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**Original Article**

# Health State Valuation in Iran: An Exercise on Cardiovascular Diseases Using Visual Analogue Scale Method

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## Abstract

**Background:** Disability Weights (DWs) are main components for computing summary measure of population health (SMPH) and economic studies. They are specific for each community, but there are no previous studies in Iran. In this study, we investigated the feasibility of health state valuation (HSV) in Iranian population.

**Methods:** Twelve cardiologists in 3 sessions of expert panels, defined 25 states, related to cardiovascular diseases (3 major and 22 specific diseases). From January to March 2008, 80 persons in 4 groups including: physicians, patients, patients' families and general publics (each group 20), were interviewed and valuated the states, using visual analogue scale (VAS) method. SPSS® 15 for window® (SPSS Corporation, Chicago, Illinois) was used for statistical analysis.

**Results:** Data showed that the defined health states had various severities. All the 4 groups ranked the "3 major-diseases" and "very-mild" and "very-severe" states, similarly. Non-physicians were not able to differentiate among "valvular-diseases" and "pacemakers" properly. The reliability of responses was acceptable.

**Conclusion:** VAS is an appropriate and reliable method for HSV in Iranian population. Non-physicians' opinions can be consider in major cardiac diseases. Valuation of more specific situations must perform by physicians.

**Keywords:** *Visual analogue scale, Cost of Illness, Health state valuation, Burden of disease, Disability weight*

## Introduction

Health State Valuation (HSV) means to determine the value or preference of a defined health state. The result of this valuation is a score, named as "disability weight" (DW) or "preference score" and represents the "overall health" (1) or "relative severity of disease" (2) and disability, produced by a state of disease. In other words, if "health" considered as a spectrum, which full health was in one end and death was in another end, it can be possible to determine the relative severity of health problems, by locating them in this range. The values of DWs are between 0 and 1 (1). This is a main input for computing the "summary measures of population health" (SMPH), as disability adjusted life years (DALY) (3, 4) and cost-effectiveness studies (5).

This value can show the relationships between the mortality of a disease and its non- fatal complications (6). Many studies have been performed for HSV around the world. Maybe the most important of them are the studies managed by world health organization (WHO) and collaborates.

At the first time, DWs were introduced in 1990, in the first global burden of diseases (GBD) study, several hundred DW, related to 107 health states, were presented (7-9). Another important study was "Dutch Study". This project was done in Netherlands in late 90s for determining the DW in western European region and 175 DWs, related to 52 disease states were defined (2). These DWs have been used in many "burden of disease" projects or economic evaluation studies. In Iranian national project of burden of diseases and injuries (10), these DWs are used for computing SMPHs.

Among several studies, which have been performed for health state valuation, only a few

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were based on large and representative samples of general populations and epidemiologic surveys. Most of these researches were performed, using small well-educated responders (1). For solving the problem, WHO has developed a conceptual frame work, based on the multi dimensional definition of health (4) and conducted world-wide surveys (11).

There are different standardized methods for HSV. These methods have been invented, according to psychometric or economic theories (such as Utility Theory). The most important methods are: visual analogue scale (VAS), time trade-off (TTO), person trade- off (PTO) and standard gamble (SG), which have been discussed elsewhere (11–14). In addition, different empirical studies have compared these methods (15-18) but still no agreements achieved on any of them as the method of choice (6).

Another important point is that the results of scoring are different in various groups in the society; for example, the health care professionals' point of view may different from the patients' point of view for valuation a known chronic health state; and both of them can be different from the general publics' point of view (1).

It should be noticed that "disability" is a subjective concept and related not only to physical and psychological well being, but also to social and cultural situations. Thus, it can be possible that a defined disease, cause different degrees of disability on different societies (19, 20). In GBD project, a constant DW was used for different regions of the world. Also in other local and national burden of disease projects, like Iran (10), these DWs have been chosen; but many authors believe the local DWs must be used for research and policy making purposes (21). Besides, in 1999 a study was conducted over the professionals of 14 various countries and showed that the DWs could not be assumed equal, internationally (22). In addition, the health condition and social and cultural characteristics of a region make the needs to define the relevant health states and to design and use appropriate methods and instruments, which are specific to that region (23). There are no previous reports on HSV in Iran. Then, we decided to perform a study for HSV and determining local DWs. Before that, we needed to be informed about the feasibility of such studies in our country and the compliance and responsiveness of Iranian people and health care professionals. Thus, a pilot study prepared and Iranian physicians', patients', patient family members' and general publics' opinions about cardiovascular states were investigated.

Cardiovascular diseases (CVDs) are the cause of 30% of total mortality around the world (24). A considerable part of all DALY's lost in the world (24) and Iran (10) is due to them. In addition, many different health states related to CVDs can be defined and various degrees of disability can be observed among these states. Then, study over these diseases had both the epidemiologic and methodological importance.

Among different scaling methods, VAS was used for this study; because it is the easiest, oldest, and most practical method for HSV (12) and the understanding of it is easier than other 3 methods for general population (23). In addition, it is easy to administration. Then it was chosen in the first step to avoid the confounding effect of method difficulties on responders' collaboration.

The results of this preliminary study are presented in this article. It helped us to designing and conducting studies that are more complete. In this study, we investigated the feasibility of health state valuation (HSV) in Iranian population.

## Materials and Methods

### *Determination of Cardiovascular Disease States*

A "CVD state" means a condition, which is related to a CVD. Twelve cardiologists (with the profession of general cardiology, interventional cardiology, echocardiography and interventional electrophysiology) participated in 3 expert panels and determined 25 CVD states for valuation. Three states were chosen from the major categories of CVDs, including: rheumatic valvular heart disease (VHD), ischemic heart disease

(IHD) and congestive heart failure (CHF). Also, 22 specific CVD states were defined. Cardiovascular states were defined and selected, according to their prevalence in Iranian patients (more prevalent states were chosen) and their different levels of severity; in order to make a spectrum, from mild to very severe states.

All of the 25 diseases were chronic. In this study, "chronic" was defined as:"living at least one year with the condition". Life expectancy was assumed equal for all the states.

These states are defined and labeled in expert panels (table 1). In addition, a standard explanation was attributed to each state for unifying the definitions.

### *Valuation Method*

Valuation of the selected diseases was performed by using visual analogue scale (VAS) method. As the first step in conduction of HSV, we needed to a method, which was easy to use and acceptable to all of people. Previous experiences showed that in comparison to other valuation methods, VAS is the easiest, especially to laypeople (1, 12, 23).

A 100 mm line was drawn, the right end (100) considered as full health and the left end (zero) considered as death. The responders were asked to locate each of the CVD states on this line, according to their severities. More severe conditions were nearer to zero. A data collection form was prepared and examined on 5 persons (2 physicians and 3 non-physicians) to reveal and correct the problems.

### *Study Population*

From January to March of 2008, 80 people in 4 equal sized groups, were participated into the study. These groups were: 1) patients; 2) patients' family members (First-degree relatives); 3) general public and 4) physicians. Patients were randomly selected from the heart clinics in a university affiliated general hospital in Tehran. Family members were selected from other patients' accompanies (who had not be selected as study participant). They had not had any history of heart diseases. For group 3, patient's accompanies from other clinics except heart clinic, (for example gynecology clinic or imaging center) were selected. If they or their first relatives had any kind of cardiac diseases, they were excluded the study. General practitioner and junior residents selected as physicians.

### *Data collection*

The study protocol was approved by the Ethics Committee of Tehran University of Medical Sciences. Face to face interview was the data collection technique. All interviews were performed by one person; a general practitioner, who was trained for this purpose. She asked the questions and gave the necessary explanations according to standard definitions and the study protocol. Firstly, the interviewer introduce the state and explain about it with few words, according to which was defined by expert panels. For non-physicians, interviewer used the popular terms instead of medical terms (for example, lay people named "pace maker" as "battery"). Explanations for group 4 (physicians) was with professional terms. Non-physicians were said to avoid to answering if they did not understand the state, well.

Interviewer also monitored participants' verbal and non-verbal responses in order to define their overall understanding of states and scaling method.

### *Reliability*

Five states (VHD, CHF, angioplasty [PCI: state No. 2], bypass surgery [CABG: state No. 3] and the stable angina pectoris [SAP: state No. 4]) were considered. After finishing the interview, the interviewer asked the responders to tell her the patient's ability (in percent) in each of these five states, in comparison to a healthy person. The answers were recorded and compared to their related VAS scores.

### *Statistical Analysis*

Disability weights were computed by a linear transformation to VAS scores, as:

$$DW = \frac{VAS}{100}$$ (VAS represents the VAS score).

Data were described using appropriated statistics, such as: median (MDN range (IQR). The results of 4 study groups were compared by Kruskal-Wallis non-parametric test. $P< 0.05$ considered as significant. Pair-wise comparisons performed by Mann- Whitney U test, using Bonferroni correction for type I error. Then, for 6 Pair-wise comparisons, the significant level was computed as:

$SL = 0.05 / 6 \approx 0.008$

Reliability of answers was investigated by Wilcoxon Signed Ranks test. SPSS® 15 for window® (SPSS Corporation, Chicago, Illinois) was used for statistical analysis.

## Results

### *Background Data*

Eighty persons (38 female, mean±SD age= 43±12.7 yr) participated the study. Mean age of physicians was 35±5 yr and they were younger than other groups. Sex ratio was similar in 4 groups. Among 60 non- physicians, 41(0.07) had academic educations and 15(0.25) graduated the high school. All responders were in middle socio-economic levels. Patients' disease types were valvular heart disease in 6, ischemic heart disease in 10 (with or without the history of surgery) and essential hypertension in 4 cases.

Interviewer's observation showed that non-physician responders had appropriate concepts about major cardiac diseases. Among specific cardiovascular states, hypertensions, different classes of heart failure and inter versions on coronary arteries (angioplasty or surgery) were more familiar to non-physicians. On the other hand, various states of valvular disease or pacemakers could not be differentiated by them, even patients by patients.

### *Major Cardiovascular Disease*

Descriptive results of the valuation of cardinal diseases are presented in Table 2. It can be observed that physicians evaluated the states, less severe than other groups. Three non-physicians groups valuated IHD and VHD similarly. CHF was valuated by physicians and families like each other and by patients and general populations the same as, too.

In VHD, the scores of 3 non-physicians groups were similar; but pair-wise comparisons revealed that the significant different only existed between the DW reported by patients (MDN= 0.6; IQR: 0.45-0.6) and physicians (MDN= 0.7; IQR: 0.625-0.75) ($P= 0.006$).

In IHD, there were significant differences between the DW determined by physicians (MDN= 0.65; IQR: 0.6- 0.725) and patients (MDN= 0.55; IQR: 0.4-0.65) ($P= 0.003$), and also physicians and publics (MDN= 0.5; IQR: 0.45- 0.6) ($P= 0.002$).

In CHF, significant differences was between the DW of physicians (MDN= 0.5; IQR: 0.3- 0.55) and publics (MDN= 0.3; IQR: 0.2- 0.4) ($P= 0.005$). In addition, there was another difference between publics and patients' family (MDN= 0.5; IQR: 0.4- 0.6) ($P= 0.002$). The valuation result of patients was similar to publics; however, no significant deference was found between patients and physicians, and between patients and family members (Table 2).

The result showed that all the groups reported that severity of VHD and IHD is the same, but CHF was more severe than other states ($P< 0.001$).

### *Specific Cardiovascular States*

Descriptive results of DWs determined by 4 study groups are showed in Table 3. No significant differences were observed among 4 groups in the following states: (implementation of) CHF class 1 and 2, treatment with CRT treatment with ICD in presence of low cardiac output, mild aortic valve stenosis and essential hypertension.

Significant differences were found among study groups about other health states. Generally, physicians evaluated the states less severe than other 3 groups. This difference in scoring was more obvious about conditions related to valvular diseases or pacemakers. The only exceptions were CHF class 3 and 4, which physicians reported them more severe than other study participants. Among non-physicians, patients and

publics valuated the states more severe than patients' family members did.

These 22 specific states were ranked, based on their median values of DWs. Considering intervals equal to 0.1, we categorized disability weights into 8 groups; from very mild to very severe (table 4). The result showed that very mild and very severe states were ranked almost identically. By another words, non-physicians were able to make difference between very severe and very mild states and other diseases. Then it can be possible to find a coefficient for transforming the scores of different study groups to scores of a reference group.

There were several disagreements among study groups in ranking of other moderate-disabling states. Excluding the diseases, which were non-familiar to laypeople, the heterogeneity in rankings (Table 4) can be explained by the fact that different people in the society have different point of views to disability and to CVDs. Such differences led to such disagreements. For example, non-physicians valuated the coronary angioplasty as well as or worse than coronary bypass surgery.

### *Reliability of the Result*

Comparing the VAS scores with relative disability (which was asked by interviewer after the interview) revealed that in 4 states, no significant differences were existed. About one condition (stable angina pectoris), the state was evaluated more severe in second time ($P$= 0.02). Then, we considered acceptable reliability for the results.

**Table 1:** Study-defined states related to cardiovascular diseases

| | Label | Definition |
|---|---|---|
| 1 | PCI (in MI) | [History of] Percutaneous Coronary Intervention (PCI) in presence of previous Myocardial Infarction (MI) and Left Ventricular Ejection Fraction (EF) > 40% |
| 2 | PCI | [History of] PCI in a normal heart (no previous MI) and EF > 40% |
| 3 | CABG | [History of] Coronary Artery Bypass Graft (CABG) surgery and EF > 40% |
| 4 | SAP | Stable Angina Pectoris (SAP) when EF > 40% |
| 5 | CHF class1 | Congestive Heart Failure (CHF), functional class I (NYHA FC = I) |
| 6 | CHF class2 | CHF, functional class II (NYHA FC = II) |
| 7 | CHF class3 | CHF, functional class III (NYHA FC = III) |
| 8 | CHF class4 | CHF, functional class IV (NYHA FC = IV) |
| 9 | CRT | Treatment with Cardiac Resynchronization Therapy (CRT) |
| 10 | ICD (Normal Heart) | Treatment with Implantable Cardioverter Defibrillator (ICD) when EF > 40% |
| 11 | ICD (Low EF) | Treatment with ICD when EF < 40% |
| 12 | PPM (Normal Heart) | Treatment with Permanent Pacemaker (PPM) when EF > 40% |
| 13 | PPM (Low EF) | Treatment with PPM when EF < 40% |
| 14 | MVC | [History of] Mitral Valve Commissurectomy (MVC) or Percutaneous Trans-venous Mitral Commissurotomy (PTMC) |
| 15 | MVR | [History of] Mitral Valve Replacement (MVR) |
| 16 | MS | Mild Mitral Stenosis (MS), under the medical treatment |
| 17 | AVR | [History of] Aortic Valve Replacement (AVR) |
| 18 | AS | Mild Aortic Stenosis (AS), under the medical treatment |
| 19 | HTN | Essential Hypertension (HTN), under the medical treatment |
| 20 | Multi PV | Presence of Multiple Prosthetic Valves (PV) |
| 21 | MVP | Mitral Valve Prolapse (MVP) |
| 22 | SVT | Benign dysrhythmia, like Supra Ventricular Tachycardia (SVT) |

*** Example for Explanation of a State**

**State1: PCI (in MI)**

***Explanation:*** This condition describes a patient who has had a myocardial infarction years ago; then was treated by percutaneous coronary intervention (angioplasty with or without stenting) and his/her cardiac output is normal (EF> 40%) and (s)he is living in this situation, at least for one year.

**Table 2:** Disability weights of cardinal cardiovascular diseases in different study groups

| Health State (ICD 10 codes) | Patients (n = 20) | Family (n = 20) | General Publics (n= 20) | Physicians (n = 20) | *P* |
|---|---|---|---|---|---|
| **Valvular Heart Diseases (I05- I09)** | † | | | † | |
| Disability Weight *Median (Inter-Quartile Range)* | 0.6 (0.45 - 0.6) | 0.6 (0.5- 0.75) | 0.6 (0.5 - 0.7) | 0.7 (0.625-0.75) | 0.024 |
| **Ischemic Heart Diseases (I20 – I25)** | † | | * | †,* | |
| Disability Weight *Median (Inter-Quartile Range)* | 0.55 (0.4- 0.65) | 0.6 (0.4-0.7) | 0.5 (0.45 - 0.6) | 0.65 (0.6-0.725) | 0.012 |
| **Heart Failure (I50)** | | * | †,* | † | |
| Disability Weight *Median (Inter-Quartile Range)* | 0.325 (0.25-0.45) | 0.5 (0.4-0.6) | 0.3 (0.2 - 0.4) | 0.5 (0.3 - 0.55) | 0.006 |

†, *: Statistically significant results in pair-wise comparisons (significance level = 0.05/6 ≈ 0.008)

**Table 3:** Disability weights of specific cardiovascular states in different study groups

| States | Patients (n = 20) | | Family (n = 20) | | General Publics (n = 20) | | Physicians (n = 20) | | *P* |
|---|---|---|---|---|---|---|---|---|---|
| PCI (in MI) | 0.575 | (0.425 - 0.7) | 0.6 | (0.55 - 0.7) | 0.5 | (0.4 - 0.6) | 0.7 | (0.65 - 0.8) | < 0.001 |
| PCI | 0.6 | (0.5 - 0.7) | 0.8 | (0.7 - 0.85) | 0.65 | (0.4 - 0.7) | 0.825 | (0.8 - 0.9) | < 0.001 |
| CABG | 0.6 | (0.5 - 0.7) | 0.6 | (0.5 - 0.7) | 0.6 | (0.5 - 0.7) | 0.7 | (0.6 - 0.9) | 0.004 |
| SAP | 0.55 | (0.45 - 0.7) | 0.6 | (0.55 - 0.65) | 0.625 | (0.6 - 0.7) | 0.675 | (0.6 - 0.8) | 0.04 |
| CHF class1 | 0.7 | (0.65 - 0.9) | 0.7 | (0.6 - 0.85) | 0.75 | (0.55 - 0.8) | 0.775 | (0.7 - 0.85) | 0.709 |
| CHF class2 | 0.6 | (0.575 - 0.8) | 0.6 | (0.5 - 0.7) | 0.625 | (0.5 - 0.7) | 0.6 | (0.475 - 0.7) | 0.58 |
| CHF class3 | 0.5 | (0.35 - 0.6) | 0.5 | (0.4 - 0.6) | 0.5 | (0.4 - 0.55) | 0.375 | (0.3 - 0.5) | 0.022 |
| CHF class4 | 0.3 | (0.15-0.475) | 0.375 | (0.3 - 0.5) | 0.35 | (0.25 - 0.45) | 0.2 | (0.15 - 0.25) | 0.003 |
| CRT | 0.3 | (0 - 0.525) | 0.5 | (0.3 - 0.6) | 0.325 | (0.2 - 0.5) | 0.325 | (0.2 - 0.4) | 0.124 |
| ICD (Normal Heart) | 0.425 | (0 - 0.5) | 0.55 | (0.4- - 0.7) | 0.4 | (0.3 - 0.6) | 0.625 | (0.4 - 0.7) | 0.015 |
| ICD (Low EF) | 0.25 | (0 - 0.4) | 0.35 | (0.2 - 0.55) | 0.3 | (0.2 - 0.4) | 0.325 | (0.225 - 0.5) | 0.099 |
| PPM (Normal Heart) | 0.35 | (0.1 - 0.65) | 0.5 | (0.3 - 0.6) | 0.4 | (0.25 - 0.55) | 0.8 | (0.6 - 0.875) | 0.001 |
| PPM (Low EF) | 0.35 | (0.15 - 0.5) | 0.375 | (0.2 - 0.55) | 0.3 | (0.2 - 0.4) | 0.5 | (0.425 - 0.575) | 0.014 |
| MVC | 0.5 | (0.4 - 0.6) | 0.7 | (0.5 - 0.7) | 0.5 | (0.5 - 0.6) | 0.8 | (0.7 - 0.8) | < 0.001 |
| MVR | 0.45 | (0.25 - 0.5) | 0.6 | (0.4 - 0.7) | 0.4 | (0.3 - 0.5) | 0.7 | (0.6 - 0.8) | < 0.001 |
| MS | 0.6 | (0.4 - 0.7) | 0.6 | (0.5 - 0.7) | 0.6 | (0.5 - 0.7) | 0.725 | (0.65 - 0.8) | 0.012 |
| AVR | 0.45 | (0 - 0.525) | 0.55 | (0.5 - 0.7) | 0.5 | (0.4 - 0.5) | 0.725 | (0.625 - 0.8) | < 0.001 |
| AS | 0.6 | (0.5 - 0.7) | 0.6 | (0.5 - 0.6) | 0.6 | (0.4 - 0.7) | 0.7 | (0.55 - 0.75) | 0.101 |
| HTN | 0.8 | (0.625- 0.85) | 0.75 | (0.7 - 0.9) | 0.8 | (0.7 - 0.9) | 0.8 | (0.75 - 0.9) | 0.353 |
| Multi PV | 0.4 | (0.125 - 0.5) | 0.55 | (0.35 - 0.6) | 0.4 | (0.3 - 0.6) | 0.625 | (0.45 - 0.7) | 0.008 |
| MVP | 0.7 | (0.55 - 0.8) | 0.9 | (0.8 - 0.9) | 0.7 | (0.5 - 0.8) | 0.9 | (0.9 - 0.95) | < 0.001 |
| SVT | 0.65 | (0.5 - 0.8) | 0.9 | (0.75 - 0.9) | 0.8 | (0.65 - 0.8) | 0.9 | (0.825 - 0.9) | < 0.001 |

**Table 4:** Severity groups and ranking of preferred cardiovascular states in different study groups

| Group | Disability Weight | Physicians | Patients | Family | General Public |
|---|---|---|---|---|---|
| 1 | 0.20– 0.29 | CHF class4 | ICD (Low EF) | - | - |
| 2 | 0.30– 0.39 | ICD (Low EF), CRT, CHF class3 | CHF class4, CRT, PPM (Normal Heart), PPM (Low EF) | ICD (Low EF), CHF class4, PPM (Low EF) | CHF class4, CRT, ICD (Low EF), PPM (Low EF), |
| 3 | 0.40– 0.49 | - | Multi PV, ICD (Normal Heart), MVR, AVR | - | Multi PV, PPM (Normal Heart), ICD (Normal Heart), MVR |
| 4 | 0.50– 0.59 | PPM (Low EF) | CHF class3, MVC, SAP PCI (in MI) | CRT, PPM (Normal Heart), CHF class 3, AVR Multi PV, ICD (Normal Heart) | CHF class3, AVR, (PCI in MI), MVC |
| 5 | 0.60– 0.69 | CHF class2, Multi PV, ICD (Normal Heart), SAP | CHF class2, CABG, PCI, MS, AS, SVT | MVR, SAP, PCI (in MI) CABG, CHF class2, MS, AS | CHF class2, CABG, MS, AS, SAP, PCI |
| 6 | 0.70– 0.79 | CHF class1, PCI (in MI), CABG, MVR, AS, AVR, MS | CHF class1, MVP | CHF class1, MVC, HTN | CHF class1, MVP |
| 7 | 0.80– 0.89 | PPM (Normal Heart), MVC,HTN, PCI | HTN | PCI | HTN, SVT |
| 8 | 0.90– 0.99 | MVP, SVT | - | SVT, MVP | - |

## Discussion

This study was conducted to assess the feasibility of health state valuation in context of Iranian society. For this purpose, we had to choose appropriate health states and appropriate responders and then made the valuation with an appropriate method. Cardiovascular diseases (CVDs) were the preferred state for our study. They are a major cause of annual deaths and have considerable role in burden of disease in our country (10). In addition, various health states can be defined, related to CVDs. Thus, valuation of the states was important from the aspects of solving a health problem and methodological concerns.

Three cardinal and 22 specific disease states were selected, because of their importance to our medical system; and not according to the general classifications of CVDs, which are found in textbooks. This approach was based on our local health priorities. GBD (7) and Dutch (2) studies and the national and local studies for determination of burden of disease in different parts of the world (10, 25, 26), only some cardinal CVDs were evaluated. There are several reports about DWs of various cardiovascular states (27). Many differences can be observed among those states and our preferred states. Maybe one main reason for such differences is the difference among countries in their health problems. By another word, studies from other parts of the world defined the CVDs states according to their own problems, we did it according to ours, and that made the difference.

Another point is that in considerable number of these reports, DWs have been determined based on the authors' personal opinions, not an original research (27). This proposes that not only in Iran, but also in other countries the lack of information about valuation of disease, exists. Besides, it is claimed that the usage of global DWs is not valid

and computing SMPH must be performed using local values (21).

Our valuation method in this preliminary study was VAS. This method is not the method of choice, especially for economic valuations; but because of its simplicity and feasibility, is the most frequently used method. Other methods have not lead to acceptable results in people with lower formal educations (12). No previous HSV reports were existed in Iran, and then in this study, we decided to use VAS for increasing the cooperation of participants and elimination the effect of responders' non-compliance on other methodological aspects and feasibility of the study. Data collection was prefect and no missing values existed in this research. In addition, our interviewer's observations showed that 100-point VAS was an appropriate and easy to understand for all groups of study participants. The good results of reliability testing in our study can confirm these findings. Then, we concluded that HSV is an acceptable and feasible study in Iranian society.

Four groups of people, according their relationships with CVDs, entered the study. Comparison among groups and identifying similarities and differences can help to determine if it is possible to use the opinion of a certain group instead of others or predict their values.

In several studies, differences among disability weights of various groups have been shown (29-31). Generally, physicians assessed the severity of diseases less than lay people; because their judgments about disability are affected by the seventy of functional impairments caused by a disease (23). In contrast, Dutch study showed that there were not considerable differences between the results of health care professionals and general population (8).

In the present study, the overall scores of physicians were greater than other 3 groups; means that they evaluated the states less disabling. However, they assessed the CHF class 3 and 4 more severe than the others. Various results of physicians in different places, at least in parts, are related to other socio-cultural factors and the general knowledge of laypeople about disease states. It seems that among Iranians, heart disease is equal to getting a very serious and life threatening problem and it leads to this finding that non-physicians reported the overall severities, grater than doctors. Of course, proving this claim needs a specific research.

It has been shown that patients reported their illnesses more severe than other people (12). We found the same result in the present study. We also found that patients' first-degree relatives valuated the severity of disease states, less than patients and publics. The latter group, like patients, reported the states more severe than physicians did. Overall results showed that non-physicians valuated the selected CVD states, similarly.

An important finding in this research was informing about the Iranians' perspective about various types of CVDs. It was observed that no differences were existed among the groups in reporting the severity of: CHF (functional class I and II), treatment with CRT, treatment with ICD in patients with low cardiac output, mild aortic stenosis and essential hypertension. Also, we found that all 4 groups ranked the 3 major cardiac diseases, similarly; VHD reported as severe as IHD and CHF more severe than those two diseases.

In contrast to what discussed above, several dissimilarity existed among the groups, especially between physicians and other groups. Non-physicians (even patients), could not distinguish among the various states of valvular diseases, or pacemaker types. Disagreements also were observed among physicians and non-physicians in some specific states, especially with moderate severities.

Apparently, the valuation act must be performed by anyone who has a proper concept about a health state; but it is important identify the states which can be evaluated by lay people in a certain community. In this explanatory study, we obtained estimation about some of these CVDs, which are mentioned above.

We categorized the CVD states, based on their DWs into 8 disability groups It was observed that in very severe and very mild states, an agreement was existed among 4 participant groups. On the other hand, no acceptable agreement were in

states with moderate severity; this finding was described also elsewhere (23).

In conclusion, the results of this explanatory study propose that HSV is feasible in our community. VAS is an acceptable and understandable method for various people, and has reliable results.

Using the physicians' opinions for valuation is confidential and suitable. About the other groups, major categories of cardiac disuses and some other states which are familiar to Iranian people (and we mentioned them before) must be considered for valuation.

***Study limitations***

This study was the first research in this kind in Iran and designed as a pilot study. Then, the sample was small and the only valuation method was VAS. Other studies with larger samples are estimate the disability weights with appropriate precisions and comparison among different valuation methods (like TTO, PTO and SG) in various population groups.

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