Research Article

Self-Rated Health and Its Determinants in Female Population in Iran: A Community-Based Study

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Abstract

Background: Self-rated health (SRH), as a single-item self-assessment of health, has been widely used in research on health inequalities in both developed and developing countries. However, limited studies have been conducted on SRH in Iran. The present study aimed to evaluate SRH and its related factors among Iranian women.

Methods: In this population-based, cross-sectional study, 1200 women > 18 years old who lived in different districts of Sanandaj, western Iran, in 2012 were randomly selected through stratified cluster sampling. SRH, as the main outcome variable, was categorized as poor or good. The results of evaluation of the associated factors with SRH were presented as odds ratios (OR), and bootstrap method was used to obtain 95% confidence interval (95% CI).

Results: The overall prevalence of poor SRH among women was 37.68% (95% CI: 34.74, 40.61). Even after adjustment for other factors, the most important determinants of poor SRH were old age (OR = 3.92, 95% CI: 2.59, 5.94), being married (OR = 1.38, 95% CI: 1.04, 1.83), quality of health services (OR = 0.62, 95% CI: 0.43, 0.88), and household's income level (OR = 0.22, CI: 0.14, 0.35).

Conclusions: The proportion of poor SRH varied depending on socioeconomic and socio-demographic determinants. As SRH is an important predictor of death, individuals with the related factors, such as advanced age, being married, household's low-income level, and low quality of health services, should be considered as the priority target population.

Keywords: Self-Rated Health, Women, Female, Cross-Sectional Study

1. Background

Self-rated health (SRH), as a single-item self-assessment of health, is a commonly used subjective measure of health used in epidemiological researches (1, 2). These self-assessments have been used in many national surveys in the countries around the world. SRH has been shown to be associated with a number of important factors, including demographics (3, 4), geographical aspects (5), educational factors (6), economic factors (1), social correlates (2, 7), lifestyle behaviors (8), and some medical endpoints (9). Moreover, several studies have consistently demonstrated that SRH is a good predictor of mortality of various diseases (10, 11). Previous studies have also ascertained the validity and reliability of SRH (12, 13).

Women have poorer health compared to men in both developed and developing countries; 33.2% in Sweden (2), 24.3% in South Africa (14), 24.2% in South Korea (15), and 11.6% in Syria (16). Yet, these results may not be generalized to other populations due to different socioeconomic statuses and culture-specific perceptions of health. With regard to the socioeconomic status, a study concluded that to accurately estimate the "true" extent of inequalities in health, it is necessary that SRH measure health in a similar way across different socioeconomic levels (17). Moreover, individuals' views regarding health are profoundly shaped by their cultural backgrounds (18, 19).

Up to now, few researches have been conducted on SRH among Iranian individuals (3, 6, 20-23). However, none of them has focused on the determinants of SRH in female population. One early study found a significant association between physical health, high-risk behaviors, and SRH among Iranian school students (21). Another study confirmed the association between SRH and economic status (3) and found the proportion of poor SRH to be 11.5% (3). In addition, among the individuals aged 15 years and over in Tehran, the capital of Iran, women reported poorer health compared to men (36% vs. 27%) (6). Two other studies also focused on the social factors related to SRH (24, 25).

The present study aimed to evaluate SRH and its related factors among women in the west of Iran.

2. Methods

This population-based, cross-sectional study was performed in the catchment area of 5 health centers in different districts of Sanandaj, western Iran, in 2012.

Based on the 11.5% proportion of poor SRH from an Iranian population (3) and considering significance level of 0.05 and error level of 0.012, a 977-subjects sample size was determined for the study. The samples were selected through cluster random sampling. Therefore, considering the design effect, the sample size was increased to 1200 subjects. To select a representative sample of women aged 18 years and over, stratified cluster random sampling method was employed considering districts (3 different districts) as strata and health centers as clusters (16 clusters). Then, all the women who came to the 5 selected health centers and consented to participate in the study were enrolled into the research. Before receiving the data from the participants, an informed verbal consent was obtained and anonymous questionnaires due to reassure the participants were distributed among them. The response rate was 87.5%.

Detailed description of the study variables have been published previously (26, 27) and only a brief summary has been reported here. The data were collected using an anonymous self-administered questionnaire by a single interviewer who was adequately trained. The questionnaire covered a wide range of socio-demographic characteristics, including age, education level, place of residence, marital, and pregnancy status, household's income level, occupation status, quality of health services, use of health services, self-reported HIV testing, and SRH. The main outcome variable was SRH measured by a valid question (12, 13): "How do you rate your general health". This question was responded through a Likert scale ranging from "very good" (coded as 1) to "very poor" (coded as 5). To analyze the data, the categories "very good", "good", and "fair" were combined (coded as 0) as were the categories "poor" and "very poor" (coded as 1) (28).

At first, each independent variable was entered separately into univariate logistic regression analysis. Then, the variables showing significance levels lower than 0.2 were entered into multiple logistic regression model. Bootstrapping with 1000 bootstrap samples was used to assess the relative robustness of the model. Lemeshow's goodness-of-fit test was used to assess goodness of fit of the model. Simple coding was used to code the independent variables to compare each variable's level to the reference level. Good SRH was used as the reference category. Furthermore, the results of evaluation of the associated factors with SRH were presented as odds ratios (OR) and 95% Confidence Intervals (95% CI) using STATA 11 statistical software (StataCorp, College Station, Texas).

3. Results

Overall, 37.68% (95% CI: 34.74, 40.61) of participants reported poor SRH and 62.32% (95% CI: 59.39, 65.26) reported good SRH. The proportion of descriptive characteristics among women is presented in Table 1.

The results of univariate and multiple logistic regression analyses have been presented in Table 2. Accordingly, older women were more likely than younger ones to describe their health as poor (OR = 1.44, 95% CI: 1.12, 1.86). Married women also had worse health status compared to those who had never been married. Additionally, higher household economic status was associated with 52% lower odds of poor SRH (OR = 0.48, 95% CI: 0.34 - 0.68). Besides, use of public and private health services were associated with 27% and 25% lower odds of poor SRH, respectively. Moreover, the women with self-reported HIV testing had 28% (OR = 0.72, 95% CI: 0.55, 0.95) lower chances of reporting poor SRH. Among the socio-demographic variables, low education level (OR = 1.32, 95% CI: 1.02, 1.71) was associated with poor SRH. However, after controlling other variables, the adjusted OR of SRH was not significant for education level.

In multiple logistic regression analysis, SRH was associated with age, marital status, household's income level, and quality of health services. Furthermore, the results of both crude and adjusted analyses revealed no statistically significant relationship between SRH and occupation status, pregnancy status, and place of residence.

4. Discussion

The present study assessed the effect of some factors on SRH in an Iranian female population. The study findings suggested that poor SRH was associated with age, marital status, household's income level, education level, quality of health services, utilization of both public and private health services, and self-reported HIV testing. The main goal of this study was estimating the proportion of SRH in the study population, and the results indicated that 32.68% of the participants rated their heath as poor.

According to the literature, the proportion of poor SRH is the result of the processes that involve several factors. Education level is an important modulator of this phenomenon (3, 29). In bivariate analysis, the results of the present study demonstrated that the individuals with low levels of education had worse health status, which is in

Table 1. Descriptive Characteristics of the Participants, West of Iran

Variable	Frequency	Percentage
Age groups, y		
18 - 28	515	49.0
29 - 39	441	42.0
+ 40	95	9.0
Educational level		
Non-academic	628	59.7
Academic	423	40.3
Occupation		
Housewife	422	40.1
Working	629	59.9
Marital status		
Married	639	60.8
Single	412	39.2
Pregnancy status		
No	460	43.8
Yes	178	16.9
No answer	413	39.3
Quality of health services		
Bad	268	25.5
Reasonable	455	43.3
Good	328	31.2
Household's income level		
Bad	344	32.7
Reasonable	450	42.8
Good	257	24.5
Place of residence		
Rural	173	16.5
Urban	878	83.5
Public health services utilization		
No	412	39.2
Yes	639	60.8
Private health services utilization		
No	485	46.2
Yes	566	53.8
Self-reported HIV testing		
No	680	64.7
Yes	337	32.1
No answer	34	3.2

agreement with other studies (6, 15, 30). However, no significance relationship was found between SRH and education level after adjusting other factors. This finding indicates that SRH is related to other variables. Although the underlying reason is unknown, the effect of education can be varying from one place to another. For example, the effect of SRH on subsequent mortality risk differs by level of education. Several studies have found a stronger association in subjects with higher levels of education (31, 32), other studies have found stronger associations in those with lower education levels (33), and some have revealed no variations by education level (17, 34). Moreover, an international study, which aimed to determine the educational health inequalities in 22 European countries, indicated that the magnitude of educational health inequalities varied among the countries (35). Consequently, educational attainment can play an important role in occupation, economic status, lifestyle, and utilization of healthcare services.

The findings of our study showed that a higher proportion of older women reported poor health compared to the younger ones. This is in line with the previous studies performed in other developing countries (15, 16) as well as 2 studies conducted in Iran (3, 30). Asfar et al., investigated the determinants of SRH in adults and found that age was a significant predictor of poor SHR in both men and women (16). After controlling other variables, there was a relatively strong association between age and poor SHR (adjusted OR = 3.92, 95% CI: 2.59, 5.94). The results also showed that older age remained as an important predictor of poor SRH. Chen et al., also used multinomial logistic regression analysis in their study and disclosed that age was a predictor of SRH (36). In a study to describe SRH in middle-aged and elderly individuals, the authors reported that global SRH declined with age in both cross-sectional and longitudinal analyses (37).

In the current study, the individuals' perception of quality of health services was found as one of the most important predictors of SRH. This finding is consistent with those of the previous studies showing that a good experience about primary care, including satisfaction with care, might be associated with SRH status (38, 39). Even after adjustment for socioeconomic and other factors, quality of health services was positively associated with good SRH status. Similarly, recent studies have demonstrated that good primary care experience was significantly associated with better health outcomes, even after controlling for income inequality and other socio-demographic correlates of health (40). Good accessibility of health facilities and the role of employers may be the main causes of satisfaction with health care (41). Expansion of the coverage of healthcare plans may be one of the possible explanations

Table 2. Determinants of Poor Self-Rated Health Among Women According to Univariate and Multiple Logistic Regression Analyses

Variables	Unadjusted		Adjusted[a]	
	OR (95% CI)	P Value	OR (95% CI)	P Value
Age group, y				
$\leq$ 30	1		1	
$\geq$ 31	1.44 (1.12, 1.86)	0.004	3.92 (2.59, 5.94)	0.0001
Education level				
Academic	1		1	
Non-academic	1.32 (1.02, 1.71)	0.034	1.21 (0.91, 1.61)	0.195
Occupation				
Homemaker	1		1	
Employee	1.20 (0.93, 1.55)	0.153	0.97 (0.71, 1.31)	0.846
Marital status				
Single	1		1	
Married	1.44 (1.11, 1.87)	0.006	1.38 (1.04, 1.83)	0.024
Pregnancy				
No	1		1	
Yes	1.03 (0.72, 1.46)	0.871	ND	ND
No answer	0.69 (0.53, 0.92)	0.010	ND	ND
Quality of health services				
Bad	1		1	
Reasonable	0.80 (0.59, 1.08)	0.152	0.86 (0.62, 1.19)	0.382
Good	0.61 (0.43, 0.85)	0.004	0.62 (0.43, 0.88)	0.007
Household's income level				
Bad	1		1	
Reasonable	0.63 (0.48, 0.84)	0.002	0.21 (0.13, 0.33)	0.0001
Good	0.48 (0.34, 0.68)	0.0001	0.22 (0.14, 0.35)	0.0001
Place of residence				
Rural	1		1	
Urban	1.10 (0.79, 1.54)	0.585	ND	ND
Public health services utilization				
No	1		1	
Yes	0.73 (0.58, 0.97)	0.029	0.63 (0.39, 1.02)	0.060
Private health services utilization				
No	1		1	
Yes	0.75 (0.59, 0.97)	0.028	1.30 (0.81, 2.10)	0.276
Self-reported HIV testing				
No	1		1	
Yes	0.72 (0.55, 0.95)	0.020	0.89 (0.64, 1.22)	0.462

Abbreviations: CI, Confidence Interval; ND, No Data; OR, Odds Ratio.
[a]Adjusted for all other variables in the Table.

for this relation (42). Some studies have also presupposed the predictive power of SRH on the subsequent healthcare utilization (43, 44). Our results were consistent with those of the previous researches indicating that utilization of health services was associated with SRH. Pu et al., (45) reported that an individual's medical care utilization was reflected in different domains of general health. Moreover, Mavaddat et al., (46) conducted a meta-analysis in order to estimate the strength of the association between SRH and fatal and non-fatal cardiovascular disease. Although health service utilization was not reported in any of the re-

trieved studies, they concluded that individuals with current poor SRH might warrant additional input from health services to identify and address reasons for their low subjective health.

Our findings showed that being married was an important predictor of poor SRH. Married women were 44% more likely to report poor health compared to the single ones. Up to now, numerous epidemiological studies have investigated the correlation between marital status and SRH. However, inconsistent findings have been obtained. Some researchers believed that never married and divorced in-

dividuals had significantly higher ORs of poor SRH (2, 47). On the other hand, some other studies claimed that being married was the most important determinant of poor SRH (6, 16). Another study reported that married people tended to overestimate their health status (48). Accordingly, being married or not is an individual level indicator, however, its impact may depend upon cultural and socioeconomic statuses that vary at the social level. In addition, in a study conducted in Syria, the authors assumed that the difference between married and unmarried women might have its roots in gender roles and traditions of the Syrian society (16). Our finding is in line with another study, conducted in Iran, which showed that singleness was related to lower health-rated status (30).

In the present study, household's income level was associated with SRH, such a way that the women who reported their income level as "good" had 52% lower odds of reporting poor SRH. Comparison of the significant variables in crude and adjusted analyses gave us points about SRH. The results of crude analysis revealed household's income level as a probably associated variable. Interestingly, after adjusting the other variables, a strong significant relationship was found between SRH and household's income level (crude OR = 0.48 vs. adjusted OR = 0.22). There may be several probabilities that help to account for the difference in reporting poor health. For instance, Molarius et al., (49) asserted that there was a disparity between women and men in terms of poor SRH. They reported that the OR of poor SRH related to good SRH was 1.29 (95% CI: 1.17, 1.42) for women compared to men. The authors also found no significant association between gender and SRH after controlling financial insecurity and condescending treatment. Another study using world health survey (WHS) data from Turkey with 10,287 respondents over 18 years old indicated that household's income level was the greatest contributing factor to self-assessed health inequality (50). Similarly, Nedjat et al. (3) studied health inequality and its determinants among different socioeconomic groups in Tehran, the capital of Iran, and reported that several factors, including age, marital status, level of education, and household's economic status were significantly associated with SRH in both crude and adjusted analyses. In that study, economic status was the main contributor to inequality in SRH (47.8%).

In our study, self-reported HIV testing, as a healthy behavior, was detected to be associated with SRH (OR = 0.72, 95% CI: 0.55, 0.95). We found only 1 similar study for comparison of the results. Tsai et al., (51) conducted a study in 2010 to investigate the association between the number of healthy behaviors and optimal SRH among U.S. adults. They found that healthy behaviors were associated with an increased likelihood of reporting optimal SRH among adults with cardiovascular diseases or diabetes.

The present study had several limitations. First of all, causality inference could not be determined due to the cross-sectional design of the study. Besides, the data were obtained through a self-report questionnaire and, therefore, recall bias was inevitable. The use of other self-report measures (household's income level and self-reported HIV testing), as a benchmark for SRH, was also a major limitation of the study. Finally, in logistic regression analysis, SRH was categorized as "poor" (very poor/poor) and "good" (very good/good/fair). Thus, fair, very good, and good self-ratings of health were assumed to be the same, while in fact they are not.

4.1. Conclusion

The proportion of poor SRH varied depending on socioeconomic and socio-demographic determinants. Particularly as the main result, factors, such as advanced age, being married, household's income level, and quality of health services were related to SRH. As SRH is an important predictor of death, individuals with the above-mentioned factors should be considered as the priority target populations.

Footnotes

Authors' Contribution: Two authors have similar contributions in the manuscript preparation.

Conflict of Interest: The authors declare that there is no conflict of interest for this work.

References

1. Shibuya K, Hashimoto H, Yano E. Individual income, income distribution, and self rated health in Japan: cross sectional analysis of nationally representative sample. *BMJ*. 2002;**324**(7328):16–9. doi: 10.1136/bmj.324.7328.16. [PubMed: 11777798].

2. Lindstrom M. Marital status, social capital, material conditions and self-rated health: a population-based study. *Health Policy*. 2009;**93**(2-3):172–9. doi: 10.1016/j.healthpol.2009.05.010. [PubMed: 19692141].

3. Nedjat S, Hosseinpoor AR, Forouzanfar MH, Golestan B, Majdzadeh R. Decomposing socioeconomic inequality in self-rated health in Tehran. *J Epidemiol Community Health*. 2012;**66**(6):495–500. doi: 10.1136/jech.2010.108977. [PubMed: 21282143].

4. Bombak AE, Bruce SG. Self-rated health and ethnicity: focus on indigenous populations. *Int J Circumpolar Health*. 2012;**71**:18538. doi: 10.3402/ijch.v71i0.18538. [PubMed: 22663937].

5. Supiyev A, Nurgozhin T, Zhumadilov Z, Sharman A, Marmot M, Bobak M. Levels and distribution of self-rated health in the Kazakh population: results from the Kazakhstan household health survey 2012. *BMC Public Health*. 2014;**14**:768. doi: 10.1186/1471-2458-14-768. [PubMed: 25073469].

6. Montazeri A, Goshtasebi A, Vahdaninia M. Educational inequalities in self-reported health in a general Iranian population. *BMC Res Notes*. 2008;**1**:50. doi: 10.1186/1756-0500-1-50. [PubMed: 18710503].

7. Hiswåls AS, Ghilagaber G, Walander A, Wijk K, Öberg P, Soares J. Employment Status and Inequalities in Self-Reported Health. *Epidemiol Biostat Public Health*. 2014;**11**(4).

8. Zarini GG, Vaccaro JA, Canossa Terris MA, Exebio JC, Tokayer L, Antwi J, et al. Lifestyle behaviors and self-rated health: the living for health program. *J Environ Public Health*. 2014;**2014**:315042. doi: 10.1155/2014/315042. [PubMed: 25530764].

9. Mewton L, Andrews G. Poor self-rated health and its associations with somatisation in two Australian national surveys. *BMJ Open*. 2013;**3**(6). doi: 10.1136/bmjopen-2013-002965. [PubMed: 23811174].

10. Burstrom B, Fredlund P. Self rated health: Is it as good a predictor of subsequent mortality among adults in lower as well as in higher social classes? *J Epidemiol Community Health*. 2001;**55**(11):836–40. doi: 10.1136/jech.55.11.836. [PubMed: 11604441].

11. Wang C, Satariano WA. Self-rated current and future health independently predict subsequent mortality in an aging population. *J Gerontol A Biol Sci Med Sci*. 2007;**62**(12):1428–34. doi: 10.1093/gerona/62.12.1428. [PubMed: 18166696].

12. Haddock CK, Poston WS, Pyle SA, Klesges RC, Vander Weg MW, Peterson A, et al. The validity of self-rated health as a measure of health status among young military personnel: evidence from a cross-sectional survey. *Health Qual Life Outcomes*. 2006;**4**:57. doi: 10.1186/1477-7525-4-57. [PubMed: 16939653].

13. Zajacova A, Dowd JB. Reliability of self-rated health in US adults. *Am J Epidemiol*. 2011;**174**(8):977–83. doi: 10.1093/aje/kwr204. [PubMed: 21890836].

14. Chola L, Alaba O. Association of neighbourhood and individual social capital, neighbourhood economic deprivation and self-rated health in South Africa–a multi-level analysis. *PLoS One*. 2013;**8**(7). e71085. doi: 10.1371/journal.pone.0071085. [PubMed: 23976923].

15. Kim SS, Choi J, Park K, Chung Y, Park S, Heo J. Association between district-level perceived safety and self-rated health: a multi-level study in Seoul, South Korea. *BMJ Open*. 2014;**4**(7). e004695. doi: 10.1136/bmjopen-2013-004695. [PubMed: 25079921].

16. Asfar T, Ahmad B, Rastam S, Mulloli TP, Ward KD, Maziak W. Self-rated health and its determinants among adults in Syria: a model from the Middle East. *BMC Public Health*. 2007;**7**:177. doi: 10.1186/1471-2458-7-177. [PubMed: 17651491].

17. Singh-Manoux A, Dugravot A, Shipley MJ, Ferrie JE, Martikainen P, Goldberg M, et al. The association between self-rated health and mortality in different socioeconomic groups in the GAZEL cohort study. *Int J Epidemiol*. 2007;**36**(6):1222–8. doi: 10.1093/ije/dym170. [PubMed: 18025034].

18. Min JW, Rhee S, Lee SE, Rhee J, Tran T. Comparative analysis on determinants of self-rated health among non-Hispanic White, Hispanic, and Asian American older adults. *J Immigr Minor Health*. 2014;**16**(3):365–72. doi: 10.1007/s10903-013-9852-2. [PubMed: 23744285].

19. Salomon JA, Tandon A, Murray CJ. Comparability of self rated health: cross sectional multi-country survey using anchoring vignettes. *BMJ*. 2004;**328**(7434):258. doi: 10.1136/bmj.37963.691632.44. [PubMed: 14742348].

20. Heshmat R, Kelishadi R, Motamed-Gorji N, Motlagh ME, Ardalan G, Arifirad T, et al. Association between body mass index and perceived weight status with self-rated health and life satisfaction in Iranian children and adolescents: the CASPIAN-III study. *Qual Life Res*.

2015;**24**(1):263–72. doi: 10.1007/s11136-014-0757-x. [PubMed: 25038635].

21. Hosseini M, Maghami M, Kelishadi R, Motlagh ME, Khoshbin S, Amirkhani A, et al. First Report on Self-Rated Health in a Nationally-Representative Sample of Iranian Adolescents: The CASPIAN-iii study. *Int J Prev Med*. 2013;**4**(2):146–52. [PubMed: 23543891].

22. Mohammadbeigi A, Valizadeh F, Mirshojaee SR, Ahmadli R, Mokhtari M, Ghaderi E, et al. Self-rated Health and Internet Addiction in Iranian Medical Sciences Students; Prevalence, Risk Factors and Complications. *Int J Biomed Sci*. 2016;**12**(2):65–70. [PubMed: 27493592].

23. Jafari-Adli S, Qorbani M, Heshmat R, Ranjbar SH, Taheri E, Motlagh ME, et al. Association of short stature with life satisfaction and self-rated health in children and adolescents: the CASPIAN-IV study. *J Pediatr Endocrinol Metab*. 2016;**29**(11):1299–306. doi: 10.1515/jpem-2016-0215. [PubMed: 27754967].

24. Ghalichi L, Nedjat S, Majdzadeh R, Hoseini M, Pournik O, Mohammad K. Determinants of Self-Rated Health in Tehran, from Individual Characteristics towards Community-Level Attributes. *Arch Iran Med*. 2015;**18**(5):266–71. [PubMed: 25959907].

25. Baheiraei A, Bakouei F, Bakouei S, Eskandari N, Ahmari Tehran H. Social Capital as a Determinant of Self-Rated Health in Women of Reproductive Age: A Population-Based Study. *Glob J Health Sci*. 2015;**8**(2):273–80. doi: 10.5539/gjhs.v8n2p273. [PubMed: 26383196].

26. Rezaeian S, Esmailnasab N. Social Determinants of Health Associated with Self-Reported HIV Testing among Women. *Iran J Public Health*. 2013;**42**(4):436–42. [PubMed: 23785685].

27. Esmailnasab N, Hassanzadeh J, Rezaeian S, Barkhordari M. Use of Health Care Services and Associated Factors among Women. *Iran J Public Health*. 2014;**43**(1):70–8. [PubMed: 26060682].

28. Wu S, Wang R, Zhao Y, Ma X, Wu M, Yan X, et al. The relationship between self-rated health and objective health status: a population-based study. *BMC Public Health*. 2013;**13**:320. doi: 10.1186/1471-2458-13-320. [PubMed: 23570559].

29. Dubikaytis T, Harkanen T, Regushevskaya E, Hemminki E, Haavio-Mannila E, Laanpere M, et al. Socioeconomic differences in self-rated health among women: a comparison of St. Petersburg to Estonia and Finland. *Int J Equity Health*. 2014;**13**:39. doi: 10.1186/1475-9276-13-39. [PubMed: 24885151].

30. Maharlouei N, Akbari M, Khabbaz Shirazy M, Yazdanpanah D, Lankarani KB. Factors associated with self-rated health status in Southwestern Iran: a population-based study. *Public Health*. 2016;**140**:179–85. doi: 10.1016/j.puhe.2016.06.027. [PubMed: 27498159].

31. Huisman M, van Lenthe F, Mackenbach J. The predictive ability of self-assessed health for mortality in different educational groups. *Int J Epidemiol*. 2007;**36**(6):1207–13. doi: 10.1093/ije/dym095. [PubMed: 17510069].

32. Dowd JB, Zajacova A. Does the predictive power of self-rated health for subsequent mortality risk vary by socioeconomic status in the US? *Int J Epidemiol*. 2007;**36**(6):1214–21. doi: 10.1093/ije/dym214. [PubMed: 17971388].

33. Singh-Manoux A, Gueguen A, Martikainen P, Ferrie J, Marmot M, Shipley M. Self-rated health and mortality: short- and long-term associations in the Whitehall II study. *Psychosom Med*. 2007;**69**(2):138–43. doi: 10.1097/PSY.0b013e318030483a. [PubMed: 17289825].

34. van Doorslaer E, Gerdtham UG. Does inequality in self-assessed health predict inequality in survival by income? Evidence from Swedish data. *Soc Sci Med*. 2003;**57**(9):1621–9. doi: 10.1016/S0277-9536(02)00559-2. [PubMed: 12948571].

35. von dem Knesebeck O, Verde PE, Dragano N. Education and health in 22 European countries. *Soc Sci Med*. 2006;**63**(5):1344–51. doi: 10.1016/j.socscimed.2006.03.043. [PubMed: 16698158].

36. Chen Y, While AE, Hicks A. Self-rated health and associated factors among older people living alone in Shanghai. *Geriatr Gerontol Int*. 2015;**15**(4):457–64. doi: 10.1111/ggi.12298. [PubMed: 24750391].

37. Andersen FK, Christensen K, Frederiksen H. Self-rated health and age: a cross-sectional and longitudinal study of 11,000

Danes aged 45-102. *Scand J Public Health*. 2007;**35**(2):164–71. doi: 10.1080/14034940600975674. [PubMed: 17454920].

38. Ren XS, Kazis L, Lee A, Rogers W, Pendergrass S. Health status and satisfaction with health care: a longitudinal study among patients served by the Veterans Health Administration. *Am J Med Qual*. 2001;**16**(5):166–73. doi: 10.1177/106286060101600504. [PubMed: 11591016].

39. Sung NJ, Markuns JF, Park KH, Kim K, Lee H, Lee JH. Higher quality primary care is associated with good self-rated health status. *Fam Pract*. 2013;**30**(5):568–75. doi: 10.1093/fampra/cmt021. [PubMed: 23759366].

40. Shi L, Starfield B, Politzer R, Regan J. Primary care, self-rated health, and reductions in social disparities in health. *Health Serv Res*. 2002;**37**(3):529–50. doi: 10.1111/1475-6773.t01-1-00036. [PubMed: 12132594].

41. Kantaris M, Theodorou M, Galanis P, Kaitelidou D. Access and utilisation of health services by domestic helpers in Cyprus. *Int J Health Plann Manage*. 2014;**29**(4):e383–93. doi: 10.1002/hpm.2272. [PubMed: 25314927].

42. Sun J, Deng S, Xiong X, Tang S. Equity in access to healthcare among the urban elderly in China: does health insurance matter? *Int J Health Plann Manage*. 2014;**29**(2):e127–44. doi: 10.1002/hpm.2227. [PubMed: 25028751].

43. Pu C, Bai YM, Chou YJ. The impact of self-rated health on medical care utilization for older people with depressive symptoms. *Int J Geriatr Psychiatry*. 2013;**28**(5):479–86. doi: 10.1002/gps.3849. [PubMed: 22700167].

44. Kristenson M, Lundberg J, Garvin P. Socioeconomic differences in outpatient healthcare utilisation are mainly seen for musculoskeletal problems in groups with poor self-rated health. *Scand J Public Health*. 2011;**39**(8):805–12. doi: 10.1177/1403494811423430. [PubMed: 21976054].

45. Pu C, Tang GJ, Fang YT, Chou YJ. Which domain of self-rated health best predicts medical care utilization among Taiwanese adults? *J Epidemiol*. 2012;**22**(5):417–24. doi: 10.2188/jea.JE20110144. [PubMed: 22672999].

46. Mavaddat N, Parker RA, Sanderson S, Mant J, Kinmonth AL. Relationship of self-rated health with fatal and non-fatal outcomes in cardiovascular disease: a systematic review and meta-analysis. *PLoS One*. 2014;**9**(7). e103509. doi: 10.1371/journal.pone.0103509. [PubMed: 25076041].

47. Supranowicz P, Wysocki MJ, Car J, Debska A, Gebska-Kuczerowska A. Determinants of self-rated health of Warsaw inhabitants. *Rocz Panstw Zakl Hig*. 2012;**63**(3):273–84. [PubMed: 23173332].

48. Zheng H, Thomas PA. Marital status, self-rated health, and mortality: overestimation of health or diminishing protection of marriage? *J Health Soc Behav*. 2013;**54**(1):128–43. doi: 10.1177/0022146512470564. [PubMed: 23321283].

49. Molarius A, Granstrom F, Feldman I, Blomqvist MK, Pettersson H, Elo S. Can financial insecurity and condescending treatment explain the higher prevalence of poor self-rated health in women than in men? A population-based cross-sectional study in Sweden. *Int J Equity Health*. 2012;**11**:50. doi: 10.1186/1475-9276-11-50. [PubMed: 22937777].

50. Sozmen K, Baydur H, Simsek H, Unal B. Decomposing socioeconomic inequalities in self assessed health in Turkey. *Int J Equity Health*. 2012;**11**:73. doi: 10.1186/1475-9276-11-73. [PubMed: 23217368].

51. Tsai J, Ford ES, Li C, Zhao G, Pearson WS, Balluz LS. Multiple healthy behaviors and optimal self-rated health: findings from the 2007 Behavioral Risk Factor Surveillance System Survey. *Prev Med*. 2010;**51**(3-4):268–74. doi: 10.1016/j.ypmed.2010.07.010. [PubMed: 20647019].