

## **A Cross-Cultural Translation and Adaptation of the Arabic Cardiac Self-Efficacy Questionnaire for Patients with Coronary Heart Disease**

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**Aim:** This study aimed to cross-culturally translate and adapt the Cardiac Self-Efficacy Questionnaire into Arabic and subsequently evaluate the psychometric properties of that translation in a population of Arabic patients. **Method:** The original English version of the Cardiac Self-Efficacy Questionnaire was translated into Arabic following a process recommended by the World Health Organization. A convenience sample consisting of 268 Jordanian patients with coronary heart disease were recruited from a university-affiliated hospital in Amman, Jordan. Data were collected from August, 2018 until January, 2019. The factor structure, face and content validities, and internal consistency of the Arabic Cardiac Self-Efficacy Questionnaire were evaluated. **Results:** The factor structure analysis supported a three-factor high-order structure of the Arabic Cardiac Self-Efficacy Questionnaire. Face validity showed that the language used, style and format were clear. The content validity demonstrated a very good content validity index. The reliability was good with ranging from 0.89 to 0.93 for all questionnaire subscales. **Conclusion:** The Arabic Cardiac Self-Efficacy Questionnaire is a valid and reliable instrument to assess the Cardiac Self-Efficacy of Arabic patients diagnosed with coronary heart disease. Further assessment of the psychometric properties of the

Arabic version of the questionnaire with different cardiac problems is now recommended.

## **SUMMARY STATEMENT**

### **What is already known about this topic?**

- Globally cardiovascular diseases are the leading cause of death and increasing progressively. Particularly, in the Middle Eastern countries.
- High self-efficacy level is associated with the adoption of a healthy lifestyle of patients with coronary heart disease.
- There is no valid and reliable Arabic tool to measure cardiac self-efficacy among patients with coronary heart disease.

### **What this paper adds:**

- The Arabic version of the cardiac self-efficacy questionnaire is valid and reliable instrument to assess cardiac self-efficacy level among patients with coronary heart disease.
- Using Modern Standard Arabic (Fusha) during the translation and cross-cultural adaptation process makes the Arabic version of the cardiac self-efficacy

questionnaire more broadly applicable for a range of cardiac patients in Arabic speaking countries.

### **Implications of this paper**

- Health intervention developer can use the translated version of cardiac self-efficacy questionnaire to evaluate cardiac self-efficacy and to improve self-management skills of patients with coronary heart disease in Arabic speaking countries.
- Measuring the self-efficacy levels of Arabic speaking people using the Arabic CSEQ, can facilitate secondary prevention intervention measures and developing cardiac rehabilitation program in Arabic speaking countries.
- The Arabic version of the cardiac self-efficacy questionnaire can be used in further research in future, through implementing comparisons between studies outcomes, in countries where there are Arabic-speaking people.

**Keywords:** Cardiac self-efficacy, Coronary heart disease, Cross-cultural translation, psychometric property.

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## **INTRODUCTION**

Self-efficacy is a psychological construct based on Bandura's social cognitive theory (Bandura, 1997). Self-efficacy is an individual's belief in his or her ability to perform a given task (Bandura, 1997). Patient's self-efficacy levels are strongly associated with the adoption of a healthy lifestyle for Coronary Heart Disease (CHD) making it an important factor given that CHD is largely preventable (Köhler, Tingström, Jaarsma, & Nilsson, 2018; Salari et al., 2016). Several studies report disease specific self-efficacy as an important variable associated with positive lifestyle change in patients with chronic diseases such as Cardiovascular Disease (CVD); self-efficacy is associated with health related quality of life (Banik, Schwarzer, Knoll, Czekierda, & Luszczynska, 2018), improvements in physical activity behaviour, dietary choices (Bergström, Börjesson, & Schmidt, 2015; Sharp & Salyer, 2012) and smoking abstinence (Berndt et al., 2013). Moreover, people with low levels of self-efficacy are less likely to adopt a healthy lifestyle (Sol, van der Graaf, van Petersen, & Visseren, 2011) and suffer adverse health outcomes such as readmission, poor mental and physical health (O'Neil, Berk, Davis, & Stafford, 2013). Cardiac self-efficacy has been used as useful tool to cardiac events (O'Neil et al., 2013) among patients with CHD. In addition, Fors and his colleges (2015) have found that cardiac self-efficacy is a useful tool to promote person-centred care in clinical practice.

CVDs are the leading cause of death worldwide (WHO, 2015); almost 30% of all deaths worldwide were caused by CVD in 2015. In the Middle East there is an especially high prevalence of CVD (Gehani et al., 2014) and associated cardiovascular risk factors (Afshin et al., 2015). Coronary risk factors are likely to increase unless people adopt a healthy lifestyle to reduce (Crouch, Wilson, & Newbury, 2011; Saleh et al., 2015). An understanding of self-efficacy levels and interventions which can increase this construct to support healthy lifestyle change in people diagnosed, or at risk of developing CHD, have the potential to play an important role in prevention and the reduction of CVD rates in the Middle East population.

The cardiac self-efficacy questionnaire (CSEQ) is a disease specific self-efficacy instrument developed by Sullivan, LaCroix, Russo, and Katon (1998) for use in patients with CHD undergoing cardiac catheterisation. The scale measures cardiac patients' self-reported self-efficacy to make lifestyle change and manage medications in daily life situations. Whilst the CSEQ has previously been culturally adapted and translated into Swedish (Fors, Ulin, et al., 2015), Thai (Saengsiri, Thanasilp, & Preechawong, 2013), Korean (Kang & Yang, 2013) and Chinese (Zhang et al., 2018). This is the first time; the questionnaire has been adapted to meet the needs of Arabic speaking patients. Therefore, the aim of this study was to translate and cross culturally adapt the CSEQ into Arabic to make it accessible to Middle Eastern populations and evaluate the psychometric properties of the Arabic version of the CSEQ.

## **Method**

This paper describes the process of translating and cross culturally adapting the questionnaire from its original English version into Arabic following a process of six steps recommended by the World Health Organization (WHO). The WHO guidelines provide a clear, comprehensive and systematic process for establishing cross-cultural adaptation of an instrument, figure 1. Moreover, the WHO process of translation and cross-cultural adaptation of instruments is a well-established method and has been refined in the course of several WHO studies. The translation and cross-cultural adaptation of the CSEQ achieved through precise stages of professional translation, an expert panel review and pre-testing of CSEQ and piloting (WHO, 2014).

In addition, the researcher used Wild et al. (2005) guidelines and standards for the translation and cultural adaptation as framework for describing each step in the translation process: 1. Preparation; 2. Forward translation; 3. Reconciliation; 4. Back translation; 5. Back translation review; 6. Harmonization; 7. Cognitive debriefing; 8. Review of cognitive debriefing results and finalization; 9. Proofreading; and 10. Final report. Subsequent evaluation of the psychometric properties of the Arabic version of CSEQ was implemented.

**Please insert figure 1 here.**

### **Translation and Cross-Cultural Adaptation of the CSEQ**

The WHO process used for cross-cultural adaptation of the CSEQ consists of six steps:

### **Step One: Forward Translation:**

After obtaining a permission from the author of CSEQ. Two Jordanian translators implemented a detailed review and translation of the CSEQ. The first translator was a native Arabic speaker: a nurse familiar with self-efficacy and the care of patients with CHD. The second translator was a professional translator with no medical background. Both translators had some knowledge of English-speaking culture, and spoke fluent English, and their mother tongue was Arabic. The translators were instructed to use natural, simple, clear and acceptable language for a target sample in Jordan. The two translators compared the two Arabic translations; and create an initial Consensual Arabic Version (CAV) 1. This approach would strengthen the conceptual equivalence of the forward translation, avoid any ambiguity, and avoid any misunderstandings, figure 2.

During the translation stage, the translators used Modern Standard Arabic (Fusha), which is a clear, concise and acceptable language for the broadest audience and considered as most widely used dialect in the translation of instruments into Arabic (Khalaila, 2013). The translators sought a conceptual equivalent of each English phrase, rather than conducting a verbatim translation, and took into consideration the definitions of the original items, questions or sentences, in order to translate them into the most relevant form. In addition, jargon, colloquialisms and idioms were avoided. Finally, they considered issues of gender applicability so; the produced translation is applicable for both male and female.



### **Step Two: Expert Panel – Review of the forward translation:**

An expert panel was convened, which consisted of an additional three individuals: a health professional and two translators. All panel members were bilingual, figure 2. The panel's aim was to review the translated version of the questionnaire and identify any unclear expressions, ambiguous concepts or discrepancies and to compare the forward translation with the original CSEQ. Any inappropriate items were rejected and alternative words suggested. Subsequently, the expert panel edit CAV1, then; a consensus of the Arabic version of the CSEQ was met and made CAV 2.

### **Step Three: Back Translation into English:**

Back translation then was undertaken which involved translating the Arabic version of the CSEQ back into its original language (English), as a means of comparing the two versions (Wild et al., 2005). Two independent bilingual translators back translated the Arabic translation into English. The two bilingual translators, who were not involved in the forward translation stage, grew up in an Arabic-speaking country (Jordan) and completed graduate level studies in the US and UK. None of the translators had any prior knowledge or experience of the original version of the questionnaire. As in the forward translation process, the back translation process focused on conceptual and cultural notions, rather than absolute linguistic equivalence. Each translator made back translation of CAV 2 to create English back translation version 1 (EV1) and English back translation version 2 (EV2). Then, the two English versions were compared to create Consensual English back translation Version (CBV), figure 2.

It is important to note that there may be some variations in the wording, as not all English words easily translate into other languages. For example, in the phrase “somewhat confident”, the word “somewhat” does not translate easily into Arabic. The underlying concept of “somewhat” is “fairly”, therefore an Arabic translation should reflect this concept rather than search for a literal translation. The response alternative “Non applicable” was removed, as, after explaining at the beginning of the questionnaire that participants should select the most appropriate or closest answer, all items were considered applicable. In addition, the issue of gender in Arabic had to be considered during translation. Hence, words and verbs were chosen to fit both genders. This involved a considerable number of changes to many items in order to capture the original concepts. Consequently, simple and standard Arabic words were used to make the CSEQ clear and understandable as presented in Table 1.

**Please insert table 1 here**

#### **Step Four: Pre testing the CSEQ and the implementation of piloting:**

The expert panel overseen the consensual English back translation version and the original CSEQ, creating final English CSEQ version, following that, the expert panel compared final English CSEQ version and CAV 2, in resulting generate consensual Arabic version CAV 3, figure 2. After reaching CAV 3 of the CSEQ; the CAV 3 of the CSEQ was administered to a sample (n=10) of Jordanian patients diagnosed with CHD in a hospital setting. The language used in the CAV 3 of the CSEQ was suitable for a 12-year-old child to comprehend, thus making it easily comprehensible for the study participants (Beaton, Bombardier, Guillemin, & Ferraz, 2000).

A pilot study, conducted by the researcher, was utilised to understand how respondents process and respond to CSEQ items. All participants signed Informed consent before joining in the study. Each participant who completed the CSEQ was interviewed in order to gain their feedback and ensure that all questionnaire items were understandable and included all the expected concepts. The interviewers asked the ten respondents the meaning of each item in the CSEQ; and whether they perceived any problems with the written language, format, or scoring scale. Participants' feedback were documented in separate sheet.

The piloting processes involved respondents completing the translated CSEQ and being asked for feedback on their understanding of individual questions; for example, what they thought the question was asking or what came to mind when they heard a particular phrase or term. They were asked to repeat the question in their own words, given associated response options, and verbalise the process they had followed when producing their answers. The participants were asked these questions for each item. If alternative words or expressions existed for an item, the respondent was asked to select the alternative that best represented their usual language. The researcher reviewed any comments made by the respondents and made any necessary revisions. Pre-testing was repeated until the respondents' comments had been minimised. At the end of the pilot process, a final Arabic version of CSEQ was produced for future psychometric evaluation.

#### **Step Five: Final version of the CSEQ:**

The final Arabic version of the CSEQ was agreed.

## **Step Six: Documentation**

The project team developed a final version of the Arabic CSEQ and the review process of the CSEQ translation has been reported above. All the steps of translation and adaptation were successfully completed and documented. A final version of Arabic CSEQ is available.

## **Psychometric properties evaluation**

When original CSEQ is translated into other languages, the validity and reliability of the items used in the original CSEQ do not always remain intact; therefore, it was necessary to determine psychometric properties such as validity and reliability for the translated CSEQ version. The psychometric properties evaluation included face and content validity, analysis of factor structure and the internal consistency of the Arabic version of CSEQ.

## **Instrument**

The original CSEQ consists of 16 items divided into two sections: control symptoms (8 items), maintain function (5 items) with an additional three items related to a healthy lifestyle (obesity, smoking and dietary habits), in which patients were asked to rate how confident they are they know on a five-point Likert scale: 0=not at all, 1=somewhat confident, 2=moderately confident, 3=very confident, 4=completely confident.

The original CSEQ has been shown to be both a valid and reliable measurement tool in patients diagnosed with CHD (Sullivan et al., 1998). The internal consistency, as assessed by Cronbach's alpha, was found to be 0.90 for control symptoms subscale and 0.87 for maintenance function subscale (Sullivan et al., 1998).

## **Setting**

Jordan is a small Arab country located in the Middle East. The total population of Jordan is 9.79 million (Department of Statistics in Jordan, 2013). Arabic is the dominant spoken language throughout the Middle East and North Africa. CVDs are the leading cause of premature death among both men and women; they account for 35% of mortalities every year in Jordan (WHO, 2014). Furthermore, CHD is the main cause of death, representing 16.8% of total deaths (WHO, 2014).

The study was conducted in Jordan University Hospital (JUH) in Amman, Jordan. JUH been established since 1971 and affiliated with Jordan University. With over 500 beds, it is one of the most specialized and advanced medical hospital in Amman. JUH patients are referral from the Ministry of Health, employees of Jordan University and their dependents (Ministry of Health in Jordan, 2014). Before this process was undertaken, permission to use and adapt the questionnaire was obtained from the author of the CSEQ. In addition, ethical approval was granted by Institutional review Board in JUH.

## **Participants and data collection**

A convenience sample of 268 patients, diagnosed with CHD were recruited to participate in the psychometric testing. Data collection procedure lasted six months, from August, 2018 until January, 2019. Patients were eligible to be included in the study if they had a confirmed diagnosis of CHD, based on a positive Electrocardiograph (ECG) or angiographic evidence of disease. Additional criteria included, being hemodynamically stable, a native Arabic speaker, over 18 years of age and possession of good literacy skills. Patients with severe comorbidity, cognitive impairment or drug

were excluded. The participants were provided with a patient information sheet prior to consenting to participate in the study. The researcher recruited 268 participants, of which thirty participants were randomly selected for face validity testing. All patients were recruited from a cardiology ward.

The participants were invited to participate in the CSEQ translation process and consented to participate in the study. The questionnaire was distributed and collected on a cardiology ward once patients were haemodynamically stable. The participants completed the CSEQ independently.

### **Ethical consideration**

Before beginning the data collection procedure, an ethical approval were obtained from JUH. In addition, a permission to use was granted from the CSEQ author. The researchers considered carefully the confidentiality, privacy and anonymity of the data during the data collection procedure. All participants were volunteered and had the right to withdrew from the study at any time and without giving any reasons. The data were kept in password-protected computer. The investigation conforms with the principles outlined in the Declaration of Helsinki (Declaration of Helsinki, 1964).

### **Data analysis**

The researchers used SPSS version 24.0 to analyse the collected data. The skewness and kurtosis were used to determine the normality of CSEQ. Descriptive statistics, such as mean and standard deviation (SD), were used to describe the participants' characteristics. In addition, internal consistency and factor structure of the Arabic version of the CSEQ was implemented.

## **RESULTS**

Before receiving the completed questionnaires, we checked that all questionnaires from the respondents had been completed; consequently, there was no missing data. Completion of the CSEQ took approximately 10-15 minutes.

### **Participants' characteristics**

Following the process outlined by the WHO, for the translation and adaptation of instruments. A total sample of 268 participants, diagnosed with CHD, were recruited from the JUH in Amman, Jordan. The sample included 166 males (61.8 %) and 102 females (38.1 %). The mean age of the respondents was 57 years of age and ranged from 38 to 82 years of age. The age of respondents was normally distributed. There was no difference in age according to gender (Males  $X=56.10$  Females= $57.55$ ). Over 60% of the sample were married and more than half (63%) were in employment. Overall, there was a good spread across demographic characteristics. There was no significant difference in age according to gender, Table 2. Mean scores of CSEQ ranged from 1.88 – 2.32 and represent a central tendency from somewhat confident towards moderate confidence. There were no issues of skewness and kurtosis across the 16 items.

**Please insert Table 2 here**

### **Validity:**

The researcher decided to test the face validity of the Arabic version of the questionnaire with 30 patients (Beaton et al., 2000). Each patient completing the questionnaire; was asked for their understanding of the meaning of each item in CSEQ

questionnaire, problems with the questionnaire format and alternative response scale. Difficulties or suggestive comments were discussed, documented and included in the final report.

The researchers wrote detailed comments, including suggested alternatives to the Arabic CSEQ version which were then forwarded to the expert panel. The participants expressed their satisfaction with the transparency of the CSEQ and the ease of its completion. The researcher asked participants whether they had any comments or suggestions that could make the questionnaire more comprehensible. More than two third of participants (21 participants) expressed their satisfaction and no improvements were suggested. Five participants suggested modifying the alternating scoring system and add numbers for each choice. Two participants suggested changing the colour to separate each section and make the questions in bold font and two participants suggested to changes the initial words in questions number 8 and 13. All comments were considered and required amendments were conducted.

The content validity of the Arabic versions of the CSEQ was evaluated by an expert panel from the faculty of nursing at the Applied Science Private University, Amman, Jordan. The experts rated each item to calculate CVI according to the four-point rating score 1= not relevant, 2= somewhat relevant, 3= quite relevant, 4= highly relevant. The CVI was calculated based on the number of experts that rated the item's relevance at either three or four on the scale. The Scale-level Content Validity Index (S-CVI), is accepted if  $CVI > 0.80$  (Polit & Beck, 2014). The CVI for the Arabic CSEQ version was found to be 1.0 which shows a very good level of content validity (Polit & Beck, 2014).



### **Exploratory factor analysis**

Examination of the correlation matrix shows three issues of collinearity as indicated by a correlation score above 0.8. All relationships were positive and the majority were low to moderate strength indicating diversity in measurement, Table 3.

The 16-items were tested using maximum likelihood extraction and with a varimax rotation in order to provide as clear a factor structure as possible. A three-factor model emerged from the analysis, Table 4. This represented 70% of the total variance. Factor 1 – control of symptoms represented 40% (eigenvalue 6.445) and factor loading ranged from 0.627 - .846. Factor 2 – Maintaining functioning - represented 17% of the total variance and had an eigenvalue of 2.651; factor 3 – behaviour change, represented 13% of the total variance and had an eigenvalue of 2.139.

**Please insert table 3**

**Please insert table 4**

The reliability of the three individual subscales of the CSEQ ranged from 0.89 to 0.93. For the first subscale, which focuses on controlling symptoms (8 items), the reliability was 0.89. For the second subscale, which considers the maintenance function (5 items), the score was found to be 0.92 and for the third subscale, which comprises three items related to a healthy lifestyle, the score was calculated as 0.93 (Table 5). The Cronbach's alpha score for the Arabic version of the CSEQ was 0.90. Mean scores of constructs show that participants were most confident in looking after their symptoms relating to cardiac care and least confident about lifestyle.

**Please insert table here Table 5**

## DISCUSSION

The global burden of CVDs is increasing year on year (Fuster, 2014), and secondary prevention strategies that encourage the adoption of healthy lifestyles are highly recommended to reduce this risk (WHO, 2015). According to Bandura's self-efficacy theory, patients with higher self-efficacy levels have a great capability of adopting such lifestyles (Bandura, 1997) which in turn highlights the importance of measuring and attempting to increase levels of self-efficacy as part of secondary prevention strategies (Katch, 2010; Sol et al., 2011). However, there has not been, until now, a valid and reliable instrument that is capable of measuring self-efficacy in Middle Eastern populations. The CSEQ is a disease specific self-efficacy questionnaire that measures self-efficacy among cardiac patients but this tool has not been available in Arabic. In order to address this need we have successfully translated and cross-culturally adapted the original version of the CSEQ into Arabic. This process was undertaken in line with the WHO process of instrument translation and cultural adaptation and Wild et al. (2005) guidelines and standards for the translation and cultural adaptation as paper framework.

Contextual meaning is closely linked to language. Without the careful translation of items, participants may have misunderstood their correct meaning. In addition, the social and cultural differences between Western and Arabic countries are also a cause for concern, particularly reflected in discussions around sexual relationships in the original CSEQ, a topic that is not normally discussed in Arabic-speaking countries. Therefore, the WHO process of translation and cultural adaptation of instruments was crucial to ensure accurate conceptual understanding of items

All items in the CSEQ were accurately translated and culturally adapted into Arabic. During implementation of piloting, the acceptability of the Arabic version of the CSEQ was excellent, with no items considered confusing and no questions considered disturbing. There were no particular problems in the questionnaire translation process.

Face validity testing showed that the appearance of the CSEQ, the writing style, format and language of items were all clear. The content validity revealed that there was good content relevance of the CSEQ (CVI =1.0). The internal consistency of the translated version is an excellent (0.90). In addition, the three CSEQ subscales have close internal consistency with each other. The psychometric properties of the Arabic CSEQ demonstrates that it is a valid and reliable instrument.

The reliability was high for all the CSEQ's subscales in this study, with reliability ranging from 0.89 to 0.93, demonstrating an excellent stability for the CSEQ over time. These results are similar to findings in studies completed in other languages under similar circumstances (Fors, Ulin, Cliffordson, Ekman, & Brink, 2014; Kang & Yang, 2013; Saengsiri et al., 2013; Zhang et al., 2018), including the original study (Sullivan et al., 1998).

As has been stated above, measuring self-efficacy and addressing low levels of self-efficacy is a key to the promotion of self-management practices. We believe that the translation and cross-cultural adaptation of the CSEQ into Arabic now allows this practice to occur in Middle Eastern populations.

CVD risk factors are markedly increased in Middle Eastern countries (Afshin et al., 2015). Improving self-efficacy has many beneficial outcomes and is essential to healthy

lifestyle changes for cardiac patients (Fors, Ekman, et al., 2015; Köhler et al., 2018; Salari et al., 2016). Therefore, the need for an Arabic CSEQ to address the gap in knowledge related to self-efficacy in Arabic patients is highly warranted. In addition, measurements of Arabic CSEQ will help nurses to support cardiac patients to reduce coronary risk and adopt healthier lifestyles, which in turn will hopefully decrease the burden of CVD in Middle Eastern countries. Moreover, using Modern Standard Arabic (Fusha) in the current study during the translation and cross-cultural adaptation process will make the CSEQ more broadly applicable for a range of cardiac patients in Middle Eastern countries.

### **Limitations of the Study:**

The Arabic CSEQ was administered solely, to people diagnosed with CHD, thus these findings cannot yet be generalized to other cardiac populations such as those with heart failure and arrhythmias. Therefore, we recommend that the Arabic version of the CSEQ should be tested in patients from a wider cardiac population.

### **CONCLUSION**

The CSEQ was successfully translated and cross-culturally adapted into Arabic using the WHO process of translation and cultural adaptation and Wild et al. (2005) as paper framework. The Arabic version of the CSEQ was found to possess good levels of face and content validity, internal consistency and reliability. We therefore suggest that the Arabic version of the CSEQ be introduced into clinical practice as a means of measuring self-efficacy in Arabic speaking patients to evaluate cardiac self-efficacy and

to improve self-management skills of patients with CHD in Arabic speaking countries. In addition, measuring the self-efficacy levels using the Arabic version of CSEQ, can facilitate secondary prevention intervention measures and developing cardiac rehabilitation program in the Middle Eastern countries. Further, using of the Arabic version of the cardiac self-efficacy questionnaire can be very helpful in future research, through implementing comparisons between studies outcomes in the Middle Eastern countries.

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**Table 1: Comparison of the original English items and back translated ones:**

Item No	Original English Items	From Arabic back to English
<b>Subscale 1</b>	How confident are you that you know or can	How are you confident that you know:
<b>1</b>	Control your chest pain by changing your activity levels	Control of chest pain by changing your activity levels.
<b>2</b>	Control your breathlessness by changing your activity levels	Control of your difficult breathing by changing your physical activity.
<b>3</b>	Control your chest pain by taking your medications	Control your chest pain by using own medications.
<b>4</b>	Control your breathlessness by taking your medications	Control of difficulty breathing by having own medicine.
<b>5</b>	When you should call or visit your doctor about your heart disease	When you are calling or visiting your doctor about heart disease.
<b>6</b>	How to make your doctor understand your concerns about your heart	How to make your doctor understand your fears about your heart disease.
<b>7</b>	How to take your cardiac medications	How to take your heart medications.
<b>8</b>	How much physical activity is good for your health	How much of physical activity improves your health.



Subscale d	How much confident to	How much you are confident to
9	Maintain your usual social activities	Maintain your usual social activities.
10	Maintain your usual activities at home with your family	Maintain your usual activities with your family at home.
11	Maintain your usual activities at work	Maintain your usual activities at work.
12	Maintain your sexual relationship with your spouse	Maintain your sexual relationship with your spouse.
13	Get regular aerobic exercise (work up a sweat and increase your heart rate)	Get regular exercises (working until sweating and increasing heart rate)
subscale c	How much is good for you to do :	How much is good for yourself to do:
14	Lose weight (if you are overweight)	Reduce your weight (if you are obese)
15	Stop smoking (if you do smoke)	Stop smoking (if you are a smoker)
16	Change your diet (if your doctor recommended this)	Changing your diet (if your doctor recommended that)
Alternative score		
1	Not at all confident	Not confident
2	Somewhat confident	Confident fairly
3	Moderately confident	Moderately confident
4	Very confident	High confident

5	Completely confident	Confident completely
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**Table (2): Demographic and characteristics of patients diagnosed with CHD.**

	<b>Characteristics</b>	<b>Frequency</b>	<b>Mean</b>
<b>1</b>	<b>Sex</b>		
	Male	166	61.8%
	Female	102	38.1%
<b>2</b>	<b>Education level</b>		
	Higher diploma or less	145	54.1%
	Bachelor degree	103	38.4%
	Postgraduate degree	20	7.5%
<b>3</b>	<b>Marital status</b>		
	Single/Widowed	55	20.5%
	Married	161	60.1%
	Divorced	52	19.4%
<b>4</b>	<b>Employment</b>		
	Employed	77	28.7%
	Unemployed	33	12.3%
	Retired	66	24.6%
	Self-employed	92	34.3%

**Table 3. Correlation matrix of 16-items of Cardiac Self-efficacy Scale**

	CSE1	CSE2	CSE3	CSE4	CSE5	CSE6	CSE7	CSE8	CSE9	CSE10	CSE11	CSE12	CSE13	CSE14	CSE15	CSE16
										0	1	2	3	4	5	
CSE1	1															
CSE2	.84	1														
CSE3	.41	.49	1													
CSE4	.42	.55	.72	1												
CSE5	.41	.47	.49	.42	1											
CSE6	.55	.65	.51	.57	.79	1										
CSE7	.50	.51	.35	.44	.40	.53	1									
CSE8	.43	.47	.41	.49	.38	.54	.77	1								
CSE9	.34	.40	.55	.39	.25	.31	.27	.27	1							
CSE10	.32	.39	.35	.32	.17	.25	.19	.17	.77	1						
CSE11	.52	.46	.22	.21	.17	.28	.30	.25	.58	.69	1					
CSE12	.47	.53	.20	.24	.16	.27	.24	.21	.62	.75	.89	1				
CSE13	.28	.32	.48	.34	.20	.24	.19	.24	.79	.74	.62	.66	1			
CSE14	.14	.11	.17	.09	.09	.08	.08	.09	.21	.16	.23	.19	.28	1		
CSE15	.20	.14	.21	.11	.14	.10	.12	.13	.22	.19	.24	.20	.29	.75	1	
CSE16	.15	.09	.18	.06	.10	.10	.09	.09	.19	.15	.21	.15	.24	.94	.74	1

**Table 4. Factor Structure of Cardiac Self-efficacy Scale**

	<b>Cardiac Self-efficacy Questionnaire items</b>	<b>1</b>	<b>2</b>	<b>3</b>
CSE1	Control your chest pain by changing your activity levels	.627		
CSE2	Control your breathlessness by changing your activity levels	.710		
CSE3	Control your chest pain by taking your medications	.643		
CSE4	Control your breathlessness by taking your medications	.685		
CSE5	When you should call or visit your doctor about your heart disease	.731		
CSE6	How to make your doctor understand your concerns about your heart	.846		
CSE7	How to take your cardiac medications	.642		
CSE8	How much physical activity is good for you	.648		
CSE9	Maintain your usual social activities		.649	
CSE10	Maintain your usual activities at home with your Family		.789	
CSE11	Maintain your usual activities at work		.877	
CSE12	Maintain your sexual relationship with your Spouse		.938	
CSE13	Get regular aerobic exercise (work up a sweat and increase your heart rate)		.693	
CSE14	Lose weight (if you are overweight)			.959
CSE15	Stop smoking (if you do smoke)			.753

CSE16	Changing your diet (if your doctor recommended that).	.964
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**Table 5: CSEQ subscales reliability.**

<b>CSEQ Subscales</b>	<b>Range</b>	<b>Cronbach's alpha</b>	<b>Mean</b>	<b>SD</b>	<b>Skewness</b>	<b>Kurtosis</b>	<b>Alpha</b>
<b>Subscale 1: control symptoms part (8 items)</b>	0-32	0.89	2.13	.58	-.17	-.16	.89
<b>Subscale 2: maintain function part (5 items)</b>	0-20	0.92	2.00	.70	.33	-.31	.92
<b>Subscale 3: healthy lifestyle part (3 items)</b>	0-12	0.93	1.92	.72	.25	-.65	.93

## **Figure legends**

Figure 1: The WHO process of cross-cultural adaptation of the CSEQ

Figure 2: Translation and cultural adaptation process of the Cardiac Self-Efficacy Questionnaire.



Figure 2: Translation and cultural adaptation process of the Cardiac Self-Efficacy Questionnaire.

