

# Validity and Reliability Studies of the Indonesian Version of Heart Failure Somatic Perception Scale (HFSPS) Questionnaire

Fanni Okviasanti<sup>1,2\*</sup>, Ah. Yusuf<sup>1</sup>, Ninuk Dian Kurniawati<sup>1</sup>

**Abstract---** Heart Failure Somatic Perception Scale (HFSPS) is one of the most commonly used questionnaires to assess HF physical symptoms. However, to be utilized in Indonesia, it needs validity and reliability studies. This study aimed to obtain a valid and reliable Indonesian version of the Heart Failure Somatic Perception Scale (HFSPS) so that it can be used in Indonesia. This study was a cross-sectional study with 152 subjects with a mean age of  $58.03 \pm 10.2$  years who had heart failure disease and were treated at the outpatient clinic of cardiology in Government Hospital in Lamongan and Gresik, East Java, Indonesia. The validity of the HFSPS was assessed by evaluating the construct validity using a multitrait-multimethod analysis and external validity was evaluated by comparing the HFSPS with the MLHF questionnaire. Reliability was assessed using Cronbach's  $\alpha$ . All items in the Indonesian version of the HFSPS questionnaire were valid and had a positive strong correlation with the MLHF questionnaire ( $r=0,635$ ;  $p<0.000$ ). The Cronbach  $\alpha$  of the Indonesian version of HFSPS was 0.813. The Indonesian version of HFSPS has good validity and reliability to assess the physical symptoms of patients with chronic heart failure in Indonesia.

**Keywords---** Heart Failure; Validity and Reliability; HFSPS; Symptoms

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## I. INTRODUCTION

Heart failure (HF) is one of the chronic diseases which interfere with bodily functions due to decreased heart pumping capacity [1]. Since the incidence continues to rise along with the increase in the aging of population, it becomes a growing health problem and economic burden on the health care system [2]. HF has affected around 26 million people worldwide [3]. The prevalence in Indonesia in 2013 based on doctor's diagnosis was 0,13% or an estimated 229.696 people, and based on symptoms, 0,3%, or an estimated 530.086 people [4]. How symptoms of HF are felt and reported by patients is variable, and it affects the evaluation of the symptoms and the documentation by health care providers [5]. A precise assessment of patients' symptoms using high-quality instruments is pivotal because it can predict morbidity and mortality [6].

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<sup>1</sup> Faculty of Nursing, Universitas Airlangga, Surabaya, Indonesia

<sup>2</sup> Faculty of Vocational Studies, Universitas Airlangga, Surabaya, Indonesia

Corresponding author:

Fanni Okviasanti

Email: fanni.okviasanti@vokasi.unair.ac.id

Several instruments have been developed to evaluate HF symptoms [7]. However, some of them have limitations. Frequently they do not assess early symptoms of HF decompensation or they only assess the main symptoms of HF (i.e. dyspnea) with a single-item question. Several investigators assess HF symptoms with QOL disease-specific instruments, which are not focused on the burden or perception of signs and symptoms of HF, but on the effect of symptoms or treatment of HF on the individual's quality of life [5], [6]. The robustness of HF symptoms instruments must be able to assess the hallmarks, early indicators, and subtle symptoms of impending decompensation broadly and complexly [6].

Heart failure somatic perceptions scale (HFSPS) V.3 is one of the most commonly used questionnaires to assess HF's physical symptoms. It consists of 18 item questions developed from the Lenz's Theory of Unpleasant Symptoms and reflects five criteria proposed by Lee and Moser to evaluate symptom instrument, including comprehensiveness, simplicity, not burdensome during completion, psychometrically sound, and informative [6], [8]. A psychometric evaluation of this instrument has conducted on American and European HF populations. The validity and reliability studies of HFSPS were supportive in those two populations [5], [6]. However, to be utilized in Indonesia, it needs further validity and reliability studies. Therefore, this study aimed to obtain a valid and reliable Indonesian version of the Heart Failure Somatic Perception Scale (HFSPS) so that it can be used in Indonesia.

## **AI. METHODS**

### **Design**

This study was a cross-sectional study consisting of two stages. The first stage was adapting the questionnaire following a method according to the guidelines provided by Beaton et al [9]. The second stage was the validity and reliability studies. The validity of HFSPS was assessed by evaluating the inter-item correlation in the Indonesian version of HFSPS and evaluating the correlation between the Indonesian version of HFSPS and the Indonesian version of Minnesota Living with Heart Failure Questionnaire (MLHF) as the gold standard. The reliability study was evaluated by calculating internal consistency using Cronbach's  $\alpha$ .

### **Subjects**

The population of this study was outpatients of the cardiology clinic of Government Hospital in Lamongan and Gresik, East Java, Indonesia from June to December 2019. This study enrolled patients aged over 30 with heart failure who could read and write in Indonesian and were willing to participate in this study. Patients who had communication barriers or cognitive disorders, as well as those with critically ill conditions, were excluded from the study. For validity and reliability testing, the minimum sample size was determined by calculating from confidence level 95% with power 80% and  $r=0.6$ . Samples were collected consecutively. Finally, 30 patients for language and cultural adaptation process and 152 patients for validity and reliability testing were involved in this study.

### **Instruments**

This study used 2 instruments, HFSPS and the Indonesian version of MLHF. The HFSPS questionnaire consisted of 18 questions with a 6-point Likert Scale (0-5), developed to evaluate the presence and severity of 18 common physical signs and symptoms of heart failure (e.g. edema and chest pain), and assess dyspnea and its effects on daily activities with six items. The HFSPS asks participants how much they had been bothered by the symptoms in the past week using 5 response options ranging from 0 (I did not have the symptoms) to 5 (extremely bothered). The scores were summed with higher values indicating higher symptom burden [5], [6]. The author had obtained permission from the developer to use and translate the questionnaire into Bahasa.

The MLHF questionnaire consisted of 21 questions with a 6-point Likert Scale (0-5), used to evaluate the quality of life specific for patients with heart failure. This questionnaire has two domains, physical and emotional, each with 8 and 5 questions, respectively. However, the total score included all the items from the physical, emotional subscale, and also other items regarding socioeconomic aspects, treatment, and some physical activities. The ranges of scores for the total score, physical and emotional subscales were 0-105, 0-40, and 0-25, respectively. The higher score indicated a worse quality of life [10]. The psychometry of this questionnaire in the Indonesian version had been evaluated and had good validity and reliability to assess the quality of life of patients with heart failure in Indonesia. Cronbach's  $\alpha$  of the Indonesian version was 0.887, while the intraclass correlation (ICCs) was 0.918 [11].

### **Adapting the Questionnaire**

The procedures for translation into the Indonesian language were modified from Beaton et al. which consists of 6 stages: initial translation, translation synthesis, back translation, committee review, pre-testing, and submission and appraisal of all written reports to the committee. After getting permission from the developer, two Indonesian translators performed the initial translation process and they synthesized one Indonesian version. In the back translation stage, the synthesis questionnaire was then translated back to English by two translators. The committee, which consists of a methodological expert, a clinical expert, and a translator, reviewed the questionnaire. The author also sent the back translation to the developer for review. After being reviewed by the committee and developer, the questionnaire was edited to be the pre-final version. The results of the translation were tested on 30 subjects who evaluated the questionnaire.

### **Data Analysis**

The validity and reliability of the final version of the Indonesian language were assessed through the participation of 152 patients by using SPSS program version 16.0 for windows. The normality of the data was calculated using the Kolmogorov-Smirnov test ( $n > 50$ ). The correlation of the data was calculated using the Spearman test (because the data was abnormal,  $p < 0.05$ ). The validity of the questionnaire was determined by evaluating the inter-item correlation of questions and correlating the total score of the HFSPS questionnaire with the physical domain and total score of the MLHF questionnaire. The reliability of the questionnaire was determined by calculating the internal consistency using Cronbach's  $\alpha$ .

### **Ethical Approval**

This study is a part of the analytic observational study of a multivariate variable that had been approved by the Ethics Committee of Health Research No. 1780-KEPK, Faculty of Nursing, Universitas Airlangga 2019.

## BI. RESULTS

The sample of this study consisted of 81 men and 71 women with a mean age of 58.03±10.2 years. The sociodemographic and clinical characteristics of the sample are presented in Table 1. Most of the samples were single (44.1%), educated to elementary school (34.2%), unemployed (54.6%), NYHA class II (53.9%), and less than 1 year diagnosed (52%).

Table 1. Demographic and clinical characteristics (N=152)

Characteristics	M ± SD or n (%)
Gender	
Male	81 (53.3)
Female	71 (46.7)
Marital status	
Single	67 (44.1)
Married	58 (38.2)
Widow/Widower	27 (17.8)
Education	
Not educated	21 (13.8)
Elementary school	52 (34.2)
Junior high school	31 (20.4)
Senior high school	34 (22.4)
Higher education	14 (9.2)
Job status	
Employed	69 (45.4)
Unemployed	83 (54.6)
NYHA class	
Class I	29 (19.1)
Class II	82 (53.9)
Class III	37 (24.3)
Class IV	4 (2.6)
Age (years)	58.03±10.2
Time since diagnosed (years)	
< 1	79 (52.0)
1 – 5	56 (36.8)
> 5	17 (11.2)

\*NYHA class, New York Heart Association classification

Table 2. Result of validity and reliability studies

Questions	Corrected-Item Total Correlation	Cronbach's $\alpha$ if Item Deleted	Cronbach's $\alpha$ (Total Items)
Q1	0.408	0.803	0.813
Q2	0.571	0.792	
Q3	0.395	0.804	
Q4	0.304	0.810	
Q5	0.165	0.819	
Q6	0.314	0.808	
Q7	0.584	0.792	
Q8	0.380	0.805	
Q9	0.540	0.794	
Q10	0.333	0.808	
Q11	0.167	0.815	
Q12	0.555	0.793	

Questions	Corrected-Item Total Correlation	Cronbach's $\alpha$ if Item Deleted	Cronbach's $\alpha$ (Total Items)
Q13	0.447	0.802	
Q14	0.408	0.803	
Q15	0.166	0.816	
Q16	0.330	0.808	
Q17	0.672	0.787	
Q18	0.365	0.806	

Table 3. Correlation of the Indonesian version of the Heart Failure Somatic Perception Scale Questionnaire and the Minnesota Living with Heart Failure Questionnaire

HFSPS Questionnaire	Physical Domain of the MLHF Questionnaire	Total Score of the MLHF Questionnaire
Total item of HFSPS	0.614'	0.635'

Note: 'significant,  $p < 0.05$

### Validity Test

Table 2 shows that all the items in the HFSPS questionnaire are valid. This was indicated by the corrected-item total correlation value that was greater than  $r$  table. The value of  $r$  table with  $df (N-2)$  150,  $p < 0.05$  (2-tailed) was 0.159. Further analysis showed that the Indonesian version of the HFSPS questionnaire had a positive correlation with both the physical domain and total score of MLHF questionnaire in the Indonesian version ( $r = 0.614$  and  $0.635$ , respectively) (Table 3). It demonstrated that the domain in HFSPS had a strong correlation with the domain in MLHF. The higher the score of HFSPS, the higher the score of MLHF (it means, the lower the quality of life).

### Reliability Study

The result of the reliability study showed that the internal consistency of each item and total item questionnaire was good as shown by the value of Cronbach's  $\alpha$  of each item ranging from 0.787 to 0.819 and 0.813 for the total item (Table 2).

## IV. DISCUSSION

The aim of this study was to obtain a valid and reliable Indonesian version of the Heart Failure Somatic Perception Scale (HFSPS) so that it can be used in Indonesia. Our analysis confirmed that the Indonesian version of HFSPS was a valid and reliable instrument for evaluating perceived symptoms of patients with heart failure in the Indonesian population. These results are consistent with another study that evaluated the questionnaire's psychometric [5], [6]. However, to the best of our knowledge, this is the first study in the Indonesian HF population using the Indonesian version.

Demographic and clinical characteristics data show similarity with the previous study that most of the patients who suffer from HF were male. Men have a higher incidence of HF, but the overall prevalence rate is similar in both sexes since women survive longer after the onset of HF [12], [13]. Most of the participants in this study were single with a duration of diagnosis of less than 1 year. It means the incidence of HF was getting higher and sliding not only in the elderly population.

The results show that all item questions in this questionnaire were valid with  $r$  value greater than  $r$  table for  $df$  150. In addition, the study has demonstrated that HFSPS has a positive correlation with MLHF and this correlation is strong. It is consistent with previous studies that show physical symptoms had a correlation with the quality of life in patients with HF [14]–[16]. In the nature of the disease, the improvement of HF physical symptoms demonstrates a compensation phase of patients to the disease. While worse physical symptoms show a decompensated phase [17], [18], [19].

The reliability result shows that this instrument is good with the total item of internal consistency 0.813. This is similar to a previous study that demonstrated Cronbach's  $\alpha \geq 0.75$  in the European population [5]. Since the Indonesian version was valid and reliable, this instrument could be used in outpatient clinics or inpatient wards to quickly assess clinical symptoms of patients with HF. Improvement in HF symptoms was associated with improvement in health-related quality of life (HRQOL) over 12 months [10]. Improvement in short and long-term HRQOL may be important for reducing hospitalization and mortality rates [20], [21]. Thus, the assessment of HF symptoms regularly is pivotal.

Our study has several limitations. First, our study does not conduct a re-test to calculate the inter-class correlation for the reliability test because of the limitation of time. Second, this study uses a limitation of the statistical test. However, our study has provided a novel translation instrument and initial psychometric evaluation of the Indonesian version of HFSPS that can be used for further research.

## V. CONCLUSION

The Indonesian version of HFSPS has good validity and reliability to assess the physical symptoms of patients with chronic heart failure in Indonesia. This instrument can be used in outpatient clinics or inpatient wards to assess clinical symptoms of patients with HF for predicting morbidity and mortality.

## CONFLICT OF INTEREST

No conflicts of interest have been declared.

## ACKNOWLEDGMENT

This study was funded by RKAT Universitas Airlangga.

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