

Validation of the Arabic Center for Epidemiological Studies Depression (CES-D) Scale in a Lebanese Community Sample

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Abstract. The factor structure of the 20-items Arabic Center for Epidemiological Studies Depression scale (Arabic CES-D) and its relationship to theoretically grounded psychosocial and sociodemographic risk factors were examined in a community sample of Lebanese adults ($n = 435$). Two factors, Depressed Affect and Lack of Positive Affect, were empirically derived, correlating $r = .35$ with each other and $r = .96$ and $r = .59$, respectively, with Arabic CES-D global scores. Depressed Affect scores but not Lack of Positive Affect scores were associated with level of education and marital status but not with gender. Also, Depressed Affect scores in the collectivist Lebanese context were more strongly correlated with avoidant attachment scores than anxious attachment scores ($r = .47$ and $r = .24$, respectively; $z = 3.68$, $p < .0001$), whereas Lack of Positive Affect scores were not significantly higher in their correlation with avoidant and anxious attachment scores ($r = .29$ and $r = .18$, respectively; $z = 1.62$, *ns*). In addition, Depressed Affect scores correlated more strongly than Lack of Positive Affect scores with avoidant attachment scores but not with anxious attachment scores. These findings suggest that the Arabic CES-D scale likely taps two distinct aspects of mental health, namely, depression and well-being, such that their correlates need to be identified separately, and that the Lebanese depressed mind is undifferentiated with respect to psychological, somatic, and interpersonal expressions of depression. Finally, we discuss the implications of the findings for the use of the Arabic CES-D in the Arab world and for the universality of the Arab depressed mind.

Keywords: Arabic CES-D, factor structure, social avoidance, social anxiety, positive affect negative affect

Introduction

The Center for Epidemiological Studies Depression Scale (CES-D) is a widely used self-report tool for the preliminary screening of depression in the community (Radloff, 1977) and for clinical settings (Weissman, Sholomskas, Pottenger, Prusoff, & Locke, 1977). It was designed to measure primarily cognitive and affective symptoms of depression (depressed mood and feelings of guilt, worthlessness, hopelessness, and helplessness), although somatic symptoms (psychomotor retardation, loss of appetite, and sleep disturbance) were also included in the scale. The items of the CES-D were taken from existing measures of depression and the four components of the scale (depressive affect, 7 items; lack of positive affect or well-being, 4 items; somatic and retarded activity, 7 items; interpersonal sensitivity, 2 items) were empirically rather than theoretically derived using principal component analysis (PCA) with orthogonal rotation (Radloff, 1977).

The development of the CES-D is informed by an individualist North American lens (the cognitive theory of

Aaron Beck; Beck, 1967), which reflects a construal of a self that is independent, a self that is influenced by a dualistic view of mind-body relations such that negative affect is expressed either in the primary form of psychological complaints or the primary form of somatic complaints, and a self that regulates emotion or internal disturbances to normalize the self into autonomy and self-sufficiency (Cole, Rabin, Smith, & Kaufman, 2004; Kanazawa, White, & Hampson, 2007). The CES-D has been successfully validated against clinical diagnosis and other self-report measures of depression including the Zung Depression Rating Scale and the Beck Depression Inventory (e.g., Fountoulakis et al., 2007).

The CES-D has also now been translated into Arabic and used in a group of diabetic patients in Southern Iraq (Mansour & Jabir, 2007), in a group of females from the United Arab Emirates (Ghubash, Daradkeh, Al Naseri, Al Bloushi, & Al Daheri, 2000), and with elderly Moroccan labor migrants living in the Netherlands (Spijkeret et al., 2004). Ghubash et al. (2000) explored the factor structure of their Arabic CES-D using principal component analysis with or-

thogonal rotation and extracted three (affective/somatic, interpersonal problems, and positive affect) rather than the four components originally reported by Radloff (1977). Ghubash et al. (2000) and Spijker et al. (2004) suggested that the Arab depressive mind – unlike the Western depressive mind – is undifferentiated in relation to somatic and negative affect symptoms, and as such their “mixed” (Ghubash et al., 2000) or “intermingled” (Spijker et al., 2004) affective and somatic expressions of depression allow them to somatize their distress. Ghubash et al. (2000) also attributed their Arab female participants’ expressions of interpersonal complaints (feelings that others dislike them and are unfriendly to them) distinct from affective and somatic complaints to oversensitivity or over self-consciousness.

The conclusions drawn from the two studies on the Arabic CES-D can be contested on theoretical and methodological grounds. Both studies were limited: The Ghubash et al. (2000) study focused exclusively on female Arabs from the United Arab Emirates, and the study of Spijker et al. (2004) focused solely on Moroccan elderly migrants. Spijker et al. (2004) also noted that their Moroccan migrant participants had difficulty answering a number of CES-D items, particularly those pertaining to interpersonal problems. Second, Ghubash et al. (2000) assumed the independence of the components of the Arabic CES-D, an assumption that is contested in favor of component interdependence (Cole et al., 2004). Third, the Ghubash et al. (2000) study was not explicit on the use of criteria (e.g., scree test; Cattell, 1966) for the final extraction of their three-factor solution for their Arabic CES-D. As importantly, the empirically derived factor, labeled as interpersonal problem, was a mixture of eight items (the two original interpersonal sensitivity items and six original negative affect items) rather than just the two original interpersonal sensitivity items reported by Radloff (1977) and confirmed by others (Goncalves & Fagulha, 2004; Prescott et al., 1998; Thomas & Brantley, 2004).

In the present study, the CES-D was translated into Arabic, and its validity was examined in the Lebanese context in the form of factor structure, and correlation with theoretically grounded risk factors for depressive symptomatology. The translation of the CES-D into Arabic, using back-translation methodology, was deemed necessary considering the potential difficulties associated with linguistic or dialectical adaptation of Arabic translations from other Arab-speaking regions.

Similarly, an evaluation of the factor structure of the CES-D for cross-cultural equivalence (Butcher, Nazimi, & Exner, 1998) was informed by the theoretical and methodological limitations of the Ghubash et al. study (2000). More specifically, principal factor analysis with oblique rotation was used in a combined community sample of male and female participants to ensure that the assumption of component interdependence is considered, and in order to rule out the gender-specificity of the factor structure reported by Ghubash et al. (2000). Considering that the original components of the CES-D were empirically rather than theoretically derived, and in light of the paucity of research

on the CES-D in the Arab world, we relied on exploratory rather than confirmatory factor analysis to examine the factor structure of the Arabic version of CES-D in the case of Lebanon. In contrast to the individualist North American culture, Lebanese culture is collectivist, and as such Lebanese tend to construe the self as interdependent with unitary beliefs about mind-body relations. They also tend to regulate their emotions or interpersonal disturbances to promote interdependence and group harmony. In the present study, we made the assumptions that Lebanese were likely to differentiate negative affect from positive affect, and that the Lebanese depressed mind was similar to the Arab depressed mind reported by Ghubash et al. (2000) in its lack of differentiation of psychological and somatic expressions of depressive symptoms despite ongoing exposure to and contact with the mind-body duality of Western culture and in light of the prevailing taboo associated with mental illness. Thus, we hypothesized that principal factor analysis of the Arabic CES-D is likely to yield the three empirically derived factors reported by Ghubash et al. (2000).

The validity of the Arabic CES-D was also assessed in the present study by correlating Arabic CES-D scores with risk factors for depressive symptomatology identified by adult attachment theory (Cooper, Shaver, & Collins, 1998; Shaver & Hazan, 1993) and state-level individual status theory (Chen, Subramanian, Acevedo-Garcia, & Kawachi, 2005).

Adult attachment theory postulates a link between insecure attachment and emotion regulation and psychosocial well-being, and it considers adults with the insecure avoidant and anxious attachment styles at risk for depression (Cooper et al., 1998; Shaver & Hazan, 1993). Adults with anxious attachment style tend to worry and fear interpersonal rejection and abandonment, whereas adults with avoidant attachment style tend to feel discomfort with intimacy and interpersonal dependency. In individualist cultures in which the self is construed as independent, adult attachment theory would posit that adults with social anxiety, who tend to seek out interpersonal experiences to cope with distress, are at a higher risk for psychological distress than adults with social avoidance, who tend to regulate their emotions by having less social involvement and engaging in fewer intimate relationships (Cooper et al., 1998; George & West, 1999). While social distancing, withdrawal, and disengagement are likely possibilities for socially avoidant adults in individualist cultures, they are highly unlikely in the collectivist culture such as Lebanon, where interdependent social intercourse is a national preoccupation and an inescapable daily routine (Kazarian, 2005). As such, in the present study, Lebanese adults with social avoidance were expected to show higher correlations with depression scores than their socially anxious counterparts.

Finally, state-level individual status theory postulates a link between depressive symptoms and individual-level disadvantage in the form of political participation, economic autonomy, and employment/income (Chen et al., 2005). More specifically, the theory suggests that adults disposed to gender inequality and economic and educational disad-

vantage are at higher risk for depressive symptoms than those in gender equality and economically and educationally advantaged contexts. In the present study, we expected Lebanese women to report higher depressive symptoms than Lebanese men because Lebanese women are more likely to experience gender inequality. Similarly, we expected single and younger Lebanese adults to report higher depressive symptoms than their married or older counterparts because they tend to be more dependent on family and kin for their economic livelihood. Finally, we expected Lebanese with low education to report higher depressive symptoms than their more educated counterparts because they are less privileged to political participation, economic autonomy and earning advantage.

Method

Participants and Procedure

A total of 435 Lebanese residing at the capital city of Greater Beirut participated in the study. The majority of the participants were female ($n = 224$, 51.7%), and their mean age was 33.8 years ($SD = 12.1$, range = 11 to 80). As to marital status, 48.4% of the group reported being single, 45.8% married, 2.6% separated or divorced, and 3.3% other. With regard to education, 2.6% reported elementary or less education, 29.6% technical or high school education, 14.7% higher education, and 53.3% university level education.

The snowballing method was used in recruiting half of the participants for the study, the other half being randomly recruited from various community settings including schools, banks, and shops. The questionnaire battery included a consent form, a demographic sheet, the Arabic CES-D scale, and the Arabic Experience in Close Relationships-Revised scale (Fraley, Waller, & Brennan, 2000; Hijazi, 2004). The questionnaire battery was distributed to a total of 485 individuals, 435 of whom returned the completed forms. Measures were pilot tested prior to final use and administered in a randomized order to minimize order effects. Smaller numbers of participants completed the social avoidance ($n = 381$) and social anxiety ($n = 394$) scales than those who completed the Arabic CES-D scale ($n = 435$).

Measures

Arabic Center for Epidemiologic Studies Depression Scale (Arabic CES-D)

The Arabic CES-D scale (Radloff, 1977) is a 20-item measure of depressive symptoms. In the present study, depressive symptom ratings from 0 to 3 were used: 0 = rarely or none of the time, < 1 day; 1 = some or little of the time, 1–2 days; 2 = occasionally or a moderate amount of time, 3–4 days; and 3 = most or all of the time, 5–7 days. Thus, higher scores indicate higher levels of depressive symp-

toms. The Arabic CES-D was translated following the backtranslation methodology. The original version of the CES-D was translated into Arabic by a professional translator, and the Arabic version was then translated back into English by another professional translator, independent of the first translator. The two English versions were then compared and differences reconciled.

Arabic Experience in Close Relationships-Revised Scale (Arabic ECR-R)

The 26-item Arabic ECR-R (Fraley et al., 2000), a refinement of the Arabic translation of the 36-item ECR-R (Fraley et al., 2000) by Hijazi (2004), was used to measure social anxiety and social avoidance. Each item requires a 7-point rating that ranges from 1 = *strongly disagree* to 7 = *strongly agree*, with higher avoidant attachment scores indicating higher discomfort with intimacy, dependency, and self-disclosure in social relationships; and higher anxious attachment scores indicating higher worry and fear of interpersonal rejection. The internal consistencies of the anxious attachment style and the avoidant attachment style were $\alpha = .85$ and $\alpha = .83$, respectively, and their intercorrelation was low ($r = .20$). The Arabic ECR-R had been translated by Hijazi (2004) following the backtranslation methodology.

Results

Principal Factors Analysis of Arabic CES-D Scale

The 20 items of the Arabic CES-D were subjected to a principal factor analysis using SPSS Version 16. The Kaiser-Meyer-Olkin (KMO) value of .88 exceeded the recommended KMO value of .6 (Kaiser, 1974) suggesting sampling adequacy. Similarly, Bartlett's Test of Sphericity reached statistical significance ($p < .0001$), supporting the factorability of the correlation matrix.

Principal factors analysis revealed the presence of five factors with eigenvalues exceeding 1 (5.48, 1.71, 1.26, 1.15, and 1.06), and explaining 27.4%, 8.6%, 6.3%, 5.7%, and 5.3% of the variance, respectively. Contrary to expectations, inspection of the screeplot revealed a clear break after the second factor, and use of Cattell's (1966) scree test suggested retention of two rather than four factors for further investigation. Retention of the two factors was further supported by parallel analysis (Horn, 1965) on a random data matrix of 20 variables by 435 respondents and 100 replications. The first five random eigenvalues generated by the parallel analysis were 1.40, 1.33, 1.27, 1.23, and 1.18. As such, only two eigenvalues obtained from the principal factors analysis (5.48 and 1.71) exceeded the corresponding eigenvalues (1.40 and 1.33) randomly generated by parallel analysis.

Table 1. Pattern and structure matrix of Arabic CES-D items ($n = 435$)

Item content	Original scale	Pattern coefficients		Structure coefficients	
		I	II	III	IV
18. Felt sad.	DA	.63	.08	.66	.32
3. Shake off the blues.	DA	.60	.08	.63	.31
11. Sleep.	S	.58	-.02	.58	.21
19. Disliked.	I	.58	-.14	.52	.08
9. Life a failure.	DA	.55	.13	.60	.34
20. Get going.	S	.55	-.02	.54	.19
17. Had crying spells.	DA	.55	-.04	.53	.17
10. Fearful.	DA	.54	-.02	.53	.19
14. Felt lonely.	DA	.54	.03	.55	.24
6. Felt depressed.	DA	.52	.29	.63	.49
15. Unfriendly.	I	.46	-.15	.40	.03
7. Was an effort.	S	.42	.09	.56	.25
1. Bothered by things.	S	.40	.08	.43	.24
13. Talked less.	S	.39	-.01	.39	.14
2. Appetite.	S	.38	.05	.40	.20
5. My mind.	S	.36	.15	.42	.29
12. Happy.	PA	-.02	.74	.26	.73
16. Enjoy.	PA	-.02	.62	.22	.61
8. Hopeful.	PA	.05	.55	.26	.57
4. As good.	PA	.08	.24	.18	.28

Note: DA = Depressed affect, I = Interpersonal sensitivity, PA = Positive affect, S = Somatic complaints.

The two-factor solution explained after extraction a total of 29.5% of the variance, with the first factor contributing 24.0% and factor 2 contributing 5.4%. To aid in the interpretation of these two factors, Oblimin rotation was performed. The pattern matrix and structure matrix of the two-factor solution of Arabic CES-D items are provided in Table 1. As can be seen, the first factor was a merged Depressed Affect factor comprising psychological, somatic, and interpersonal symptomatic items, whereas the second factor was a Lack of Positive Affect factor comprising all four positively worded affective items.

The empirically derived mixed Depressed Affect factor scores correlated $r = .96$ ($p < .0001$) with Arabic CES-D total scores and $r = .35$ ($p < .0001$) with the empirically derived Lack of Positive Affect factor scores whereas Lack of Positive Affect factor scores correlated $r = .59$ ($p < .0001$) with Arabic CES-D total scores.

Reliability of the Arabic CES-D Scale

The internal consistency of the Arabic CES-D scale was high ($n = 435$, $\alpha = .84$) and comparable to the reliabilities of .84 and .85 reported by Radloff (1977), as were the internal consistencies for males and females ($\alpha = .84$ and $\alpha = .86$, respectively). The reliability obtained in the present

study for Lebanese females is comparable to $\alpha = .88$ reported by Ghubash et al. (2000) for their female Arab sample from the United Arab Emirates.

The internal consistencies of the empirically derived Arabic CES-D Depressed Affect and Lack of Positive Affect factors were $\alpha = .86$ and $\alpha = .62$, respectively. Taken together, these findings suggest acceptable reliability for the Arabic CES-D scale and the Depressed Affect factor but not for the Lack of Positive Affect factor.

Arabic CES-D Scale and Attachment Styles

Fisher's z -transformation was used to compare the correlations of Arabic CES-D scores with social avoidant and social anxiety scores. As expected, the magnitude of the correlation between Arabic CES-D total scores and Arabic ECR-R social avoidant scores was significantly higher than that of social anxiety ($r = .49$, $p < .0001$ and $r = .26$, $p < .0001$, respectively; $z = 3.74$, $p < .0001$). Similarly, the magnitude of the correlation between Arabic CES-D Depressed Affect scores and Arabic ECR-R social avoidant scores was significantly higher than that of social anxiety scores ($r = .47$, $p < .0001$ and $r = .24$, $p < .0001$, respectively; $z = 3.68$, $p < .0001$). On the other hand, the magnitude of the Arabic CES-D Lack of Positive Affect scores and Arabic ECR-R social avoidant scores was not significantly higher than that of social anxiety scores ($r = .29$, $p < .0001$ and $r = .18$, $p < .0001$, respectively; $z = 1.62$, ns), and both correlations were lower than those for the Arabic CES-D total scores and the Depressed Affect scores. Finally, Depressed Affect scores in the collectivist Lebanese context correlated more strongly than Lack of Positive Affect scores with avoidant attachment scores ($r = .47$ and $r = .29$, respectively; $z = 2.93$, $p < .002$) but not social anxiety scores ($r = .24$ and $r = .18$, respectively; $z = .87$, ns).

Arabic CES-D and Sociodemographic Risk Factors

As expected, Arabic CES-D total scores correlated negatively with age ($r = -.15$, $p < .002$), as did Arabic CES-D Depressed Affect scores and Lack of Positive Affect scores ($r = -.13$, $p < .006$, and $r = -.13$, $p < .005$, respectively). Nevertheless, the magnitude of the correlations between CES-D scores and age was small.

Contrary to expectations, Lebanese females achieved Arabic CES-D scores comparable to those of males ($t(431) = 1.76$, $p < .08$ for total scale, $t(431) = 1.64$, ns for Depressed Affect factor, and $t(431) = 1.21$, ns for Lack of Positive Affect factor). Consistent with predictions, Lebanese with less education (high school and less) reported significantly higher Arabic CES-D total scores ($t(428) = 2.61$, $p < .009$) and higher Depressed Affect scores ($t(428) = 2.51$, $p < .05$) but not Lack of Positive Affect scores

Table 2. Means and standard deviation of Arabic CES-D scale ($n = 435$) by gender, education, and marital status

	CES-D Total		CES-D Depressed affect		CES-D Lack of positive affect	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Sex						
Male	17.4	9.5	12.8	8.2	4.6	2.7
Female	19.0	9.8	14.1	8.4	4.9	2.9
Total	18.2	9.7	13.5	8.3	4.8	2.8
Education						
Low	20.0	9.6	15.0	8.4	5.1	3.0
High	17.5	9.6	12.8	8.2	4.6	2.8
Marital Status						
Single	19.8	10.0	14.8	8.5	5.0	2.9
Married	16.5	8.9	12.0	7.8	4.5	2.8

Note: CES-D Scale = Center for Epidemiological Studies-Depression Scale.

($t(428) = 1.50, ns$) than those with more education. Similarly, and consistent with predictions, single Lebanese reported significantly higher CES-D total scores ($t(428) = 3.61, p < .0001$) and Depressed Affect scores ($t(428) = 3.53, p < .0001$) but not Lack of Positive Affect scores ($t(428) = 1.95, ns$) than married Lebanese. Table 2 presents the Arabic CES-D scores in relation to sex, education and marital status.

Discussion

The present study examines the validity of the Arabic translation of the CES-D by evaluating its factor structure and its relationship to theoretically grounded psychosocial and demographic risk factors. We extracted two factors in the present study, a lack of positive affect factor comprising expressions of well-being items and a depressed affect factor comprising a cluster of psychological, somatic and interpersonal expressions of depressive symptoms. The two-factor solution obtained in the present study is inconsistent with the three-component solution reported by Ghubash et al. (2000) for their Arabic CES-D scale. The discrepancy in the present findings and those of Ghubash et al. (2000) may reflect methodological differences in that the present study used principal factor analysis with Oblimin solution, whereas the Ghubash et al. (2000) study used a principal component analysis with Varimax solution. Also, the Ghubash et al. (2000) study focused exclusively on female Arabs from the United Arab Emirates, whereas the present study focused on a community sample of Lebanese males and females. Alternatively, the discrepancy in findings between the two studies may reflect universality in the Arab construction of well-being, on the one hand, because in

both studies a positive affect component was extracted, and culture specificity in the construction of the Arab depressed mind, because the depressed affect components extracted in the two studies were not isomorphic in relation to the clusters of depressive symptoms. Whereas young female Arabs in the United Arab Emirates had both affective and somatic idioms for expressing depressive feelings, Lebanese had affective, somatic, and interpersonal idioms for expressing distress. The finding of a difference in the presentation of depressive symptoms between the Lebanese community sample and the United Arab Emirates participants raises the possibility that the factor structure of the CES-D may lack cultural universality in the context of the Arab world. More Arabic CES-D studies are needed to clarify the specificity or universality of the depressed Arab mind.

The two-factor solution obtained in the present study suggests that the Arabic CES-D may be measuring two distinct aspects of mental health, namely, depression and well-being. Joseph (2006) also raised the possibility that the CES-D scale represents a continuous measure of depression and happiness, and that the two dimensions of mental health the scale taps need to be scored and their correlates identified separately. In the present study, the differential correlations of the positive affect scores and the negative affect scores with the theoretically grounded psychosocial factors and sociodemographic characteristics provide tentative support for the distinctness of the depression and well-being components of the Arabic CES-D and the value of identifying their correlates separately. Negative affect scores (but not positive affect scores) in the present study correlated more strongly with social avoidant than social anxiety scores, and depressed affect scores correlated more strongly with avoidant attachment scores than positive affect scores. These findings are of course correlational, and as such they are limited in terms of their directionality. Similarly, the theoretically grounded sociodemographic factors of education and marital status were not related to positive affect scores, but they were identified as risk factors for depressed affect. The latter findings are consistent with a local epidemiological study on mood disorders (Karam et al., 2006), in which education and marital status were associated with depression prevalence rates. In the present study, gender was not identified as a risk factor for depressed factor, as was reported in the Karam et al. (2006) study. A possible explanation for the lack of a gender difference on depression in our study is the overrepresentation of females with high education (70%).

It should be underscored that the internal consistency of the well-being factor in the present study was below accepted psychometric standards, and one of its items ("I am as good as others") had a factor loading of less than .30. These findings suggest caution in the use of the positive affect factor of the Arabic CES-D as a well-being measure and the need for refinement with a view toward improving its psychometric properties in the Lebanese context. On the other hand, the Depressed Affect factor showed slightly

higher internal consistency than the 20-item Arabic CES-D scale, correlating highly with the Arabic CES-D total score and suggesting that the 16-item depressed affect factor is as reliable and as valid a measure of depressive symptoms as the 20-item Arabic CES-D scale in the Lebanese case.

Finally, the Lebanese sample of the present study was not representative of the Lebanese population, and it was skewed in relation to level of education. The study also relied on principal factor analysis to examine the factor structure of the Arabic CES-D. Future studies would benefit from the use of confirmatory factor analysis to further elucidate the structure of the scale in the Arab world in order to better inform use of the Arabic CES-D for the assessment of well-being in the Arab world and the Arab depressed mind.

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