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Health-related quality of life variation by socioeconomic status: Evidence from an Iranian population-based study

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Abstract:

BACKGROUND: Health-Related Quality of Life (HRQoL) values based on the accurate and reliable European Quality of Life Five Dimension (EQ-5D) questionnaire gives health-state utilities as a helpful data set for studying socio-demographic and socio-economic inequalities in health status in the general population. We aimed to do a population-based study to see how HRQoL varies by socio-demographics and socioeconomic status (SES).

MATERIALS AND METHODS: The study was a cross-sectional population-based study in Shiraz, Iran's southwest. Data was gathered utilizing a personal digital assistant (PDA). A trained interviewer administered the EQ-5D questionnaire to a representative sample of 1036 inhabitants. Principal component analysis (PCA) was used to create SES indices. Because of the skewed distribution, quantile regression was utilized to model the quartiles of HRQoL values. STATA 12.0 was used to perform all statistical analyses. $P < 0.05$ was considered statistically significant.

RESULTS: In 1036 study respondents, women had a mean HRQoL of 0.67 ± 0.28 , whereas men had a mean HRQoL of 0.78 ± 0.25 . Gender and age remained significant in all quartiles of HRQoL value. Participants with insurance showed 0.14 and 0.08 higher HRQoL values in the first and second HRQoL quartiles than those without coverage, respectively. Education [95% CI: 0.034, 0.111], economy [95% CI: 0.013, 0.077], and assets [95% CI: 0.003, 0.069] all had an impact on HRQoL value in the lowest quintile.

CONCLUSION: In all quartiles of HRQoL value, women had lower reported HRQoL than men. Insurance programs aimed at more disadvantaged groups with poorer HRQoL may help to minimize inequity. Education, economics, and assets all had an impact on the lower quartiles of HRQoL value, emphasizing the importance of general policies in determining public health status.

Keywords:

Health-related quality of life, Iran, socioeconomic status

Introduction

Quantifying and tracking scored general people's preferences, and self-reported Health-Related Quality of Life (HRQoL) is critical for proper health policy measures. As a result, significant information about HRQoL across various socio-demographic and

socioeconomic categories becomes available.^[1-7] Other researchers have explored the determinants of HRQoL and systematic disparities in HRQoL by socioeconomic status (SES), particularly in developed countries.^[1,4,8-12] Although HRQoL is widely investigated in Iran, it is mostly limited to specific disease groups or populations.^[13-19]

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Recently, population-based studies for HRQoL assessment in western Iran have been conducted.^[2,5,6] These studies found that better economic situations were connected with better HRQoL, and that poor HRQoL was concentrated in lower socioeconomic categories. These population-based studies discovered that, while women had slightly greater HRQoL, low HRQoL was more prevalent in women than in males.^[6] However, the data to date is not perfect since population-based studies of HRQoL frequently account for potential confounding characteristics such as gender and age rather than studying their impact on HRQoL.

A variety of tools have been developed to assess HRQoL. The EQ-5D self-report questionnaire, for example, can give an overall primary measure of health status and be intended primarily for assessing the success of medical interventions.^[20,21] Nonetheless, studies on HRQoL have typically provided the EQ-5D questionnaire findings as a percentage of the problem, but the EQ-5D value set based on the visual analog scale (VAS) has recently become available in Iran.^[22] However, the distribution of responses is skewed, necessitating additional statistical considerations.

The population-based evidence on Iranian people's HRQoL is still in its infancy. There is currently no representative population-based research with the least biased sampling approach available. There is little evidence that socio-demographic variables and SES influence HRQoL.

As a result, we planned to perform a population-based study in Shiraz to investigate the variation of HRQoL using EQ-5D values defined by socio-demographic and SES factors. HRQoL value based on the valid and reliable EQ-5D questionnaire gives health-state utilities as a helpful data set for studying socio-demographic and socio-economic disparities in health status. It would also allow us to compare health-related quality of life over time.

Materials and Methods

Study design and setting

This cross-sectional study was conducted in Shiraz, the capital of a major province in southwest Iran with a population of 1,869,000 in 2017.

Study participants and sampling

The study sample was chosen via multistage random sampling. The Shiraz Central Post Office chose head clusters at random from a list based on the population density of each postal area. We chose 63 head clusters at a gap of every ten households. Using the head cluster as a starting point, we moved on to the next postal code

to reach the ultimate sample size. With 0.05 error and a confidence interval of 95% for replies, a response distribution of 50%, a dropout rate of 30%, and a design effect of 2, the sample size was predicted to be 1100. Finally, 1036 adult respondents were included in the final analysis, corresponding to a 95% response rate.

The study comprised people above the age of 18 who were willing to participate. The study omitted residential locations such as hotels, stores, agencies, companies, and other places other than residential houses.

Data collection tool and technique

The purpose of the study was explained to each of the chosen residences, and informed consent was acquired. In a family with more than one member over the age of 18, one of the adults was chosen at random using a software program designed expressly for this study and installed on a personal digital assistant (PDA). Trained interviewers then completed the questionnaire on PDA.

After the data collection began, the trained interviewers' supervision and the accuracy with which they accomplished their tasks were refined daily. In addition to the local supervision, some of the respondents were contacted and asked how they completed the questionnaires.

Questions on demographic variables (such as age, gender, marital status, and family size) were asked first, followed by questions about SES and assets (including employment status, education level of respondent and family head, health insurance coverage, type of house ownership, ownership of the car, number of cars, monthly family income, and family expenditure, etc.). The presence of any chronic health condition(s) was also inquired about. Finally, the HRQoL was evaluated using the EQ-5D questionnaire.

The EQ-5D divides health status into five aspects (mobility, self-care, usual activities, pain/discomfort, and anxiety/depression), each with three levels of severity (no problems, moderate problems, and severe problems).^[20] This study was conducted in conjunction with an investigation into the threshold for one quality-adjusted life year in Shiraz.^[21]

A software program was created to assure the accuracy of access to certain postal codes, as well as close monitoring of data collecting. Before the study began, the software package was installed and tested on PDAs. The PDAs were connected to the Internet during the survey sessions. The gadgets might also be linked to a GPS, allowing us to track a trained interviewer's whereabouts on a map, the city up to the entrance of a dwelling, and questionnaire completion.

STATA 12.0 was used for all statistical analyses, and a $P < 0.05$ was considered statistically significant. The descriptive variables are shown as n (percentage) and Mean \pm SD. Previous studies analyzed the severity of each EQ-5D dimension as an independent variable and a proxy for HRQoL, then utilized standard regression methods to assess the connection between the independent and dependent variables. However, a so-called value set of the EQ-5D health status (HRQoL value) for an Iranian population has just been available,^[23] which creates a single index value for all the hypothetical health states given by the EQ-5D. This value set was used in this study. Because the distribution of the EQ-5D index value (=HRQoL value) as a dependent variable was not normally distributed in the initial evaluation, quantile regression was used to model the quartiles of the dependent variable.^[24]

Because women had a larger sample size than males, a survey analysis approach was used, which lends weight to the data for data comparability.^[25] In this approach due to unequal probabilities of selection, each sampled individual with data has a sample weight associated with his or her data.^[26,27]

To construct indexes through which we could identify SES in a better manner, a principal component analysis (PCA) was applied.^[28]

Ethical consideration

Shiraz University of Medical Sciences Ethics Committee approved the project (ID: IR.SUMS.REC.1395.S403). All of the steps in this study were done in line with the ethical standards of the institution's research committee, the Helsinki declaration, and its later changes.

Results

In this section we first describe the characteristics of the study population, then the results of quantiles regression are detailed.

The mean age \pm SD of the participants was 43.7 ± 15.5 , and their mean HRQoL value \pm SD was 0.71 ± 0.28 . The mean family size was 3.7 ± 1.4 . There were 710 women (68.5%) and 326 men (31.5%). The characteristics of the respondent are presented in Table 1.

According to PCA results, SES was categorized into three factors education (respondent and family head), economy (monthly family income and expenditure), and assets (house ownership, car ownership, and the number of cars).

Results of quantiles regression for the first, second, and third quartiles (25%, 50%, and 75%) of HRQoL value

as the dependent variable and different significant independent variables are displayed in Table 2, respectively.

Gender and age were significant predictive factors for HRQoL in all three quartiles. Although men had significantly higher HRQoL values than women in all quartiles, the strongest effect of gender was in the median HRQoL values.

An increase in age corresponded to a significant decrease in HRQoL value for 0.6%, 0.5%, and 0.3% for the first, second, and third quartiles, respectively.

Having insurance coverage had a significant effect on the first and second quartiles of HRQoL values and this effect increased in higher HRQoL values. In the first and second quartiles, respondents who had insurance coverage had 0.14 and 0.08 higher HRQoL values than a person without insurance coverage, respectively [Table 2].

In the lowest HRQoL value quintile, all three SES factors (education, economics, and assets) affect the HRQoL value [Table 2]. Results also showed that only 2 out of three SES factors (economic and education) remained significant on the median, and only one (education) significantly affected the third quartile (75%) of HRQoL value [Table 2].

Table 1: Characteristics of the respondents

Characteristic	Age ^a	HRQoL ^b value ^c	Have no Insurance ^d
Female	43.3 \pm 14	0.67 \pm 0.28	54 (7.6)
Male	44.7 \pm 18	0.78 \pm 0.25	24 (7.4)

^aMean \pm SD. ^bHealth related quality of life. ^cn (%)

Table 2: Results of quantiles regression for first, second and third quartiles of HRQoL value as dependent variable and significant independent variables

HUI ^a Factors	Regression coefficient (B) [95% confidence interval (CI)]		
	First quartile (25%)	Second quartile (Median)	Third quartile (75%)
Sex	0.106 (0.043-0.170)	0.152 (0.124-0.180)	0.036* (0.008-0.064)
Age	-0.006 (-0.008-0.004)	-0.005 (-0.006-0.005)	-0.003 (-0.004-0.003)
Insurance	0.142* (0.004-0.281)	0.082* (0.018-0.146)	–
Education	0.072 (0.034-0.111)	0.060 (0.043-0.080)	0.023 (0.008 0.038)
Economy	0.045 (0.013-0.077)	0.020 (0.006-0.035)	–
Assets	0.036* (0.003-0.069)	–	–
Constant	0.520 (0.322-0.712)	0.683 (0.586-0.780)	1.032 (0.975-1.090)

^aHUI: HRQoL value. *Significant at level 0.05, other effects are significant at level 0.001. Not significant

Discussion

This population-based study confirms that, on the HRQoL value set, women say they are in worse health than men. In all three quartiles of HRQoL value, the difference remained the same. This finding supports earlier population-based studies that show that, despite having a lower life expectancy and a higher risk of suffering from life-threatening events, men state to have higher HRQoL values than women.^[1,8,9,12,29-32] In Iran, population-based studies on different age groups revealed that men reported better HRQoL than women,^[13,14] but in two population-based studies in the west of Iran (Ilam and Kermanshah) there were different findings however the sampling method of these studies may limit the generalizability of the findings. Men have slightly lower HRQoL than women in Ilam. This disparity could be attributed to disparities in gender distribution (which was not reported in the results) and the use of a different study method, Short Form 36, for HRQoL assessment. In Kermanshah, similar to our study, HRQoL values were established using the EQ-5D, with women reporting greater claimed HRQoL than men. Again, this disparity could be attributed to a failure to account for a higher proportion of men in contrast to women (64.7 percent versus 35.3 percent). We propose additional national population-based studies using different research methodologies to evaluate HRQoL in men and women.

The current study additionally focused on the impact of insurance coverage on HRQoL value. While previous population-based studies in Iran highlighted the importance of insurance coverage on HRQoL^[3,33] the current study discovered that respondents in the highest quartile of HRQoL value were unaffected by insurance coverage, while respondents in the two lower quartiles of HRQoL value were significantly affected by insurance coverage. However, it is unclear if insurance coverage contributes to decreased HRQoL or whether the vicious cycle of poverty and disease does. This conclusion has significant implications for policymakers in terms of expanding and targeting insurance schemes for more disadvantaged marginalized people with lower HRQoL.^[34]

This study discovered that SES influences all quartiles of HRQoL, albeit in various ways. The effect of socioeconomic position, including income, education, and marital status, on HRQoL, has been widely documented in various places, including Iran.^[1-3,35] These studies in Iran attempted to simulate the influence of different levels of SES on HRQoL or give a concentration index for SES components influencing poor HRQoL.^[5,6,33,35] In the west of Iran, for example, an increase in SES (as measured by the wealth index) corresponded to an increase in HRQoL, whereas

in Shiraz, wealth, physical inactivity, the presence of chronic health condition(s), and lack of insurance coverage all contributed to poor HRQoL among disadvantaged groups.^[33,35] The current study aims to demonstrate the impact of SES on different quartiles of HRQoL values, which could be a significant outcome for both general and health legislation and planning in Iran. Lower quartiles of HRQoL value were influenced by education, economics, and asset. This could be a proxy for the complexity and interdependence of SES factors influencing the health of unhealthier responders. Furthermore, it emphasizes the significance of general policies on general population health status^[36] in such a way that none of these elements are under the direct control of the health system. This finding is less complicated in the middle and upper quartiles of HRQoL values in a way that assets did not affect these two quartiles of HRQoL value. In the highest quartile, only education significantly corresponded to the HRQoL value.

Limitation and recommendation

This is among the first population-based studies to find a relationship between SES and different quartiles of the HRQoL value set of the EQ-5D questionnaire, however, it has limitations. The study's cross-sectional design makes it impossible to determine the causal association between SES and HRQoL. Prospective multicenter trials with more SES factors are suggested.

Conclusion

In all quartiles of HRQoL value, women reported poorer HRQoL than males. Insurance programs aimed at more disadvantaged populations with poorer HRQoL may aid in eliminating inequity. The lower quartiles of HRQoL value were influenced by education, economy, and asset; this highlights the importance of general policies in determining general public health status.

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Conflicts of interest

There are no conflicts of interest.

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