



Translation and validation of the Cardiac Depression Scale to Arabic



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ABSTRACT

Background: The Cardiac Depression Scale (CDS) has been designed to measure depressive symptoms in patients with heart disease. There is no Arabic version of the CDS. We translated and validated the CDS in an Arabic sample of patients with heart disease.

Methods: Forward and back translation of the CDS was followed by assessment of cultural relevance and content validity. The Arabic version of the CDS (A-CDS) and the Arabic version of the Hospital Anxiety and Depression Scale (A-HADS) were then administered to 260 Arab in-patients with heart disease from 18 Arabic countries. Construct validity was assessed using exploratory factor analysis with polychoric correlations. Internal consistency was assessed using ordinal reliability alpha and item-to-factor polychoric correlations. Concurrent validity was assessed using Pearson's correlation coefficient between the A-CDS and the depression subscale of the A-HADS (A-HADS-D).

Results: Cultural relevance and content validity of the A-CDS were satisfactory. Exploratory factor analysis revealed three robust factors, without cross-loadings, that formed a single dimension. Internal consistency was high (ordinal reliability alpha for the total scale and the three factors were .94, .91, .86, and .87, respectively; item-to-factor correlations ranged from .77 to .91). Concurrent validity was high ($r = .72$). The A-CDS demonstrated a closer to normal distribution of scores than the A-HADS-D.

Limitations: Sensitivity and specificity of the A-CDS were not objectively assessed.

Conclusions: The A-CDS appears to be a valid and reliable instrument to measure depressive symptoms in a representative sample of Arab in-patients with heart disease.

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1. Introduction

Depression is a leading cause of disability worldwide, afflicting more than 350 million people of all ages (WHO, 2012). Its prevalence ranges from 6.6% to 21% across countries (Kessler and Bromet, 2013), rising to 18.3% in Qatar (Bener et al., 2015). Nearly 20% of patients with heart disease suffer from depression (Carney and Freedland, 2008; Elderon and Whooley, 2013; Thombs et al., 2006), while depression following myocardial infarction is associated with 2.25- to 2.38-fold risk of all-cause mortality and 2.59- to 2.71-fold risk of cardiac mortality (Meijer et al., 2011; van Melle et al., 2004). In patients with heart failure, depression is associated with 51% increased risk of all-cause mortality and 119%

increased risk of cardiac mortality (Fan et al., 2014). Based on the consistency of evidence relating depression to adverse outcomes after acute coronary syndrome, the American Heart Association has elevated depression to the status of a risk factor for poor prognosis in patients with acute coronary syndrome (Lichtman et al., 2014).

Given the impact of depression on the prognosis of patients with heart disease, it is not surprising that screening for depressive symptoms in patients with coronary heart disease has also been recommended (Lichtman et al., 2008). Several psychometric scales have been used for this purpose, including the Beck Depression Inventory II (BDI-II) (Beck et al., 1996), the Hospital Anxiety and Depression Scale (HADS) (Zigmond and Snaith, 1983), the Hamilton Rating Scale for Depression (HAM-D) (Hamilton, 1960), and the Centre for Epidemiologic Studies Depression Scale (CES-D) (Radloff, 1977). These scales are validated and exhibit satisfactory internal consistency [$\alpha = 0.80$ – 0.90 for BDI-II (Beck et al., 1996), $\alpha = 0.67$ – 0.90 for the depression subscale of HADS (Bjelland et al., 2002), $\alpha = 0.77$ – 0.81 for HAM-D (Trajkovic et al., 2011), and $\alpha = 0.85$ – 0.90

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for CES-D (Radloff, 1977)]. However, none of these scales were developed specifically for patients with heart disease and therefore, their psychometric properties may not apply to this patient group. Moreover, they may not be comprehensive enough to detect depression in patients with heart disease. The HADS, for example, lacks items related to somatic symptoms of depression, such as fatigue and sleep disturbance. Furthermore, they may not be sensitive enough to detect minor depression, which is clinically significant (Bush et al., 2001; Catipovic-Veselica et al., 2007; Lossnitzer et al., 2013). The BDI-II, for example, has a positively skewed distribution of scores which results in low scores clustering and poor differentiation (Di Benedetto et al., 2006). It is clear that generic scales have significant limitations in assessing depression and depressive symptoms in patients with heart disease (Vieweg et al., 2011).

The Cardiac Depression Scale (CDS) (Hare and Davis, 1996) is the only psychometric scale designed to measure depressive symptoms in patients with heart disease. It was validated in Australian outpatients of a cardiology clinic comprising a wide range of diagnosis including angina, heart failure, post-myocardial infarction, post-surgery, valve disease and arrhythmias. The CDS consists of 26 items scored on a seven-point Likert scale ranging from *strongly disagree* (1) to *strongly agree* (7) and it exhibited satisfactory correlations with clinical assessment ($r = .67$) and the BDI ($r = .73$), as well as satisfactory internal reliability ($\alpha = .90$) (Hare and Davis, 1996). It also demonstrated a normal distribution of scores compared to the strongly positively skewed distribution of the BDI (Hare and Davis, 1996), which enables CDS to differentiate low scores and therefore be sensitive enough to detect minor depression. These results have been replicated in other English-speaking samples (Birks et al., 2004; Kiropoulos et al., 2012; Ski et al., 2012; Wise et al., 2006).

The CDS has been translated and validated in German (Hare et al., 2000), Chinese (Wang et al., 2008), and Iranian (Gholizadeh et al., 2010) patients with heart disease. There is no Arabic version of the CDS; therefore, the purpose of this study was to develop an Arabic translation of the CDS and validate it in Arab patients with heart disease.

2. Methods

This study was conducted in two phases:

1. Translation of the original version of the CDS to Arabic ensuring cultural relevance and content validity.
2. Evaluation of construct validity, internal consistency, and concurrent validity of the Arabic version of the CDS (A-CDS).

2.1. Translation of the Cardiac Depression Scale to Arabic

Forward translation (English to Arabic) was conducted by two bilingual Arab experts (psychiatrist and cardiac rehabilitation specialist with Master degree). After translating the scale separately, they met and agreed on the final translation of each item. Back translation (Arabic to English) was conducted by a certified translation services company. Subsequently, the principal investigator (T.P.), the two bilingual Arab experts and two Arab representatives from the translation services company met and finalized each item of the A-CDS. There was unanimous agreement on conceptual equivalence in every item.

2.2. Cultural relevance and content validity

The cultural relevance and the content validity of the A-CDS were evaluated by a panel of six bilingual Arab clinicians (three

psychiatrists, one consultant cardiologist, one physiatrist, and one nurse specialized in quality improvement). They were asked to rate the cultural relevance and the content validity of each item by using a 4-point Likert scale: 1 = not relevant, 2 = somewhat relevant, 3 = quite relevant, and 4 = highly relevant. The scale content validity index (S-CVI) was calculated as the proportion of items that achieved a rating of 3 or 4 by all clinicians. An S-CVI score of 80% or higher is indicative of satisfactory content validity (Davis, 1992).

2.3. Evaluation of construct validity, internal consistency, and concurrent validity

2.3.1. Instruments

2.3.1.1. Cardiac Depression Scale. The CDS is a self-administered depression scale for use in patients with heart disease. It consists of 26 items scored on a seven-point Likert scale ranging from *strongly disagree* (1) to *strongly agree* (7). In the original study (Hare and Davis, 1996), seven factors have been reported to comprise the scale: Sleep, anhedonia, uncertainty, mood, cognition, hopelessness, and inactivity. These factors formed two dimensions in a second-order factor analysis. The scale exhibited satisfactory internal consistency ($\alpha = .90$) and correlated with the BDI and clinical assessment ($r = .73$ and $r = .67$, respectively).

2.3.1.2. Hospital Anxiety and Depression Scale. The HADS is a self-administered depression scale developed in a hospital medical outpatient clinic (Zigmond and Snaith, 1983). It consists of 14 items scored on a four-point Likert scale (0–3) that are evenly divided into an anxiety subscale and a depression subscale. The scale comprises two factors (anxiety and depression) and it exhibits satisfactory internal consistency ($\alpha = .86$ for the total scale, $\alpha = .77$ for the anxiety subscale, and $\alpha = .82$ for the depression subscale) (Zigmond and Snaith, 1983). An Arabic version of the HADS has been developed (el-Rufaie and Absood, 1987; el-Rufaie and Absood, 1995) with satisfactory correlation with clinical evaluation ($r = .82$) and internal consistency ($\alpha = .88$).

2.3.2. Procedure

A subject to item ratio of 10:1 was used to estimate the sample size, as it is often used in the absence of clear scientifically sound recommendations on this topic (Anthoine et al., 2014). A convenience sample of 260 adult (18 years and above) patients admitted to the Heart Hospital, a tertiary care hospital for patients with heart disease in Doha and member of Hamad Medical Corporation, were recruited from June 2014 to February 2015 based on data collectors availability (see patient flow in Fig. 1). Inclusion criteria were the following: (a) having a diagnosis of heart disease, (b) not suffering from a major psychiatric disease, including schizophrenia, bipolar disorder, and dementia (this was confirmed by reviewing the medical records and asking the participant and family members), (c) being a national of a country where Arabic is an official language, and (d) having Arabic as mother tongue and preferred mode of oral and written communication. The study was approved by the ethics committee of Hamad Medical Corporation. Nurses specialized in cardiac rehabilitation explained the study to eligible participants, provided a sheet with study's details, answered any questions, and obtained verbal consent from participants. Participants were given an envelope with the A-CDS and the Arabic version of the HADS (A-HADS) (el-Rufaie and Absood, 1987, 1995) and were left alone to complete them and seal the envelope. The sealed envelopes were collected later within the day by the same nurse who provided them. Demographic and clinical data were obtained from medical records. All administering personnel were blinded to outcomes and interpretation.

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