

## Construction and Validation of a Questionnaire about Heart Failure Patients' Knowledge of Their Disease

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### Abstract

**Background:** The lack of tools to measure heart failure patients' knowledge about their syndrome when participating in rehabilitation programs demonstrates the need for specific recommendations regarding the amount or content of information required.

**Objectives:** To develop and validate a questionnaire to assess heart failure patients' knowledge about their syndrome when participating in cardiac rehabilitation programs.

**Methods:** The tool was developed based on the Coronary Artery Disease Education Questionnaire and applied to 96 patients with heart failure, with a mean age of  $60.22 \pm 11.6$  years, 64% being men. Reproducibility was obtained via the intraclass correlation coefficient, using the test-retest method. Internal consistency was assessed by use of Cronbach's alpha, and construct validity, by use of exploratory factor analysis.

**Results:** The final version of the tool had 19 questions arranged in ten areas of importance for patient education. The proposed questionnaire had a clarity index of  $8.94 \pm 0.83$ . The intraclass correlation coefficient was 0.856, and Cronbach's alpha, 0.749. Factor analysis revealed five factors associated with the knowledge areas. Comparing the final scores with the characteristics of the population evidenced that low educational level and low income are significantly associated with low levels of knowledge.

**Conclusion:** The instrument has satisfactory clarity and validity indices, and can be used to assess the heart failure patients' knowledge about their syndrome when participating in cardiac rehabilitation programs. (Arq Bras Cardiol. 2014; 102(4):364-373)

**Keywords:** Heart Failure / rehabilitation; Validation Studies; Questionnaires.

### Introduction

Heart failure (HF) has become an increasing public health problem. Approximately 23 million people worldwide are estimated to have HF, and two million new cases are diagnosed every year<sup>1-3</sup>. In addition, HF is one of the major causes of hospitalization worldwide<sup>1,3</sup>, having a great impact on economy, mortality and quality of life<sup>1,3,4</sup>.

Thus, alternatives that can reduce HF mortality and morbidity rates have been sought, among which the following stand out: to provide patients with greater access to information on HF and on the procedures performed, contributing directly to HF treatment<sup>5-8</sup>.

According to the Brazilian Guidelines on Cardiac Rehabilitation (CR)<sup>9</sup>, rehabilitation programs are developed to direct patients back to their usual daily activities and work. Therefore, the practice of physical exercise is emphasized, along with educational actions aimed at changes in lifestyle<sup>9,10</sup>.

The patients' lack of knowledge of HF contributes to a worse quality of life, social isolation, increased co-morbidities, ignorance about signs and symptoms, and lack of self-care and of adherence to treatment<sup>11,12</sup>. Such factors are inherent in increasing health care costs, because patients' knowledge of their condition determines adherence to treatment and, thus, its success<sup>12,13</sup>.

Assessment tools are used in health educational programs, because they enable us to measure the effects of the teaching and learning process, and the possible changes in the attitude towards HF<sup>14,15</sup>. However, validated tools capable of determining the level of knowledge of patients with HF participating in CR programs have not been described. The reason for that lies in the fact that the educational needs of patients with HF, specifically those in CR programs, differ from those of patients with heart problems in general, thus justifying the existence of a specific tool to assess knowledge of HF<sup>11,16</sup>.

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This study was aimed at developing and validating a tool, a questionnaire, to assess HF patients' knowledge about their own disease when participating in CR programs.

## Methods

### Sample

This is a cross-sectional study, comprising three distinct intentional and non-probabilistic samples (Groups I, II and III), carried out from February 2012 to March 2013.

Group I comprised health professionals experienced in CR, also known as specialists (CR professionals), who participated in the content validity and clarity evaluation stages of the tool. Group II comprised patients with HF (classes I to III) participating in the clarity evaluation and reproducibility stages of the tool. Group III comprised patients with HF (classes I to III) participating in the construct validity and internal consistency stages.

Group II and III patients met the inclusion criteria proposed: clinical diagnosis of HF; age, 18 years and over; and be a participant in a CR program for at least one month. Illiterate patients and those with cognitive changes that hindered the completion of the questionnaire were excluded from this study. The study sites selected were as follows: Clínica de Cardiologia e Reabilitação Cardiopulmonar e Metabólica – Cardiosport; Núcleo de Cardiologia e Medicina do Esporte of the Clínica Escola de Fisioterapia/ Santa Catarina State University (CEFID/UEDESC); and Instituto de Cardiologia de Santa Catarina (ICSC), of the Hospital Regional de São José, in the state of Santa Catarina.

All patients provided written informed consent, in accordance with the Resolution 196/96 of the Brazilian Council of Health. This study was approved by the Committee on Ethics and Research in Human Beings of the Santa Catarina State University (protocol 63.405/12).

### Developing the tool

The development of the questionnaire about HF patients' knowledge of their disease comprised three steps with three different procedures: theoretical, empirical and analytical<sup>17,18</sup>. The theoretical step related to the theoretical grounding and adaptation of the construct to be elaborated. The empirical step comprised the application of the pilot questionnaire and data collection used in assessing the properties of the tool. The analytical step comprised statistical data analyses aimed at tool validation<sup>17-20</sup>.

### Content validity and clarity evaluation

For content validity and clarity evaluation, the CR professionals were asked to provide two types of analysis: semantic, aimed at verifying if all items were compatible with the study population (patients with HF); and of content, aimed at verifying the adequacy of the attribute presentation<sup>21,22</sup>. Assessing the content and clarity index involved intervals; for each question tested, a scale was organized with values ranging from 1 to 10, as follows: from 1 to 4, the question was considered 'confused'; from

5 to 7, 'unclear'; and from 8 to 10, 'clear'<sup>21,23</sup>. Below each component, there was room for suggestions regarding the analysis of content and semantics of the items proposed. The clarity index was obtained by use of the arithmetic mean of the sums of the scores attributed by the CR professionals<sup>19,21,24</sup>.

Statements with clarity index below 8 were re-elaborated, and replaced by others sharing the same concept, so that the structure and property of the tool did not significantly change<sup>17,19,23,24</sup>. That version was submitted again to the same CR professionals to generate the second version of the questionnaire.

Then the second version of the questionnaire was submitted to ten patients with HF to assess its clarity, by use of a pilot study, similarly to the phase of the CR professionals. The objective was to evaluate the understanding of the items proposed. Questions with a score equal to or lower than 8 were reformulated, generating the final version of the questionnaire, which was submitted to validation of the construct and reproducibility<sup>17,19,24</sup>.

### Reproducibility

Reproducibility was assessed via Intraclass Correlation Coefficient (ICC), using the test-retest method. In this phase, the ten patients participating in the clarity evaluation phase answered the questionnaire on two different occasions, at a 14-day interval<sup>20</sup>. The ICC analysis used the total scores generated by the questionnaire, based on a value greater than 0.8<sup>17,19</sup>.

### Construct validation

Exploratory factor analysis was performed with principal component analysis and orthogonal rotation, by use of the Varimax method. Initially sampling adequacy was assessed by using the Keiser-Meyer Olkin test (KMO) and the Bartlett's test of sphericity<sup>19,20</sup>.

Principal components analysis was used to extract the factors, considering only those with autovalue greater than 1.0 and factor loading over 0.3. After selecting the values, a factorial matrix was generated, in which the relationships between the items and the factors were observed via factor loadings<sup>17,19,25</sup>.

### Internal consistency

Internal consistency was assessed by use of Cronbach's alpha in all study participants, considering the minimum value of 0.6<sup>17,19,25</sup>.

### Descriptive analysis

The following sample characteristics were assessed: sex; profession; age; time for diagnosis; CR program duration; clinical diagnosis; CR program type (public or private); and socioeconomic level (determined by family income and educational level)<sup>19</sup>. Descriptive statistics comprised the following: absolute and relative frequencies; mean; median; and standard deviation (SD).

The Kolmogorov-Smirnov normality test was used for the variables age and questionnaire score, which did not meet the required criteria. To compare the knowledge scores

between patients from public and private CR programs, the Mann Whitney U test was used<sup>19</sup>. To assess the existence of a relationship between the level of knowledge of HF and the other variables (educational level, socioeconomic level, and CR program duration), Spearman correlation test was used. The significance level of  $< 0.05$  was adopted for all analyses<sup>19</sup>.

## Results

### Participants

Group I comprised 18 CR professionals as follows: ten physicians; four physical therapists; two nurses; one physical educator; and one nutritionist. Group II comprised ten male patients with HF, whose mean age was  $73 \pm 9$  years. Group III comprised 96 patients (62 men), whose mean age was  $60.22 \pm 11.6$  years.

### Developing the questionnaire

The development of the questionnaire comprised initially a comprehensive literature review of the relevant publications on the topic over the past ten years, and was based on the Coronary Artery Disease Education Questionnaire (CADE-Q)<sup>17</sup>.

The specific literature about HF comprised the following references: Update on the Brazilian Guidelines of Chronic Heart Failure<sup>26</sup>; III Brazilian Guidelines of Chronic Heart Failure<sup>4</sup>; Brazilian Guidelines of Cardiac Rehabilitation<sup>9</sup>; Normalization of Equipment and Techniques of Supervised Cardiovascular Rehabilitation<sup>27</sup>; and Brazilian Guidelines of Cardiopulmonary and Metabolic Rehabilitation: Practical Aspects and Responsibilities<sup>10</sup>.

Nineteen items were developed, each one divided into ten areas of importance for the patient's education. The items were divided according to the content proposed as follows: HF pathophysiology; HF concept; risk factors; signs and symptoms; lifestyle; diagnosis; drugs; treatment; self-care; and physical exercise. Each question was presented with four multiple-choice alternatives, as follows: only one correct answer; one incomplete answer; one wrong answer; and 'I do not know'.

### Content validation

The questionnaire was individually presented to each CR professional and the results are shown in Table 1.

Verificou-se que 66,66% dos especialistas consideraram claras as regras de construção referente à fonte dos itens, às regras de construção e à análise teórica dos itens, conteúdo e semântica. However, most items assessed generated comments regarding semantics. Every item was discussed by the authors, and the changes suggested by the CR professionals were implemented.

### Clarity evaluation

Clarity evaluation was conducted concomitantly with content validation by the CR professionals, who, when choosing

between the options 'clear', 'unclear' and 'confused', indicated simultaneously the grades of the expressions previously marked. The mean grade for clarity was  $8.91 \pm 0.63$ .

The second version of the questionnaire, with implementation of the suggestions, achieved 80% of agreement between the items assessed, being, then, resubmitted to the same CR professionals. The mean grade for clarity was  $8.83 \pm 0.43$ .

### Pilot study

In the pilot study, ten Group II patients completed the questionnaire as described, and attributed a grade to each set of question/answer regarding understanding and clarity, generating the clarity index of the questionnaire. The questionnaire achieved a clarity index of  $8.94 \pm 0.83$ , the mean time of questionnaire completion being  $15.3 \pm 1.6$  minutes.

### Reliability assessment

The ten patients participating in the pilot study answered the questionnaire on two distinct occasions, at a 14-day interval, to assess reliability. On the two distinct occasions, they checked only one alternative for each question, the one they considered correct. The scores established for the alternatives were as follows: correct = 3; incomplete = 1; wrong = 0; and 'I do not know' = 0<sup>13,17</sup>. The maximum score was established according to the final number of questions answered<sup>13,17</sup>. The ICC obtained from the final scores was 0.856<sup>19</sup>.

Table 2 shows the classification of the level of knowledge based on other studies<sup>13,17</sup>.

### Descriptive analysis

The descriptive analysis involved 96 patients with HF (mean age,  $60.22 \pm 11.6$  years), the mean time for diagnosis being  $6.77 \pm 5.99$  years. Table 3 shows the characteristics of the sample.

The questionnaire had a mean total score of  $45.52 \pm 8.39$ , and median of 47. According to the patients' classification, the 'good level of knowledge' prevailed (44.8%). Comparing the patients' levels of knowledge between the public and private CR programs, a significant difference between both groups was observed ( $p < 0.001$ ), with a higher level of knowledge of HF among the private group.

Moderate positive correlations were observed between the level of knowledge and the sociodemographic variables 'educational level' ( $\rho = 0.603$ ;  $p < 0.001$ ) and 'family income' ( $\rho = 0.506$ ;  $p < 0.001$ ). Nevertheless, a weak positive correlation was observed between age ( $\rho = 0.225$ ;  $p = 0.027$ ) and the level of knowledge. Correlation of the level of knowledge was observed with neither CR program duration ( $p = 0.224$ ) nor sex ( $p = 0.083$ ).

### Construct validity of the questionnaire

To assess the construct validity, exploratory factor analysis was performed (Table 4). That method was chosen because the factors of the questionnaire are relatively independent.

**Table 1 – Content validation performed by the cardiac rehabilitation professionals**

Questions	Clear (10-9-8) n (%)	Unclear (7-6-5) n (%)	Confused (4-3-2-1) n (%)
1	12 (66.66)	6 (33.33)	0
2	15 (83.33)	3 (16.66)	0
3	15 (83.33)	3 (16.66)	0
4	14 (77.77)	3 (16.66)	1 (5.55)
5	14 (77.77)	3 (16.66)	1 (5.55)
6	10 (55.55)	8 (44.44)	0
7	17 (94.44)	0	1 (5.55)
8	11 (61.11)	1 (5.55)	6 (33.33)
9	17 (94.44)	1 (5.55)	0
10	15 (83.33)	3 (16.66)	0
11	15 (83.33%)	2 (11.11)	1 (5.55)
12	16 (88.88)	2 (11.11)	0
13	16 (88.88)	1 (5.55)	1 (5.55)
14	17 (94.44)	1 (5.55)	0
15	10 (55.55)	6 (33.33)	2 (11.11)
16	15 (83.33)	3 (16.66)	1 (5.55)
17	15 (83.33)	3 (16.66)	0
18	15 (83.33)	3 (16.66)	0
19	13 (72.22)	2 (11.11)	2 (11.11)

**Table 2 – Classification of the patient's level of knowledge according to the questionnaire scores**

Sum of the scores (points)	%	Classification of knowledge
51 - 57	90 – 100	Excellent
40 - 50	70 – 89	Good
29 - 39	50 – 69	Acceptable
17 - 28	30 – 49	Little knowledge
< 17	< 30	Insufficient knowledge

The KMO test and the Bartlett's test of sphericity showed that the data were adequate for factorial analysis (KMO = 0.634 and Bartlett had a  $p < 0.001$ )<sup>19</sup>. Five factors accounted for 50.6% of the total variance of the items, whose autovalues were greater than 1.2.

Changing the number of factors, the total variance of the items showed values lower than 50%, or factor loadings under 0.3 and/or autovalues < 1, considered not recommended in validation processes<sup>17,19,25</sup>.

Factor number one, called "General Factor", comprised five items, involving the following areas of knowledge: physical exercise; treatment; drugs; concept; signs and symptoms; diagnosis; lifestyle and risk factors. It accounted for 20.4% of the total variance, while the other factors contributed less to that variance.

Factor number two, called "Treatment Factor", comprised three items, involving the following areas of knowledge: treatment; self-care; lifestyle; and signs and symptoms. Factor number three, called "Physical Exercise Factor", comprised five items, involving the following areas of knowledge: physical exercise; treatment; self-care and pathophysiology. Factor number four, called "Drug Factor", comprised two items, involving the following areas of knowledge: drugs; treatment and self-care. Factor number five, called "Diverse Factor", involved the following areas of knowledge: drugs; treatment; self-care; lifestyle; concept and risk factor.

#### Internal Consistency of the Questionnaire

As a whole, the questionnaire had good internal consistency, with Cronbach's alpha of 0.749<sup>19</sup>.

**Table 3 – Characteristics of the patients**

Variable	Category	n (%)
Sex	Male	62 (64.6)
	Female	34 (35.4)
Co-morbidities	Obesity	9 (9.4)
	Dyslipidemia	49 (51.0)
	CAD	66 (68.8)
	CPOD	3 (3.1)
	POAD	11 (11.5)
	SAH	58 (60.4)
	DM	22 (25)
Cardiac procedures	CVA	5 (5.2)
	Angioplasty	40 (41.7)
	Cardiac surgery	25 (26)
Rehabilitation type	Private	35 (36.5)
	Public	61 (63.5)
Family income (wage)	Up to 1	6 (6.3)
	From 1 to 5	48 (50)
	From 5 to 10	15 (15.6)
	From 10 to 20	18 (18.8)
	More than 20	9 (9.4)
Educational level	No schooling	1 (1.0)
	Incomplete elementary education	13 (13.5)
	Complete elementary education	13 (13.5)
	Incomplete secondary education	9 (9.4)
	Complete secondary education	28 (29.2)
	Incomplete higher education	2 (2.1)
	Complete higher education	22 (22.9)
	Post-graduation	8 (8.3)

CAD: coronary artery disease; COPD: chronic obstructive pulmonary disease; POAD: peripheral obstructive arterial disease; SAH: systemic arterial hypertension; CVA: cerebral vascular accident; DM: diabetes mellitus.

## Discussion

The first step in the development of educational actions is to identify the need for information on what patients really know about their own disease. The development and validation of tools that measure the amount and the content of information are essential in the attempt to improve the knowledge of HF patients participating in CR programs about their disease<sup>11,16,28,29</sup>.

The clarity index generated by the CR professionals and patients determined that the questionnaire proposed was easy to understand<sup>17,21,24</sup>. In addition, the tool met the minimum requirements for structuration, abiding by the principles of clarity, simplicity, relevance, reliability and balance, and used intelligible and consistent items with pertinent expressions regarding the attribute, expressing one single idea<sup>13,21,22</sup>.

Data regarding internal consistency and reliability determined the homogeneity and stability of the questionnaire, showing that multiple applications can generate similar and accurate results<sup>17,19,20</sup>. The sample size met the basic requirements described in the literature, which recommend a number of five to ten individuals per item proposed in processes of tool development and validation<sup>21,22</sup>.

The exploratory factorial analysis showed five factors, which were grouped considering stability and interpretation of the areas and basic principles of the development rules to elaborate a reliable and consistent construct. The five factors comprised a diversified amount of items in each domain, intercorrelated, which can be explained by the fact that HF is a complex syndrome of systemic and multifactorial character<sup>11,17,19,25-27</sup>.

Table 4 – Factorial structure of the questionnaire

Item	Area	Factors				
		1	2	3	4	5
11	Treatment - Physical exercise	0.712				
19	Treatment - Drug	0.656				
6	Concept - Signs and symptoms	0.656				
10	Treatment - Risk factors - Lifestyle	0.547				
7	Treatment - Diagnosis	0.530				
8	Treatment - Self-care - Lifestyle		0.720			
13	Treatment		0.712			
3	Signs and symptoms - Self-care		0.653			
14	Pathophysiology			0.752		
15	Self-care			0.596		
16	Physical exercise - Treatment			0.511		
12	Physical exercise - Treatment			0.416		
1	Concept - Pathophysiology			0.404		
5	Treatment - Physical exercise				0.715	
17	Treatment - Drug - Self-care				0.643	
9	Self-care - Lifestyle - Risk factors					0.607
2	Concept - Risk factors					0.492
4	Self-care - Signs and symptoms - Risk factors					0.479
18	Self-care					0.441

Compared to the factorial analysis reported in CADE-Q<sup>17</sup>, this questionnaire about the HF patients' knowledge of their disease showed conformity with the disposition of factors and items, but in each of the five factors, similar items in the areas of knowledge predominated. The similarity of this questionnaire with those cited in the literature is specifically due to the relevant areas of knowledge and to the items suggested, also showing the lack of tools directed to CR programs<sup>28-31</sup>.

Our tool also assessed the HF patients' level of knowledge, which was compared with their socioeconomic characteristics. The greater the family income and educational level, the higher the score achieved by the patients, indicating that knowledge is mediated by the individuals' education, cultural and economic levels, and language. Similar data have been observed in several studies<sup>13,15,17,32-35</sup>.

Although in this study the CR program duration and the level of knowledge did not result significant, other studies have shown that, when all the components of a CR program center, including education, are applied systematically and comprehensively, there is a significant impact on the level of knowledge<sup>10,11,29,32</sup>. It is worth noting that the CR program duration interferes directly with the patient's level of knowledge<sup>11,29,32,35</sup>.

A structured CR program comprises the patient's educational process, which should provide basic information on the HF pathophysiology of the disease, relationship of the disease and physical exercise, mechanisms of action of the

drugs and lifestyle reformulation, in addition to assessment of the individual learning needs, which strengthen the knowledge of the disease<sup>16,11,28-30</sup>. That highlights the need to develop tools capable of performing that measurement and of following HF patients on CR programs up.

Considering that the inadequate understanding of a syndrome and related factors can cause emotional changes, non-adherence to treatment, and disease progression, the application of specific tools to measure how much patients know about their affections is fundamental<sup>11,29,34</sup>. Regarding HF, optimization of the therapy and adherence to treatment reduce the number of HF-related hospitalizations, with direct consequences to quality of life and self-care and a reduction in hospital costs<sup>11,12,4,29,34,35</sup>.

## Conclusion

The tool called "Questionnaire about heart failure patients' knowledge of disease" met the psychometric properties from its development to its validation process. Thus, that tool proved to be scientifically appropriate to assess the HF patients' knowledge of their own disease when participating in CR programs.

## Author contributions

Conception and design of the research: Bonin CDB, Ghisi GLM, Amboni R, Benetti M; Acquisition of data: Bonin CDB, Vieira AM, Amboni R; Statistical analysis: Bonin CDB, Santos RZ, Amboni R; Analysis and interpretation of the data: Bonin

CDB, Santos RZ, Ghisi GLM, Vieira AM, Benetti M; Writing of the manuscript: Bonin CDB, Santos RZ, Vieira AM, Amboni R; Critical revision of the manuscript for intellectual content: Bonin CDB, Santos RZ, Ghisi GLM, Benetti M.

#### Potential Conflict of Interest

No potential conflict of interest relevant to this article was reported.

#### Questionnaire About Heart Failure Patients' Knowledge of Their Disease

##### 1. Heart failure (HF) is:

- A disease that affects the elderly and results from heart weakness.
- A heart problem that reduces the amount of blood delivered to the tissues, and can cause pulmonary and vascular changes.
- A change in cardiac arteries that manifests since childhood.
- I do not know.

##### 2. What group of factors influences most the development of HF?

- Environmental factors (climate) and age (younger than 65 years).
- Changes in diet: overweight/obesity.
- Coronary artery disease, arterial hypertension and Chagas disease.
- I do not know.

##### 3. Regarding the symptoms of HF, check the correct alternative:

- Headache during physical exercise.
- Palpitations during exertion.
- Chest pain, shortage of breath and fatigue (tiredness).
- I do not know.

##### 4. Still about HF:

- Excessive ingestion of sodium (salt) and fluids can worsen the disease symptoms and the HF patient condition.
- Shortage of breath is associated with the presence of fluid in the lungs.
- The symptoms of HF can be prevented with only changes in lifestyle.
- I do not know.

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#### Study Association

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##### 5. Regarding the supervised practice of physical exercise by patients with cardiac changes, such as HF, the following is indicated:

- Blood pressure and heart rate measurement during physical exercise practice.
- Blood pressure and heart rate measurement, and observation of signs (edema) and symptoms (shortage of breath) of cardiac problems during physical exercise practice.
- Neither monitoring nor measurement, because physical exercise practice is not recommended for patients with HF due to the high risk of the disease.
- I do not know.

##### 6. The symptoms of HF are classified into classes I, II, III and IV, whose purpose is to assess:

- The difficulties and limitations caused by the disease on daily activities of patients with HF.
- The quality of life of patients with HF.
- The amount of medication used by patients with HF.
- I do not know.

##### 7. Which alternative indicates the most used tests for HF diagnosis (knowledge) and prognosis (outcome)?

- Catheterization and tomography.
- Chest X-ray and electrocardiography.
- Treadmill test, echocardiography and biochemical analysis.
- I do not know.

##### 8. The most indicated nutritional guidance for patients with HF is:

- Use of nutritional supplement for patients who ingest few calories.
- Diet is not a factor that worsens the disease.
- Control of sodium (salt) intake.
- I do not know.

**9. Which item indicates worsening of the disease prognosis (outcome)?**

- a) Low exercise capacity and several hospitalizations.
- b) Weight loss.
- c) Gastrointestinal complications.
- d) I do not know.

**10. The treatment of HF includes:**

- a) Stopping working.
- b) Nutritional diet and psychological support.
- c) Use of drugs in association with cardiac rehabilitation and prevention of factors that aggravate the disease.
- d) I do not know.

**11. The practice of physical exercise prescribed to patients with HF is related to:**

- a) A reduction in the risk for other cardiac diseases.
- b) Favorable adaptations of the body to reduce the disease symptoms and improve quality of life.
- c) Patients with HF should not practice physical exercises because of the high risk of death.
- d) I do not know.

**12. Physical exercise for patients with HF should:**

- a) Respect the patient's individual needs that should be analyzed via medical assessment.
- b) Consist of walking and begin right after the diagnosis.
- c) Be standardized to individuals of the same sex, age and symptoms.
- d) I do not know.

**13. Which interventions used to treat HF can prolong the patients' life and improve its quality?**

- a) Drug treatment + prolonged rest + surgical treatment.
- b) Drug treatment + surgical treatment in some cases.
- c) Drug treatment + change in lifestyle + surgical treatment in some cases.
- d) I do not know.

**14. One of the consequences of untreated HF is:**

- a) Risk of acute myocardial infarction.
- b) Progressive cardiac muscle weakening with aggravation of symptoms and risk of death.
- c) Increased serum levels of fat.
- d) I do not know.

**15. Regarding the HF patient's self-care, the following is important:**

- a) Knowledge of the disease by HF patients and family members improves the quality of life of individuals with HF.
- b) Hospitalization of patients with HF is more frequent among those most severely ill.
- c) Physical exercise increases depression and anxiety of individuals with HF.
- d) I do not know.

**16. The recommendation of physical exercise for patients with HF should include:**

- a) Aerobic exercise (walking) associated with resistance exercise (muscle strengthening), in addition to stretching.
- b) Stretching exercise associated with flexibility exercise.
- c) Localized exercise for weight reduction.
- d) I do not know.

**17. What are the possible side effects of drugs used to treat HF?**

- a) Arterial hypotension (decrease in blood pressure) and sexual dysfunction.
- b) Cough and dehydration.
- c) Dermatitis (skin disease) and intestinal disorders.
- d) I do not know.

**18. What should someone with HF know?**

- a) Individuals with HF have depression, and psychological support is recommended.
- b) Knowing about the disease helps people to identify HF signs and symptoms.
- c) Follow-up and treatment of non-cardiac diseases, such as diabetes, are not important to the health of HF patients.
- d) I do not know.

**19. What drugs can be used in the treatment of HF?**

- a) Diuretics (furosemide, lasix and hydrochlorothiazide).
- b) Angiotensin-converting enzyme inhibitors (ACEI), such as captopril and enalapril; beta-blockers (carvedilol, propranolol, atenolol, selozok and nebivolol); diuretics (furosemide, lasix and hydrochlorothiazide).
- c) Nitrates (isordil and monocordil).
- d) I do not know.

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