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Abstract

A short health complaints measure may provide information on the degree of recovery from acute myocardial infarction. The present study therefore evaluated a questionnaire – called the Somatic Health Complaints Questionnaire (SHCQ) – that includes 13 items concerning health problems common in cardiac patients. The sample included 114 patients in total, 37 women and 77 men, who had suffered a first-time myocardial infarction five months prior to the testing. Confirmatory factor analysis was performed to examine whether the factor structure replicated the hypothesized hierarchical model. The results indicated that SHCQ represents four dimensions; breathlessness, fatigue, pain and unrest. It was also found that SHCQ may be treated as one general concept. It is a brief and easily administered questionnaire and may therefore be a useful tool in secondary prevention work, identifying patients at risk for possible negative consequences of a first-time myocardial infarction.

Key Words: myocardial infarction, psychometric evaluation, somatic health complaints
Introduction

Coronary heart disease is the leading cause of death and morbidity in industrialized countries. However, heart disease rates have fallen in most countries in the Western world during the past decades [1]. The decline in coronary mortality, coronary events and case fatality rates can partly be associated with changes in lifestyle, e.g., fewer smokers [2], and improvements in acute coronary care [1]. Besides efforts to reduce deaths due to heart disease, life consequences are also of great importance. Both men and women have an overall negatively affected health-related quality of life (HRQL) after acute myocardial infarction [3]. One study found poorer perceived HRQL in the younger age group (<59 years) [4]. Other studies have shown that women report significantly poorer physical condition and mental health than do men [5,6].

Many current HRQL instruments may be worthwhile measurements in the post acute treatment of myocardial infarction patients [7]. However, they may be too time-consuming to complete in daily clinical assessment of disease-related consequences. A short health complaints measure, although subjective in nature, may provide easily obtained information on the degree of recovery from acute myocardial infarction. The Somatic Health Complaints Questionnaire (SHCQ) includes 13 items concerning somatic health problems common in cardiac patients. Questions have been partly developed based on clinical experiences and partly modified from Rose, Blackburn, Gillum and Prineas [8]. These questions have previously been used as separate items at Sahlgrenska University Hospital, Sweden [e.g., 9]. In one myocardial infarction study a summary score of SHCQ was used. The SHCQ summary score was negatively correlated ($r = -0.65$) [10] with the physical dimension of HRQL in SF-36 [11], showing that somatic health complaints are related to physical HRQL. Therefore, the
present study examined whether using the questionnaire as a summary score, but also as a measure of dimensions of somatic health complaints, is warranted.

The hypothesis in the present study was that the 13-item SHCQ is able to represent four different dimensions – breathlessness, fatigue, pain and unrest – with an underlying general factor of somatic health complaints. The purpose was to examine the internal structure of the SHCQ by performing confirmatory factor analysis to assess the dimensionality of the scale using a hierarchical approach.

**Methodology**

*Participants*

Participants in this study developed a first-time acute myocardial infarction and were admitted to the coronary care unit at a Swedish rural hospital, during the period October 1998 – September 1999. During their first week in hospital, the patients were asked to participate in a study on life consequences following myocardial infarction. The present study investigates cross-sectional data from the five-month follow-up of 114 patients in total, 37 women and 77 men (response rate 83%). Table 1 shows the demographic characteristics of the participants.

*Measure*

**The Somatic Health Complaints Questionnaire (SHCQ)**

The questionnaire addresses 13 health problems common in cardiac patients: chest pain, chest pain that limits daily activity, shortness of breath, shortness of breath during exertion, sweating, dizziness, headache, stomach trouble, lack of energy, heart palpitations, tiredness, weakness, and sleep disturbance. The participants were asked to report how often these symptoms had occurred during the past week. Each question was answered using a six-point
Likert scale, ranging from never (1) to always (6) (Table 2). In a study of myocardial infarction patients, the SHCQ was summarized into a total score with a Cronbach’s alpha of 0.83 [10].

Analysis

Confirmatory factor analysis was performed, using LISREL [12] within the STREAMS environment [13], to examine the extent to which the factor structure replicated the hierarchical model hypothesized a priori. The model of fit was tested with the $\chi^2$ goodness-of-fit and the Root Mean Square Error of Approximation (RMSEA). A value of RMSEA $\leq 0.05$ would indicate a close fit of the model and a value of $\leq 0.08$ would indicate a reasonable fit [14].

Findings

A four-factor model indicated that SHCQ fitted the data reasonably well, $\chi^2 (59, N = 114) = 89.83 \,(p < 0.01)$ and RMSEA = 0.062. Each of the 13 items was an indicator of one of the four factors. The model was built up with one latent variable for each of the four subscales, and with covariance between the four latent variables. The standardized factor loadings showed that all the variables were positively and significantly related to each of the four factors. The intercorrelations for the four factors are presented, see Figure 1. The intercorrelations among the dimensions indicated an underlying commonality representing the same construct.

In the next step, a hierarchical model was specified (Figure 2). This structure was tested with the purpose of investigating whether a summary score of SHCQ would reflect one broad dimension. The analysis confirmed the significance of the hypothesized structure, $\chi^2 (61, N =$
The fit of this model – with one general factor related to the four factors, of which each represents one of the four dimensions – was as good as that of the four-factor model, $\Delta\chi^2 (2, N=114)=3.53$. This result showed that the hypothesized general factor was sufficient to account for most of the intercorrelations among the four factors. Thus, the result confirmed that underlying the four dimensions is one broad dimension representing a summary of health complaints. The factor loadings on the general SHCQ factor were: fatigue = 0.76, pain = 0.63, breathlessness = 0.69, unrest = 0.72.

**Discussion**

The present result showed that SHCQ represents four dimensions: breathlessness, fatigue, pain and unrest. It was also found that SHCQ measures one general concept. Thus, the hierarchical structure test supported the legitimacy of summing the 13 items into scores for each of the four dimensions and into a total score, providing a summary of somatic health complaints.

The main purpose of the present study was to investigate the internal structure of the SHCQ in a sample of first-time myocardial infarction patients. This is the first examination of the SHCQ treated as a four-dimensional scale with an underlying general factor. Given that we do not have a concise picture of the properties of the questionnaire, it seemed appropriate to initiate the present validation process of SHCQ. Previous evaluation efforts have only been made on single items and in studies with different populations. From a clinical point of view, each of the single items in SHCQ seems appropriate in assessment of different health problems in a group of myocardial infarction patients. In order to investigate the possibility of using SHCQ as a predictive measure in a sample of myocardial infarction patients, we needed to test its psychometric properties. Further systematic psychometric examinations of the
questionnaire in a longer perspective may give opportunities for screening patients at risk for negative consequences following first-time myocardial infarction.

The SHCQ has been shown to correlate with measures of HRQL [10]. Pedersen and Denollet validated a Belgian Health Complaint Scale (HCS) in a Danish sample. They found that somatic and cognitive health complaints were unrelated to severity of cardiac disease, but reflected subjective perception of quality of life [15]. In the present study, we wished to evaluate a questionnaire on somatic factors (SHCQ) in myocardial infarction patients, as anxiety and depression scales, e.g. the Hospital Anxiety and Depression Scale (HADS) [16], have already been developed. The HADS has been validated in coronary heart disease patient groups [17,18]. Actually, an important question for further research is how fatigue (a dimension in SHCQ) is associated with depression. According to the Diagnostic and Statistical Manual of Mental Disorders (DSM-IV), fatigue is one of several possible criteria for depression [19]. Wojciechowski argued that fatigue and depression may be different expressions of the same post-myocardial infarction phenomenon [20]. However, it was found that fatigue is sometimes experienced by myocardial infarction patients without coexisting depression [21], and in such differentiating measure, a somatic health questionnaire such as SHCQ could be useful. It may also be useful to separate fatigue from vital exhaustion, an independent risk factor for coronary heart disease. In line with McGowan et al., future studies should investigate fatigue instead of vital exhaustion as a risk factor for poor prognosis in myocardial infarction patients [21].

The present validation of SHCQ indicates that the scale is a useful tool in a sample of first-time myocardial infarction patients, and it seems meaningful to further evaluate the scale in larger samples and in other groups of coronary heart disease patients. From a clinical nursing
perspective, the possibility to assess underlying dimensions and to obtain a summary of a
general somatic health complaints factor may be useful in further care of coronary heart
disease patients. For example, assessment of fatigue in the recovery phase may identify
patients at risk for developing further negative consequences of myocardial infarction, and
secondary prevention strategies can be directed to support this specific health problem.
Patients experiencing fatigue may need special information and advice in managing daily life
activities [22]. Patients struggling with breathlessness as well as pain and unrest may also
need individually designed nursing support. One issue for health care professionals is to
strengthen self-care strategies in myocardial infarction patients in order to maintain medical
treatment results and optimize HRQL after the acute heart attack. Assessment of a summary
SHCQ score may be a helpful tool in identifying patients at risk for developing decreased
HRQL and in monitoring patients with an increased need for nursing support.

In conclusion, the validity of the SHCQ was confirmed in a sample of first-time myocardial
infarction patients five months after the acute heart attack. SHCQ is a brief and easily
administered questionnaire that assesses somatic, cardiac-specific health problems. It could
probably serve as a predictive tool for indicating impaired physical functioning and mental
well-being – which needs further investigation.
References


Table 1. Demographic and other characteristics (N = 114).

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender (% female)</td>
<td>32.5</td>
</tr>
<tr>
<td>Age (m ± SD)</td>
<td>67.6 ± 10.1</td>
</tr>
<tr>
<td>Married/living together (%)</td>
<td>71.7</td>
</tr>
<tr>
<td>Education ≤ 9 years (%)</td>
<td>70.2</td>
</tr>
<tr>
<td>History</td>
<td></td>
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<tr>
<td>Hypertension (%)</td>
<td>35.5</td>
</tr>
<tr>
<td>Angina Pectoris (%)</td>
<td>27.4</td>
</tr>
<tr>
<td>Congestive heart failure (%)</td>
<td>3.5</td>
</tr>
<tr>
<td>Diabetes mellitus (%)</td>
<td>15.0</td>
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<tr>
<td>Acute treatment</td>
<td></td>
</tr>
<tr>
<td>Intravenous β-blocker (%)</td>
<td>85.0</td>
</tr>
<tr>
<td>Thrombolysis (%)</td>
<td>42.5</td>
</tr>
<tr>
<td>Revascularisation (%)</td>
<td>13.1</td>
</tr>
</tbody>
</table>
Table 2. SOMATIC HEALTH COMPLAINS QUESTIONNAIRE (SHCQ)

<table>
<thead>
<tr>
<th>Description</th>
<th>Never</th>
<th>Once</th>
<th>Sometimes</th>
<th>Several times</th>
<th>Mostly</th>
<th>Always</th>
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</thead>
<tbody>
<tr>
<td>1. Chest pain</td>
<td></td>
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<td>2. Chest pain that limits daily activity</td>
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<tr>
<td>3. Shortness of breath</td>
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<td>4. Shortness of breath during exertion</td>
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<tr>
<td>5. Heart palpitations</td>
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<tr>
<td>6. Tiredness</td>
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<tr>
<td>7. Weakness</td>
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<td>8. Lack of energy</td>
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<tr>
<td>9. Headache</td>
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<td>10. Dizziness</td>
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<tr>
<td>11. Stomach trouble</td>
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<tr>
<td>12. Perspiration</td>
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<tr>
<td>13. Sleep disturbance</td>
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</tbody>
</table>
Caption

Figure 1. The four-factor model of the Somatic Health Complaints Questionnaire (SHCQ) including standardized factor loadings and correlations between the factors.

Figure 2. The hierarchical model of the Somatic Health Complaints Questionnaire (SHCQ) including standardized factor loadings.