19.7) | |
| Age | 60-86 | Mean (SD) | Mean (SD) | P-value | Mean (SD) | Mean (SD) | P-value | Mean (SD) | Mean (SD) | P-value | Mean (SD) | Mean (SD) | P-value |
| | | 66.54 (5.97) | 67.90 (5.16) | 0.110[b] | 66.98 (5.07) | 67.65 (5.87) | 0.638[b] | 70.71 (7.10) | 70.77 (8.97) | 0.645[b] | 67.86 (6.14) | 68.80 (6.69) | 0.544[b] |

* P-value based on Chi-squared test; ** P-value base on Fisher's Exact test; [a] No statistics are computed because variable is a constant; [b] P-value based on Mann-Whitney U (age); Significant at 0.05 level.

There was observed a significant association between marital status and utilizing mammography test (p = 0.048). Married people had a higher rate of mammography test than others. Also, there was a statistically significant association between income and performing fasting blood sugar test (p = 0.028), blood lipid test (p = 0.024), and blood pressure test (p = 0.011). Having a chronic disease had a significant association with conducting fasting blood sugar test (P=0.011), blood lipid test (p = 0.047), and blood pressure test (p = 0.005). In this study, because the majority of people had health insurance, no significant association was found between insurance status and utilization of preventive care. There was no significant association between any of the demographic variables and conducting colonoscopy, fecal occult blood, and prostate tests (p > 0.05).

The results of multiple logistic regression analysis, provided in Table IV, showed that the elderly people with a chronic disease were more likely to perform a fasting blood sugar test and a blood pressure test than those without a chronic disease. Women were more likely than men to conduct a bone mineral density test. Retired people were more likely to utilize a Pap-smear test than unemployed people. Also, having middle and high income was related to a higher chance of conducting blood sugar, blood lipid, and blood pressure test in the elderly (compared to people with low income).

## Discussions

The present study investigated the rate of utilization of preventive care services, and its associated socio-demographic factors among the Iranian elderly.

The findings of the study related to the utilization of preventive care services among the elderly referred to comprehensive health centers in East Guilan showed that blood pressure test (96.9%), blood lipid (88.8%), and blood sugar (87.5%) test were the most common types of utilized preventive care services, while colonoscopy (17%), fecal occult blood test (29.4%) and Pap-smear test (37.8%) were the least common types of utilized preventive care services among the elderly participated in this research.

In a study conducted by Peng et al. [11] in Taiwan, the utilization rate of the blood pressure test, fasting blood sugar test before a meal, and flu vaccine (flu shot) were over 50%. However, the utilization rates for most of the disease-specific preventive care services (such as mammography, colonoscopy, and fecal occult blood test) were reported less than 20%. In our study, the utilization rates of most cancers screening tests were reported as less than 50%.

In a study conducted in Belgium by Hoeck et al. [9] 63.1% of the elderly participants had measured their blood lipid and 55.3% of them had measured their blood sugar in the past, which were lower than those of present study.

**Tab. IV.** Result of logistic regression regarding socio-demographic factors associated with utilization of preventive services of research.participants.

| | Fasting blood sugar | | | Blood lipid test | | | Blood pressure | | | Bone density test | | | Pap-smear test | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | b | OR (95% CI) | Sig | b | OR (95% CI) | Sig | b | OR (95% CI) | Sig | b | OR (95% CI) | Sig | b | OR (95% CI) | sig |
| Income | | | | | | | | | | | | | | | |
| Low* | | | | | | | | | | | | | | | |
| Middle | 2.11 | 8.3(1.93- 35.68) | 0.004 | 2.10 | 8.22(1.93-34.97) | 0.004 | 20.19 | 587944035.033 | 0.996 | | | | | | |
| High | 1.16 | 3.19(.91-11.14) | 0.069 | 1.31 | 3.72(1.03-13.43) | 0.044 | 3.79 | 44.24(2.226-879.542) | 0.013 | | | | | | |
| Disease | | | | | | | | | | | | | | | |
| No* | | | | | | | | | | | | | | | |
| Yes | 1.35 | 3.88(1.12-13.46) | 0.32 | 1.15 | 3.16(0.89-11.26) | 0.075 | 4.76 | 116.828(6.03-2263.094) | 0.002 | | | | | | |
| Age | 0.058 | 1.06 (.959-1.172) | 0.255 | .070 | 1.07(.966-1.190) | 0.188 | | | | | | | | | |
| Gender | | | | | | | | | | 1.82 | 6.18(2.878-13.279) | 0.001 | | | |
| Occupation | | | | | | | | | | | | | | | |
| Unemployed* | | | | | | | | | | | | | | | |
| Employed | | | | | | | | | | | | | 1.37 | 3.97(0.609-25.870) | 0.149 |
| Retired | | | | | | | | | | | | | 1.16 | 3.21(1.306-7.913) | 0.011 |

Dependent variable, preventive services, was dichotomized as no = 0, yes = 1; CI: confidence interval; OR: odds ratio; Significant at 0.05 level.

Raisi et al. [19] found that only 23.2% of elderly women have had a mammogram test in the last two years. Also, the utilization rate of the PSA test among men for prostate cancer screening in the past year was only 30%, and only 19% of the participant had utilized a fecal occult blood test in the past year for colorectal cancer screening. Compared to the Raisi study, our result showed higher values for all tests.

The rate of utilization of preventive care services varies across countries around the world. A study conducted by Jusot et al. [20] in 14 European countries showed that the Netherlands (84.5%), Sweden (83.9%), and France (83.2%) had the highest mammography utilization rates among women aged 50 to 69 years, while Denmark (24.7%) and the United Kingdom (29.1%) had the lowest utilization rate of screening tests. Also, Australia (67%) and Switzerland (42.5%) had the highest utilization rate for the colorectal cancer screening test and Spain (11.9%) and Greece (10.8%) had the lowest utilization rate for colonoscopy.

The differences observed between the results of the present study and other studies can be due to the factors affecting the use of preventive care services such as awareness, insurance coverage, having a history of a disease, the health concerns and sensitivities, different health systems across countries, cultural differences and socio-economic status of participants.

Bivariate analysis revealed, several demographic characteristics (i.e. age, income, occupational status, marital status, education, disease and gender) were found to be significantly associated with some preventive care. Also, multivariate analysis showed that among the significant variables in bivariate analysis, only income, underlying disease, gender and occupation status significantly associated with some preventive care.

A study in China found that gender, age, occupation and level of education, income, health insurance, history of high blood pressure, and diabetes had statistically significant effects on people's demand for preventive care services [21]. This was consistent with the results of our study in some influential factors.

The results of a study on rural Indonesian elderly showed that the elderly who suffered from a chronic disease utilized more preventive examinations compared with the elderly without a chronic disease [22]. Peng et al. [11] also showed that the presence of a chronic disease was associated with the utilization of most of the preventive care services (except mammography and Pap-smear). In the present study, the utilization rate of preventive care services was higher among people with an underlying disease, nonetheless, only the association of blood sugar, blood lipid, and blood pressure tests was statistically significant. Also, regression analysis indicated a greater chance of performing fasting blood sugar test and blood pressure test among elderly patients. It can be said that people with chronic diseases such as heart disease and diabetes are more likely to visit a doctor and they are recommended by doctors to utilize preventive care services [8].

In the present study, the income levels of most participants, who conducted blood sugar, blood lipid, and blood pressure tests, were moderate to high. Income differences are likely to contribute to the gap in accepting preventive care services. The results of a study in Saudi Arabia showed that the income level of people who utilized preventive care services was higher than those who did not [23]. People with higher income levels may also use private health care services or supplemental health insurance, which helps them have an easy access to health care services [24, 25].

A study conducted in Ghana indicated an association between income and self-control of blood pressure. The researchers reported that this may be due to the fact that high-income people could provide blood pressure monitors and therefore be able to control their blood pressure at home without any problems compared to low-income people [26].

The results of a study conducted by Vaidya et al. [13] indicated that women controlled their blood pressure and blood lipid more than men. Despite the fact that the proportion of women who utilized preventive care services was higher than men in the present study, this difference between the two genders was only significant in the utilization of the bone mineral density test. Moreover, in the study of Jafari et al. [27] the adherence rate to the bone mineral density test in women was 1.5 times that of men, which was similar to the results of the present study. Because osteoporosis is common in women of menopausal age, there is a possibility that men may consider this test specific to postmenopausal women and be less inclined to do it. Nevertheless, in general, less utilization of preventive care services in men reinforces the view that most men do not attend regular health examinations and are less likely to visit a doctor, indicating a missed opportunity to discuss preventive care in this gender [13, 28, 29].

In the present study, married women had a greater rate of mammography than unmarried women, and retired women had a greater rate of mammography than employed women and housewives. These results were consistent with the findings of Rakowski et al. [30] and Baljani et al. [16]. The greater rate of mammography among married women can be due to emotional and informational support from the family, especially the spouse [31] which can be an important factor in performing a variety of cancer screenings, including mammography. In terms of occupation status, we found that there was an association between occupation and conducting a Pap-smear test. Due to social interactions, retired women appeared to be more aware of the advantages of preventive measures including Pap-smear. In the study of Mupepi et al. [32] it has been reported that financially independent women were more likely to have access to cervical screening (a Pap-smear test) tests than women who were dependent on their husbands. This was consistent with the present study. In the study of Bahrami et al. [33] in Sanandaj city, the employment status of women was reported as one of the most important factors affecting the utilization of the Pap-smear test.

Peng et al. [11] showed that having a high school diploma was associated with more utilization of most of the preventive care services which were consistent with the results of the present study. Our findings showed that the education level of more than half of the participants, who utilized mammography, was high school and higher. A similar study found that there was a positive association between education level and some health-related behaviors, including participation in screening [34]. This is because educated people may have access to better resources and information, so they will become more aware of health and behavioral issues to improve their health [35]. Moreover, higher education may also influence preventive care through better occupation and access to care [36].

In a study conducted by Peng et al. [11] aging was shown to increase the likelihood of conducting blood sugar and Pap-smear tests. In the present study, based on the results of bivariate analysis, people who had their blood sugar and blood lipid tests were older than those who did not. Also, in our study, younger people had a higher utilization rate of Pap-smear test, mammography, and colonoscopy. This was consistent with the results of Simon et al. [37] that showed a negative association between age and conducting Pap-smear test and mammography. However, in our study, the difference between the two age groups was not significant. This can be attributed to the reluctance of some elder people of higher ages to be aware of diseases such as breast and intestinal cancer. Also, Richard et al. study showed that age was significantly associated with utilization of preventive care services. Older ages were associated with receiving more flu shots, while having a younger age was associated with utilization of more Pap-smear, mammography, and dental services [38].

Limitations of the study included self-reported answering to the questionnaire, and conducting virtual interviews, which were mostly conducted not in person due to the pandemic of COVID19 and lack of access to the elderly, which can reduce the accuracy of the results of this study to some extent. Also, the present study was conducted in the elderly group (people 60 years and older), so the findings cannot be generalized to other age groups.

## Conclusions

Based on our findings, the utilization rates of screening test for most cancers, including gastrointestinal cancers, were low. Also, income was among the most important predictors for conducting blood sugar and blood lipid tests as well as controlling blood pressure. Moreover, having an underlying disease is one of the most important predictors of conducting blood sugar and blood pressure tests; gender was the most important predictor of a bone mineral density test, and occupation was one of the most important predictors of performing Pap-smear in the elderly participants. According to the results of the present study, developing policies and strategies aiming to encourage the elderly population regarding adopting preventive care and making preventive care free for the elderly are recommended in order to increase the utilization rate of preventive care services. Also, further research is needed to explore additional factors that may influence preventive care utilization.

## Funding

This research received no specific grant from Guilan University of Medical Sciences.

## Ethics consideration

The present research was approved by the Ethics Committee of Guilan University of Medical Sciences (Ethics Code: IR.GUMS.REC.1399.626).

## Consent to participate

Verbal informed consent was obtained from all participants.

## Acknowledgments

This article is part of a MSC thesis in geriatric nursing that was approved by Guilan University of Medical Sciences. The authors thank all participants in this study.

## Conflict of interest statement

The authors declared no conflict of interest.

## Authors' contributions

RM: was involved in conceptualizing, generating of the project, data collection, and also drafting the manuscript; FB: was involved in conceptualizing, generating of the project, data analyses, and also drafted the manuscript; PP: assisted with the conceptualization of the project; BGH: assisted with the data analyses. All authors read drafts of the manuscript and provided comments.

### References

[1] Bai Y, Bian F, Zhang L, Cao Y. The impact of social support on the health of the rural elderly in China. Int J Environ Res Public Health 2020;17:2004. https://doi.org/10.3390/ijerph17062004

[2] Mirzaie M, Darabi S. Population aging in Iran and rising health care costs. Iranian Journal of Ageing 2017;12:156-69. https://doi.org/10.21859/sija-1202156

[3] Mazloumi A, Hajizadeh L, Feyzi V. Development and validation of ergonomics elderly house risk factors checklist and assessment elderly functional ability checklist. Iranian Journal of Er-

gonomics 2019;7:20-7. http://journal.iehfs.ir/article-1-581-en.html

[4] Yahyavi Dizaj J, Emamgholipour S, Pourreza A, Nommani F, Molemi S. Effect of aging on catastrophic health expenditure in Iran during the period 2007-2016. Journal of School of Public Health and Institute of Public Health Research 2018;16:216-27. http://sjsph.tums.ac.ir/article-1-5674-fa.html

[5] Mofrad ZP, Jahantigh M, Arbabisarjou A. Health promotion behaviors and chronic diseases of aging in the elderly people of Iranshahr*-IR Iran. Glob J Health Sci 2016;8:139-45. https://doi.org/10.5539/gjhs.v8n3p139

[6] Hosseinpour S, Behpour N, Tadibi V, Ramezankhani A. Effect of cognitive-motor exercises on physical health and cognitive status in elderly. Iran J Health Educ Health Promot 2017;5:336-44. https://doi.org/10.30699/acadpub.ijhehp.5.4.336

[7] Raghupathi W, Raghupathi V. An empirical study of chronic diseases in the United States: a visual analytics approach to public health. Int J Environ Res Public Health 2018;15:431. https://doi.org/10.3390/ijerph15030431

[8] Chen C-C, Lin Y-J, Lin Y-T. Awareness and utilization of preventive care services among the elderly under National Health Insurance. Int J Health Care Finance Econ 2013;13:247-60. https://doi.org/10.1007/s10754-013-9128-3

[9] Hoeck S, Van der Heyden J, Geerts J, Van Hal G. Preventive care use among the Belgian elderly population: does socio-economic status matter Int J Environ Res Public Health 2014;11:355-72. https://doi.org/10.3390/ijerph110100355

[10] Lijuan L, Kun S, Weimin R, Yue W. Living alone, health and preventive care use among the elderly in Shanghai, China. Journal of Medical Colleges of PLA 2013;28:219-227. https://doi.org/10.1016/S1000-1948(13)60036-2

[11] Peng Y-I, Lin T-F. Social capital and preventive care use among the elderly under Taiwan's National Health Insurance. Arch Gerontol Geriatr 2018;75:28-36. https://doi.org/10.1016/j.archger.2017.11.002

[12] Anderson G, Hussey PS. Comparing health system performance in OECD countries. Health Aff (Millwood) 2001;20:219-32. https://doi.org/ 10.2147/RMHP.S7500

[13] Vaidya V, Partha G, Karmakar M. Gender differences in utilization of preventive care services in the United States. J Womens Health (Larchmt) 2012;21:140-5. https://doi.org/10.1089/jwh.2011.2876

[14] Carrieri V, Wübker A. Assessing inequalities in preventive care use in Europe. Health policy 2013;113:247-57. https://doi.org/10.1016/j.healthpol.2013.09.014

[15] Patel R, Lawlor DA, Ebrahim S. Socio-economic position and the use of preventive health care in older British women: a cross-sectional study using data from the British Women's Heart and Health Study cohort. Family Practice 2007;24:7-10. https://doi.org/10.1093/fampra/cml064

[16] Baljani E, Lak S, Salimi S, Safari S, Alavi E, Movahed S. Health promotion practices and cancer screening in older adults of Urmia. Urmia Medical Journal 2010;21:217-23. http://umj.umsu.ac.ir/article-1-680-en.html

[17] Hodkinson HM. Evaluation of a mental test score for assessment of mental impairment in the elderly. Age Ageing 1972;1:233-38. https://doi.org/10.1093/ageing/1.4.233

[18] Foroughan M, Wahlund LO, Jafari Z, Rahgozar M, Farahani IG, Rashedi V. Validity and reliability of abbreviated Mental Test Score (AMTS) among older I ranian. Psychogeriatrics 2017;17:460-5. https://doi.org/10.1111/psyg.12276

[19] Riisi M, Mostafavi F, Hassanzadeh A, Sharifi Rad GR. Relationship between health literacy and general health status and health behaviors in the elderly of Isfahan. Health system research. 2011;7:469-80. https://doi.org/10.4103/2277-9531.100160

[20] Jusot F, Or Z, Sirven N. Variations in preventive care utilisation in Europe. Eur J Ageing 2012;9:15-25. https://doi.org/10.1007/s10433-011-0201-9

[21] LU Y, CAO Q. The demand for preventive care services of residents in China and its influencing factors. Chinese General Practice 2015;18:428-32. https://doi.org/10.1016/j.healthpol.2009.09.012.

[22] Aji B, Anandari D, Masfiah S, Wijayanti SPM, Chamchan C. Utilization of Preventive health check-ups among older people in rural Indonesia. Journal Aisyah: Journal Ilmu Kesehatan 2021;6:133-6. https://doi.org/10.30604/jika.v6i1.464

[23] Al-Hanawi MK, Chirwa GC. Economic analysis of inequality in preventive health check-ups uptake in Saudi Arabia. Front Public Health 2021;9:745356. https://doi.org/10.3389/fpubh.2021.745356

[24] Al-Hanawi MK, Mwale ML, Kamninga TM. The effects of health insurance on health-seeking behaviour: evidence from the Kingdom of Saudi Arabia. Risk Manag Healthc Policy 2020;13:595-607. https://doi.org/10.2147/RMHP.S257381

[25] Al-Hanawi MK, Mwale ML, Qattan AM. Health insurance and out-of-pocket expenditure on health and medicine: heterogeneities along income. Front Pharmacol 2021;12:638035. https://doi.org/10.3389/fphar.2021.638035

[26] Konlan KD, Afam-Adjei CJ, Afam-Adjei C, Oware J, Appiah TA, Konlan KD, et al. Practice and sociodemographic factors influencing self-monitoring of blood pressure in Ghanaians with hypertension. Int J Chronic Dis 2020;2020:6016581. https://doi.org/10.1155/2020/6016581

[27] Jafari Sirizi M, Shakibi MR, Shafie M, Mohammad-Taghizadeh S, Barouni M, Nakhaee N. Adherence to osteoporosis screening and its related factors: a population-based study, Kerman, Iran. Iran Red Crescent Med J 2018;20. https://doi.org/10.5812/ircmj.61473

[28] Thompson AE, Anisimowicz Y, Miedema B, Hogg W, Wodchis WP, Aubrey-Bassler K. The influence of gender and other patient characteristics on health care-seeking behaviour: a QUALICOPC study. BMC Fam Pract 2016;17:1-7. https://doi.org/10.1186/s12875-016-0440-0

[29] Schlichthorst M, Sanci LA, Pirkis J, Spittal MJ, Hocking JS. Why do men go to the doctor? Socio-demographic and lifestyle factors associated with healthcare utilisation among a cohort of Australian men. BMC Public Health 2016;16:81-90. https://doi.org/10.1186/s12889-016-3706-5

[30] Rakowski W, Wyn R, Breen N, Meissner H, Clark MA. Prevalence and correlates of recent and repeat mammography among California women ages 55-79. Cancer Epidemiol 2010;34:168-77. https://doi.org/10.1016/j.canep.2010.02.005

[31] Taymoori P, Habibi S. Application of a health belief model for explaining mammography behavior by using structural equation model in women in Sanandaj. Scientific Journal of Kurdistan University of Medical Sciences 2014;19:103-15. https://doi.org/10.22102/19.3.12

[32] Mupepi SC, Sampselle CM, Johnson TR. Knowledge, attitudes, and demographic factors influencing cervical cancer screening behavior of Zimbabwean women. J Womens Health (Larchmt) 2011;20:943-52. https://doi.org/10.1089/jwh.2010.2062

[33] Bahrami M, Taymoori P, Bahrami A, Farazi E, Farhadifar F. The Prevalence of breast and Cervical Cancer screening and related factors in woman who refereeing to health center of Sanandaj city in 2014. Zanko Journal of Medical Sciences. 2015;16:1-12. http://zanko.muk.ac.ir/article-1-88-en.html

[34] Cutler DM, Lleras-Muney A. Understanding differences in health behaviors by education. J Health Econ 2010;29:1-28. https://doi.org/10.1016/j.jhealeco.2009.10.003

[35] Adams R. Improving health outcomes with better patient understanding and education. Risk Manag Healthc Policy 2010;3:61-72. https://doi.org/ 10.2147/RMHP.S7500

[36] Fletcher JM, Frisvold DE. Higher education and health investments: does more schooling affect preventive health care use? J Hum Cap 2009;3:144-76. https://doi.org/10.1086/645090

[37] Simon MA, Li Y, Dong X. Preventive care service usage among Chinese older adults in the Greater Chicago area. J Gerontol A Biol Sci Med Sci 2014;69(Suppl 2):S7-S14. https://doi.org/10.1093/gerona/glu143

[38] Reichard A, Fox MH. Using population-based data to examine preventive services by disability type among dually eligible (Medicare/Medicaid) adults. Disabil Health J 2013;6:75-86. https://doi.org/10.1016/j.dhjo.2012.12.001

Received on April 4, 2023. Accepted on July 20, 2023.

**Correspondence:** Fereshteh Besharati, Department of Nursing, Zeynab (P.B.U.H) School of Nursing and Midwifery, Guilan University of Medical Sciences, Rasht, Iran. E-mail: fereshteh.besharati@yahoo.com

**How to cite this article:** Khanghah RM, Besharati F, Pourghane P, Gholami-Chaboki B. Status of the utilization of preventive care services and its associated socio-demographic factors among Iranian elderly. J Prev Med Hyg 2023;64:E188-E197. https://doi.org/10.15167/2421-4248/jpmh2023.64.2.1913