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Assessing self-care behaviour of heart failure patients: cross-cultural adaptation of two heart failure self-care instruments

Key Messages

1. The Chinese version of the Self-care of Heart Failure Index (SCHFI) and the European Heart Failure Self-Care Behaviour Scale (EHFScBS) are culturally sensitive and conceptually relevant to measure self-care of Chinese heart failure patients.
2. The reliability and validity of the Chinese version of the SCHFI and EHFScBS are sufficient to support their use in clinical and research contexts.
3. The internal structure of the Chinese version of the SCHFI differs from that of its original version. Further examination is recommended.

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Introduction

Heart failure is a chronic disabling cardiac condition characterised by ineffective myocardial pumping. It is one of the top five conditions for hospital admission among the elderly, with a recurrent admission rate of 10%.[1] Successful management of heart failure not only relies on an advanced pharmacotherapy, but also requires effective self-care behaviour from patients. International clinical guidelines of heart failure highlight the importance for health care service to enhance the patients' self-care behaviour. Yet, a better understanding of self-care behaviour of heart failure patients and a more stringent outcome evaluation of the health care services are hampered by a lack of instrument that can fit into the linguistic and cultural background of Chinese people for measuring heart failure–related self-care behaviour.

The Self-Care of Heart Failure Index (SCHFI)[2] and the European Heart Failure Self-Care Behaviour Scale (EHFScBS)[3] are conceptually and psychometrically sound self-care measures. The SCHFI covers various aspects: (1) self-care maintenance (including symptom monitoring and treatment adherence), (2) self-care management (referring to an active, deliberate decision-making process involved in managing the symptoms of heart failure), and (3) self-care self-confidence (referring to patients' confidence in performing self-care). The EHFScBS focuses more on assessing the self-care behaviour (including dietary modification, weight monitoring, medication, exercise and prompt seeking of medical help), which affects the health of heart failure patients. The strengths of the SCHFI and the EHFScBS appear to be complementary. The former provides precise information about area of deficiency in self-care; the latter is a brief and practical measure that focuses on the self-care behaviour. The variations in the focus of these instruments also allow health care professionals to choose the one which can better suit the purpose and the health care setting for assessing self-care of heart failure patients.

The aim of this study was to translate and adapt the SCHFI and the EHFScBS for use in the Chinese population with heart failure in Hong Kong, and to evaluate their psychometric properties and administrative and respondent burden of these Chinese versions.

Methods

Subjects and settings

This study was conducted from October 2006 to September 2007. For performing cross-cultural adaptation of the SCHFI and EHFScBS, a purposive sample of 19 Chinese heart failure patients, aged 18 years or older, was recruited for focus-group interviews. Two focus groups (n=13) were recruited from a subacute hospital and one was from a community-based heart failure programme. The mean age of the subjects was 80.7 (standard deviation [SD], 5.1) years, and 68.4% were female. They had been diagnosed with heart failure for 2 to 11 years. Another convenience sample of 143 heart failure patients, who met the same selection criteria, was recruited from the outpatient clinic for conducting psychometric

evaluation. Table 1 shows the sample characteristics.

Main study instruments

The 18-item SCHFI and the 12-item EHFScBS were translated into Chinese by Brislin's method. The SCHFI measures self-care maintenance, self-care management and self-care self-confidence on a four-point Likert scale. The EHFScBS measures self-care behaviour on a five-point Likert scale. The ranges of scores for SCHFI and EHFScBS were 0 to 300 and 12 to 60, respectively. Higher scores represent better self-care in the SCHFI; the reverse was true for the EHFScBS. The Medical Outcomes Study Social Support Survey (MOS-SSS-C) and the Hospital Anxiety and Depression Scale (HADS), which respectively measure perceived social support and psychological distress, were used to establish the construct validity of the two self-care instruments. Theoretical justifications exist to indicate patients with better social support, and lower psychological distress exhibits better self-care.

Results

Equivalence in translation

Twenty health professionals rated translation equivalence of the Chinese versions of the SCHFI and EHFScBS on a four-point Likert scale in the ascending 'appropriateness of translation'. More than 80% of the health professionals assessed all the SCHFI and EHFScBS items as appropriately translated. The panel suggested more easily understood terminologies for translating 'ankle oedema' and 'flu shot' in both instruments. Changes were made accordingly.

Cross-cultural adaptation

An expert panel, which comprised four cardiologists and four cardiac nurses, rated most of the items of Chinese versions of the SCHFI and EHFScBS as culturally relevant and contextually appropriate for measuring self-care. Three main concerns about contextual difference in managing heart failure were raised: (1) access to health care service, (2) the prescription of flexible diuretic regimen, and (3) weight control of heart failure patients. Changes were made accordingly to some related items.

Three focus-group interviews were conducted to examine the conceptual equivalence of the SCHFI and EHFScBS from the perspectives of patients. Information about their self-care maintenance, symptom experience and recognition, response to symptoms as well as self-confidence in performing self-care were elicited. The findings indicated that the SCHFI and EHFScBS were relevant to Chinese heart failure patients in terms of content and concept. Changes recommended by the expert panel were supported by the interviewing data.

Psychometric evaluation
Content validity

Based on a four-point ascending Likert scale for 'relevance', another panel of experts in cardiology (n=4) and Chinese

Table 1. Demographic, clinical, self-care and psychosocial characteristics of the sample

Parameter	Mean±SD / No. (%)
Age (years)	78.1±14.5
Male	54 (37.8)
Marital status	
Single	13 (9.1)
Married	62 (43.4)
Widowed	67 (46.9)
Divorced	1 (0.7)
Educational level	
No formal education	78 (54.5)
Primary school	34 (23.8)
Secondary school	19 (13.3)
Above secondary school	12 (8.4)
Living condition	
Alone	34 (23.8)
Couple only	33 (23.1)
With family	69 (48.3)
With friends	9 (6.3)
Years of diagnosed heart failure	4.2±3.4
Aetiology of heart failure	
Ischaemic heart disease	40 (28)
Hypertension	65 (45.5)
Dilated cardiomyopathy	11 (7.7)
Valvular heart disease	10 (7)
New York Heart Association grading	
I	9 (6.3)
II	62 (43.4)
III	70 (49)
IV	2 (1.4)
Medications	
Diuretics	86 (60.1)
Angiotensin-converting enzyme inhibitor	78 (54.5)
Anti-anginal	77 (53.8)
Antiplatelet	63 (44.1)
Beta-blocker	52 (36.4)
Digoxin	41 (28.7)
Angiotensin II receptor blockers	17 (11.9)
Anti-coagulant	16 (11.2)
Self-Care Heart Failure Index	
Total score	84.80±40.80
Self-care maintenance subscale	27.39±17.61
Self-care management subscale	31.47±16.25
Self-care self-confidence subscale	25.95±17.48
European Heart Failure Self-care Behavioural Scale	28.62±4.19
Hospital Anxiety and Depression Scale	
Anxiety subscale	3.16±3.26
Depression subscale	6.14±3.89
Medical Outcomes Study Social Support Survey	46.19±20.33

heart failure patients (n=2) rated the Chinese versions of SCHFI and EHFScBS as content valid, with content validity indices of 0.89 and 0.93, respectively.

Reliability

The internal consistencies of the Chinese versions of the SCHFI and EHFScBS were high, with Cronbach's alphas of 0.73 and 0.82, respectively. All except items 6 and 11 in the SCHFI and item 7 in the EHFScBS had corrected item-to-total/subscale correlations above the criterion level of 0.30. Nevertheless, deletion of any item did not increase Cronbach's alpha by >0.1, indicating that all of them were homogeneous for measuring the overall constructs and/or subsconstructs.

Construct validity

Both the Chinese versions of the SCHFI and EHFScBS demonstrated significant moderate relationships with the MOS-SSS-C (Table 2). Yet, there was no or only a slight relationship between the two self-care instruments and the anxiety and depression subscales of the HADS.

Table 2. Construct validity of the Self-Care of Heart Failure Index (SCHFI) and the European Heart Failure Self-Care Behaviour Scale (EHFScBS)

Self-care instruments	Medical Outcomes Study Social Support Survey (Chinese version)	Hospital Anxiety and Depression Scale	
		Anxiety subscale	Depression subscale
SCHFI			
Overall scale	0.45[*]	-0.03[†]	-0.24[*]
Self-maintenance subscale	0.38[*]	-0.11[†]	-0.33[*]
Self-management subscale	0.39[*]	-0.13[†]	-0.01[†]
Self-care self-confidence subscale	0.48[*]	-0.09[†]	-0.22[*]
EHFScBS	0.36[*]	-0.03[†]	-0.03[†]

[*] P<0.001
[†] Not significant

As confirmatory factor analysis requires all items to be responded on the same type of scale, the analysis was performed using data from 86 subjects who did not report a '0' score on item 7 (how quickly to recognise the symptom) of the Chinese version of SCHFI. All items except items 6 and 10 loaded strongly and significantly on the proposed factor of the three-factor structure, with factor loading of >0.30 and a t-value of >2.00.[4] However, the overall model was only supported by $\chi^2/df=1.57$, with the other fit indices lower than the criterion level to suggest a data-model fit (normed fit index=0.60, non-normed fit index=0.59, comparative fit index=0.64). As the data-model fit did not improve with minimum post hoc modification, exploratory factor analysis was conducted. A Scree plot indicated that three factors should be extracted. Factor solution was then obtained by using principal axis factoring with Varimax rotation method. By using a factor loading cut-off of 0.30[4] to interpret the data, item 6 (get a flu shot every year) was loaded on the self-care management subscale, but not the originally proposed self-care maintenance subscale. Item 11 (you're your doctor or nurse for guidance) was also not loaded on any factors. The other items followed the original internal structure.

Administrative and respondent burden

The Chinese versions of the SCHFI and EHFScBS were administered by registered nurses. They were provided with 3 hours of training on the item meaning and techniques of administering the questionnaire to older respondents. They did not report difficulty in collecting data with the self-care instruments. The mean time for administering the SCHFI and EHFScBS were about 5 to 8 minutes and 4 to 6 minutes, respectively. As both of these questionnaires were administered in face-to-face interviews, there was no missing data.

Discussion

The results indicate that the Chinese versions of the SCHFI and EHFScBS are culturally sensitive and conceptually and psychometrically sound instruments to measure self-care in Chinese heart failure patients. Their reliability and validity are sufficient to support their use in clinical and research contexts. The low administrative and respondent burden also heightens their value in clinical and research contexts.

Three aspects of the psychometric properties of the two self-care instruments warranted attention. Factor analysis did not support the original three-factor structure of the SCHFI. Items 6 (get a flu shot every year) and 11 (call your doctor or nurse for guidance) may account for the data-model misfit. Indeed, the results converged with the low item-to-subscale correlations of these two items. Instead of measuring self-care maintenance, item 6 was found to load on the self-care management subscale. This may be related to the fact that this item does not refer to a day-to-day non-pharmacological action for maintaining health, in contrast to the other items in the original subscale. Findings from the focus-group interviews indicated that it is always a doctor's decision to give a flu shot to the heart failure patients. It is likely that patients conceive it as a treatment for heart failure based on the doctor's assessment of their condition, and thus conceptualise it as an action in self-care management. As for item 11, the absence of significant loading to any of the subscales may reflect that Chinese patients regard seeking medical help as a kind of self-care behaviour, which differs from that directed at controlling symptoms. Further studies are needed to confirm the internal structure of the Chinese version of SCHFI.

Although the EHFScBS demonstrated good internal consistency, item 7 (take a rest during the day) had a low item-to-total correlation. The lesser specificity of this item as compared to others in describing the self-care for heart failure may explain its lesser homogeneity with other items. This is especially true, as the sample was in the elderly, where taking a daytime nap or rest was a common habit irrespective of health status. Nevertheless, as rest during the day is an important self-care to cope with fatigue and activity intolerance in heart failure, item deletion was not considered.

Both the SCHFI and EHFScBS demonstrated a low correlation with the HADS. Although these findings warrant further investigation for construct validity of the self-care instruments, the low correlation may be related to the fact that most subjects were defined as not having anxiety (91.6%) and depression (68.5). Hence, the magnitude of the relationship was reduced by the restricted range of HADS scores. Nevertheless, further testing of the validity of both self-care instruments is warranted.

Conclusion

The Chinese version of the SCHFI and EHFScBS are culturally and conceptually relevant for measuring self-care of Chinese heart failure patients in Hong Kong. There

was also evidence of adequate psychometric properties of the SCHFI and EHFScBS to warrant recommending these instruments for measuring self-care of such patients. This study also suggested a modified internal structure for the SCHFI (Chinese version) that requires confirmation by future studies.

Acknowledgement

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