Validity and reliability of Self Rated Health (SRH) measure among Iranian community-dwelling older adults

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INTRODUCTION

In 1945, the World Health Organization (WHO) defined health as, “a complete state of physical, mental, and social well-being and not merely the lack of disease or disability” ¹ ². According to this definition, health has four areas, that include physical, mental, social, and spiritual aspects ³ and it can be influenced by various factors such as economic, social, and socio-cultural factors. Therefore, individuals with the same objective health may report different values for their health ⁴. With this background and due to multidimensionality nature of health, it is one of the most important topics in research ⁵.

On the other hand, measuring health is one of the most challenging issues for researchers specially for older adults ⁶. During the aging process, a series of internal and external alterations occur that lead to changes in the functions of an individual’s organs and systems. These changes increase the possibility of organ failure and disease ⁷. For older adults, it’s hard to recall
conditions related to their illnesses or information about their hospitalization for a long time. In fact, they may be tired or unable to complete long questionnaires. Another problem for assessing the health status is that questioners themselves are required to be educated in the field of healthcare and well-being or at least have previous medical training.

Different tools and methods have been introduced to measure health status. Many of these tools are based on medical examinations, which, despite being costly and time-consuming, are considered gold standard of examination and recognition. Another way, is to employ a series of long questionnaires to assess health with multiple domains. They can evaluate medical history, medicines or symptoms of diseases. Based on these questionnaires, decision making is carried out with more an objective view of health.

Obviously, utilization of tools that are easy to use, reliable, and practical, will be accepted by researchers. Additionally, the results obtained by these tools should be generalizable. In this regard, there is a simple instrument, the Self-Rated Health measure (SRH) that reports general health status using a single question. The SRH was first introduced in 1982 by Mossey in a paper that predicted mortality in the elderly using the SRH. The SRH measure attempts to describe health and disease behaviors or health status only with one word order. In fact, the response that participants give to the question about their health, is the balance between objective health and expected health. In this tool, a single question, with a non-comparative nature, is asked and health is usually measured based on the response has been given to this question. To this purpose, respondents are asked to rate their health with a 5-point Likert scale. The responses include: “excellent, very good, good, fair and poor” in the USA version, and “very good, good, regular, poor and very poor” in the European version. A lower score of the SRH measure indicated a lower health status.

The SRH is a simple and easy to use tool for measuring general health. It is a way for evaluating the state of health in people based on the biological, mental, functional, and spiritual dimensions of their status. This tool has a good validity and reliability in people with no cognitive impairment.

The SRH has been measured and reported in many countries. For example, in Italy, about 11% of population reported their health as poor or very poor. In France, 6% of population stated that their level of health were poor or very poor. Various studies have shown that people’s health is affected by social, economic, psychological, environmental, cultural, demographic, and clinical indicators, as well as lifestyle and family history.

Various studies have shown that the SRH is a good predictor of outcomes, such as disability and mortality, even after controlling the confounding variables. Physical condition and the presence of certain diseases such as dementia, cardiovascular disease and the use of health services can also be predicted with the SRH.

According to the articles mentioned, it is necessary for all agents and practitioners in the health sector to evaluate health status in older adults, with correct, simple, and reliable method. The use of the SRH can reduce the mistakes that may arise when a large amount of information is to be collected in older adults. This simple question can be considered as an abstract of various components of health, and the response to it, is affected by all areas of health (physical, mental, social and spiritual), family history, socio-economic status, demographic variables, biological factors, and clinical indicators.

Due to the benefits of this single-item measure instead of time-consuming and costly tools, health status of individuals, can be assessed with the SRH. This study was conducted to explore the validity and reliability of the SRH measure among Iranian community-dwelling older adults.

MATERIALS AND METHOD

The validity and reliability of the SRH measure among Iranian community-dwelling older adults were assessed using the cross-sectional method. The Cross-sectional study design is a kind of observational study method that the investigator measures the outcome and the exposures in the study participants at the same time according to the inclusion and exclusion criteria. Data gathering step lasted since July to November 2017 (about 5 months) and during the period of data collection didn’t occur any major incident that would have been of concern to community dwelling older adults (e.g. security, earthquakes, air pollution and …) Six hundred people aged 60 years and over in Tehran (capital of Iran), 2017 were included with a multistage clustered random sampling technique. The ability to communicate verbally, not taking medications affecting the level of consciousness, and no end stage diseases were the inclusion criteria. Unwillingness to continue participating in the study, incomplete fulfillment of the questionnaires, and acute physical or psychological conditions during the completion of the questionnaires was the exclusion criteria for the study.

The sampling method was according to geographic information system of Tehran and rate of aging in Iran (about 10%) in Tehran is capital of Iran and is divided
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into 22 districts and each district has several regions. From the districts of Tehran, six districts and from each it, one region was selected as a cluster by simple random sampling from the list of regions. From the selected regions, 100 samples were selected randomly based on eligibility criteria. This will continue until the number of participants in each neighborhood reaches the sample size.

The data-collecting tools were used in this study included demographic questions, the SRH, Charlson Comorbidity Index (CCI), and the World Health Organization-five (WHO-5) well-being index. Two data-collectors were trained to administer the questionnaires and randomly supervised during the completion, and when required provided with appropriate support. All questions were asked by two trained questioners with interview way and sampling was done without loss. The 600 community-dwelling older adults rated their health status according to the SRH measure. The SRH was assessed using a single item questionnaire entitled “In general, how would you rate your health” and asked them rate their health status on a Likert scale (“5” excellent, “4” very good, “3” good, “2” fair, and “1” poor). A lower score of the SRH measure showed a lower health status.

**Criterion Validity**
To determine the validity of the SRH, criterion validity was used. One type of criterion validity is concurrent validity, which refers to the relationship between the results from the tool studied and other variables which were collected. Criterion validity can also refer to a condition where a tool replaces with another tool. In this study, to assess the physical health, the CCI was used, which consists of 19 categories of comorbidity and can predict the 1-year mortality risk and burden of disease. Each condition (disease) was assigned with a score of 1, 2, 3 or 6 depending on the risk of mortality associated with the condition. Validity and reliability of the CCI were previously assessed and supported in Iran. The WHO-5 well-being index was used to assess mental health status. This index is a short self-reported measure of the current mental well-being. The WHO-5 well-being consists of five statements, which respondents rate according to their past two weeks’ experiences. Answers include; All of the time = 5, Most of the time = 4, More than half of the time = 3, Less than half of the time = 2, some of the time = 1, and at no time = 0. The total score varies in the range 0-25, which representing the worst and best perceived well-being, respectively. This measure at first was introduced by the WHO regional office in Europe in 1998, and it has been shown to have an acceptable validity in screening for depression. Studies have suggested that this measure has a good construct validity as a one-dimensional scale measuring well-being in people of 9 years old and over. Psychometric properties of the Persia version of WHO-5 well-being index was evaluated in Iran by Dehshiri et al. (2016). It’s results showed that WHO-5 well-being index is valid and reliable instrument to measure subjective well-being. In order to investigate the SRH validity, the correlation between the SRH, CCI and WHO-5 well-being index was examined.

**Reliability:** To assess the reliability of the SRH measure, a test-retest method was performed for 51 of the study subjects. The test-retest reliability of a measure is an estimate of the repeatability of its results over time when no change in condition occurs. The time gap should be such that the responder forgets the phrases given in the questionnaire but not the general concept under study. The SRH measure was completed again by the same questioners to examine the test-retest reliability of the SRH measure. Researchers were ensured that the subject's health status was stable during the 20-day interval period. If the subjects had an acute health condition, they would be advised not to complete the retest questionnaires.

**Data Analysis**
Data were analyzed using the SPSS software version 23. Descriptive statistics such as percentages, means, standard deviations (SD), and range were used where appropriate. To assess the concurrent validity of the SRH, Pearson correlation coefficient was used. To examine the reliability of the SRH, a test-retest method was applied and Intra-class Correlation Coefficient (ICC) reported as the repeatability of the SRH.

**Ethical Issues**
This study protocol was approved conducted in accordance with the guidelines in the Declaration of Helsinki, World Medical Association (WMA) and approved by the Medical Research Ethics Committee of the University of Social Welfare and Rehabilitation Sciences, Tehran, Iran. Written informed consent was obtained from all participants who agreed to participate after explaining the study purpose.

**Results**
Six hundred community-dwelling older adults (63.7% women) completed the questionnaires. Their mean age was 76.82 (SD = 7.45) years, and a majority of them were in the range of 75-84 years old. Around 63.0% of the study subjects were married and 48% of them were able to read and write. Nearly 25% of total sample were retired that of which 10.5% were female. Table I
Table I. Demographic characteristics of the community-dwelling older adults Iranian.

<table>
<thead>
<tr>
<th>Variables</th>
<th>Category</th>
<th>Frequency</th>
<th>Percentage</th>
<th>Mean</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>60-74</td>
<td>225</td>
<td>37.5</td>
<td>76.82</td>
<td>7.45</td>
</tr>
<tr>
<td></td>
<td>75-84</td>
<td>283</td>
<td>47.2</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>+85</td>
<td>92</td>
<td>15.3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sex</td>
<td>Male</td>
<td>218</td>
<td>36.3</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>382</td>
<td>63.7</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Marital status</td>
<td>Married</td>
<td>379</td>
<td>63.1</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>Widow</td>
<td>211</td>
<td>35.2</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Divorced</td>
<td>10</td>
<td>1.7</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of children</td>
<td>0</td>
<td>2</td>
<td>0.3</td>
<td>4.94</td>
<td>1.95</td>
</tr>
<tr>
<td></td>
<td>1-2</td>
<td>40</td>
<td>6.7</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>3-5</td>
<td>344</td>
<td>57.3</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>6-8</td>
<td>184</td>
<td>30.7</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>+9</td>
<td>30</td>
<td>5.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ability to read and write</td>
<td>No</td>
<td>314</td>
<td>52.3</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>Yes</td>
<td>286</td>
<td>47.7</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Employment status</td>
<td>Employed</td>
<td>31</td>
<td>5.2</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>Retired</td>
<td>153</td>
<td>25.5</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Unemployed</td>
<td>43</td>
<td>7.2</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>House wife</td>
<td>373</td>
<td>62.1</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table II. Frequency distribution of the SRH, CCI and WHO-5 well-being tools of the community-dwelling older adults Iranian.

<table>
<thead>
<tr>
<th>Variables</th>
<th>Category</th>
<th>Frequency</th>
<th>Percentage</th>
<th>Mean</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>SRH</td>
<td>1 (poor)</td>
<td>127</td>
<td>21.2</td>
<td>2.17</td>
<td>0.84</td>
</tr>
<tr>
<td></td>
<td>2 (fair)</td>
<td>278</td>
<td>46.3</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>3 (good)</td>
<td>165</td>
<td>27.5</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>4 (very good)</td>
<td>25</td>
<td>4.2</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>5 (excellent)</td>
<td>5</td>
<td>0.8</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CCI</td>
<td>0 (no comorbidity)</td>
<td>312</td>
<td>52</td>
<td>1.8</td>
<td>1.9</td>
</tr>
<tr>
<td></td>
<td>1-2 (mild comorbidity)</td>
<td>133</td>
<td>22.1</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>3-4(moderate comorbidity)</td>
<td>100</td>
<td>16.7</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>+5 (severe comorbidity)</td>
<td>55</td>
<td>9.2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>WHO-5 well-being index</td>
<td>13 (low well-being)</td>
<td>323</td>
<td>53.8</td>
<td>11.60</td>
<td>5.87</td>
</tr>
<tr>
<td></td>
<td>+13 (high well-being)</td>
<td>277</td>
<td>46.2</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

shows demographic characteristics of the community-dwelling older adults.

The study results showed that only 5 older adults reported their SRH excellent and majority of them (46.3%) were fair. Indeed 48% of older adults had comorbidity according to the SRH. Based on WHO-5 well-being index 46.2% of subjects had high level of well-being. Table II shows details of frequency distribution of the SRH, CCI and WHO-5 well-being.

Validity of Self Rated Health measure

The results of the study demonstrate that there is a significant linear relationship between the Self Rated Health (SRH) measure with CCI and WHO-5 well-being index, since the correlation coefficient is significantly different from zero. Regarding CCI, this correlation is the opposite ($r = -0.35, p < 0.001$), which means that high scores for the SRH measure are negatively related with CCI scores. Furthermore, WHO-5 well-being index is positively correlated ($r = 0.5, p < 0.001$) with the SRH measure, which means that higher scores of the SRH measure are positively associated with high scores of WHO-5 well-being index.

Reliability of Self Rated Health

The results showed the variations of the health ratings based on the SRH measure between the first time the questionnaires were completed and after 20 days. In the subjects who rated their health again, almost all of them were stable or had little change. To investigate
the reliability of the SRH measure, ICC was measured (0.83; 95% CI, 0.72 to 0.90). The results are shown in Table III.

**DISCUSSION**

The findings of the present study confirmed the validity and reliability of the SRH as a measure of overall health status among Iranian community-dwelling older adults. For this purpose, criterion validity and test-retest methods were used. The main potential advantage of the SRH measure compared with other health measures is being brief and easy to use in social and routine clinical practice. The current study, with its large representative sample of community-dwelling older adults living in Tehran is the first study to examine the validity, can be attempt to investigate the validity and reliability of the SRH in Iran.

According to the study results, association of the SRH measure with the CCI and WHO-5 well-being index is a good evidence for the criterion validity of the SRH measure among Iranian community-dwelling older adults. In this regard, several studies have reported and confirmed the validity of the SRH measure. For example, Qin Qin Meng et al. (2016) compared the short physical performance battery with the SRH measure in different elderly populations, and their results indicated that there was a significant linear association between the mean scores of the short physical performance battery and categories of the SRH. Therefore, the findings confirmed the validity of the SRH as a measure of overall health status in older adults.

To our knowledge, despite the widespread use of the SRH, this is the first study to investigate the validity and reliability of the SRH measure in Iran. However, in other countries, several studies have been conducted in this area. In this regard, Vaillant et al. (2012) investigated the reliability of the SRH as evidence from the available data in the Albanian. Their results showed that the SRH is a good measure of health.

**CONCLUSIONS**

The results of this study showed that the SRH measure has good validity and reliability among community-dwelling older adults in Iran. This measure reflects the health status of the older adults and is a cost-effective tool for measuring the health status. It is an easy-to-use and can reduce both recall and investigator bias, thus it can be widely used in health surveys.

**LIMITATIONS**

The present study had several limitations. First, it was conducted only in one city. However, considering the multicultural environment of Tehran, the results can be generalizable; but the generalization of the results to other cities requires further investigation. Second, the cross-sectional nature of the study precludes causal claims regarding predictive validity. The last limitation that should be noted is that the inter-rater reliability was not formally assessed. However, it is noteworthy to mention that the enumerators were extensively trained before data collection.

Despite the above mentioned limitations, the SRH was found to be a good measure for assessing overall health status among community-dwelling older adults. Based on the single-item nature of this measure, it is easy-to-use and cost-effective for the societal and clinical settings related to older adults.

**CONFLICT OF INTEREST**

The Authors declare to have no conflict of interest.

**ACKNOWLEDGMENTS**

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**REFERENCES**


2. WHO. Not merely the absence of disease, 2014 ed. The 12th General Programme of Work was adopted by the World Health Assembly in May 2013. Presented in this document is the full text, as adopted. World Health organization, 2014.


