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Evaluation of the CES-D Scale factor structure in a sample of second-generation Arab-Americans

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Very few studies have examined the psychometric properties of mental health measures for use with the immigrant Arab American population, and fewer still have evaluated measures for use with the second generation. The present study evaluated the reliability and factor structure of the Center for Epidemiologic Studies Depression Scale (CES-D). A total of 119 second-generation Americans of Arab descent completed the instrument on a Website. Cronbach's alpha was high, at .90. Principle components factor analysis yielded a three-factor solution in which emotional and physiological symptoms overlapped in one factor. These results are consistent with many other studies of ethnic minority immigrants, which report that affective and somatic symptoms were not experienced as separate. They are also consistent with research on the somatization of depression among Arabs living in the Middle East. However, the results challenge assumptions that as a result of the acculturation process, children of immigrants will experience depression more similar to the mainstream population rather than immigrants. Additionally, more than 40% of participants reported scores above the cut-off for clinically significant depression. Further research is needed to determine a more accurate cut-off score and identify the causes for the high self-reported depression.

Keywords: depression; Arab American; CES-D; second-generation; ethnic minority; factor analysis

Introduction

In recent years, researchers have documented a risk for depression among Arab Americans, a group defined by their ethnic heritage from the Arabic-speaking nations in North Africa and Middle East. For example, when compared to Chaldeans and African Americans in Southeastern Michigan, Arab Americans reported the highest rate of depressive symptoms, at 23% (Jamil et al., 2008). Similarly, Amer and Hovey (2012) found rates of depression among Arab Americans to be higher compared to other ethnic groups, and nearly 50% of their Arab American respondents met the criteria for clinical caseness for depression. In another study of 350 mostly immigrant Arab and Muslim Americans, an astounding 61% met clinical caseness for depression (Abu-Ras & Abu-Bader, 2009).

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The risk for depression as documented by these scholars can be attributed to several factors. Pressures to assimilate to American culture can be taxing, particularly when there is conflict between traditional values and customs and those of the dominant culture. External pressures may be faced, such as social isolation or being stereotyped. Immigrants may experience additional stressors such as coping with pre-immigration trauma, loss of family networks and learning new skills, such as English language. Several studies have linked these types of traditional acculturative stressors to psychological distress, including depression, for Arab Americans (Abu-Ras & Abu-Bader, 2009; Ahmed, Kia-Keating, & Tsai, 2011; Ajrouch, 2007; Amer & Hovey, 2007; Hassouneh & Kulwicki, 2007; Wrobel, Farrag, & Hymes, 2009). In addition to these acculturation challenges, the events of September 11, 2001, led to a sharp increase in discrimination towards this group (Ibish, 2003) that may have resulted in poorer psychological adjustment and mental health outcomes (e.g. Abu-Ras & Abu-Bader, 2008; Awad, 2010; Moradi & Hasan, 2004; Padela & Heisler, 2010).

Given the importance of studying depression among Arab Americans, it is surprising that no research publications could be found related to the validation of depression measures for this population. In most studies, researchers used measures that were developed for other groups, without confirming whether the instruments demonstrated similar psychometric properties for the Arab American samples. Moreover, almost all of the adult Arab American mental health literature to date has focused on immigrants, with the second generation – in other words, those who were raised in the USA by immigrant parents – largely ignored. Second-generation Arabs are at a unique intersection between traditional and new cultures. Because they were raised in the USA, they would not be expected to show the same measurement properties on depression scales validated for Arabs residing in the Middle East. At the same time, despite their experience of being raised in the USA, it cannot be assumed that they would show the same measurement properties on depression scales validated for the mainstream European-American population. Exploring the psychometric properties of scales such as depression may shed light not only on the functioning of the scales themselves but also how the construct of depression may uniquely experienced by this group. As research expands on the Arab minority in the USA, it is anticipated that more work will be conducted with the second generation, making it more important to ensure that a useful measure of depression is available. Given these concerns, this study sought to contribute to the literature by examining the use of a depression questionnaire for second-generation Arab Americans.

Perhaps one of the most promising measures for use with this population may be the Center for Epidemiologic Studies Depression Scale (CES-D: Radloff, 1977), which is one of the most widely used depression scales. Unlike measures such as the Beck Depression Inventory (Beck, Ward, Mendelson, Mock, & Erbaugh, 1961) and Zung Self-Rating Depression Scale (Zung, 1965), which were developed for clinical populations and can be used for clinical intake assessments and monitoring depressive illness over time, the CES-D was introduced to specifically assess frequency of depressive symptoms in community samples (Radloff, 1977; Shaver & Brennan, 1991). This makes it a more relevant measure for the predominantly community-based literature on Arab American mental health. The 20-item scale emphasizes depressed mood or affect rather than the severe physiological symptoms associated with clinical depression.

Acceptable-to-excellent psychometric properties have been reported for the CES-D for many ethnic minority groups, including African Americans (e.g.

Makambi, Williams, Taylor, Rosenberg, & Adams-Campbell, 2009; McCallion & Kolomer, 2000; Rozario & Menon, 2010), Native Americans (e.g. Dick, Beals, Keane, & Manson, 1994), Hispanics/Latinos (e.g. Leykin, Torres, Aguilera, & Muñoz, 2011) and Asian Americans (e.g. Edman et al., 1999; Li & Hicks, 2010). For example, Falcon and Tucker (2000) reported internal consistency reliabilities ranging from .88 to .90 in a sample of Latinos, and a Cronbach's alpha of .82 was found in a sample of Native Americans (Manson, Ackerson, Dick, Baron, & Fleming, 1990). Prescott and colleagues (1998) found the CES-D to have predictive validity for screening depression among Native Hawaiians and other ethnic minority groups, while Noh, Avison and Kaspar (1992) found it to have content, construct and concurrent validity for Korean immigrants to Canada.

Although there is thus general consensus in the literature that the CES-D has reliability and validity for diverse ethnic groups, inconsistencies have been reported regarding its factor structure. The original factor structure of the CES-D yielded a four-factor solution consisting of Positive Affect, Depressed Affect, Somatic and Retarded Activity and Interpersonal Troubles in a sample of White participants (Radloff, 1977). This four-factor solution was confirmed in a meta-analysis of 28 exploratory factor analysis or principal components analysis studies (Shafer, 2010). In studies utilizing confirmatory factor analysis, a four-factor structure has been supported, including among older American and Canadian individuals (Hertzog, Van Alstine, Usala, Hultsch, & Dixon, 1990), African American and European American homeless individuals (Wong, 2000), African American women (Williams et al., 2007) and Mexican Americans (Golding & Aneshensel, 1989). On the other hand, when the number of factors was not specified or hypothesized (e.g. exploratory factor analysis) there was more variability in the number of factors that emerged for ethnic minority groups.

For example, Edman and colleagues (1999) reported a two-factor structure in a sample of Filipino-American adolescents in which depressed affect, somatic-retardation and interpersonal items all loaded on one factor and the positive affect items loaded on a second factor. Guarnaccia, Angel and Worobey (1989) found a three-factor solution using exploratory factor analysis for Mexican Americans, Cuban-Americans and Puerto Ricans samples in which affective and somatic items were combined and loaded on the same factor. Even with similar factor structures, ethnic groups may show subtle differences. For example, in Roberts' (1992) study, a three-factor solution was found for European American, African American and Hispanic American respondents, labelled as negative affect, positive affect and somatic symptoms. However, for the Hispanic group the somatic symptoms tended to cluster together with negative affect. Many other configurations of factor structures have been reported for diverse ethnic groups. For example, in a study on Cuban Americans, an uninterpretable five-factor solution emerged (Crockett, Randall, Shen, Russell, & Driscoll, 2005).

To date, there is no published research on the factor structure or overall psychometric properties of the CES-D with second-generation Arab Americans, or even Arab Americans in general. However, two studies have been conducted using an Arabic translation of the CES-D with Arabs residing in the Middle East. In a community sample of Lebanese adults, Kazarian and Taher (2010) reported a two-factor solution: mixed depressive affect (including negative affect, interpersonal symptoms and somatic symptoms) and lack of positive affect. The authors also reported internal consistency reliability of .84. On the other hand, a study of female

young adults living in the United Arab Emirates reported a three-factor solution (Ghubash, Daradkeh, Al Naseri, Al Bloushi, & Al Daheri, 2000). The three components were interpersonal sensitivity, mixed affective and somatic symptoms and positive affect. The authors concluded that the young Arab women express their depression in both somatic and emotional symptoms but experience the two as one unity. Additional measurement properties were reported by the authors. The test's inter-item, split-half and test-retest reliabilities were .88, .83 and .59, respectively. Based on receiver-operating-characteristic procedures, the authors suggested that a cut-off score of 21 best balanced between sensitivity and specificity of the instrument in discriminating between depressed and non-depressed individuals.

Both these examinations of the CES-D with Middle Eastern samples reported a factor structure in which somatic and affective symptoms overlapped, unlike a separation of the two as has been documented for European Americans. This illustrates how peoples of diverse cultures may experience their depression differently. Similar to Asian cultures, the somatic expression of depressive illness has been found to be a common phenomenon for Arabs in the Middle East (Al-Krenawi & Graham, 2000). Kazarian and Taher (2010) argued that this conflation of affect and soma is due to the influences of Arab collectivistic cultures on shaping an interdependent self-construal in which mind and body are interrelated. This differs from the mind-body duality promoted in European culture. As discussed by Ghubash and colleagues (2000), other hypotheses are evolutionary (i.e., the ability to articulate affect and differentiate affective from somatic expressions is limited in less developed societies) and cross-cultural (i.e., there are different norms for depression, with somatization of affect being the norm in some cultures and psychologization of depression emerging only recently in European cultures). Based on these theories, it would be expected that depressive experiences may evolve as a result of the acculturation process. For example, Iwata and Roberts (1996) posited that as persons immigrate and acculturate to Western society, the somatic expression of their depressive symptomatology may decrease as they become more similar to the mainstream population.

The purpose of this study was to examine the reliability and factor structure of the CES-D in a sample of second generation Arab-Americans, including the question of whether they would demonstrate either a conflation between negative affect and somatic symptoms like Arabs in the Middle East or a pattern more consistent with European Americans. Based on the theories and findings discussed above (e.g. Ghubash et al., 2000; Iwata & Roberts 1996; Kazarian & Taher, 2010), we expected the second generation to demonstrate a pattern more similar to the dominant American culture. We defined the second generation as those who were born and raised in the USA or those who arrived by the pre-school age of five. This age cut-off was based on arguments by Rumbaut (2004) that children who immigrate below age six show acculturation experiences similar to the second generation – they speak English without an accent and may not remember their culture of origin.

Methods

Participants

A total of 119 individuals who self-identified as second-generation Arab American participated in this study. Approximately 34% ($n = 40$) of participants reported being

male and 66% ($n = 79$) were female. Ages ranged from 18 to 46, with a mean age of 24.9 ($SD = 6.5$). The majority of the sample was single, never married (73.9%, $n = 88$) and nearly a fourth were married (23.5%, $n = 28$). In terms of religion, approximately 35% ($n = 42$) reported being Christian, whereas 55% ($n = 65$) reported being Muslim. The remaining participants defined themselves with other religious affiliations (e.g. Druze, agnostic). Participants resided in 20 USA states, with the largest percentages living in California (21.8%), Texas (21.8%) and Michigan (16.0%). Parents of the participants came from 11 different Arab states, the most represented being Egypt, Lebanon and Palestine.

Instrument

The CES-D consists of 20 symptoms. Respondents are instructed to rate the frequency of experiencing these symptoms during the past week. There are four possible choices, ranging from 1 = 'rarely or none of the time (less than one day)' to 4 = 'most or all of the time (five–seven days)'. Four items are reverse scored. The respondent's answers are summed for a possible score range of 20 to 60.

Radloff ([1977]) used a probability sample of adults in Missouri and Maryland as the first normative sample, and two more surveys in which the original test questionnaire was altered and shortened. She reported split-half reliability to range from .76 to .77 for these three community samples, with the Spearman-Brown corrected reliability ranging from .86 to .87. Coefficient alpha reliability ranged from .84 to .85. Test-retest reliabilities ranged from .67 at four weeks to .32 at 12 weeks (Shaver & Brennan, [1991]). With respect to validity, Radloff reported moderate correlations between the CES-D and self-report measures of depression and depressed mood such as the Bradburn Negative Affect measure. There was also a positive correlation with number of negative life events experienced in the previous year. Further research has shown the CES-D to correlate highly with the Beck Depression Inventory (.81) and The Self-Rating Depression Scale (.90) (Shaver & Brennan, [1991]). The factor structure of the CES-D as reported by Radloff is presented in the literature review above.

Although the CES-D was designed primarily for community samples, Radloff ([1977]) also conducted clinical validation studies in psychiatric facilities, with the argument that since the measure is based on symptoms of depression it should nevertheless be sensitive at assessing different levels of depression symptomatology and distinguishing between patients and non-patients. She found that the CES-D discriminated between normal and psychiatric samples as well as among levels of severity within the patient groups. She suggested a cut-off score of 16 to indicate clinically significant depression (i.e., caseness) – 21% of non-patients reported a score higher than 16. In her validation study of 70 inpatient psychiatric residents in Maryland, 70% obtained a score above 16 and, in another study of 35 outpatient psychiatric respondents in Connecticut, all obtained a score of 16 and above.

Procedures

This study was approved by the ethics board of The University of Toledo, Ohio. Criteria for inclusion were: (1) age 18 or above, (2) at least one parent of Arab national origin and (3) birth in the USA or immigration to the USA before the age of six. These eligibility criteria were clearly stated on the consent form. To ensure that

participants were second-generation, the survey additionally provided definitions for first (i.e., immigrant) through fourth or subsequent generational statuses and required the participant to indicate which description most accurately matched their status. For further verification, participants were asked if they were born in the USA, arrived before the age of six or arrived at the age of 6 or above.

Non-probability convenience and chain referral sampling were used for recruitment, with potential participants contacted primarily via electronic announcements sent to individual contacts, Arab cultural centers, churches, student organizations and Internet groups. This email invitation included a link to the survey website, which could be accessed without a password from any computer with Internet access. The invitation encouraged forwarding of this link to other potential respondents. Participants reported that they learned of the study through a personal acquaintance (43%), listserv for an Arab university organization (31%), other Internet group or web posting (14%) or other methods such as listservs of Arab cultural centers. Participants consented to the study and completed the questionnaire at an Internet website. In addition to the CES-D and demographic characteristics, participants completed other measures unrelated to this study such as family functioning and intrinsic religiosity. These measures were similarly being examined for their psychometric properties.

Data analysis

Data were analyzed using a variety of methods. First, one-sample *t*-tests were used to compare the current sample with means from previous studies. Second, an independent samples *t*-test was utilized to compare females and males in the current sample. Reliability estimates were calculated using Cronbach's alpha. A principal components factor analysis using a Varimax rotation with Kaiser Normalization (maximum likelihood extraction) procedure was conducted to assess factor structure in the current sample.

Results

Table 1 presents means and standard deviations of CES-D scores from this study and previous studies. The mean CES-D score in the current study was 15.0 ($SD = 10.18$). Using one-sample *t*-tests, it was found that this mean was significantly higher than mean scores reported in Radloff's two original standardization samples ($t = 6.16$, $p < .001$; $t = 7.31$, $p < .001$). There was no significant difference between the current mean score and mean scores found in Ghubash and colleagues' (2000) study of Arab females living in the United Arab Emirates. On the other hand, the mean score in the present study was significantly lower than that of Kazarian and Taher's (2010) sample of Lebanese adults: $t = -3.43$, $p = .001$.

A two-tailed independent samples *t*-test was additionally conducted to compare male and female participants in the current study. Although male participants presented with generally higher levels of depression, the difference was not significant.

Radloff (1977) suggested a cut-off score of 16 to indicate clinically significant depression, while, as discussed above, Ghubash and colleagues (2000) recommended a more conservative cut-off score of 21 based on their study of females in the United

Table 1. Mean CES-D scores in current study compared to previous studies.

Study and sample characteristics	*n*	Mean	*SD*	*t*	*p*
Within sample comparisons					
Gender				1.75	.08
Male	40	17.28	10.37		
Female	79	13.85	9.96		
Religious affiliation				−.25	.80
Christian	42	14.81	10.92		
Muslim	65	15.31	9.76		
Total	119	15.0	10.18		
Comparison to previous studies					
Radloff (1977)					
Probability sample: White Americans in Missouri and Maryland	2514	9.25	8.58	6.16	< .001
Standardization sample: White Americans in Maryland	1060	8.17	8.23	7.32	< .001
Re-interview (retest) of probability sample	1422	7.94	7.53	7.56	< .001
Ghubash et al. (2000)					
Female young adults in United Arab Emirates	350	15.5	9.9	−.54	.59
Kazarian and Taher (2010)					
Adults in Lebanon	435	18.2	9.7	−3.43	.001

Arab Emirates. In the current study, 41.2% of the participants obtained a CESD-D total score above 16 and 26.1% scored above 21.

Reliability and factor structure of the CES-D

To assess internal consistency reliability of the CES-D, Cronbach's test was conducted. The reliability coefficient was .90, which is consistent with previous findings (Shaver & Brennan, 1991).

Principle components factor analysis was conducted to explore dimensionality of the 20-item CES-D scale. Five factors were initially extracted with eigenvalues above 1.0. Based on the scree plot, three-factor and four-factor solutions were also considered. The three-, four- and five-factor solutions were evaluated using a Varimax rotation with Kaiser Normalization (maximum likelihood extraction) procedure. The forced five-factor solution had one factor consisting of only one item. The four-factor solution did not yield interpretable results, with only one item loading singly on the fourth factor and several items loading on more than one factor. The three-factor solution was chosen as the most elegant solution (see Table 2). The first factor accounted for 20.60% of the variance, with Factors 2 and 3 accounting for 12.21% and 10.79%, respectively.

The first factor was titled 'Clinical symptoms' because it consisted of items relating to affective and physiological symptoms of depression such as sadness, difficulty concentrating, anhedonia and restless sleep. The item 'did not feel like eating' was retained on the first factor despite its lower loading (.256) because it conceptually fit with clinical symptoms although it was poorly functioning. Further CES-D research with second-generation Arab Americans should explore the functioning of this item to determine if it should be modified or even dropped from the scale. The second factor was named 'Positive mood' as it included four reverse-scored items that assessed happiness and hopefulness. The third factor,

Table 2. Factor structure of the CES-D scale.

Item	Factor structure			Item characteristics	
	Factor 1 'Clinical symptoms'	Factor 2 'Positive mood'	Factor 3 'Interpersonal symptoms'	Item Mean (*SD*)	Item total scale correlation
Felt depressed	**.693**	.445	.193	.87 (.89)	.77
Felt lonely	**.683**	.221	.225	.94 (.99)	.66
Could not shake off blues	**.670**	.205	.165	.69 (.94)	.64
Could not get going	**.670**	.116	.240	.72 (.93)	.64
Felt sad	**.606**	.266	.429	.89 (.95)	.73
Trouble keeping mind on tasks	**.588**	.063	−.078	1.1 (.97)	.41
Felt fearful	**.548**	.110	.181	.67 (.85)	.53
Thought life had been failure	**.457**	.104	.149	.33 (.67)	.44
Had crying spells	**.427**	.050	.352	.41 (.81)	.46
Sleep was restless	**.405**	.195	.334	1.0 (1.05)	.54
Everything was an effort	**.367**	.150	.116	.97 (.93)	.37
Did not feel like eating	**.256**	.106	.214	.45 (.71)	.33
Enjoyed life (R)	.191	**.827**	.056	.91 (.86)	.51
Was happy (R)	.262	**.711**	.096	.98 (.81)	.53
Felt hopeful about future (R)	.145	**.594**	.130	.94 (.96)	.41
Felt I was as good as others (R)	.066	**.520**	.281	.62 (.81)	.41
People were unfriendly	.013	.183	**.849**	.45 (.73)	.43
People disliked me	.324	.134	**.559**	.39 (.71)	.53
Talked less than usual	.397	.308	**.421**	.89 (.89)	.61
Bothered by things	.337	.097	**.354**	.78 (.96)	.43

Note: Items denoted with a (R) were reverse coded; inter-item correlations were conducted and no inter-item correlation was found to be redundant (i.e., correlation greater than .85).

'Interpersonal symptoms', consisted of items relating to external symptoms of depression such as interpersonal difficulties and being bothered by things.

Discussion

In this study, the reliability and factor structure of the CES-D was examined in a group of second-generation Arab-Americans. The CES-D demonstrated high internal consistency reliability (alpha = .90). Factor analysis was conducted to examine the underlying structure of the scale. Three factors were produced. The first, 'Clinical symptoms', included classic symptoms of depression such as sadness, loneliness, difficulty concentrating, anhedonia, sleep disturbance and appetite disturbance. The second factor, 'Positive mood', related to reduced positive affect such as happiness, optimism and self-confidence and contained the same four items that emerged as the 'Positive affect' factor in Kazarian and Taher's (2010) study. The third factor, 'Interpersonal symptoms', consisted of items that reflected difficulties such as interpersonal tension, poor motivation to interact with others and irritation with external events or 'things.'

The overlap of affective and physiological symptoms on the Clinical Symptoms factor was of interest. This finding been repeatedly demonstrated in studies with

other ethnic groups (e.g. Dick et al., 1994; Edman et al., 1999; McCallion & Kolomer, 2000) and it is also consistent with the tendency for Arabs to present negative emotions through somatic complaints (Al-Krenawi & Graham, 2000). On the other hand, assuming that second-generation Arab Americans are more acclimated to USA culture than their first-generation counterparts, a pattern more similar to the mainstream culture would have been expected, such as separation of somatic and affective symptoms (c.f., Iwata & Roberts, 1996). The results of the current study did not provide support for this contention. Because the current study did not directly measure acculturation, results should be interpreted with caution. Future studies should assess acculturation directly and examine why second-generation Arab Americans approximated depression patterns more similar to immigrants or Arabs in the Middle East rather than the mainstream American population.

A question that emerged through the course of this study was that of which cut-off score to use as the marker for clinical caseness. Radloff (1977) initially proposed a total CES-D cut-off score of 16 to indicate clinical depression. This cut-off has been supported for other ethnic groups. For example, in a study of Chinese women, a caseness cut-off of 16 showed 100% specificity and 76% specificity (Li & Hicks, 2010). Expected normative caseness rates are about 20% and this was found in studies using the CES-D 16-point cut-off (Alderete, Vega, Kolody, & Aguilar-Gaxiola, 1999; Radloff, 1977). However, Ghubash and colleagues (2000) recommended a more conservative cut-off score of 21 for Middle Eastern Arabs. For the current study, 26.1% of respondents obtained a total score at or above 21, whereas almost half (41.2%) had scores above 16. Ghubash's suggestion of 21 as the cut-off therefore may be more appropriate. However, further studies should be conducted to determine an accurate cut-off score for the second-generation Arab Americans.

The reason for the seemingly high levels of depression on the CES-D among the Arab Americans in our sample, as well as Arabs living in the Middle East, is puzzling. Because acculturative stressors cannot explain the high scores found in the Middle East samples, this is an area that deserves further exploration. It is possible that for the current study, depressive experiences were inflated due to history effects (i.e., the socio-political stressors facing Arab Americans in the post-September 11 climate). Other potential explanations include artifacts due to small non-probability sampling or culture-specific response styles or interpretations of the questions. For example, previous authors have suggested that Arab respondents tend to select the extreme-most ends of scales (Amer, Hovey, Fox, & Rezcallah, 2008). It is therefore recommended that further investigations be conducted to determine firmer conclusions regarding the external validity of previous findings regarding the exceptionally high rates of depression among Arab Americans. If indeed depression rates are found to be higher for this population, then the specific causes should be determined.

The present study showed high reliability of the CES-D for use with second-generation Arab Americans. However, researchers using this tool for this population should consider the factor structure and caseness cut-offs when making any interpretations. Research is needed to further explore the experience and presentation of depression among Arab Americans of different generations and to evaluate other measures that can be used in research and clinical service with this population. Future studies should conduct additional psychometric analyses, such as confirmatory factor analysis and item analysis, using item response theory. It is important to note that it is typically not possible to identify people of Arab descent for probability sampling because they are classified in the USA as 'White/Caucasian'. Therefore,

larger and more diverse samples may be useful for studies aiming at greater generalizability to the population.

The socio-demographic compositions of Arab American study samples are sensitive to non-probability recruitment methods, so this should be considered in future research. For example, the present study was predominantly young, single and female. This is consistent with findings that younger persons are more represented in Internet research compared to those older in age (Gosling, Vazire, Srivastava, & John, 2004) and that females tend to respond in greater numbers to survey invitations compared to males (Wiseman, 2009). Additionally, our methods of targeting university student organizations and relevant Internet communities would have contributed to a younger sample and the researcher's female gender may have indirectly contributed to higher response rates from females. In the present study, the demographic characteristics did not appear to adversely influence the usefulness of the results. The younger age was consistent with the younger age of the Arab American community as a whole (Kulczycki & Lobo, 2001) and there was no significant difference between females and males on their depression scores. However, future studies can try to oversample men if a more even gender distribution is desired. Additionally, using a combination of community and Internet data collection for Arab Americans may ensure a more representative sample.

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Notes on contributors

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